How end-user participation in Financial Management Information Systems development engenders a sense of system ownership in municipalities: A case in South Africa

By

NOZIBELE PANSY GCORA-VUMAZONKE

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Supervisor: Professor Wallace Chigona

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ABSTRACT

Background: The public sector in South Africa has long been concerned with poor performance in financial management in municipalities. The Auditor-General who has a constitutional mandate to audit government departments highlighted challenges in financial management facing the municipalities. The challenges include lack of compliance with the legislation of municipal financial management, weak audit outcomes, financially unqualified financial statements, mismatch in produced financial statements, missing reports regarding performance, incomplete disclosure in financial authorisation and unauthorised and waste expenditure. To overcome these challenges, the government introduced the Financial Management Information Systems (FMIS) to municipalities in South Africa to support budget preparation and implementation, accounting and reporting, performance monitoring and auditing and evaluation. However, FMIS have not reached widespread use and in the majority of municipalities required re-implementation. Employees are concerned that FMIS are not aligned with their work processes. Lack of sense of ownership towards FMIS is the contributing factor to end-users being reluctant to use FMIS. It was noted that end-users of FMIS were not given a chance to take control and contribute to the development of FMIS for their municipalities.

Objective: Previous research posits that the degree of end-user's sense of ownership towards a system that they use in the workplace positively correlates to their level of involvement in the development process of the system. Employees in government departments such as municipalities are not usually involved or participate in the system development process. Sense of ownership towards the system is expected to arise when end-users participate in the system development process of the system. End-users may perceive that they have influence and control during the development of the system and thereby develop a sense of ownership about the system when it is ready for use. The study, therefore, investigated how end-user participation in system development engenders a sense of ownership among end-users of FMIS in municipalities.

Method: The study was qualitative, deductive, followed the interpretive research epistemology and drew on a theory of psychological ownership as a theoretical lens, to analyse how end-user participation in FMIS development engenders a sense of ownership. A case study of the Western Cape Province focusing on two local and two

district municipalities was considered as a representation of a South African context. Data was collected through semi-structured interviews, observations of end-users during co-design sessions of FMIS development and document analysis. Thematic data analysis was appropriate for the study.

Findings: Findings showed that end-users were excluded through the waterfall system development model used for FMIS development. The FMIS development was a top-down approach in which strategic decisions regarding the implementation of FMIS were made from the executive top management of the National and Provincial Treasury departments. The communication about the development was between National Treasury, Provincial Treasury and the system development team. Although end-users were provided training before using the system, they were concerned that the systems were not aligned with their work processes.

It was evident that end-user participation in project initiation, system requirements specifications and system design specifications phases could enable end-users to gain a sense of ownership in the form of a sense of responsibility through problem-solving and decision-making, meaningfulness through collective learning during participation and locus of control through shared leadership. End-users revealed that the more they contribute to the development, they learn new skills, feel psychologically empowered and boost their confidence towards FMIS. End-users emphasised that shared leadership during end-user participation is likely to have an influence on how the system is developed to suit work processes. However, findings showed that end-user participation in organisations with complex structures such as municipalities could be hindered by a myriad of factors. Standardisation and lack of stakeholder collaboration, complex job-design and leadership-style approach across tiers of government have been stated by end-users as factors that may hinder the effectiveness of end-user participation in system development in municipalities.

Originality/contribution: The theoretical contribution of the research emerges from the use of the theory of psychological ownership to investigate end-user participation to engender an end-user's sense of ownership towards FMIS. There is a lack of evidence-based studies in developing countries focusing on the end-user perspectives regarding factors affecting poor uptake of information systems in the public sector. To address this gap, this study made a descriptive contribution to the

concept of a sense of ownership. There is a dearth of studies examining how end-users of information systems in government departments in developing countries can be empowered through a sense of ownership to enhance the use and acceptance. In response to this research gap, this study focuses on the concept of end-user participation and contributes to the body of IS knowledge by examining the end-user participation approach as a systems development strategy to engender a sense of ownership to end-users of information systems in government departments.

Keywords: Municipalities, financial management, FMIS, end-user participation, system development, sense of ownership

CONTENTS

DECLARATION ..... **iii**
ACKNOWLEDGEMENTS ..... **iv**
ABSTRACT ..... **v**
CONTENTS ..... **viii**
LIST OF FIGURES ..... **xv**
LIST OF TABLES ..... **xvi**
PUBLICATIONS RELEVANT TO THIS STUDY ..... **xviii**
LIST OF ACRONYMS ..... **xix**
GLOSSARY OF TERMS ..... **xx**

Chapter 1: Introduction of the study

1.0. Introduction 1
1.1. Context overview of the study 1
1.2. Background to the study 4
1.3. The research problem of the study 6
1.4. Research questions and objectives 7
1.5. The research approach 10
1.6. The potential contribution of the study 11
1.7. Assumptions and delimitations 12
1.8. Explanations of key terms used in the study 13
1.9. The organisation of the chapters 14

Chapter 2-The background: Context of FMIS in municipalities in South Africa

2.0. Introduction 16
2.1. The description of municipalities in South Africa 16
2.2. Types of municipalities in South Africa 19
2.2.1. Metropolitan Municipalities 20
2.2.2. District Municipalities 21
2.2.3. Local Municipalities 21
2.3. Financial Management in municipalities 22
2.3.1. Financial management policies and regulations for municipalities 23
2.3.2. The role of Auditor-General in municipal financial management 24
2.4. Challenges of financial management in municipalities 24
2.4.1. Municipalities' failure to attain clean audit outcomes 25
2.4.2. Non-compliance with the legislation of financial management and internal controls in municipalities 27
2.4.3. Poor governance on expenditure in municipalities 28
2.5. An intervention of FMIS for municipalities 28
2.6. Summary of the chapter 31

Chapter 3: Literature review

3.0. Introduction 32
3.1. The sense of ownership 32

3.1.1. Experienced control towards the target 34
3.1.2. Knowing the target intimately: know how the system operates 34
3.1.3. Investment of the self into the target 34
3.2. Forms of sense of ownership 35
3.2.1. A sense of ownership in the process 35
3.2.2. A sense of ownership in the outcome 35
3.2.3. A sense of ownership in distribution 36
3.3. Information systems as a target of a sense of ownership 36
3.4. Degree of sense of ownership in low-level public sector organisations 39
3.5. Information systems development process 40
3.6. End-user involvement 42
3.7. End-user participation 44
3.7.1. Approaches to end-user participation 45
3.7.1.1. Participatory design 45
3.7.1.2. User-centred design 46
3.7.1.3. Co-designing 47
3.7.2. Dimensions of end-user participation 48
3.7.2.1. Forms of participation 49
3.7.2.2. Degree of participation 49
3.7.2.3. Content of participation 50
3.7.2.4. Extent of participation 50
3.7.2.5. Formality of participation 51
3.7.2.6. Influence of participation 51
3.7.3. Relationship between end-user participation in the SD process and system use 51
3.7.3.1. Overall responsibility and hands-on activities 52
3.7.3.2. End-user and information system relationship 52
3.7.3.3. Positive attitudes towards the system 53
3.7.3.4. System impact and system use 54
3.8. Relationship between end-user participation and sense of ownership 55
3.8.1. Sense of ownership and perceived ease of use 55
3.8.2. Sense of ownership and perceived usefulness 56
3.8.3. Sense of ownership and continuance intentions 57
3.9. Research gap in the literature 57
3.9.1. End-user participation in information systems' development in the public sector 57
3.9.2. Dearth of studies in IS discipline focusing on the influence of end-user participation on a sense of ownership for end-users 58
3.10. Summary of the chapter 59
Chapter 4: Theoretical background

4.0 Introduction 60
4.1. The psychological ownership perspective in the study 60
4.2. Justification for selecting a theory of psychological ownership 61
4.2.1. Theories of information systems adaptation 62
4.2.2. Theories for social and socio-technical perspective 63
4.3. Theory of psychological ownership 64
4.4. Paths through which a sense of ownership emerges 65
4.5. Adopted framework for the development of a sense of ownership 67
4.5.1. Mechanisms to build a sense of ownership 68
4.5.2. Relational dynamics to build a sense of ownership 70
4.5.3. Behavioural determinants of a sense of ownership 71
4.5.4. Effects and outcomes of a sense of ownership 72
4.5.5. Contextual factors affecting the development of a sense of ownership 73
4.6. Application of the theory of psychological ownership in IS 73
4.7. Research critiques and limitations of the theory of psychological ownership 75
4.8. Summary of the chapter 76

Chapter 5: Research methodology

5.0. Introduction 78
5.1. Philosophical foundations 78
5.1.1. Ontological assumptions 79
5.1.2. Interpretive epistemology 80
5.2. Qualitative research method 82
5.3. Approach to theory 84
5.4. Research Design 85
5.4.1. Case study design 85
5.4.2. Rationale for a single case study design 86
5.4.3. Rationale for selecting the case of Western Cape province 87
5.4.4. Unit of analysis 88
5.5. Sampling of respondents 89
5.5.1. Purposive sampling 89
5.5.2. Demographic characteristic of respondents 92
5.6. Data collection methods 94
5.6.1. Semi-structured interviews 95
5.6.1.1. Research instruments for semi-structured interviews 96
5.6.1.2. Interview process 99
5.6.2. Co-designing simulation sessions 100
5.6.2.1. Participants of co-designing sessions 100
5.6.2.2. Co-designing activities of FMIS development 101
5.6.2.3. Observations of participants during co-designing sessions 102
5.6.3. Documents analysis 103

5.7. Data analysis 105
5.7.1. Data preparation 105
5.7.2. Data coding 105
5.7.3. Thematic analysis 106
5.8. Validity and reliability 107
5.8.1. The validity of the study 107
5.8.2. Reliability of the study 108
5.9. Ethical considerations 109
5.10. Summary of the research methodology 110

Chapter 6: The development of FMIS in the selected municipalities

6.0. Introduction 111
6.1. Background of Western Cape municipalities in the study 111
6.2. FMIS and financial management in the municipalities 113
6.2.1. Accounting and reporting weaknesses 114
6.2.2. Internal controls and financial accountability in the municipalities 114
6.3. The development of FMIS in the municipalities 115
6.3.1. The SDLC model for FMIS in municipalities 115
6.3.2. The role of different stakeholders in the development of the FMIS 117
6.3.3. Communication during the FMIS development 118
6.3.4. Training of end-users of FMIS 120
6.4. Challenges with the FMIS development for municipalities 121
6.4.1. Ability to implement changes to FMIS 121
6.4.2. Level of end-user engagement during FMIS development 121
6.5. The use of FMIS in municipalities 122
6.5.1. Attitudes towards FMIS for municipalities 122
6.5.2. Degree of use of FMIS 123
6.5.3. Passive resistance towards FMIS in municipalities 123
6.5.4. Covert resistance towards FMIS 124
6.6. Summary of the chapter 125

Chapter 7: End-user participation to engender a sense of ownership

7.0. Introduction 126
7.1. Outcomes of the co-designing sessions 126
7.1.1. Session 1: Project initiation of the system 126
7.1.2. Session 2: System requirements specifications 129
7.1.3. Session 3: System design specifications 132
7.2. Mechanisms of end-user participation on end-users' sense of ownership 135
7.2.1. Locus of control 135
7.2.1.1. Shared leadership between end-users and the SD team 136

7.2.1.2. Sense of authority during FMIS development 137
7.2.2. Knowledge of the results 137
7.2.2.1. Attitude of end-users and SD team 138
7.2.2.2. Critical awareness of the operability of the system 139
7.2.3. Self-Investment 139
7.2.3.1. Quality Assurance of FMIS 140
7.2.3.2. Future Use Intentions of FMIS 140
7.3. Relational Dynamics of end-user participation on end-users' sense of ownership 141
Perceived usefulness 141
7.3.1. Belongingness and self-identity 142
7.3.1.1. Linkages between the end-user, municipality and FMIS itself 142
7.3.1.2. Linkages between end-users and the SD team 143
7.3.2. Perceived Usefulness 143
7.3.2.1. Competence and system use and acceptance 144
7.3.3. Self-Efficacy 145
7.3.3.1. System Skills during the SD process of FMIS 145
7.3.3.2. Tacit Knowledge Management 145
7.4. Behavioural determinants of end-user participation on end-users' sense of ownership 146
Patterns of involvement 147
7.4.1. End-users' initiatives and contributions 147
7.4.1.1. Self-Confidence 147
7.4.1.2. Self-Worth 148
7.4.2. Patterns of Involvement 148
7.4.2.1. Conflict Management 149
7.4.2.2. Workflow 150
7.4.3. Patterns of usage 151
7.4.3.1. Compliance with the system 151
7.4.3.2. Work Ethic and Teamwork 151
7.5. Outcomes of end-user participation on end-users' sense of ownership 152
7.5.1. Experienced Meaningfulness 152
7.5.1.1. Sense of meaning during project initiation 152
7.5.1.2. Sense of meaning during requirements specifications of FMIS 154
7.5.1.3. Sense of meaning during design specifications 155
7.5.1.4. Continued learning and self-development during the stages of FMIS development 156
7.5.2. Experienced sense of responsibility 158
7.5.2.1. Problem-Solving 158

7.5.2.2. Decision-Making 159
7.5.3. Accountability 160
7.5.3.1. End-User Expectations 160
7.5.3.2. Municipal Consequence Management 161
7.6. Contextual factors that may hinder end-user participation in municipalities 162
7.6.1. Structural conditions 162
7.6.1.1. Standardisation and lack of stakeholder collaboration across three tiers of government 163
7.6.1.2. Top-down approach and complex job-design across tiers of government 163
7.6.2. Cultural Aspects 164
7.6.2.1. Leadership style approach across three tiers of government 164
7.6.2.2. Political interference across the three spheres of government 165
7.7. Summary of the Chapter 166

Chapter 8: Discussion of the research findings

8.0. Introduction 167
8.1. How the system owners exclude the end-users from the implementation of FMIS 167
8.1.1. Top-down approach in the SD process of municipal FMIS 168
8.1.2. Communication during the SD process of FMIS 170
8.1.3. Training of end-users before using the system 172
8.2. End-users' reactions to not being involved in the implementation of FMIS 173
8.2.1. Passive resistance 174
8.2.2. Covert passive resistance 175
8.2.3. Individual Adoption of FMIS 176
8.3. The development of a sense of ownership through end-user participation in the SD process of FMIS 178
8.3.1. Sense of responsibility during end-user participation in the SD stages of FMIS 179
8.3.2. Experienced meaningfulness through collective learning during the SD process 180
8.3.3. Sense of control through shared leadership during the SD process of FMIS 182
8.4. The hindrances of end-user participation in the SD process in municipalities 183
8.4.1. Standardisation and lack of stakeholder collaboration across tiers of government 184
8.4.2. Complex job-design across tiers of government 185
8.4.3. Leadership style approach across tiers of the government sector 186
8.5. Main research question of the study 187
8.6. Summary of the chapter 190

Chapter 9: Conclusions

9.0. Introduction 191
9.1. Summary of problem statement and objective 191
9.2. Recap of the research design 193
9.3. Summary of the research findings 194
9.4. Contributions of the study 196

9.5. Limitations of the study 198
9.6. Recommendations 199
9.7. Suggestions for future research 201
9.8. Self-reflection and final word 202
References 205

APPENDIX "X"

Appendix A: Ethics Approval Letter 236
Appendix B: A letter seeking permission to conduct the study 237
Appendix C: Authorisation to conduct the study in Western Cape Government departments 239
Appendix D: Participant Consent Form 240
Appendix E: Interview instrument for the project manager of FMIS development 241
Appendix F: Interview instrument for end-users of FMIS in municipalities 242
Appendix G: Interview instrument for the SD team involved in FMIS development for municipalities 247
Appendix H: Co-designing sessions 248

LIST OF FIGURES

Figure 1-1: Challenges of financial management in municipalities in South Africa from 2013 until 2019 (Auditor-General South Africa, 2019; Makwetu, 2019).....3

Figure 2-1: Tiers of government in South Africa (Zulu, 2014).....17

Figure 2-2: Pillars of financial management for municipalities (Farvacque-Vitkovic & Kopanyi, 2014).....22

Figure 2-3: Processes of FMIS for municipalities in South Africa (National Treasury, 2018) 30

Figure 3-1: Forms of user involvement (Imahanyehor, 2011; Zhang et al., 2015).....43

Figure 3-2: End-user participation in the system development process (Holgersson, 2014).....45

Figure 3-3: Relationship between end-user participation in the SD process and system use (Ju, Wei, & Tsai, 2016).....51

Figure 3-4: An illustration of the relationship between end-user participation, sense of ownership about the system use (Yim, Moses, & Azalea, 2017).....55

Figure 4-1: Paths through which a sense of ownership emerges (Pierce et al., 2001).....66

Figure 4-2: The development of a sense of ownership (Pierce et al., 2009; Avery et al., 2009; Rey-Moreno et al., 2015).....68

Figure 5-1: The process of data collection of the study.....94

Figure 6-1: The influence of stakeholders in the development of FMIS.....118

LIST OF TABLES

Table 1-1: Research sub-questions and corresponding objectives.....9

Table 2-1: Description of municipalities as constituted Constitution of South Africa (Municipal Demarcation Board, 2016).....18

Table 2-2: A summary of the challenges of financial management in municipalities since 2013-2019 (Auditor-General South Africa, 2019).....25

Table 2-3: End-users of FMIS in municipalities.....30

Table 3-2: Forms of sense of ownership (Lachapelle, 2008).....35

Table 3-2: Selected studies on the influence of sense of ownership on information technologies.....37

Table 3-3: Previous studies outlining end-user influence in the development process of information systems in the public sector.....39

Table 3-4: Stages of the SDLC process.....41

Table 3-5: Comparison of end-user participation approaches (Holgersson, 2014).....48

Table 4-1: Studies that have applied the theory of psychological ownership.....74

Table 5-1: Characteristics of interpretivism (Niehaves, 2007).....79

Table 5-2: Qualitative and quantitative approaches in social research (Creswell, 2014).....83

Table 5-3: Summary of challenges of financial management facing municipalities in the Western Cape (Auditor-General South Africa, 2019).....88

Table 5-4: A sample size of respondents for the study.....90

Table 5-5: Background characteristics of end-users.....92

Table 5-6: Background characteristics of the SD team.....93

Table 5-7: Data sources and research questions.....95

Table 5-8: Structure of the research instruments for the study.....96

Table 5-9: Data gathering through co-designing sessions of system development.....102

Table 5-10: A summary of documents analysed for the study.....104

Table 5-11: Phases of thematic analysis (Braun & Clarke, 2006).....106

Table 5-12: Schematic summary of the research design.....110

Table 6-1: Characteristics of municipalities of the study (STATS SA, 2011).....111

Table 6-2: Summary of audit outcomes of the selected municipalities.....114

Table 7-3: End-users contributions during the project initiation phase.....127

Table 7-4: End-users contributions during system requirements specifications phase.....130

Table 7-5: End-users contributions during system design specifications phase.....132

Table 7-4: Mechanisms of end-user participation in relation to end-users' sense of ownership towards FMIS.....135

Table 7-5: Relational dynamics of end-user participation in relation to sense of ownership.....141

Table 7-6: Behavioural determinants of end-user participation in relation to sense of ownership.....147

Table 7-7: Outcomes of end-user participation in relation to sense of ownership.....152

Table 7-8: Contextual factors that could hinder end-user participation in municipalities...162

Table 8-6: Hindrances of end-user participation municipalities.....184

Table 9-7: Reflection on the research process.....203

PUBLICATIONS RELEVANT TO THIS STUDY

1. Gcora, N. (2017). How sense of ownership empowers Bottom-of-the-Pyramid (Bottom) ICT users in Co-Designing: A systematic review. *African Conference on Information Systems & Technology (ACIST)* (pp. 32-44). Cape Town, South Africa: ACIST proceedings.

2. Gcora, N., & Chigona, W. (2019). Post-implementation evaluation and challenges of Integrated Financial Management Information Systems for municipalities in South Africa. *South African Journal of Information Management*, 21(1), 1-12. Doi: 10.4102/sajim.v21i1.1066.

LIST OF ACRONYMS

Acronym	Explanation
AGSA	Accounting-General South Africa
COGTA	Ministry of Cooperative Governance and Traditional Affairs
FMIS	Financial Management Information Systems
GD	General Director
GUI	Graphic User Interfaces
HOD	Head of Department
ICT	Information and Communication Technology
IS	Information Systems
IT	Information Technology
LGMSA	Local Government: Municipal Systems Act
MFMA	Municipal Finance Management Act
MSCOA	Municipal Charts of Accounts
PFMA	The Public Finance Management Act
SD	System Development
SDLC	System Development Life Cycle
UCD	User-Centred Design

GLOSSARY OF TERMS

TERM	DEFINITION
Clean audit outcomes	Clean audit outcomes mean that an organisation followed accounting standards, while unqualified outcomes mean that in financial statements, misrepresentations were made and the organisation's employees did not adhere to accounting standards.
District municipalities	These are the municipalities that coordinate the development and delivery of services to citizens in the whole district.
End-user participation	This is a form of user involvement that places end-users at the centre of the system development process, usually through contributing to defining the business problem and system requirements.
End-users of FMIS	These are employees such as Budget Officers, Accounting Officers, Internal Auditors and Chef Finance Officers who use FMIS for work activities of financial management in municipalities
Financial management	This enhances efficiency, effectiveness, accountability, transparency, compliance, the security of financial data management and comprehensive financial reporting.
Financial Management Information Systems	These are financial systems to support adequate budget preparation, budget execution, monitoring and control, accountability and reporting, and preparation of auditable financial statements.
Information System development	This is a system development life cycle that consists of phases such as planning, requirements gathering and analysis, design, implementation, coding, testing, and deployment and maintenance.
Local municipalities	These are municipalities that exist under district areas. These are responsible for all local service delivery to the community. Local municipalities share service delivery responsibilities with district municipalities.
Municipalities	Municipalities are local government departments meant to provide local government services to the community. Municipalities are categorised into metropolitan, district and local municipalities.
Sense of ownership	A sense of ownership refers to a state of mind in which individuals feel that they have control over the target to ownership.

Chapter 1: Introduction of the study

1.0. Introduction

Previous research indicates that the public sector in comparison to the private sector organisations, their counterparts are still struggling to harness the productive capacity of their information systems' initiatives and the objectives, and the uptake remains largely unachieved (Kiarie & Wanyoike, 2016; Hendriks, 2018). End-user resistance towards information systems in the public sector organisations at low-level, such as municipalities, is a widespread challenge (Bennis, 2015; Ngoepe, 2016). The literature points to a myriad of reasons behind this resistance. One of the challenges is a lack of sense of ownership amongst the end-users (Gineikiene, Schlegelmilch, & Auruskeviciene, 2017). Using the case study of municipalities in the Western Cape province in South Africa, this study analysed end-user participation in Financial Management Information Systems (FMIS) development to engender a sense of ownership in municipalities. This chapter provides an overview of the study.

Section 1.1 discusses the context of municipalities in South Africa and financial management for municipalities. Section 1.2 presents the background of the study. Section 1.3 outlines the problem statement of the study. Section 1.4 summarises research questions and objectives guiding the study. Section 1.5 presents the research approach adopted for this research. Section 1.6 discusses the potential contributions of the study. The study makes both theoretical and practices contributions. Section 1.7 discusses delimitations and assumptions of the study. Section 1.8 outlines selected key terms that are used in the dissertation. Section 1.9 summarises how the chapters in the dissertation are organised.

1.1. Context overview of the study

The institutional framework of the public sector of the Republic in South Africa established in 1996 comprises of the three tiers: national, provincial and local governments (Republic of South Africa, 1998; Zulu, 2014).

- **The national government:** Departments are the top-level which are responsible for implementing policies and laws for provincial and local government departments (Jacobs, Rivett, & Chemisto, 2018).

- **Provincial government:** Departments in nine provinces in South Africa are at the middle level and deal with matters that affect their provinces (DPLG, 2010; Lodge, 2005). Each province is responsible for its provincial growth and is required to have strategies in place that focus on developing the economy and improving service delivery to citizens of the province (Munetsi, 2011; Zulu, 2014).
- **The local governments:** Also known as municipalities, these are the lowest level of the institutional framework of the public sector (Lodge, 2005).

Municipalities compared to the national and provincial governments have complex structures that are embedded in the three types of municipalities that include metropolitan, district and local municipalities (Municipal Demarcation Board, 2016). There are 257 municipalities in the country; the municipalities are divided into eight metropolitans, 44 districts and 205 local municipalities (Municipal Demarcation Board, 2016; Zulu, 2014). As amended in the constitution, municipalities are responsible to ensure that they handle their finances with integrity and achieve service delivery to their citizens (Hanabe, Taylor, & Raga, 2017).

A strong public financial management is a catalyst for economic growth and development in any country (Selfano, Peninah, & Sarah, 2014; Harelimana, 2017; Micheni, 2017). Sound financial management practices are essential for the long-term sustainability of government departments in South Africa (Botlhoko, 2017; National Treasury, 2018). These practices underpin the process of accountability and good governance in the public sector (Ngoepe & Ngulube, 2016; Khalo, 2013). Poor financial management can be a cause of misdirection of public resources and it increases the risk of corruption (Combaz, 2015). The Public Finance Act (PFMA) No.1 of 1999 is one of the significant reforms passed by democratic South Africa to promote sound financial management in the public sector (National Treasury, 2016). This also ensures that government departments are able to manage and spend public resources in an efficient and transparent way, with the aim of improving service delivery (Mazibuko & Fourie, 2013; Hendriks, 2018). In addition, the Local Government: Municipal Finance Management Act 56 of 2003 (MFMA) is also an Act to modernise municipal financial management across all municipalities in the country (Mazibuko & Fourie, 2013; National Treasury, 2018). The reforms that have been introduced by the MFMA are the cornerstone of the broader reform package for

municipalities, as outlined in the White Paper on Local Government of 1998 (Mazibuko & Fourie, 2013; Botlhoko, 2017).

In South Africa, the public sector has for a long time been concerned with the persistent poor performance of financial management in municipalities (Mazibuko & Fourie, 2013; National Treasury, 2018; Makwetu, 2019). The Auditor-General in South Africa highlighted fundamental municipal management and administration challenges (Mantzaris, 2014; Khanyile, 2016; Hanabe et al., 2017). Previous research indicates a declining pattern in the effective financial management in municipalities for the financial years such as 2013/2014, 2014/2015, 2015/2016, 2016/2017, 2017/2018 and 2018/2019 (Mantzaris, 2014; Makwetu, 2019). The challenges of financial management are summarised in Figure 1-1.

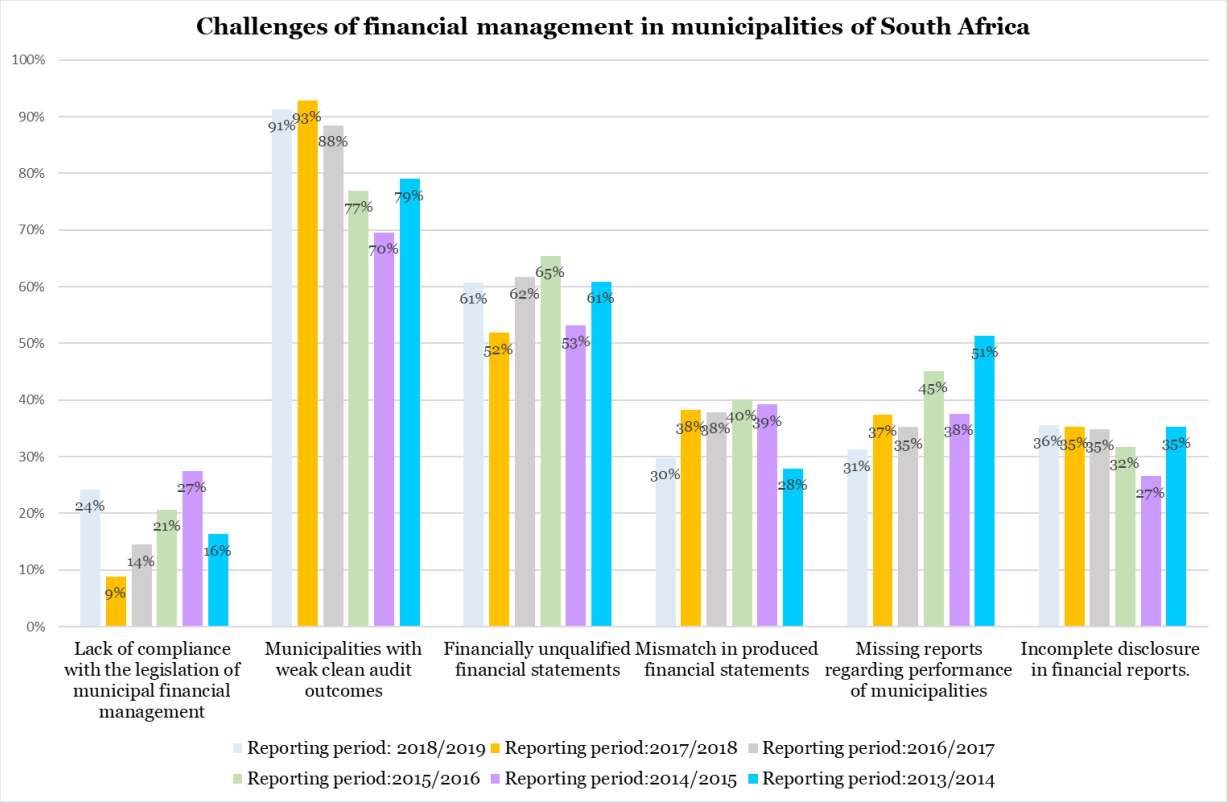

Figure 1-1: Challenges of financial management in municipalities in South Africa from 2013 until 2019 (Auditor-General South Africa, 2019; Makwetu, 2019)

The challenges of financial management facing municipalities in South Africa since 2013 include lack of compliance with the legislation of financial management, weak audit outcomes, financially unqualified financial statements, mismatch in produced financial statements, incomplete disclosure in financial statements and unauthorised, irregular, fruitless and waste expenditure (Khanyile, 2016; Sepuru,

2017; Auditor-General South Africa, 2019). Only a few municipalities in the country obtained clean audit outcomes (Mazibuko & Fourie, 2013; Mantzaris, 2014; Hanabe et al., 2017). The Auditor-General in South Africa found non-compliance with financial management regulations in municipalities, in which 90% of auditees had findings on material non-compliance with laws and regulations of municipal financial management (Mazibuko & Fourie, 2013). Since 1994, the Auditor-General reported that non-compliance deteriorated in almost all provinces of the country (Mantzaris, 2014; Combaz, 2015).

To overcome poor financial management in municipalities, the National Treasury introduced Financial Management Information Systems (FMIS) to be implemented across municipalities of the country (National Treasury, 2018). FMIS are information interventions that track financial events and support adequate budget preparation, budget execution, accounting and financial reporting, forecasting, policy decisions, fiduciary responsibilities and the preparation of auditable financial statements (Kiarie & Wanyoike, 2016; Godi, 2018). The objectives of FMIS are to enhance efficiency, effectiveness, accountability, transparency, the security of data management and a comprehensive understanding of financial reporting in municipalities in South Africa (Hendricks, 2012; Kiarie & Wanyoike, 2016; National Treasury, 2018). They are also structured to enable the National and Provincial Treasury to track municipal budget formulation, budget execution, accounting and reporting in municipalities (National Treasury, 2018). This could assist in eliminating waste and corruption in the use of public resources (Waema & Adera, 2014; Mantzaris, 2014; Combaz, 2015).

1.2. Background to the study

Despite high investments in information systems initiatives such as FMIS in government departments, these information systems interventions are experiencing low uptake by end-users, resulting in failure (Hendriks, 2018). Although FMIS have been initiated, municipalities are currently grappling with the introduction of FMIS as a tool through which financial management is achieved and show improvement (Hendriks, 2018; National Treasury, 2018). There are still challenges in the implementation and use of the FMIS in municipalities (National Treasury, 2018). Only a few of the implementations have reached widespread adoption. Further, some

municipalities require to re-implement FMIS due to poor alignment with work processes (Combaz, 2015; National Treasury, 2018). Staff still largely operate on paper-based processes of their financial reporting, even though there are financial systems being implemented to facilitate effective financial management (Ngoepe, 2015; Scholtz, Govender, & Gomez, 2016). This is due to the reluctance by the end-users to adopt and use FMIS in their financial management.

The barriers to the use and acceptance of FMIS in municipalities have been attributed to, *inter alia,* a lack of sense of ownership towards the implemented systems (Kwatsha, 2010; Ngoepe, 2015). Sense of ownership can be viewed as the feeling that an individual has over an object and how they use it. In this research, having a sense of ownership can be viewed as the feeling an end-user has over the system that he or she uses in the workplace (Pare, Sicotte, & Jacques, 2006; Barki, Pare, & Sicotte, 2008; Kirk, Swain, & Gaskin, 2015). When end-users experience a sense of ownership in a system, the chances are high that they would use the system and it would become part of their self-identity (Blau & Caspi, 2009; Baden-Fuller & Haefliger, 2013; Randel, et al., 2017). This feeling of being psychologically tied to an object such as the system has implications for technology use and acceptance (Klesel, Ndicu, & Niehaves, 2016).

Previous studies note that end-users can cultivate a sense of ownership in an organisation that they work for, through the system that they use for their work processes (Klesel et al., 2016; Talonen et al., 2018). Lack of the end-user's sense of ownership towards information systems in the public sector organisations such as municipalities stems from the lack of employee involvement in the creation of the strategic planning for the implementation of information systems for the workplace (Ngoepe, 2015). Staff members in the departments of finance in municipalities complain that they are not given opportunities to contribute to the FMIS development process. Previous research showed that end-users of technology need to feel that they have a substantial influence on the system and locus of control and thereby develop feelings of ownership. In turn, the sense of ownership will sustain the use of technology (Sehgal & Stewart, 2004; Terrapon-Pfaff et al., 2014).

1.3. The research problem of the study

The end-user's sense of ownership for the system that directly affects their work processes may arise from active participation in system development (Marks & Davis, 2012; Randel, et al., 2017; Talonen et al., 2018). The idea that end-users can develop a sense of ownership when they participate in system development has long been a principle of the end-user participation literature (Lee, Lee, & Lee, 2001; Karahanna, Xu, & Zhang, 2015; Klesel et al., 2016). End-users may perceive that they have had a substantial influence on the system and the development process, thereby developing feelings of ownership about the system when it is ready for use (Karahanna et al., 2015). Even though end-user participation in FMIS has the potential to influence the development of a sense of ownership and contribute to the widespread use and acceptance of the system, end-users in the public sector organisations such as municipalities have not participated in system development.

Research on factors affecting the use and acceptance of information systems in the public sector has mostly focused on organisational factors such as infrastructure, finance, policies and legislations. The studies have not focused on the end-user's perspective such as a lack of a sense of ownership to use the system. The previous studies have approached end-user participation in system development from the acceptance lens, developing many theories of acceptance (Davids, 1989; Rogers, 2004; Dwivedi et al., 2017). The technology acceptance of empirical contributions mostly explores adoption behaviours (Laumer, Maier, & Weitzel, 2017), leaving gaps in the literature of IS domain on the development of a sense of ownership towards technology in the public sector.

The adoption of information systems within the public sector takes time compared to the private sector; usually, it takes many years for a system to be accepted, more especially by the employees at a low level. One of the main factors hindering the uptake of the systems is user resistance, that is attributed to a lack of sense of ownership amongst the potential users (Kwatsha, 2010; Ngoepe, 2015). One of the major causes of low uptake and system failures in public sector organisations is the exclusion of staff members from decision-making of the system development that affect their work processes (Ngoepe, 2016). In many cases, the implementers develop functions that differ from the usual work processes (Holgersson, 2014). If inputs of end-users were sought throughout the implementation process, then the new system

would be unlikely to effectively handle overlooked expectations, complexities and nuances (Sutrisno, Gill, & Suseno, 2017). Hence, it is crucial for end-users to be brought into participatory contact with experts, specialists and policymakers (Holgersson, 2014).

1.4. Research questions and objectives

This study investigated how end-user participation in FMIS development influences the emergence of a sense of ownership in end-users. This research study intends to answer the following primary research question:

> *How does end-user participation in FMIS development engender a sense of system ownership of end-users in municipalities?*

To answer the primary research question, the study developed the following sub-questions and corresponding objectives.

1. **Research Sub-question 1:** *How do system owners exclude end-users of municipal FMIS in the implementation process?*

Previous studies note that little or no participation of end-users in the implementation of IS in the public sector affects the uptake of IS in developing countries (Ika & Saint-Macary, 2014; Ngoepe, 2016; Okereke, 2017). This study, therefore, investigated the manifestation of non-involvement of end-users in the implementation of FMIS in the public sector. It was necessary to understand what approaches were followed in the development process of FMIS in municipalities. This assisted in framing how end-user participation influences their sense of ownership to enhance their uptake of the system.

2. **Research sub-question 2:** *How do end-users' reactions to a lack of involvement in the System Development (SD) process of FMIS affect a sense of ownership of end-users?*

End-users of IS react in different ways to a newly developed system (Samhan, 2018). They may reject it completely, partially use the functions of the system, actively and passively resist it, unwillingly accept it or embrace it fully (Kim & Kankanhalli, 2009). With not involving end-users in the implementation of IS, different concepts of end-users' decisions to use or not to use the implemented system were described

in IS adoption and implementation reviews (Haddara & Moen, 2017; Laumer, Maier, & Weitzel, 2017; Samhan, 2018). It is necessary to investigate how their reactions to a lack of involvement in the development process of FMIS affect a sense of ownership.

3. **Research sub-question 3:** *What are the multi-dimensions of a sense of ownership in end-user participation in the FMIS development in municipalities?*

In an emerging technology context, the concepts of psychological ownership such as having a sense of ownership of the system are considered an important factor affecting end-users to adopt information systems (Chen et al., 2016; Kim et al., 2016). When end-users have a sense of ownership towards the system, they are likely to adopt the implemented system in the workplace (Kirk et al., 2015). Previous research mentions that end-user participation in the SD process gives them influence and control which can result in the end-user feeling that the system is an extension of the self and thus enables the development of a sense of ownership (Hooi & Cho, 2017). When people invest resources in a relationship, they are likely to become committed to it (Chen et al., 2016). When end-users participate in the SD processes, they are likely to become committed to using the system (Kwon, 2020). However, research shows that end-users in government departments do not always participate in the SD process of their systems. The objective of this sub-question was to investigate the manifestation of a sense of ownership behaviour in end-user participation in system development of FMIS in municipalities.

4. **Research sub-question 4:** *What are the hindrances to end-user participation in the SD process in municipalities?*

Organisations are complex social systems that make cultural change a difficult task (Sarrayrih & Sriram, 2015; Purwanto, 2018). Strategies for implementing new information systems in an organisation or the workplace usually require buy-in from employees who will use the system for work processes (Purwanto, 2018). End-user participation, a strategy for implementing information systems for an organisation, could work to facilitate buy-in from employees (Kimaro & Titlestad, 2008). However, when it is employees who belong to an organisation with complex structures, end-user participation is likely to face some challenges (Ju, Wei, & Tsai, 2016; Wasson,

2016). Previous research specifies that organisations with high-power distance among divisions of the organisation may have limited power in letting employees be involved in decision-making such as participation in the implementation of IS to be used in the workplace (Matende, Ogao, & Nabukenya, 2015). End-user participation in the SD process may be affected by many factors such as organisational factors, cultural aspects, political and structural conditions within the organisation (Kilpatrick, et al., 2017). Therefore, the objective of this sub-question was to examine end-users' perceptions regarding the effectiveness of end-user participation for municipalities in South Africa. Table 1-1 present research sub-questions with corresponding objectives.

Table 1-1: Research sub-questions and corresponding objectives

Research sub-questions	Research objectives
Research Sub-question 1: How do system owners exclude end-users of municipal FMIS in the implementation process?	To explore the system development of FMIS in municipalities which affect the development of a sense of ownership in end-users.
Research sub-question 2: How do end-users' reactions to a lack of involvement in the SD process of FMIS affect a sense of ownership of end-users?	To examine end-users' reactions to exclusion in the development process of FMIS and effects on end-users' sense of ownership.
Research sub-question 3: What are the multi-dimensions of a sense of ownership in end-user participation in the FMIS development process in municipalities?	To understand the manifestation and influence of a sense of ownership behaviour in end-user participation in FMIS development in municipalities.
Research sub-question 4: What are the hindrances to end-user participation in the SD process in municipalities?	To examine end-users' perceptions about the effectiveness of end-user participation in system development for municipalities.

The objective of this research study was to analyse how end-user participation in FMIS development engenders a sense of ownership in municipalities of South Africa. The intermediate objectives include the analysis of challenges facing end-users with the current style of system development in their municipalities, and factors for the development of a sense of ownership such as behavioural determinants, relational dynamics, contextual factors, mechanisms of ownership and outcomes of ownership.

1.5. The research approach

The study subscribed to the interpretivism paradigm and applied qualitative research methodologies. The study was based on a single case study of the Western Cape Province in South Africa. The units of observation within the case study of the Western Cape included two district and two local municipalities. The unit of analysis for the case study focused on the system development processes of FMIS to understand implementation challenges facing the municipalities, and to investigate how end-user participation in system development may engender a sense of ownership among end-users to reduce challenges in the use and acceptance of systems.

The qualitative methods used to collect the data were semi-structured interviews, observations of end-users during co-designing sessions of system development, and document analysis. Semi-structured interviews were firstly conducted with the project manager involved in the development of FMIS in the Western Cape and end-users of FMIS in municipalities engaged in the study to explore and get familiar with the development of FMIS. Semi-structured interviews were again conducted with end-users to understand how end-user participation in FMIS development engenders end-users' sense of ownership towards the system. The developers (the system development team) were also interviewed in the study to understand their views on end-user participation in FMIS development to engender a sense of ownership among end-users. Co-designing sessions involved project planning, system requirements specification and system design specification phases of FMIS development. End-users and the system development team participated in these co-designing sessions of the study. Observations were adopted in the study to observe end-users during co-designing sessions. Observation of end-users during co-designing sessions was adopted in the study to evaluate how end-users contribute to FMIS development and to evaluate whether end-users participation would work in municipalities to psychologically empower end-users through a sense of ownership to enhance use and acceptance of FMIS.

The constructs that informed data collection in the study were drawn from the theoretical background of the theory of psychological ownership in an organisation (Pierce, Kostova, & Dirks, 2001) and its further extension by (Avey, Avolio, Crossley, & Luthan, 2009). The theory of psychological ownership was used to investigate and

describe how end-user participation in FMIS development engenders a sense of ownership of end-users in municipalities. The theoretical background consisted of five constructs: behavioural determinants, relational dynamics, contextual factors, mechanisms or direct routes to ownership and behavioural outcomes for the development of a sense of ownership (Avery et al., 2009; Pierce et al., 2009; (Rey-Moreno, Sabiescu, Siya, & Tucker, 2015). Thematic data analysis (Braun & Clarke, 2006) was appropriate for the study. The research findings were presented across two districts and two local municipalities in the Western Cape province of South Africa. By drawing on the theory of psychological ownership, this study argued that the key to promoting effective use and acceptance of the system is to create feelings of ownership towards the system through end-user participation, as this signifies a strong psychological bond between end-users and the system.

1.6. The potential contribution of the study

The research makes three types of contributions: theoretical, the relevance of the study to practice and knowledge. The theoretical contribution of the research emerges from the use of the theory of psychological ownership in the IS research domain to explain how end-user participation in system development engenders a sense of ownership in end-users of IS such as FMIS in municipalities. Because of the lack of evidence-based studies in developing countries focusing on the end-user perspectives regarding factors affecting poor use and acceptance in government departments to better meet end-users halfway, this research made a descriptive contribution on the concept of sense of ownership. The study develops propositions, drawing on empirical observations and theoretical underpinnings, to emerge with a better explanation and theoretical background for end-user participation in FMIS development to engender a sense of ownership. There is a dearth of studies examining how end-users of information systems in government departments in developing countries can be empowered through a sense of ownership to enhance the use and acceptance. In response to this research gap, this research study brought back the concept of end-user participation and adds to the body of IS knowledge by examining the end-user participation approach as a systems development strategy to engender a sense of ownership to end-users of IS in government departments.

This research could be significant to the wider arena of government departments in developing continents such as Africa. It could draw on theoretical and practical insights to help address social inconsistencies and inequalities brought about the implementation and use of new technologies in everyday work practices in the government sector. Relevant stakeholders in top management and IS experts would apply research findings to expand understanding of strategies for IS implementation in government departments and to understand end-users' perspectives. This, therefore, formulates the practical contribution of the study. The study provides a platform to listen and hence to inform on, better strategies that could help improve the development of a sense of ownership in end-users of FMIS. At the same time, they could increase the update of FMIS in government departments in developing countries and similar settings. Such practical contributions could inform change management strategies, policies and processes appropriate for government departments in developing countries during the system development, thus assisting to improve uptake of systems such as FMIS.

1.7. Assumptions and delimitations

Due to the nature of the study, the exploration of the study rests on qualitative analysis and not on the quantitative analysis that usually use of some form of validated measures. The aim was rather to provide a detailed description of the components for end-user participation in FMIS development, to engender a sense of ownership as perceived by end-users in the specified context of the study. The data gathered through the study was qualitative in nature and it is important to note that the data was therefore subjective in nature as it relates to individuals and personal experiences. The gathered data was organised, coded and processed to reveal relevant themes. The respondents were able to express themselves sufficiently for the purposes of this investigation due to the fact that they are at the middle management level in their municipalities.

The study has the following delimitations with regard to the context, constructs and theoretical perspectives and sampling units of the study. In terms of the context, the study was limited to one province in South Africa, the Western Cape province. Further, the study focused on two districts and two local municipalities. The study focuses on FMIS for the municipality's effective financial management. The sampling

units for the study were end-users in municipalities who work with FMIS for budget preparations, budget implementation, monitoring and control, auditing and evaluation of work processes. Other employees (end-users) in other areas of the finance department such as the supply chain in municipalities were not considered for the purposes of the study. The concepts studied in the study were specific to the emergence of a sense of ownership in end-user participation in system development.

1.8. Explanations of key terms used in the study

End-users of FMIS: End-users of FMIS are those employees in municipalities who are responsible for financial management work such as budget preparation, budget execution, accounting and reporting, and auditing and evaluation (Hendriks, 2018). These end-users include budget officers, accounting officers, internal auditors and chief finance officers (National Treasury, 2018).

System Development (SD) process: SD is the process followed for a system project (Iqbal & Idrees, 2017; Sutrisno, Gill, & Suseno, 2017). The SD process applies in IS projects to ensure that strategic goals and objectives for the business problem are met (Wasson, 2016; Mantyla, Adams, & Khomh, 2015). The process offers a structured and standardised process of SD of any system development efforts (Wasson, 2016). The System Development Life Cycle (SDLC) consists of phases such as planning, requirements gathering and analysis, design, implementation and coding, testing, and deployment and maintenance (Sutrisno et al., 2017).

End-user participation: End-user participation is the behaviour and activities that the target end-users perform in the SD process (Holgersson, 2014). In an organisation, end-user participation enables employees to exercise control over their work environment and work futures (Aidemark et al., 2015; Bano et al., 2017). End-user participation in SD provides a more accurate and complete definition of the end-user and system information requirements, and knowledge about the organisation and organisational unit the system is intended to support (Holgersson, 2014; Bano et al., 2017).

Sense of ownership: Is a cognitive-affective psychological state in which an individual develops feelings of ownership over an object (Rey-Moreno et al., 2015). Having a sense of ownership over information systems is one of the factors that has

been shown to have an influence on technology use and acceptance (Klesel et al., 2016).

1.9. The organisation of the chapters

This section provides a brief outline of each of the chapters as provided in the dissertation.

Chapter 1 is an overview of the dissertation, which provides the introduction of the research. The chapter outlined the research problem, giving more rationale on why it is important to gain more insights of the role of sense of ownership in the low uptake of FMIS for financial management in government departments, specifically to municipalities in South Africa. The primary and secondary research questions, with their corresponding objectives, followed research approaches are also presented, together with the potential contributions from the study.

Chapter 2 summarises the context overview of financial management in South African municipalities. The chapter further discusses the mandate of financial management for municipalities in South Africa. Further, the chapter explores the challenges of financial management municipalities in South Africa.

Chapter 3 is a literature review chapter. The chapter reviews the importance of a sense of ownership as a mediator for employee psychological empowerment in the workplace. The chapter further reviews the influence of a sense of ownership on end-users to use the system in the organisation. The chapter furthermore reviews the concept of end-user participation in system development and gaps regarding a sense of ownership are also discussed.

Chapter 4 discusses the theoretical background of the study. The study employed the theory of psychological ownership; the theory describes the paths through which a sense of ownership emerges in individuals. The concepts of the theory are used in the study to explain how end-user participation in FMIS development engenders a sense of ownership in municipalities.

Chapter 5 articulates the research methodology that is used for this study. The chapter discusses the research approach used. Furthermore, the chapter outlines the

data collection methods. The chapter also narrates the data analysis process and the validity and reliability of the study.

Chapter 6 presents findings on the development of FMIS for municipalities in South Africa. The chapter establishes the perceived challenges relating to the development process of FMIS in municipalities.

Chapter 7 discusses the findings of the study. The chapter presents a thematic summary of the study findings. It also explains the implications of the findings, using key theoretical concepts of the theory of psychological ownership. The chapter analyses behavioural determinants, relational dynamics, contextual factors, mechanisms or direct routes to ownership and outcomes or effects of ownership in relation to end-user participation to influence a sense of ownership in municipalities.

Chapter 8 discusses the results of the research. The chapter examines the implications of the empirical findings of the study. It discusses the findings of the study. The main research question and secondary research questions are revisited to summarise how the study answered them and suggests theoretical propositions for the study.

Chapter 9 outlines the conclusions of the study. The chapter summarises the contributions of the study in terms of theory, knowledge and practice. It further reflects on the limitations of the study and outlines recommendations and areas for further research. The chapter concludes with reflections on the research process by the research.

Chapter 2-The background: Context of FMIS in municipalities in South Africa

2.0. Introduction

This chapter presents the context of the study. South Africa was used as an empirical setting of an emerging country to understand the theoretical context of the study. The Western Cape local government, situated in South Africa, was used as the case study. Within the Western Cape local government, two district municipalities and two local municipalities were units of observation for the case study. Within the case study of the Western Cape local government, the development of municipal financial management information systems is the unit of analysis.

The chapter is structured as follows. Section 2.1 discusses the description of municipalities in South Africa. Section 2.2 outlines different types of municipalities in the country. Section 2.3 highlights the mandate of municipal financial management. The challenges of financial management in municipalities are discussed in Section 2.4. Section 2.5 discusses an intervention of FMIS in municipalities. Lastly, Section 2.6 provides a summary of the chapter.

2.1. The description of municipalities in South Africa

The Constitution in South Africa establishes the principles governing the structures and nature of a system of governance in the country (Zulu, 2014). The Constitution established principles that pertain to the principles of cooperative governance and inter-governmental relations. These key principles are set out in Section 40(1), (2) and (41) of the Constitution. Section 40(1) stipulates that the government is constituted as the national, provincial and local tiers of government. Section 40(2) specifies that all tiers of government must observe and adhere to the principles in this chapter and must conduct their activities within the parameters that the chapter provides (Republic of South Africa, 1998). Section 41(1) of the constitution states requirements to be followed by the three tiers of government. These requirements are as follows:

- Preserve the peace, national unity and the indivisibility of the Republic.

- Commit to secure the well-being of the people of the Republic.
- Secure the well-being of the people of the Republic.
- Provide effective, transparent, accountable and coherent government for the Republic as a whole.
- Be loyal to the Constitution of the county, the Republic and its people.
- Respect the existing constitutional status, government institutions, powers and functions of government in the other tiers.
- Not assume any power and function except those conferred on them in terms of the Constitution.
- Exercise their powers and perform their functions in a manner that does not encroach on the geographical, functional or institutional integrity of government in another tier.
- Co-operate with one another in mutual trust and good faith (Republic of South Africa, 1998; Zulu, 2014).

The institutional framework of the public sector in South Africa was established in 1996 with the adoption of the first democratic constitution; it comprises of three tiers or spheres – national, provincial and local governments (DPLG, 2010; Zulu, 2014). Compared to national and provincial government spheres, municipalities are at the bottom of the pyramid (Jacobs, Rivett, & Chemisto, 2018). These tiers have distinctive functional responsibilities (Zulu, 2014) and are illustrated in Figure 2-1.

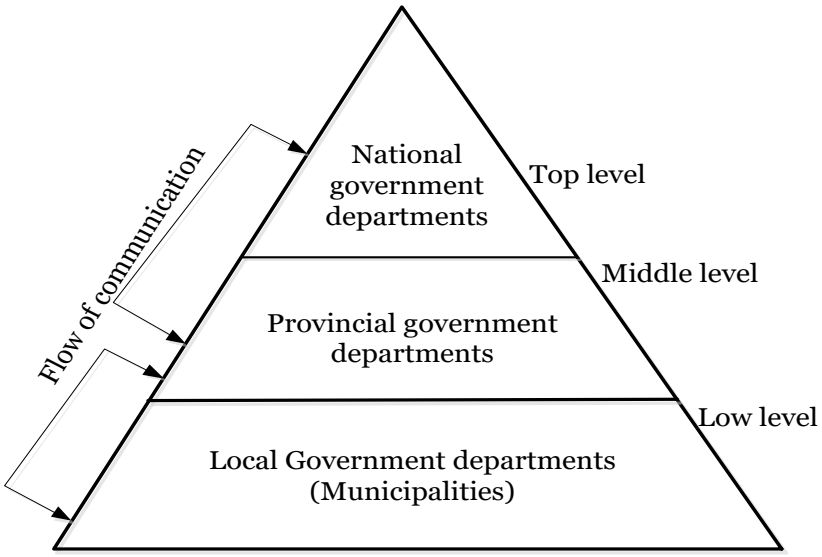

Figure 2-1: Tiers of government in South Africa (Zulu, 2014)

The national government level is exclusively responsible for national defence, foreign affairs, the criminal justice system (safety and security, courts), higher education, water and energy resources, national treasury and administrative functions such as home affairs and tax collection (DPLG, 2010). In addition, the constitution provides for the powers and authority in South Africa's nine provinces: Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West and Western Cape; each comprising of a provincial legislature and provincial executive (Zulu, 2014). Each province has its own provincial governments, with legislative power vested in a provincial legislature and executive power vested in provincial premier, and exercised together with the other members of a provincial executive council (Oelofse, 2016). Provincial government departments in these nine provinces deal with matters that affect their own provinces (DPLG, 2010; Lodge, 2005).

Local governments, also known as municipalities, are demarcated geographic areas and are the governing body responsible for areas within provinces of the country (DPLG, 2010). Municipalities are charged with a range of roles and responsibilities, as set out in the Municipal Systems Act No. 32 of 2000 (DPLG, 2010). Municipalities are described in Section 151 of the Constitution set in 1996 (Republic of South Africa, 1998; Municipal Demarcation Board, 2016). The sections describing municipalities are summarised in Table 2-1.

Table 2-1: Description of municipalities as constituted Constitution of South Africa (Municipal Demarcation Board, 2016)

Section of the Constitution	Description of the section
151(1)	The local government consists of municipalities, which must be established for the whole of the territory of the Republic.
151(2)	The executive and legislative authority of a municipality is vested in its Municipal Council.
152(2)	A municipality must strive, within its financial and administrative capacity, to achieve the objects set out in Sub-section *151(1)*.
151(3)	A municipality has the right to govern, on its own initiative, the local government affairs of its community, subject to national and provincial legislation, as provided for in the Constitution.
151(4)	The national and provincial may not compromise or impede the municipality's ability or right to execute its powers or reform its functions.
156(1)	A municipality has executive authority in respect of and has the

	right to administration.
156(2)	A municipality may make and administer by-laws for the effective administration of the matters which it has the right to administer.
156(5)	A municipality has the right to exercise any power concerning a matter reasonably necessary for, or incidental to, the effective performance of its functions.

Municipalities are obligated to deliver services and be responsive to the needs of communities. Service delivery is the provision of municipal benefits, goods, activities and satisfaction that are deemed public to enhance the quality of life of citizens of the country (Reddy, 2016; Hanabe et al., 2017). Municipal services that are usually delivered to citizens include public housing, road, water and sanitation systems, public transport, electricity public safety standards and so forth (Magagula, Mukonza, Manyaka, & Moeti, 2019). Municipalities are recognised as primary drivers of service delivery to the communities to enhance the economic growth of the country (Zulu, 2014). Municipal Systems Act of 2000 states that each municipality should develop mechanisms' impact to be followed to provide municipal services in its area; it must also provide for the extent to which such mechanisms are reviewed and followed by the municipality (Reddy, 2016; Hanabe et al., 2017).

2.2. Types of municipalities in South Africa

There are three types of municipalities in South Africa: Metropolitan, District and Local municipalities, as set out in the Local Government: Municipal Structures Act No. 117 of 1998 (Republic of South Africa, 1998; Pasquini, Zierrogel, Cowling, & Shearing, 2015). The total of 257 municipalities are sub-divided as follows (Municipal Demarcation Board, 2016; Reddy, 2016):

- 8 metropolitan municipalities,
- 44 district municipalities and
- 205 local municipalities (Republic in South Africa, 1998; Zulu, 2014).

The functions and powers of municipalities are divided between metropolitan, district and local municipalities (DPLG, 2010; Reddy, 2016). While metropolitan municipalities are responsible for urban areas, local municipalities share service delivery responsibilities with district municipalities (Nabe, 2016). This is specifically the case in rural areas, where district municipalities will have more responsibilities

for development and service delivery (Ramukumba, 2012). This can sometimes pose challenges and complexities (Hanabe et al., 2017).

2.2.1. Metropolitan Municipalities

Metropolitan Municipalities are large urban complexes with the exclusive municipal executive and legislative authority in an area that includes more than one municipality (Republic in South Africa, 1998). These municipalities are divided into wards. 50% of the councillors are elected through a proportional representation ballot, where voters vote for a part. The other 50% are elected as ward councillors by the electorate in each ward. The country consists of eight Metropolitan Municipalities. Metropolitan Municipalities have the following characteristics:

- Areas of high population,
- An intense movement of people, goods and services,
- Extensive development, and
- Multiple business districts and industrial areas (Republic of South Africa, 1998; Municipal Demarcation Board, 2016)

These metropolitan cities deliver job opportunities and incomes to raise the living standards of citizens and to improve the stability and cohesion of communities. Conversely, these are the strong cities that promote productivity growth and innovation of the country, partly because they contain the shared services, infrastructure, institutions and social amenities to attract investment, enterprises and skills (South African Cities Network, 2011; Ruwanza & Shackleton, 2016). Conversely, these include Johannesburg, City of Cape Town, eThekwini, Tshwane, Nelson Mandela, Ekurhuleni, Buffalo City, Mangaung (DPLG, 2010; Municipal Demarcation Board, 2016). However, some provinces such as Limpopo, Mpumalanga, Northern Cape and North West do have Metropolitan municipalities, as they do not have metropolitan areas (Municipal Demarcation Board, 2016). These eight metropolitan cities, accounting for 58% of the country's national economic product, is home to 42% of the country's population. Moreover, these are the critical developmental zones, as the mandate for the development of local government is implemented through Metropolitan municipalities, as they are the largest urbanised and industrialised centres for the country (Nabe, 2016).

2.2.2. District Municipalities

District municipalities have the municipal, executive and legislative authority in an area that includes more than one municipality (Zulu, 2014). District municipalities consist of a number of local municipalities that are demarcated into one district. There are 44 district municipalities in South Africa and are usually between three and six local municipalities that are demarcated into a district council (Jacobs et al., 2018). These municipalities have since been incorporated into provinces since they are not a category B municipality. They must coordinate the development and delivery of services in the whole district (DPLG, 2010; Zulu, 2014).

The district council is made up of two types of councillors. The first type consists of elected councillors who are elected for the district council on a proportional representation ballot by all voters in the district area; this consists of 40% of the district councillors (Magagula et al., 2019). The second type consists of councillors who represent all local municipalities in the district area. These are local councillors assigned by their council to represent it on the district; this consists of 60% of the district councillors (Municipal Demarcation Board, 2016).

2.2.3. Local Municipalities

Local municipalities share municipal executive and legislation authority in their areas with district municipalities within those areas they fall (Republic in South Africa, 1998). These are 226 local municipalities that exist in the area that falls outside of the six metropolitan areas and are divided into local municipalities (Jacobs et al., 2018). Each local municipality within a district is divided into wards. Residents in each ward are represented by a local ward councillor (DPLG, 2010). The 50% of the local councillors are elected through a proportional representation ballot, where voters vote for a party, while the other 50% are elected as ward councillors by the electorate in each ward (Municipal Demarcation Board, 2016; Hanabe et al., 2017).

Municipalities cannot deliver services to the citizens in South Africa without sufficient municipal finance. They have to raise income from taxes paid by taxpayers, and levies, rates and service charges paid by ratepayers (Mazibuko & Fourie, 2013). Each municipality is required to structure and manage its administration, budgeting and planning processes to give priority to the basic needs of the community and to promote the social and economic development of communities in South Africa

(Hanabe et al., 2017). This involves sound financial management to be able to deliver adequate services to citizens of the country (Mazibuko & Fourie, 2013; Ngoepe & Ngulube, 2016). The municipal financial management in South Africa is discussed in the following section.

2.3. Financial Management in municipalities

Financial management for the public sector consists of the identification, acquisition, allocation and utilisation of public assets and/or financial resources, with the governmental goal in mind (Mazibuko & Fourie, 2013). The core of financial management for the public sector is budget planning and preparation, budget implementation, accounting and financial reporting, and auditing and evaluation (Khanyile, 2016; Sepuru, 2017). The same views are applicable to municipalities in South Africa. Figure 2-2 presents public financial management for municipalities.

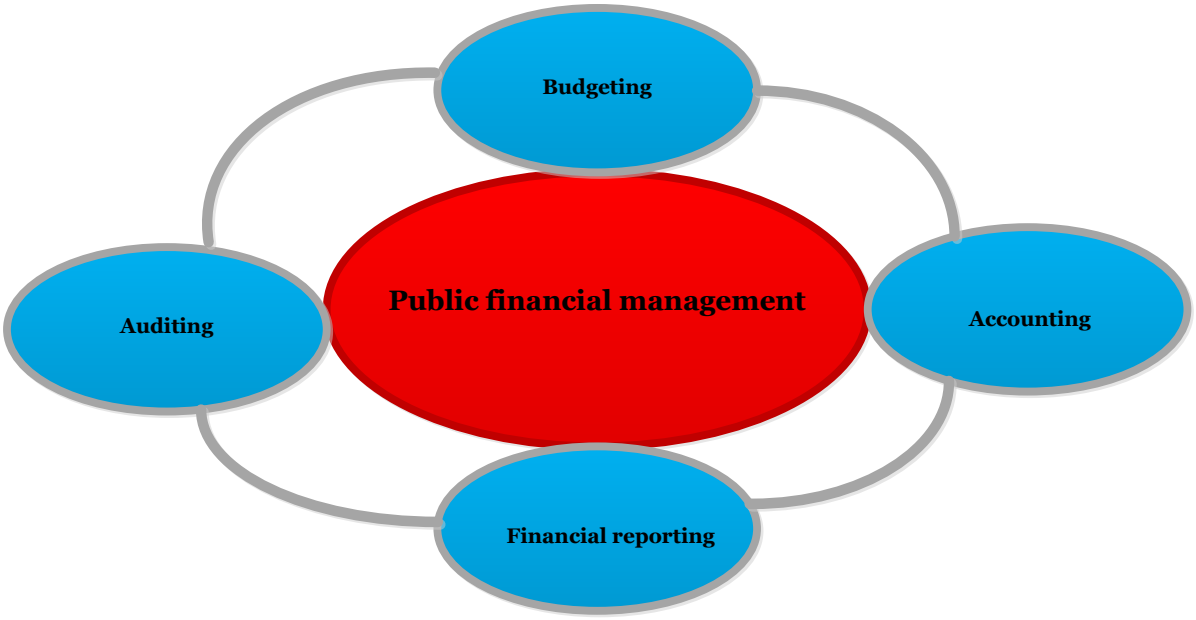

Figure 2-2: Pillars of financial management for municipalities (Farvacque-Vitkovic & Kopanyi, 2014)

The budgeting process focuses on the annual financial planning of municipalities, which explains operational and development priorities for the ensuing financial year and describes how the government plan will be financed (Farvacque-Vitkovic & Kopanyi, 2014). The accounting process for municipal financial management focuses provide complete, timely and accurate records concerning revenues, expenditures, assets and liabilities (National Treasury, 2016). Accounting records also focus on

providing information on billing taxpayers and receiving tax payments, paying employees, paying vendors and contractors, and service delivery to communities (Khanyile, 2016). The municipal financial reporting process makes use of accounting records to compile financial reports to communicate with stakeholders such as parliament, legislative bodies, the Auditor-General of South Africa and the citizens (Sepuru, 2017). The auditing process in municipalities assists in ensuring that public resources are not subject to fraud, waste and to errors in reporting; they ensure compliance with financial management (National Treasury, 2016; Makwetu, 2019).

Sound financial management practices in place are essential to the long-term sustainability of municipalities (Ngoepe & Ngulube, 2016). Virtuous financial management in municipalities in South Africa has the potential to underpin the process of accountability and flexibility (Nabe, 2016; Hanabe et al., 2017). This could ensure that municipalities are able to manage and spend public resources in an efficient and transparent way with the aim of improving service delivery (Mazibuko & Fourie, 2013; Harelimana, 2017; Micheni, 2017). In addition, strong public financial management is a catalyst for economic growth and development in any country (Selfano, Peninah, & Sarah, 2014).

2.3.1. Financial management policies and regulations for municipalities

To have a clear understanding of financial management in the context of the public sector, it is significant to know the policies and regulations that govern public financial management (Khanyile, 2016). The Public Finance Management Act (PFMA), 1999 (Act No.1 of 1999, as amended by Act 29 of 1999) is one of the most significant statutes passed by the democracy in South Africa (Graves & Dollery, 2009). This act promotes the objectives of sound financial management to maximise service delivery through the effective and efficient use of limited resources (National Treasury, 2018; Hanabe et al., 2017). In addition to the PFMA, the Constitution of South Africa further requires that all municipalities structure and manage their finances to give priority to service delivery within communities (National Treasury, 2016).

The Municipal Finance Management Act 56 of 2003 (MFMA) was introduced in line with the National Treasury's strategy of establishing a modern municipal financial management so as to lay a sound financial base for the sustainable delivery of

services for municipalities in South Africa (Ngoepe & Ngulube, 2016; Nabe, 2016; Hanabe et al., 2017). The objective of this framework is to enhance the structure of financial management in all municipalities (Mazibuko & Fourie, 2013). The framework is meant to enable National Treasury and Provincial Treasury to track municipal budget formulation, budget execution, accountability and reporting, and external oversight (Hanabe et al., 2017). The framework also aims at empowering finance employees in municipalities to be able to manage their workflows, but at the same time to be held more accountable (Mazibuko & Fourie, 2013; Magagula et al., 2019). Furthermore, the objective of the framework is to ensure the timely provision of quality information and to eliminate waste and corruption in the use of public resources (Combaz, 2015; National Treasury, 2018).

2.3.2. The role of Auditor-General in municipal financial management

In South Africa, government departments including municipalities are audited by the Auditor-General. The Auditor-General has a constitutional mandate to do so (Motubatse, 2016; Khanyile, 2016). The Auditor-General is responsible for overseeing and evaluating financial reporting on accounts, financial statements, the status of financial management and the performance of government departments (National Treasury, 2016; Khanyile, 2016). The office of the Auditor General was established by the 1996 Constitution of South Africa in an effort to support the growing professionalism of the audit profession and to increase public confidence in the state's accounts (Auditor-General South Africa, 2019). The MFMA Act requires the appointed Auditor-General to submit audit reports on financial statements of municipalities to the National Treasury, Provincial Treasury, municipal councils, boards of municipal entities and to the public (Mazibuko & Fourie, 2013; Sepuru, 2017). The Auditor-General report findings play a major role in stating whether the municipality has effective or ineffective financial management (National Treasury, 2016).

2.4. Challenges of financial management in municipalities

Previous research shows that the Auditor-General highlighted fundamental municipal management and administration challenges that presented ineffective municipal financial management since the 2013/2014 financial year (Mantzaris,

2014; Khanyile, 2016 Hanabe et al., 2017). The challenges of financial management in the municipality include lack of compliance with the legislation of municipal financial management, failure to attain clean audit outcomes, financially unqualified, mismatch and incomplete disclosure of financial statements, missing reports regarding the performance of municipalities, and unauthorised irregular and waste expenditure. These Challenge of financial management are illustrated in Table 2-2 and discussed thereafter. These challenges have been constant for the six-year period from 2013/2014 until 2018/2019 (Auditor-General South Africa, 2019; Makwetu, 2019).

Table 2-2: A summary of the challenges of financial management in municipalities since 2013-2019 (Auditor-General South Africa, 2019)

Province	Non-compliance with the legislation and internal controls	Failure to attain clean audit outcomes	Financially unqualified financial statements	Mismatch in financial statements	Missing reports regarding performance	Incomplete disclosure in financial reports	Irregular and waste expenditure
Reporting Period: 2018/2019							
Eastern Cape	10%	95%	53%	39%	21%	33%	5400 Bn
Free State	17%	100%	71%	21%	12%	12%	641 m
Gauteng	18%	91%	100%	50%	50%	65%	2 750 m
KwaZulu Natal	48%	89%	73%	40%	18%	55%	1 520 m
Limpopo	12%	100%	33%	12%	8%	31%	2 056 m
Mpumalanga	12%	90%	68%	33%	42%	32%	980 m
Northern Cape	11%	97%	46%	25%	27%	15%	351 m
North West	11%	100%	10%	10%	14%	9%	1 442 m
Western Cape	79%	60%	38%	38%	89%	68%	541 m
Reporting Period: 2013/2014							
Eastern Cape	13%	97%	67%	19%	39%	31%	1 430 Bn
Free State	12%	96%	74%	9%	32%	19%	2 429 Bn
Gauteng	31%	54%	37%	22%	24%	24%	228 m
KwaZulu Natal	33%	90%	68%	52%	42%	42%	145 m
Limpopo	9%	77%	48%	15%	30%	31%	325 m
Mpumalanga	18%	92%	71%	65%	48%	49%	7 400 m
Northern Cape	13%	71%	62%	27%	12%	34%	1 691 m
North West	8%	77%	49%	25%	55%	18%	347 m
Western Cape	10%	57%	72%	17%	80%	70%	170 m

2.4.1. Municipalities' failure to attain clean audit outcomes

Municipalities in South Africa are required to prepare financial statements in accordance with the financial reporting framework such as the Generally Recognised Accounting Practice (GRAP) framework (National Treasury, 2016; Auditor-General

South Africa, 2019). GRAP is a financial reporting framework designed to standardise financial reports submitted to the Auditor-General in South Africa (Powell, O'Donovan, Avele, & Chigwana, 2014). Over the years, *"the clean audit"* opinion has received significant attention following the repeated failure of municipalities in South Africa to achieve favourable audit outcomes (National Treasury, 2016; Auditor-General South Africa, 2019). The significance of obtaining a clean audit outcome opinion in municipalities has been confirmed by the National Treasury, the Ministry of Cooperative Governance and Traditional Affairs (COGTA) and the office of the Auditor-General South Africa as a key indicator of the achievement of a clean administration across the nine provinces of the country (Khanyile, 2016; Makwetu, 2019).

A failure to obtain clean audit opinions has been identified as the result of the challenge of weak financial management and weak governance in municipalities (Mazibuko & Fourie, 2013; Sepuru, 2017). In a review of the factors affecting South African municipalities' progress towards achieving clean audit outcomes, weak financial management and weak governance have been at the centre of discussion (Netswera & Kgalane, 2014). Only 33 out of 257 municipalities (33%) in the country received a clean audit outcome in the 2018/2019 financial year. Meaning that they produced quality financial statements and performance reports to comply with the key legislation of financial management, thereby receiving a clean audit (Auditor-General South Africa, 2019). Factors that contributed to a failure to attain clean audit outcomes in municipalities include:

- **Financially unqualified financial statements:** Only a few municipalities received unqualified financial statements (Netswera & Kgalane, 2014). This reflects that financial procedures and standards for financial statements do not conform to accounting procedures and standards (Sepuru, 2017).
- **Mismatch and incomplete disclosure in financial statements and reports:** An accounting mismatch occurred in municipalities in which some municipal financial liabilities were classified as financial assets for financial reporting (Makwetu, 2019).
- **Missing reports regarding the performance:** The measurement of performance against the planned budget in municipalities was reported to be ineffective (Auditor-General South Africa, 2019).

The majority of municipalities with clean audit outcomes decreased by 61% in the 2018/2019 financial year and 68% in the 2017/2018 financial year (Auditor-General South Africa, 2019). The Western Cape, Eastern Cape, Free State and North West provinces' financial statements contained worse financial statements with incomplete disclosure of financial reports and mismatch in produced financial statements from 2013/2014 until 2018/2019 financial periods (Makwetu, 2019). There were no improvements in presenting reports regarding the performance of municipalities in the provinces in the five-year period from 2013/2014 until 2018/2019 (Auditor-General South Africa, 2019).

2.4.2. Non-compliance with the legislation of financial management and internal controls in municipalities

Internal control is an aspect identified as a good practice for public financial management (National Treasury, 2016). Internal control refers to the policies and procedures which are used by the management to attain various goals, which include safeguarding the municipality's assets, and to provide reasonable assurance that undesired events will be prevented, detected and corrected (Ngcobo & Malefane, 2017). For financial management, internal control is viewed as a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of the objectives in the following categories: effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws and regulations (Netswera & Kgalane, 2014). Internal control is one of the financial management disciplines identified by the National Treasury as an integral part of financial management for government departments (National Treasury, 2016; Makwetu, 2019).

The weakness in internal controls at the municipality is one of the factors which contributed to unfavourable outcomes of financials in municipalities in the country (Ngcobo & Malefane, 2017; Makwetu, 2019). The Auditor-General reports for the six-year period (from 2013/2014 to 2018/2019) highlighted the weakness in internal controls and that the risk needed attention in the municipalities. The reports also raised non-compliance to the legislation as a distinct concern.

Auditor-General South Africa found non-compliance with financial management regulations in municipalities in which 90% of auditees had findings on material non-compliance with MFMA requirement laws and regulations of municipal financial

management (Mazibuko & Fourie, 2013; Ngcobo & Malefane, 2017). In this regard, the Accounting-General South Africa reported that non-compliance deteriorated in KwaZulu-Natal, Mpumalanga, Northern Cape and the North West, while other provinces such as Western Cape, Limpopo, Free State, Gauteng and Eastern Cape showed no major improvements (Mantzaris, 2014; Ngcobo & Malefane, 2017). The challenges in unfavourable outcomes in municipalities in South Africa are deep-rooted and are the result of a generally poor understanding of governance and pieces of legislation related to administrative system and financial management (Mantzaris, 2014; Combaz, 2015, Sepuru, 2017). This limits the effectiveness of the municipal financial management Act (such as MFMA) in bringing about the improvements in municipalities financial controls (Smoke, 2015; Sepuru, 2017). It is therefore critical that municipalities respond to the policies and regulations of government in place to ensure accountability (Mazibuko & Fourie, 2013; Netswera & Kgalane, 2014).

2.4.3. Poor governance on expenditure in municipalities

Over the 2013/2014 to 2018/2019 period, all municipalities had unplanned expenditures (Khanyile, 2016; Auditor-General South Africa, 2019). In the 2018/2019 financial year, unauthorised, fruitless and irregular expenditure across municipalities in all provinces in South Africa amounted to 16 billion rands; this was a 50% increase over the six-year period (Auditor-General South Africa, 2019; Makwetu, 2019). The spending made by municipalities across all provinces was not aligned with the budget allocations (National Treasury, 2016; Auditor-General South Africa, 2019). These irregularities contributed to persistent increases in budget deficits, public debts and poor performance of the economy, hence the need for the introduction of FMIS for municipalities (Nabe, 2016; Magagula et al., 2019).

2.5. An intervention of FMIS for municipalities

FMIS for municipalities are the information systems for promoting efficiency, effectiveness, accountability, transparency in budgeting, accounting and reporting, and auditing and evaluation (Kiarie & Wanyoike 2016; Harelimana 2017; Micheni 2017). Generally, the FMIS for municipalities refers to information systems interventions in financial operations to support management and budget decisions, fiduciary responsibilities and the preparations of financial reports and statements in the municipalities in South Africa (Ngoepe & Ngulube 2016; National Treasury, 2018). FMIS improves the municipality's financial management through enhanced

management of cash, debt and liability, the ability to use historical information to provide better budget modelling processes and increased decision-making efficiency (Mantzaris, 2014). FMIS improves all municipalities of SA from budget formulation, budget execution, accounting and reporting, and external oversight (Hendricks, 2012; National Treasury, 2018). There has been limited research focusing on FMIS for municipalities; most of the studies in the literature were focused on national and provincial government departments (Harelimana, 2017; Micheni, 2017; Hendriks, 2018).

All municipalities in provinces in South Africa are required to have financial information systems that are configured to operate according to the standards sets for the Standard Chart of Accounts chart by the National Treasury in South Africa (National Treasury, 2018). The Municipal Charts of Accounts is for the provincial and national levels to have the ability to assess municipalities' performance and financial management against strategic planning and outcomes-based objectives of the Republic in South Africa (Mantzaris, 2014). The municipal chart of accounts is regarded as a classification framework for municipal financial management, which aims to improve data quality and integrity through requiring the consistent classification of transactions across municipalities and from one financial year to the next (Mantzaris, 2014; National Treasury, 2018). In ensuring successful financial management, all municipalities are required to implement their FMIS based on the Municipal Charts of Accounts requirements and all municipalities are further required to prepare and approve a fully compliant budget cycle (National Treasury, 2018). The processes of financial management include budget formulation, budget execution, accounting and reporting, and auditing and evaluation; these are presented in Figure 2.3 and discussed thereafter.

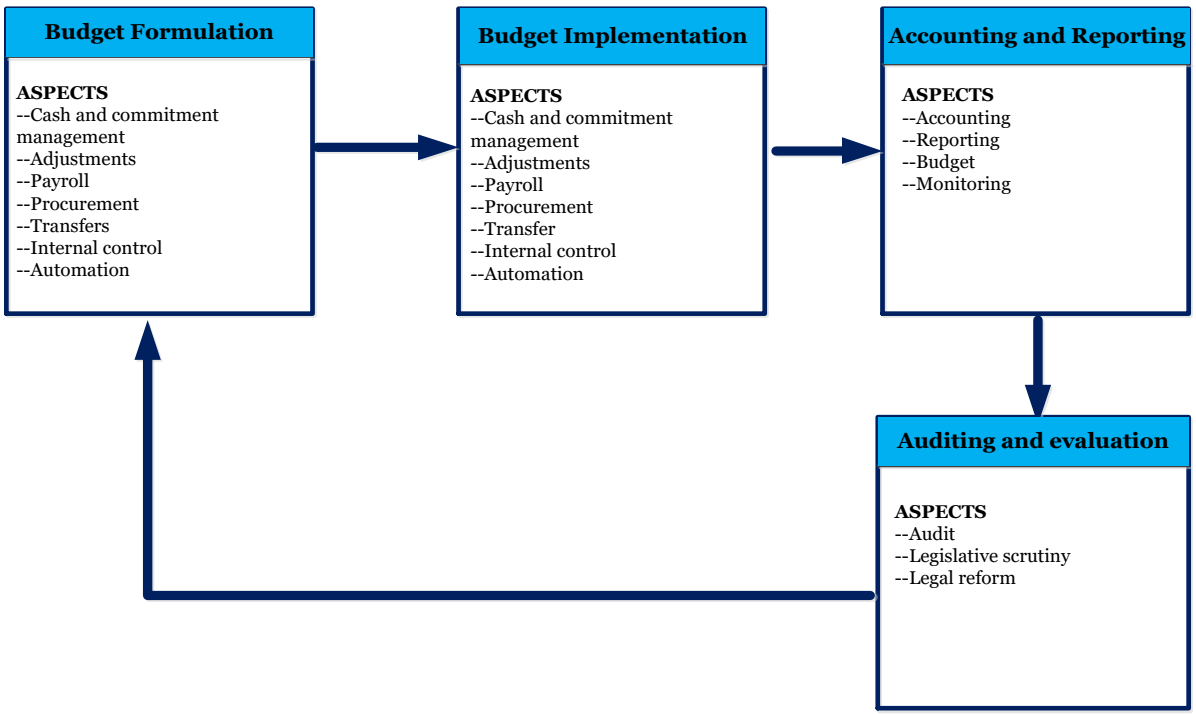

Figure 2-3: Processes of FMIS for municipalities in South Africa (National Treasury, 2018)

These processes of budgeting in FMIS are planned to allow a more standardised and realistic financial management for municipalities while promoting better control of public resources (Da Cruz, Tavares, Marques, Jorge, & De Sousa, 2016; Hendriks, 2018; National Treasury, 2018). Previous literature acknowledged the effect of FMIS on reducing corruption, fraud and theft (Chêne, 2009; Mantzaris, 2014; Kiarie & Wanyoike, 2016). A well designed FMIS has the potential to provide a number of features that may help detect irregular expenditure and non-compliance with the regulation of financial management (Micheni, 2017; National Treasury, 2018). The end-users of FMIS in municipalities are presented in Table 2.3.

Table 2-3: End-users of FMIS in municipalities

Processes of FMIS in municipalities	End-users of FMIS in municipalities
Budget preparation	Main end-user: Budget Officers and Accounting Officers Approver: Chief Finance Officers
Budget implementation	Main end-user: Budget Officers and Accounting Officers Approver: Chief Finance Officers
Accounting and	Main End-users: Accounting Officers, Internal Auditors,

reporting	Chief Finance Officers External end-users: external auditors
Auditing and evaluation	Main end-users: Accounting Officers, Internal Auditors, Chief Finance Officers External end-users: External Auditors, Auditor General in South Africa

Budget officers in municipalities are responsible for budget preparation work processes, and the Chief Finance Officer is the approver of planned budgets in municipalities. The main three processes of budget preparation processes include annual budget planning, supplementary budgets and annual procurement plans. The budget implementation process of FMIS in municipalities is handled by the Budget Officers, Accounting Officers and Chief Finance Officers (Hendriks, 2018). The Accounting Officers with the assistance of the Budget Officer and Chief Financial Officer are responsible for the drafting of the execution of budget timelines for the municipality for the ensuing financial year (Botlhoko, 2017). End-users of FMIS in municipalities such as Accounting Officers, Internal Auditors are responsible for both Accounting and reporting, and Auditing and evaluation (Botlhoko, 2017).

2.6. Summary of the chapter

This chapter presented the background of local municipalities in South Africa. The FMIS related challenges of facing financial management in municipalities. The challenges included lack of clean audit outcomes, non-compliance with the legislation of financial management and internal controls, and unauthorised, irregular and fruitless and wasteful expenditure. FMIS were introduced in municipalities to modernise financial management in municipalities. Even though FMIS are introduced in municipalities, FMIS are experiencing a lack of uptake, and in other municipalities required re-implementation.

Chapter 3: Literature review

3.0. Introduction

This chapter presents a review of relevant literature on topics that underpin the study. The chapter discusses the importance of end-user participation in the information systems development process and the role it plays in enhancing a sense of ownership among end-users of information systems in organisations. An understanding of what leads end-users to hold certain beliefs such as a sense of ownership about the system would be of value in explicating system use behaviour (Thilo, Bilger, Schols, & Hahn, 2017).

Section 3.1 discusses the sense of ownership focusing on a behavioural perspective. Section 3.2 reviews forms of sense of ownership. Section 3.3 explores information systems as a target of a sense of ownership in an organisation. Section 3.4 discusses the degree of sense of ownership in low-level public sector organisations. Section 3.5 explores the information systems development process. Section 3.6 outlines end-user involvement. End-user participation is discussed in Section 3.7. Section 3.8 reviews the relationship between end-user participation, sense of ownership and system use. Section 3.9 discusses knowledge gaps from the synthesised literature which the study intends to address in line with research objectives. In Section 3.10, the chapter culminates with a summary of all the sections of this chapter.

3.1. The sense of ownership

A sense of ownership could manifest in a variety of contexts (Pierce & Jussila, 2011). Various disciplines such as psychology, economics, politics, history, philosophy and law have studied the phenomena of sense of ownership behaviour and its motives (Pare, Sicotte, & Jacques, 2006; Pierce & Jussila, 2010). Having a sense of ownership refers to how an individual feels, as though the target or object is theirs (Pierce & Jussila, 2010; Kumar, 2019). A sense of ownership is further viewed as a state of mind in which an individual develops a possessive feeling for the target (Pare et al., 2006; Peng & Pierce, 2015). A sense of ownership is crucial in determining the potential buy-in from individuals (Kirk et al., 2018). A sense of ownership generates positive attitudes towards the target objects (Pierce & Jussila, 2011). In consumer studies research, this means influencing consumers to get attached to a brand

(Lessard-Bonaventure & Chebat, 2015), and in IS this means influencing end-users to develop a willingness to adopt the system (Kirk et al., 2015; Kumar, 2019). A sense of ownership towards a system is one of the factors that influence the likelihood to use and accept the system (Klesel et al., 2016).

In the context of an organisation, a sense of ownership can be categorised into organisation-based and job-based psychological ownership (Ramos, Man, Mustafa, & Zuie-Ng, 2014; Joo & Marakhimov, 2017). The former entails one's sense of ownership towards an organisation. This can be influenced by the organization culture, climate, attitudes of the top management, corporate goals and vision, and corporate policies and procedures (Ramos et al., 2014). On the other hand, the latter reflects on one's feelings towards their current position in his/her present organisation and their existing job (Ramos et al., 2014; Peng & Pierce, 2015).

Members of staff can develop a sense of ownership towards an organisation through having control over the organisation, coming to know the organisation closely, and investing their time and effort in the organisation (Joo & Marakhimov, 2017). For instance, the feelings of ownership over the organisation can affect the employee's attitudes towards change within the organisation (Sinha, Priyadarshi, & Kumar, 2016). The feelings of ownership can positively influence the transfer of quality management practices within multinational organisations and can play a critical role of trust in the work environment (Brown, Crossley, & Robinson, 2014). A sense of ownership among employees can have a positive effect on organisational competitiveness under turbulent and competitive conditions (Chung & Yang, 2017). An increased sense of ownership can result in the continued use of the target of ownership (Peng & Pierce, 2015).

As employees within an organisation develop a sense of ownership, they are likely to increase in motivation, self-confidence, high self-esteem and positive attitudes (Ye & Gawronski, 2016; Joo & Marakhimov, 2017). Organisations can create a link between organisation-based psychological ownership and job-based psychological ownership, by ensuring that employees understand the importance of their roles and jobs within the organisation (Pierce & Jussila, 2010; Olckers, 2011). This can facilitate the creation of a sense of ownership within the organisation. Organisations need to be aware of the concept of a sense of ownership which entails feelings of how to nurture

and revelling in it in the workplace (Tayebinik, & Puten, 2012; Chung & Yang, 2017). There are three distinct routes through which a sense of ownership of information systems can emerge in an organisation (Kirk et al., 2015; Klesel et al., 2016; Kumar, 2019). These three routes are discussed in the following sections.

3.1.1. Experienced control towards the target

Experienced control is described as a feeling of being in control over the target, which is experienced through its usage (Pierce & Jussila, 2011). The level of control that individuals develop over the target can result in feeling that it has become an extension of the self (Pare et al., 2006). This is through continued functional control exercised over an object to perform the desired task (Kirk et al., 2015). This can be experienced through information systems, as the interactivity in information systems allows a varying degree of control (Klesel et al., 2016). This can facilitate the development of a sense of ownership for the system (Kirk et al., 2015; Huang, Parolia, & Cheng, 2016; Klesel et al., 2016).

3.1.2. Knowing the target intimately: know how the system operates

This route of sense of ownership is anchored on knowledge about the target of ownership which can bring about the psychological connection between the self and the target concerned (Pierce & Jussila, 2011). Having knowledge about an object enhances association and strengthens proximity between the target of ownership and the individual (Lee & Chen, 2011). Individuals gain information and knowledge about the target of ownership such as in information systems through being involved in the systems and also getting trained how to use the system (Yee, 2017).

3.1.3. Investment of the self into the target

Investment of the self into the target implies that when individuals invest their energy, time, imagination and aspects of themselves into a target, their sense of ownership towards the target is enhanced (Pierce & Jussila, 2011). When individuals see part of themselves in an ownership target, the sense of ownership effect can improve the emergence of a sense of responsibility, accountability and, to a greater extent, the willingness to accept personal risks in the interests of the target (Pierce & Jussila, 2011). In IS, end-users believe that the system reflects them when they invest their energy, skills, ideas into the system development process (Pare et al., 2006; Smith et al., 2014).

3.2. Forms of sense of ownership

A sense of ownership may be viewed in different contexts and practices based on the three essential forms: a sense of ownership in the process, in outcomes and distribution (Lachapelle, 2008). These forms of sense of ownership are presented in Table 3.1 and discussed in the following sub-sections.

Table 3-1: Forms of sense of ownership (Lachapelle, 2008)

Forms of sense of ownership	Description
A sense of ownership in the process	Who has a voice and whose voice is heard?
A sense of ownership in the outcome	Who influences decision-making and what results from the efforts?
A sense of ownership in distribution	Who is affected by the process and outcomes?

3.2.1. A sense of ownership in the process

A sense of ownership in the process involves the processes through which the voices of individuals are heard and considered legitimate and/or valid (Lachapelle, 2008). During the process of developing a target, an answer needs to be answered of who has a voice and whose voice is heard (Handberg, 2018). To develop a sense of ownership for the target, it is important to know who has a voice in a development process and, more importantly, whether the voices of end-users of technology are heard (Lachapelle, 2008; Kelly, et al., 2017). Whose voices are heard in any development efforts often determine who defines the problem or the situation (Lachapelle, 2008; Handberg, 2018). It is likely for those individuals whose voices are heard during the development of the target to gain a sense of ownership towards the target (Marks & Davis, 2012; Kelly et al., 2017). Not allowing an individual's voice to be heard diminishes their sense of ownership in a given situation (Lachapelle, 2008).

3.2.2. A sense of ownership in the outcome

A sense of ownership in the outcome involves who influences the decision-making (Lachapelle, 2008). The sense of ownership provides an explicit focus on the influence and direct authority over decision-making and the execution of actions. Negotiating a redistribution of influences on the decision-making is complex, particularly within organisations in the public sector (Lachapelle, 2008; Kelly et al.,

2017). While employees in the public sector may have the intention or feel a sense of responsibility to influence decision-making, they may not have opportunities to do so (Handberg, 2018). In the public sector, ownership over the decision-making process is hardly allocated to members of staff in low-level organisations such as local governments departments (Lachapelle, 2008). Influence in outcomes is an ongoing issue in the public sector since democracy means nothing if it does not mean involvement in decision-making to gain a sense of ownership (Yee, 2017).

While direct decision-making authority may be practical, there are other tacit forms of promoting a sense of ownership through decision-making (Handberg, 2018). Decision-making to influence a sense of ownership may be achieved through: participation in processes, encouraging different forms of knowledge to be used and allowing more interaction with those who will be affected by the process (Marks & Davis, 2012; Yee, 2017). For this reason, a sense of ownership emphasises analysis of decision-making dynamics, that is, those individuals with an ability to influence the outcome and the reasons why (Lachapelle, 2008).

3.2.3. A sense of ownership in distribution

The sense of ownership in distribution involves an analysis of those individuals who are affected by a decision made for the process, as well as how the effects of decisions are distributed and accepted (Lachapelle, 2008). Applying the concept of ownership moves the focus from the present to the future, where heirs of a development effort would reap the benefits of any decisions taken (Marks, Onda, & Davis, 2013; Kumar, 2019). In this form of a sense of ownership, the focus for developing a sense of ownership should be on those who will be affected by the outcome (Kirk et al., 2015; Misfud, Molines, Cases, & N'Goala, 2019). In the context of IS, the focus should be on those individuals who are affected by the system (Klesel et al., 2016).

3.3. Information systems as a target of a sense of ownership

The potential of a sense of ownership to influence human motivation and behaviour has been applied and tested in the technology context (Smith et al., 2014; Kumar, 2019; Kwon, 2020). This involved various technologies such as information systems (Smith et al., 2014), virtual worlds (Wu & Chen, 2017), workplace devices (Yee,

2017), social media (Kwon, 2020) and online education (Dommett, 2018). Table 3.2 summarises previous studies on various technologies as a target of ownership.

Table 3-2: Selected studies on the influence of sense of ownership on information technologies

Technologies as a target of ownership	Research studies	Contexts of the study
Information systems	Pare et al. (2006)	Consumer technology appropriation in a marketing firm
	Barki et al. (2008)	Physicians using Computerised Physician Order Entry (CPOE) system
	Huang, Parolia and Cheng (2016)	Employees in private organisations using information systems
	Smith et al. (2014)	Physicians using Electronic Medical Records (EMR) system in the healthcare
	Kirk et al. (2015)	Consumer technology appropriation in an organisation
	Marks and Davis (2012)	Rural water systems for use by households in communities
Workplace devices	Kumar (2019)	Online-Brand-Focused System for collaboration between communities and the owner firm
	Klesel et al. (2016)	Managers and employees using technology in the workplace
	Yee (2017)	Employees of the National Audit Department using Audit and Evaluation system
Social media	Kwon (2020)	Users of Amazon's Mechanical Turk (MTurk) social network
	Karahanna, Xu and Zhang (2015)	Users of Facebook and Twitter
	Zhao, Chen and Wang (2016)	End-users of WeChat, WhatsApp and LINE
Online education	Buchem (2012)	Students using Online Personal Learning Environment (OPLE)
	Dommett (2018)	Students using open-source software
	Buchem, Tur and	Students using Online Personal Learning

	Holterhof (2014)	Environment (OPLE)
Virtual world	Wu and Chen (2017)	Online learning with the virtual technology-enhanced learning environment
	Lee & Chen (2011)	Virtual end-users of a Website
	Moon, Hossain, Sanders, Garrity and Jo (2013)	End-users e-loyalty in an online multiplayer game

The sense of ownership can sustain human behaviour towards a particular target of ownership, as individuals strive to promote the continuity of their possession when it is considered part of themselves (Pare et al., 2006; Pierce & Jussila, 2011). It is, therefore, reasonable to include a sense of ownership as a factor that may affect the continuance usage of information systems (Barki et al., 2008; Kirk & Swain, 2018). Sense of ownership can play a major role in facilitating the relationship between employees and the information system that they use for work activities (Kirk et al., 2015; Klesel et al., 2016; Kumar, 2019). In the workplace, a sense of ownership can be seen as the feeling that an employee has over the system or software and reflects in terms of what the system does with it and how it is used (Pare et al., 2006; Barki et al., 2008; Kirk et al., 2015). This feeling of being psychologically tied to an object has implications for technology use and acceptance of the object (Klesel et al., 2016).

Lack of sense of ownership is when individuals are that affected by the target of ownership that they do not have control to manipulate the target ownership (Yee, 2017). Lack of sense of ownership is described as a concept through which to:

- Assess whose voice is not heard,
- Who lacks influence over decision-making that directly affects them and
- Who is affected by the process and outcome but may not contribute to the development of the outcome (Lachapelle, 2008)?

Lack of sense of ownership towards technologies means that end-users have no control and may not contribute to the development process or change management process of the information systems (Huang et al., 2016; Dommett, 2018). Drawing on the lens of consumer ownership, end-user ownership, sense of ownership towards

the system has been found to be a good predictor for end-user acceptance of the system (Kirk et al., 2015; Klesel et al., 2016; Wu & Chen, 2017).

3.4. Degree of sense of ownership in low-level public sector organisations

In the public sector, organisations at the lower levels depend on departments that are at higher levels such as national and provincial government departments (Chai, Song, & You, 2020). Public sector organisations are managed at national and provincial levels and the leadership is characterised by inflexibility, rules and regulations and limited employees participation in decision-making at the low level (Garcia, 2018). The development of information systems for the low-level public sector organisation is handled by the national level and provincial levels in Africa (Zulu, 2014; Jacobs et al., 2018).

The success of information systems in public sector organisations in developing countries has been low. One of the main factors for the low success rate is the lack of sense of ownership for the systems amongst the employees (Nkohkwo & Islam, 2013; Chai, Song, & You, 2020). Lack of employee's sense of ownership towards information systems in the public sector organisations stems from the lack of employee involvement in the creation of the strategic planning for the implementation of information systems for the workplace (Ngoepe, 2015). Previous studies report on the lack of end-user participation in the development process of information systems in the public sector in developing countries (Abu-Shanab, 2015; Rahman et al., 2015; Rehouma, 2019). For instance, in Rwanda, FMIS faced use and acceptance challenges due to poor coordination in the implementation process and little involvement of employees who are directly affected by FMIS. Table 3.3 summarises previous studies on the level of control and influence that end-users have in the development process of information systems in African countries.

Table 3-3: Previous studies outlining end-user influence in the development process of information systems in the public sector

Reference	The level of end-user influence in the development process of information systems in the public sector	Country
Yaokumah and Biney	End-users of FMIS had no influence and control during the development process.	Ghana

(2010)		
Hendriks (2018)	End-users of FMIS systems in municipalities had no control and influence during the development process; national and provincial departments had more influence.	South Africa
Kasambara et al. (2017)	The implementation of Health Management Information Systems (HMIS) involved end-users of the community, health facility, village health committee, district and national levels.	Malawi
Bosire (2016)	FMIS were implemented for public sector end-users in the Ministries of Foreign Affairs. Top management in the department had an influence on the development process.	Kenya
Muwema and Phiri (2020)	The FMIS were implemented for government departments. End-users in provincial departments had influence and control during the development of the system.	Zambia
Harelimana (2017)	FMIS were implemented for government institutions in tiers of government. End-users in low-level government institutions did not have influence in the system development.	Rwanda

Research on end-user participation in the public sector to engender a sense of ownership remains a topic that is still sparse in the IS field (Rehouma, 2019). End-user participation in the SD process in the public sector is less emphasised compared to the private sector (Rahman et al., 2015). Sense of ownership towards information systems has not been considered in municipalities in developing countries, including South Africa (Kwatsha, 2010; Ngoepe, 2014).

3.5. Information systems development process

Information system development (SD) is a process followed for a system project within an organisation (Iqbal & Idrees, 2017). The SD process is applied to information systems projects to ensure that strategic goals and objectives for the business problem are met (Mantyla, Adams, & Khomh, 2015; Wasson, 2016). SD consists of a detailed plan describing how to develop, maintain, replace, alter or enhance a specific system (Wasson, 2016). The purpose of the SD is to guarantee that the system being developed is of quality and built according to schedule. It includes process, methods, tools to help achieve this (Wasson, 2016; Iqbal & Idrees, 2017).

The System Development Life Cycle (SDLC) is crucial for the success of the system for an organisation (Barjtya, Sharma, & Rani, 2017). The SDLC consists of a number of phases (Hussain & Mkpojiogu, 2015; Sutrisno et al., 2017), Table 3.4 summarises the phases.

Table 3.4: Stages of the SDLC process

Phases of SDLC	Explanation	Affected stakeholders
Project initiation	The organisation establishes the need for the system (Ali, 2017). In this phase, all stakeholders who will be affected by the system should have a common understanding of system considerations (Sutrisno et al., 2017).	End-users, management, project manager and SD team
System requirements specification	This phase involves requirements gathering and analysis (Hussain & Mkpojiogu, 2015). This involves the application domain analysis, stakeholder identification, end-users and system stories, constraints and requirements gathering, non-functional requirements elicitation, functional requirements elicitation and requirements clustering (Silhavy, Silhavy, & Prokopova, 2014).	End-users, management, project manager and SD team
System design specification	This phase involves the specification of a user interface design, database design, process design and system specification design of the system (Ali, 2017). This helps in defining overall system architecture based on system requirements specifications (Wasson, 2016). The system design specifications serve as input for the next phase of the system implementation (Mantyla et al., 2015).	End-users, management, project manager, SD team
Implementation and coding	In this phase, the system is built. The developers generate the programming code that is generated (Wasson, 2016).	Project manager and SD team
Testing	After the system is developed, it is tested against the requirements (Wasson, 2016). The testing involves unit testing, integration testing, system testing, acceptance testing as well as non-functional testing	End-users, management, project manager, SD team

	(Ali, 2017). The main focus of this stage is end-user satisfaction (Mantyla et al., 2015)	
Deployment and maintenance	Here the tested system is ready to be deployed. System deployment may happen in stages (Ali, 2017; Mantyla et al., 2015). System maintenance: after successful testing, the system is deployed and then issues come up and need to be solved from time to time (Wasson, 2016; Ali, 2017).	End-users, management, project manager

The different stages of SDLC affect different stakeholders (Nurhayati & Mulyani, 2015). Key SD stakeholders include:

- **Management**: Has the power to influence the overall stages of SD. The project manager is responsible for coordinating the SD process and the resources to complete the SD project on time (Abelein & Paech, 2015).
- **The system SD team**: (e.g. business analysts, systems analysts, database administrators and software developers) are responsible for developing a system that meets specified objectives.
- **End-users**: Use the final product of the system (Wasson, 2016).

End-users are needed in the SD process to assist the SD team to identify the current problems that the systems development team might neglect due to a lack of understanding of the environment (Zhang, Peng, & Gu, 2015). However, the different roles which end-users play in the SD process are generally not well defined (Abelein & Peach, 2015). End-users are usually seen as "inferior party" by the SD team (Butt & Ahmad, 2012). Lack of a clear definition of end-users' roles in the SD negatively impacts the system success (Bradford, 2014). Lack of user involvement in SD not only affects the system quality but also can result in user dissatisfaction (Butt & Ahmad, 2012).

3.6. End-user involvement

The involvement of end-users in the system development is seen as a measure of their contributions from conceptualisation to actualisation of the system (Imahanyehor, 2011). End-user involvement in the SD process aids to an in-depth understanding of their work environment and can improve the quality, accuracy and

completeness of the system requirements (Bano & Zowghi, 2015; Eichhorn & Tukel, 2016). End-user involvement may take three forms based on the degree to which end-users contribute to the development process of the system (Imahanyehor, 2011; Abelein & Paech, 2015). The forms are informative, consultative and participative (See Figure 3-1) (Peng & Pierce, 2015).

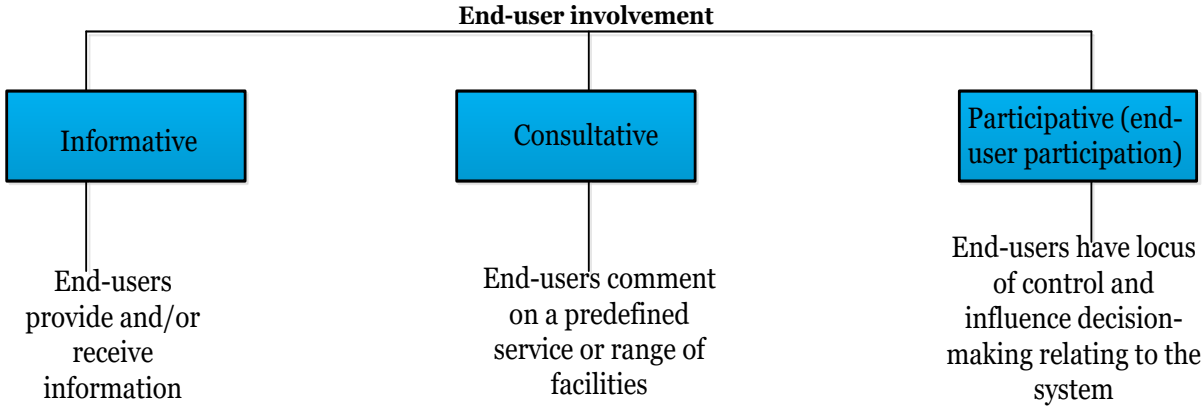

Figure 3-1: Forms of user involvement (Imahanyehor, 2011; Zhang et al., 2015)

In informative involvement, end-users are usually required to provide relevant information about the input, expected output and processes between the inputs and outputs, and they are not usually involved in how the input is processed (Imahanyehor, 2011). This form of involvement does not give end-users the ability to actively influence the SD involvement process (Eichhorn & Tukel, 2016). Consultative involvement is a deeper form of informative involvement (Zhang et al., 2015). Similar to informative, end-users in consultative involvement have little influence or control over the operation and output of the system (Bano, Zowghi, & da Rimini, 2017). Since end-users are knowledgeable about the business processes, they are likely to provide accurate information to the SD team (Imahanyehor, 2011; Abelein & Paech, 2015). The information provided could be vital for information system success (Barki & Hartwick, 1994; Abelein & Paech, 2015; Bano et al., 2017).

Participative involvement refers to end-users actively participating in the development process of the system (Sun, 2013). Participative involvement places end-users at the centre of the information system development process (Zhang et al., 2015). End-users usually contribute to defining the business problem and system requirements and contribute to the system development process (Imahanyehor, 2011; Sappri, Baharudim, & Raman, 2016). The sense of ownership towards the

system development process rests with end-users and the system development team (Imahanyehor, 2011; Abelein & Paech, 2015). This form of involvement gives a high degree of information, influence and control to end-users (Sun, 2013; Imahanyehor, 2011). The participative involvement of end-users in SD is centered on the three key terms: information, control and influence (Imahanyehor, 2011). To assert the level of end-user involvement in SD, answering the three questions could provide some direction (Imahanyehor, 2011; Eichhorn & Tukel, 2016):

- Are end-users contributing the required information?
- Are end-users influencing decision-making?
- Are end-users controlling activities during the development process?

A substantial amount of research shows that participative involvement is an important component compared to other forms of involvement (Holgersson, 2014; Abelein & Paech, 2015; Conradie, Marez, & Saldien, 2015; Bano et al., 2017). Principally, end-users may either take active roles, or they may be involved as providers of information, commentators or objects for observations during the development process of the system (Bano & Zowghi, 2015). The participative involvement in the information system development process gives a high degree of information, influence and control to end-users (Peng & Pierce, 2015).

3.7. End-user participation

End-user participation is a form of end-user involvement that is viewed as activities that the end-users contribute to the SD process (Holgersson, 2014). In an organisation, end-user participation can be viewed as the democratic processes that enable employees to exercise control over their work environment and work futures (Aidemark et al., 2015; Bano et al., 2017). End-user participation in SD provides an accurate definition of the end-user and system information requirements, knowledge about the organisation and organisational unit the system is intended to support (Holgersson, 2014; Bano et al., 2017). End-user participation is illustrated in Figure 3-2.

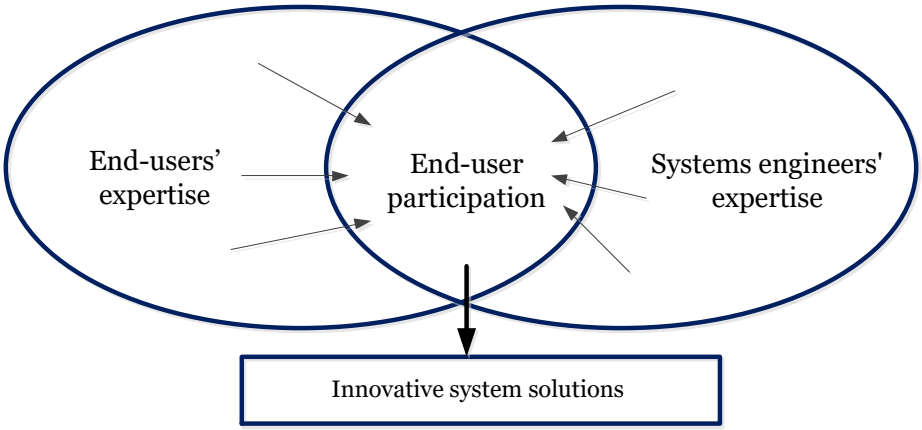

Figure 3-2: End-user participation in the system development process (Holgersson, 2014)

Figure 3-2 illustrates a process where end-users define what is to be done, and how it will be done, in collaboration with the development team (Holgersson, 2014). Managing requirements during the SD is one of the crucial and complex tasks, mostly because end-users cannot express their needs clearly during requirements analysis; hence end-users must be present during the whole system development process (Holgersson, 2014; Bano et al., 2017). End-user participation can be applied as a response to failed system development projects stemming from incomplete system requirement specifications (Mirri, Roccetti, & Salomoni, 2018). The approaches to end-user participation are discussed in the following sections.

3.7.1. Approaches to end-user participation

There are numerous approaches that support the implementation of end-user participation (Alampalli, 2015). The approaches to end-user participation include user-centred design, participatory design and co-designing (Donoso, Van Mechelen, & Verdoodt, 2014; Holgersson, 2014; Sanders & Stapper, 2014). The following sub-sections describing these approaches and their characteristics are elaborated.

3.7.1.1. Participatory design

Participatory design requires end-users to actively participate in the development process. This approach requires commitment from both end-users and the SD team, to cooperate and share responsibilities during the process. However, the level of user participation may vary (Bano & Zowghi, 2014). For a good fit between implemented systems and end-users, 'participatory' builds upon the idea that end-users act as creative and productive contributors, as long as they are given a chance to use their expertise and be able to express their opinion (Holgersson, 2014; Wilkinson & De

Angeli, 2014; Moraine et al., 2017). The participatory design aims to provide end-users with knowledge of how the new system can be used or applied to affect their everyday work processes (Holgersson, 2014). The main goal of participatory design is to ensure a good fit between systems and the way employees want to perform their work activities (Bodker, Kensing, & Simonsen, 2011; Holgersson, 2014). This means that workers have the right to appropriate tools when performing their work activities. To achieve this, it is necessary that the system should never be viewed as an isolated phenomenon (Bennis, 2015; Thilo et al., 2017).

There is a general consent within the participatory design approach regarding the kind of basic requirements that must be fulfilled in a participatory design process (Zhang et al., 2015). There are three proposed basic requirements for the participatory design (Qin et al., 2017):

- End-users must have access to relevant information, i.e., knowledge of possible technological options to solve a specific task or problem,
- End-users must have the possibility to take an independent position regarding the identification of the problem and
- End-users must participate in decision-making and be actively involved in the information system development process to achieve the desired outcomes.

Both the end-users and the SD team have a shared responsibility for the development process, as well as the final implemented system (Zhang et al., 2015). By doing so, the participatory design process can be altered in the sense that the SD team cannot make any decisions themselves, while the end-users are co-responsible for the system and cannot blame anyone else for the eventual insufficiencies (Bennis, 2015; Toikkanen, Kuene, & Leinonen, 2015). Mutual responsibility means that the end-users must learn about the capabilities of emerging technologies and the system developers must learn about the application area of interest and contexts of end-users (Holgersson, 2014). End-users mainly act as sources of information, but have little influence on the information systems development process (Conradie et al., 2015).

3.7.1.2. User-centred design

User-centred design is the end-user participation approach whereby end-users are actively present in the information systems development process, playing an advisory

role in the process (Gulliksen et al., 2016). End-users are also used as a source of information early in the stages of the development process such as initiation and system requirements specifications stages. Further, they may also serve as test pilots in the later stages when there is a likelihood of being able to make changes (Thilo et al., 2017).

The user-centred design approach posits that it is important to understand the end-user and the end-user's working environment to truly acknowledge the end-user in the information systems development process (Thilo et al., 2017). With this knowledge, the SD team may design usable user interfaces and develop systems that are suited to the end-users, compared to performing these activities without such knowledge (Bano & Zowghi, 2015).

During the early years of the user-centred design approach, end-users did not necessarily have to be actively involved in the systems development process. Instead, end-users were allowed to play a somewhat advisory role (Gulliksen, et al., 2003). The SD team often took on the role of end-user acting on behalf of the real end-users during the information system development process (Gregory, 2003). The SD team was used to invest in gathering knowledge of end-users' needs and tasks to develop systems that end-users could employ to perform the tasks and meet their needs (Baek et al., 2008). When doing so, the SD team had to build up a thorough understanding of the end-users and their natural work environment, to be able to meet the expectations of the end-users (Gregory, 2003; Gulliksen, et al., 2003).

3.7.1.3. Co-designing

The co-designing approach is described as an instance of co-creation which offers a collective creativity in favour of the design process by participants that are not specifically trained about the information systems development process (Steen, Manschot, & Deconing, 2011; Sanders & Stappers, 2014). Co-designing puts a typical focus on end-users of the system and is a form of co-creation compatible with the mindset of most end-users (Sanders & Stappers, 2014). The co-designing approach is considered with the aims of attaining benefits to end-users that include higher satisfaction of the implemented system (Donetto, Pierri, Tsianakas, & Robert, 2015). This approach can educate end-users in the long run and can lower the time to be

invested to learn the new system after it is implemented (Bennis, 2015; Schumacher & Feurstein, 2016).

With co-designing, there is support for the end-user's needs and wants about the system, on the basis of which the system can be made more suitable for the end-user (Bennis, 2015). Close participative involvement of end-users during the entire designing process will have positive effects on the acceptance and use of the system (Steen, Manschot, & Deconing, 2011). Although the integration of end-users into the development of the system remains difficult, projects that adopted co-designing have demonstrated that the approach reduces business risks. These reduced business risks include the invention and acceptance of products, services and applications (Schumacher & Feurstein, 2016). In this sense, co-designing with end-users represents a promising paradigm for the information systems development process (Romero & Molina, 2011).

3.7.2. Dimensions of end-user participation

The different approaches of end-user participation can be differentiated along six dimensions: The type of participation, degree of participation, the content of participation, the extent of participation, the formality of participation and influence of participation (see Table 3-5).

Table 3-5: Comparison of end-user participation approaches (Holgersson, 2014)

Dimensions	User-centred design	Participatory design	Co-designing
Form of participation	Advisory or representatives of end-users	Advisory	End-users, lead end-users
Degree of participation	Advisory, in some cases sign-off responsibility	Mostly sign-off responsibility, and in some cases advisory	Sign-off responsibility, in some cases full responsibility
Content of participation	Mainly technical and social	Technical and social	Technical and social
Extent of participation	Requirements elicitation, testing, evaluation	Requirements elicitation, design, testing, evaluation	Project definition, requirements elicitation, design and implementation, testing

Formality of participation	Semi-formal	Semi-formal	Informal, semi-formal
Influence of participation	Low to medium	Medium to high	High

3.7.2.1. Forms of participation

The form of participation describes the roles that end-users have in the SD process (Charif, 2017; Holgersson, 2014). In user-centred design and participatory design approaches, participants during the development process are usually either advisors or end-user representatives (Thakurta, 2017). In advisory participation, end-users are only involved in specific design decisions as advisors, whereas, in representative participation, end-users actively contribute to design decisions at a more general level (Charif, 2017). The role of advisory representation is a practical option depending on the current setting in the SD process (Charif, 2017; Thakurta, 2017).

In co-designing, lead end-users to take can be considered as end-user representatives, since the inherent meaning of the lead end-user concept implies that the lead end-user is ahead of the pack in terms of experienced needs (Hutter, Nketia, & Fuller, 2017). Lead end-users are described as those end-users that attempt to present strong needs based on their experience and can contribute to providing new concepts for the system requirements and design (Thakurta, 2017). Lead can bring a useful knowledge base to the SD team that would be difficult to get through traditional approaches of defining requirements and matching up the systems (Conradie et al., 2015). However, there is a risk that leads end-users do not represent typical end-users, as no one can predict whether lead end-users' needs are representative of a larger number of end-users (Nguyen et al., 2017). Therefore, lead end-users may also be considered as individuals that only represent their own needs (Holgersson, 2014).

3.7.2.2. Degree of participation

The degree of participation describes the level of responsibility that end-users may have when participating in the SD process (Holgersson, 2014). In some cases, end-users may only have an advisory role and be required to only respond to specific design decisions presented by the SD team (Charif, 2017). This situation is most common in user-centred design rather than in participatory and designing (Holgersson, 2014). End-users may have sign-off responsibilities or have an even

deeper involvement as members of the design team (Gatignon, Gotteland, & Haon, 2016). This is normally representative for participatory design, but also user-centred design in some cases (Gulliksen, et al., 2016; Halskov & Hansen, 2015), or are even fully responsible for certain design decisions, for instance, co-designing with lead end-users (Holgersson, 2014; Gatignon, et al., 2016). Regardless of the degree of participation, it is vital to remember that end-users and the SD team be regarded as cooperating partners during the process (Bennis, 2015).

3.7.2.3. Content of participation

Content of participation describes aspects of the information system development process that participants can take part in (Abelein & Paech, 2015). User-centred design is usually considered in terms of aspects related to enhancing the technical design of a system (Bano et al., 2017). This includes requirements for Graphical User Interfaces (GUIs), as well as general functional requirements of the system (Bano & Zowghi, 2015). In co-designing and participatory design, end-users may participate in other stages of the SD process, such as the project initiation phase, system requirements specifications, and design phase for the social and human impact of a new system (Holgersson, 2014; Bano et al., 2017). However, the participatory design is concerned with technical design, but may also encompass the social dimension of the development process (Halskov & Hansen, 2015). In co-designing, end-users are considered to be involved in both technical as well as social design, due to the possibility of end-users being fully responsible for at least specific parts of the development process (Holgersson, 2014).

3.7.2.4. Extent of participation

The extent of participation refers to those aspects of the SD process in which the end-users participate (Holgersson, 2014; Halskov & Hansen, 2015). In this dimension, user-centred design describes the end-user participation in activities related to requirements elicitation, testing, and evaluation that occurs at the beginning and at the end of an SD process (Abelein & Paech, 2015). In participatory design, both end-users and the SD team are committed to collaborating during a larger proportion of the SDLC (Holgersson, 2014). In co-designing, the end-user is responsible for the requirements specifications and design phase (Halskov & Hansen, 2015), hence the end-user is present during the entire development process (Holgersson, 2014).

3.7.2.5. Formality of participation

The formality of participation refers to how end-user participation is put into place in an organisation (Holgersson, 2014). In all three approaches, participation activities are specified before they take places, such as formal user groups and official meetings (Holgersson, 2014; Charif, 2017). Participation efforts are based on informal discussions among participants (Hutter, Nketia, & Fuller, 2017).

3.7.2.6. Influence of participation

Influence of participation refers to the degree to which participation affects the system development process, such as what effect end-user participation has in the systems development process (Holgersson, 2014). In some cases, end-user participation is viewed as meaningless, where the SD team ignores any input from participants (Charif, 2017). In other cases, end-user participation is taken seriously and end-user inputs are carefully considered by the SD team (Hutter et al., 2017). Co-designing is considered to have the most influence, whereas user-centred design and participatory design to have the least influence on participation (Holgersson, 2014; Hutter et al., 2017).

3.7.3. Relationship between end-user participation in the SD process and system use

The relationship between end-user participation in the SD process and system use may be described based on overall responsibility, end-user and system relationship, hands-on activities, attitudes towards the system, and system impact and use (Barki et al., 2008; Ju, Wei, & Tsai, 2016). Figure 3-3 illustrates the relationship between end-user participation in the SD process and system use and are discussed thereafter.

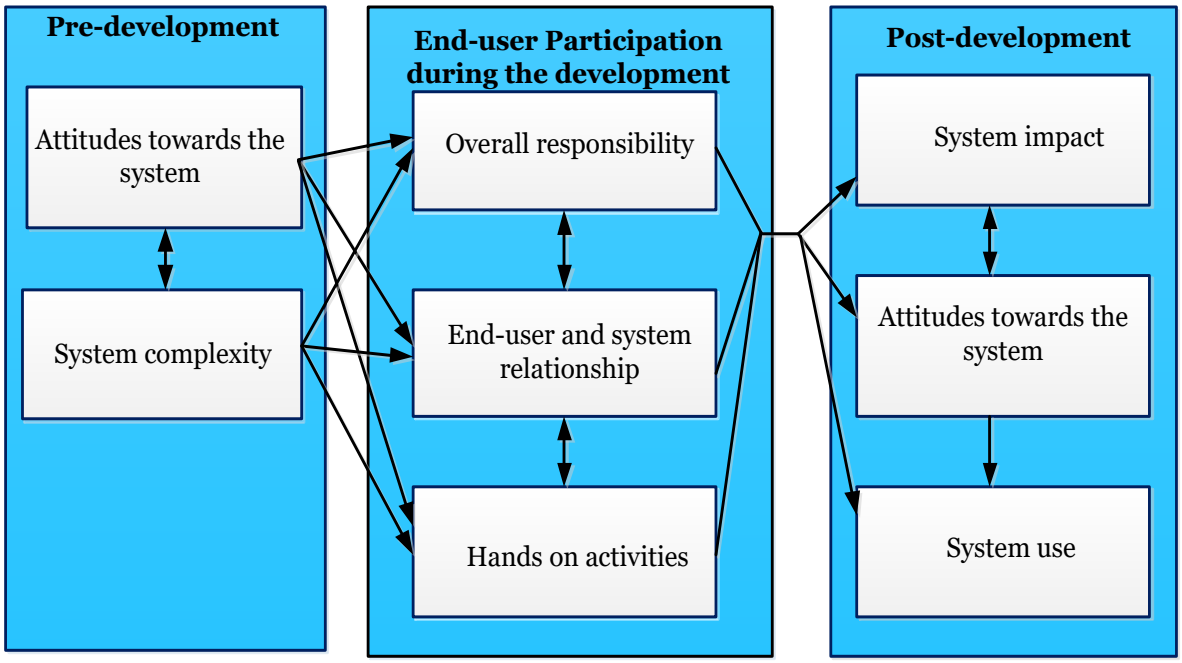

Figure 3-3: Relationship between end-user participation in the SD process and system use (Ju, Wei, & Tsai, 2016)

3.7.3.1. Overall responsibility and hands-on activities

Overall activities refer to end-users' activities and assignments, reflecting their overall accountability during the development process of the system (Holgersson, 2014). Hands-on activities refer to system development tasks performed by end-users (Abelein & Peach, 2015). End-users may assist in defining the scope of the project and business context and may provide useful information and ideas for the system to be developed (Ju et al., 2016). Hands-on activities and overall responsibility reflect that end-user participation offers end-users the responsibility for the overall success of the system (Thilo et al., 2017). End-users' responsibilities during the development process can influence their involvement in the success goal and attitudes towards the system (Zhang et al., 2015). The responsibilities that are given to end-users during participation influence them to develop positive attitudes toward the system (Holgersson, 2014; Zhang et al., 2015).

3.7.3.2. End-user and information system relationship

End-user and information systems relationship refers to the development activities reflecting user-IS communication and influence (Barki et al., 2008; Ju et al., 2016). The relationship between end-users through hands-on activities and shared responsibility between end-users and the SD team have been noted to have a significant influence on end-users' satisfaction with the system (Ju et al., 2016). The interaction and ability to exchange information among end-users and the SD team

can affect system use, impact and attitudes towards the system through knowledge exchange and learning (Bennis, 2015; Abelein & Paech, 2015).

3.7.3.3. Positive attitudes towards the system

Attitudes are described as the feeling of favourable feelings or unfavourable feelings towards using an object or an action (Davids, 1989). Attitude reflects an individual's disposition towards performing a behaviour (Teo, Zhou, & Noyes, 2016). Attitude is determined by an individual's beliefs and affective evaluation of the consequences of performing the behaviour (Teo et al., 2014). Attitudes towards using technology are linked to behavioural intentions which operationalised attitudes, based on the effect dimension which focused on individuals' positive or/and negative feelings about performing a particular behaviour (Davids, 1989). Attitudes towards using information systems can be operationalised as positive psychological feelings such as a sense of ownership about using the system (Aga, Noorderhaven, & Vallejo, 2018).

End-users are usually expected to have negative attitudes towards the change that the system is going to bring (Bano et al., 2017). Attitudes towards the system during the pre-development of SD are acknowledged by the degree of end-user participation during the development process of the system (Kwon, 2020). Prior to the SD process, end-users usually have vaguely formed attitudes and beliefs towards the system being complex (Zhang et al., 2015). The most important, the more personally relevant, and the better the system to be developed could be perceived to be, the more likely end-users will desire and choose to participate in the SD process (Barki et al., 2008). End-users who are active during the SD process are likely to develop the belief that the system is both important and personally relevant and the feeling that the system will be good for the work activities (Ju et al., 2016).

There is much research that acknowledges end-user participation influence end-users attitudes towards the uptake of the system (Aidemark et al., 2015; Moraine et al., 2017; Bano et al., 2017). Previous research on attitudes such as in psychology posits that highly involved individuals have been found to gain positive attitudes concerning the issues at hand (Marks & Davis, 2012). In marketing research, highly involved individuals (with a product) have been found to gain positive attitudes towards the product (Kwon, 2020). In organisational behaviour research, highly involved individuals (with their jobs) have been found to have gained positive job attitudes (Ju et al., 2016). It, therefore, stands to reason that highly involved end-

users in the development of the system are likely to gain positive attitudes towards the system during post-implementation (Ju et al., 2016; Bennis, 2015). End-users who participate in the SD process are likely to hold the belief that the system is both important and personally relevant and therefore are likely to develop positive attitudes concerning the system (Ju et al., 2016).

3.7.3.4. System impact and system use

Another commonly mentioned benefit for end-user participation is eased implementation in terms of better acceptance of the system, based on the participating end-users' realistic expectations of what the system can and cannot do (Aidemark et al., 2015; Zhang et al., 2015). End-user participation can improve a user's understanding of why the finished system works as it does, and why it is not possible to fulfil every single end-user requirement when developing it (Holgersson, 2014). Greater use and acceptance are yet another commonly mentioned argument for end-user participation in the SD process (Ju et al., 2016). By letting end-users participate, researchers argue that the end-users' commitment to the SD project increases (Holgersson, 2014), which in turn may reduce end-user resistance to the SD project and the system to be implemented (Moraine et al., 2017).

Despite the potential benefits that information systems can offer for public sector organisations, the level of acceptance is low (Ngoepe, 2016; Nguyen et al., 2017). Previous research notes that the majority of system development projects in the public sector in developing countries follow a waterfall SDLC model for the development (Ika & Saint-Macary, 2014). It is estimated that 25% to 60% of information systems projects for government departments are never successful in their development processes; some pass the development process stage but immediately get abandoned and adopted by end-users such as employees (Mbele, 2016). Most information systems projects for government departments fail because they ignore the inclusion of end-users in the development process of systems. What happens is that the projects are developed without adequate participation of employees, hence, later, the projects become unsustainable and their life spans are cut short (Samimi, Ledary, & Samimi, 2015; Bennis, 2015). Furthermore, failure to meet end-users' expectations have been identified as one of the challenges facing government departments in developing countries (Holgersson, 2014; Sutrisno et al., 2017).

3.8. Relationship between end-user participation and sense of ownership

People psychologically attach to things as a result of their active participation or association with those things (Barki et al., 2008; Pierce & Jussila, 2011). In IS, the active participation of end-users with the system during the development process could enable them to experience a sense of ownership and feel satisfied with the end product(Barki et al., 2008; Aga et al., 2018). The relationship between end-user participation and sense of ownership to system use and acceptance has been previously modelled based on perceived ease of use, perceived usefulness and continuance intentions to use the system (Wu & Chen, 2017; To & Tang, 2018). System use and acceptance have been previously predicted and tested through perceived ease of use, perceived usefulness and continuance intentions (Davids, 1989; Barki et al., 2008; Wu & Chen, 2017). Figure 3-4 illustrates how end-user participation affects the sense of ownership and provides a key link in the relationship between end-user's participation in system development and their usage behaviours.

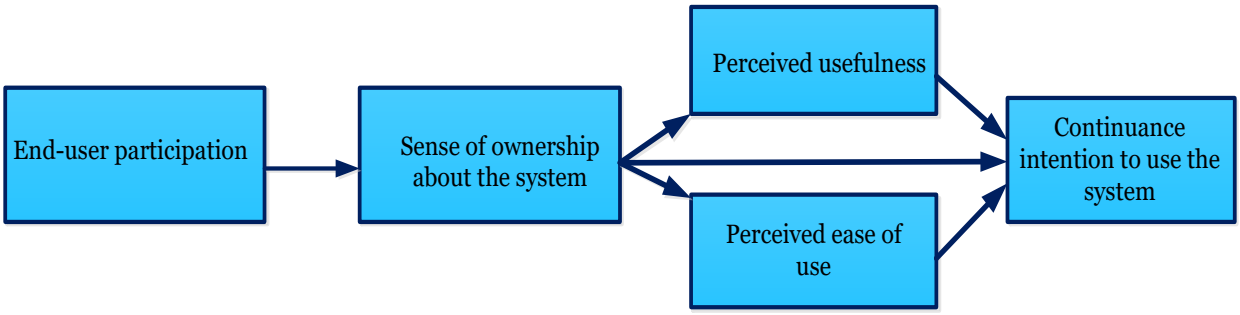

Figure 3-4: An illustration of the relationship between end-user participation, sense of ownership about the system use (Yim, Moses, & Azalea, 2017)

3.8.1. Sense of ownership and perceived ease of use

Perceived ease of use is one of the independent constructs in the Technology Acceptance Model (TAM) (Davids, 1989). Perceived ease of use is the degree to which a prospective end-user expects that the use of the target system is free of effort (Davids, 1989). This term follows from the definition of the word ease: *"which enable a user to be free from difficulty, physical effort, mental effort, and learning effort when using a system"* (Wu & Chen, 2017, P. 223). Perceived ease of use is an extent

to which the end-users believe that using the system would be free of difficulty, physical effort, mental effort, and learning effort (Yim, Moses, & Azalea, 2018).

Perceived ease of use was found to be the precursor to the end-users' sense of ownership and perception about the system performance (Yim et al., 2018). Previous studies found that the time an end-user participates in system development has a substantial effect on the ease of use of the system (Yim et al., 2017; Wu & Chen, 2017). When end-users participate in the development process of the system, they get familiar with how the system will operate in the workplace and that has been found to significantly influence a sense of ownership about the system (Pare et al., 2006; Barki et al., 2008; Chen, Zhao, & Wang, 2016). When end-users interact with the system while it is developing, they acquire knowledge (Kim et al., 2016). However, end-users need to be equipped with the necessary knowledge about how the system will effectively operate within their work processes during their participation, so that they can come to know the system better (Hooi & Cho, 2017; Lee & Suh, 2015). This argument reflects in previous research where employees who conduct data capturing in a database of the organisation did not develop a sense of ownership about the system that they were using, as they were not involved in the creation of the database (Huang et al., 2016).

3.8.2. Sense of ownership and perceived usefulness

Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance (Davids, 1989). Several psychological processes explain the influence of end-user participation on the perceived usefulness of the system (Pare et al., 2006; Barki et al., 2008). End-users who participate in the system development process are likely to influence system attributes in accordance with their personal needs and desires (Winkelman, Leonard, & Rossos, 2005). This, in turn, would result in a system they would perceive as important, personally relevant and good (To & Tang, 2018; Yim et al., 2018).

Therefore, end-users who participate in the SD process will align their beliefs and attitudes, resulting in higher levels of involvement and more positive attitudes toward the system (Amoako-Gympah, 2007; Pereira et al., 2017). Previous studies posit that the higher levels of experienced control though their participation in system development not only increase perceived usefulness directly, but also increase their sense of ownership (To & Tang, 2018; Yim et al., 2018), which in turn

leads to their belief in system usefulness (Barki et al., 2008). Strategies in place during end-user participation need to promote sense ownership to contribute to positive beliefs about the usefulness and ease of use of the system (Pare et al., 2006; Lee & Mendlinger, 2011).

3.8.3. Sense of ownership and continuance intentions

Continuance intentions are considered as post-adoption behaviours that reflect the continued usage of a particular system (Aga et al., 2018; Yim et al., 2018). Continuance intentions can be explained by the process where the bond between the end-user and the system is strengthened, and make end-users see the system as part of themselves, rather than a tool or software in their workplace (Wu & Chen, 2017). This, therefore, indicates that a sense of ownership is beneficial from other theoretical standpoints (Smith et al., 2014). Experienced control through end-user participation in system development influence has been stated to influence continuance intentions to use the system when it is ready for use (Pare et al., 2006; Barki et al., 2008; To & Tang, 2018). This goes above being willing to utilise the system and includes a state of possession that encompasses attachment and personal involvement with the system (Lee & Suh, 2015). In this vein, a sense of ownership is continuance behaviour and attitude due to the level of involvement in system development (Yang, Shao, Liu, & Liu, 2017; Aga et al., 2018).

3.9. Research gap in the literature

The gaps in the literature review are twofold: lack of end-user participation in information systems development in the public sector, specifically to local government (municipalities). Secondly, lack of studies in IS discipline focusing on end-user participation to influence a sense of ownership for end-users.

3.9.1. End-user participation in information systems' development in the public sector

The research gap resides in the application of end-user participation in system development in government departments. Research studies on participation in e-government do not always imply that end-users such as employees in local government departments are participating in system development that will later affect their work activities. The majority of information systems within municipalities in developing contexts such as in South Africa are implemented

without adequate participation of end-users in project implementations, hence, later these systems become unsustainable and take time to reach the expected use rate, or later they become unsustainable with their life cycles cut short (Ika & Saint-Macary, 2014; Ngoepe, 2014).

One of the major causes of system failures in the public sector is the "exclusion" of end-users, from the design process, of those people who will be using the system (Ngoepe, 2016). In many cases, SD practitioners usually follow tacit sessions of the ways that employees in municipalities will use the system that often differ from the actual conditions of their work activities (Holgersson, 2014). If end-users' feedback is sought throughout the design process, then the new system is unlikely to effectively handle overlooked expectations, complexities and nuances (Sutrisno et al., 2017). Hence, it is vital for end-users to be brought into participatory contact with experts, specialists and policymakers (Holgersson, 2014).

There are fewer IS studies on e-government that have discussed e-government interventions from the end-users' perspective, focusing on their participation in system development (Ika & Saint-Macary, 2014). Simultaneously, previous research emphasised the need to research problems related to the SD specific to the end-users' perspective. There is, therefore, a need to synthesise research surrounding end-user involvement in SD, focusing on municipalities.

3.9.2. Dearth of studies in IS discipline focusing on the influence of end-user participation on a sense of ownership for end-users

Another research gap resides in the emergence of a sense of ownership in the IS domain with specific to end-user participation in system development. The review of existing research on the development of a sense of ownership in IS perspective reveals the following implications for future research.

1. The concept of a sense of ownership is a complex phenomenon in IS discipline and calls for a comprehensive conceptualisation of its emergence through end-user participation in system development.
2. To develop a theory for the development of a sense of ownership in end-user participation in system development that is lacking in the IS research domain, there is a need for a deeper conceptualisation of the emergence of a sense of ownership that builds onto the theory of psychological ownership grounding this study.

3. The majority of technology studies explain end-user participation in SD from the theoretical lens of technology use and acceptance.

Despite being significant, it is more critical to study other critical success factors, such as a sense of ownership of the end-users towards technology, that can emerge in end-user participation in SD.

3.10. Summary of the chapter

This chapter gave an overview of the emergence of a sense of ownership in end-user participation in system development. The concepts such as a sense of ownership, the process of SD and end-user participation in SD were discussed. The reviews showed that factors such as work-based self-determination, intrinsic motivation and job satisfaction and commitment affect the sense of ownership in the workplace. The reviews further note that end-users who participate in the SD process are likely to hold the belief that the system is important and personally relevant and thus are likely to develop positive attitudes towards it. However, end-user participation in SD should be handled with caution because too much involvement of end-users in SD can be unproductive, resulting in conflicts and endless iterations. The reviews further revealed that end-users can perceive that they have substantial influence during their participation in the SD process, thereby develop feelings of ownership or a sense of ownership about the system that they will use in the workplace. The factors found to be the mediators of system use included perceived usefulness, perceived ease of use, attitudes and continuance intentions to use the system. Lastly, the chapter outlined research gaps in the domain regarding the development of a sense of ownership through end-user participation.

Chapter 4: Theoretical background

4.0. Introduction

This chapter discusses the theoretical background of the study. The study seeks to explore how end-users develop a sense of ownership through their participation in system development. The study used a theory of psychological ownership to investigate the development of a sense of ownership if end-users were to be offered an opportunity to participate in system development.

Section 4.1. discusses the psychological perspective of the study. Section 4.2 provides justification for selecting a theory of psychological ownership in the study. Section 4.3 outlines the background of the theory of psychological ownership. Section 4.4 discusses paths through which a sense of ownership emerges in a given situation. Section 4.5 presents the adopted theoretical framework for the investigation of how end-user participation in FMIS development engenders a sense of ownership among end-users in municipalities. Section 4.6. discusses previous studies that applied the theory of psychological ownership for the development of a sense of ownership towards the system. Section 4.7 outlines the research critiques and limitations of the theory of psychological ownership and, lastly, Section 4.8 concludes the chapter.

4.1. The psychological ownership perspective in the study

Research in the field of organisational and employee behaviour has for a long time been concerned with factors that promote employee performance, discretionary efforts, innovation and retention (Avey et al., 2009; Kelly et al., 2017). This has led to a research focus on ways in which employees feel psychologically attached to their workplace in the organisation. Researchers have described the importance of employee-workplace relationship where employees feel devoted to the workplace in an organisation with the dedication to see the organisation succeed (Olckers, 2011; Peng & Pierce, 2015; Yildiz & Yildiz, 2016). Employees also placed importance towards contributing to the organisation's improvements (Dawkins et al., 2017). This employee-workplace relationship is reflected in the psychological experience of a connection and emotional bond between the employee and the workplace, often resulting in a psychological and behavioural effect (Peng & Pierce, 2015).

A psychologically empowered workplace through a sense of ownership creates conditions necessary for employees to experience autonomy and control, which are fundamental to psychological ownership. Previous research suggests that psychology of possession can play a major role in facilitating a relationship between employees and their organisation (Peng & Pierce, 2015; Olckers, 2017; Dawkins et al., 2017). Employees can experience a sense of ownership towards an organisation that they work for, especially over their everyday employment, and this may manifest in different ways (Avey et al., 2009; Pickford, Joy, & Roll, 2016). Employee sense of ownership may manifest through the information systems that employees use in the workplace to achieve work processes (Dawkins, Tian, Newman, & Martin, 2017). In this regard, the concept of a sense of ownership has received attention as an important phenomenon affecting end-users of emerging technologies in the workplace (Kirk & Swain, 2018). As information systems became ubiquitous in the workplace, boundaries between humans and devices disappear when information systems increasingly become an extended self of its end-users (Klesel et al., 2016; Yim et al., 2017).

Municipalities in South Africa are experiencing low uptake of information systems such as FMIS (Recall Chapters 1 and 2). End-users of information systems need to gain a sense of ownership by allowing them to participate in the systems development as this can influence power and lead to end-users quickly appreciating the need for these systems. To investigate the development of a sense of ownership of end-users through their participation in system development, the theory of psychological ownership (Pierce et al., 2001) was an appropriate theoretical framework for this study.

4.2. Justification for selecting a theory of psychological ownership

This section motivates the selection of the theory of psychological ownership in the study. Other theories considered and not selected in the study are discussed based on technical perspectives in theories of information systems adaptation, and social and socio-technical perspectives.

4.2.1. Theories of information systems adaptation

Technology adoption research has mainly focused on exploring the determinants of end-user's intentions to use new technologies such as information systems (Ajibade, 2018). Many theories have been developed to study technology adoption issues including the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 2010), Theory of Planned Behaviour (TPB) (Ajzen, 1991). Theory of Technology Acceptance Model (TAM) (Davids, 1989) and the Unified Theory of Acceptance Model (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003). Although adoption theories are considered to be the most widely applied means of measuring the degree of acceptance by end-users, the models do not, however, consider the majority of social perspectives that may affect end-users' intentions to use information system (Zhao et al., 2016; Ajibade, 2018). These adoption theories do not focus on the factors affecting end-users' behaviour to use information systems in different organisations such as private and public organisations (Lee & Mendlinger, 2011; Chandio, Burfat, Abro, & Naqvi, 2017; Yim et al., 2017).

The social and cultural aspects of decision-making in organisations affecting end-user's intentions to use information systems are neglected in these adoption theories (Hai & Kazmi, 2015; Ajibade, 2018). The adoption theories do not consider factors such as psychological empowerment through a sense of ownership which could influence acceptance and willingness to use technology in the workplace (Zhao et al., 2016; Yim et al., 2017). Accordingly, the potential end-users of information systems in the workplace may not always base their acceptance of and willingness to use developed systems on their perceptions of usefulness and how it is to use (Pereira et al., 2017; To & Tang, 2018). Lack of sense of ownership may affect the adaptation of information systems in the workplace (Pare et al., 2006; Barki et al., 2008; Kirk et al., 2015). For instance, TAM is mostly suitable for the personal use of technology; there are limitations in using the theory for technology used in the working environment as there are rule-governed behaviour (Chandio et al., 2017; Ajibade, 2018), which affect control and influence (sense of ownership) for using the technology (Zhao et al., 2016). These theories were excluded in the study to investigate the emergence of a sense of ownership among end-users of information systems in municipalities.

4.2.2. Theories for social and socio-technical perspective

The socio-technical perspective is more relevant to this study. Social and socio-technical theories were considered in the focus of this study. These theories include Actor-Network Theory (ANT) (Collan, 1986), Theory of Practice (TOP) (Bourdieu, 1977) and theory of psychological ownership (Avey et al., 2009; Pierce, 2009). ANT is a type of critical social theory development which claims that any actor whether people, objects and organisations, is equally important to a social network (Collan, 1986). TOP is a socio-technical theory that is used to explain internal and external interactions of the social field in particular, with three key elements: fields, habitus and capital (Bourdieu, 1977). The theory of psychological ownership is a socio-technical theory that claims the importance for employees in an organisation to develop a sense of ownership towards a target (such as a system used in the workplace) (Avey et al., 2009; Pierce, 2009). Individuals tend to experience a basic motivation, a sense of responsibility when they are given control and have influence during the development of the target of ownership, and thereby feel cognitively connected and emotionally attached to it (Peng & Pierce, 2015).

As this study focused on end-user participation in FMIS development to engender a sense of ownership in municipalities, a theory of psychological ownership was found more fitting in the interests of the study compared to other social and socio-technical theories such as. The theory of psychological ownership has received attention as an important factor in affecting end-user's behaviour in technology adoption (Lee & Chen, 2011; Lee & Suh, 2015; Klesel et al., 2016). Since this study focuses on end-user participation to engender a sense of ownership, the theory of psychological ownership is suitable to other social and socio-technical theories, hence the Actor-Network Theory (ANT) (Collan, 1986) and Theory of Practice (TOP) (Bourdieu, 1977) were excluded in the study. Previous research in IS has linked and empirically found a relationship between end-user participation, psychological ownership on end-users' beliefs towards information systems (Barki et al., 2008; Shen, Khalifa, & Almulla, 2013; Klesel et al., 2016). The logic is apparent; as end-users participate in system development and become involved in a system, the system becomes personally relevant and important to them, thereby inducing their sense of ownership fo the particulate system (Van Rijn & Stappers, 2016; Zhao et al., 2016).

In an organisational setting using information systems in the workplace, the concept of psychological ownership is continuing to gain prominence as a valuable state with positive implications on employee attitudes and behaviour to use systems in the workplace (Zhao et al., 2016; Aga et al., 2018). Psychological ownership has been previously used to evaluate an increased employee motivation to use information systems in the workplace (Marks & Davis, 2012; Van Rijn & Stappers, 2016; Kirk & Swain, 2018). In addition, given the relative lack of robust emergence of a sense of ownership motive measures appropriate for FMIS public sector research, the study adopts the theory of psychological ownership to contribute to the literature, through outlining the sense of ownership motives in end-user participation in the system development process. Previous studies tested and validated the theory of psychological ownership in contexts of human interaction, making it suitable for use as a source of a theoretical-led enquiry of how a sense of ownership is developed in end-user participation in this study (Karahanna et al., 2015; Rey-Moreno et al., 2015; Klesel et al., 2016). This affirms that the theory of psychological ownership is applicable in this study.

4.3. Theory of psychological ownership

The origins of psychological ownership can be traced to the literature in human development, psychology and sociology (Pierce & Jussila, 2011). The principle of the theory of psychological ownership (Pierce et al., 2004) is the feeling of possessiveness and of being psychologically attached to the object (Avey et al., 2009). Previous research provided empirical evidence that individuals express their feelings of ownership towards their work (Pierce & Jussila, 2010), the products they create (Kirk & Swain, 2018) their work activities and processes (Klesel et al., 2016), the practices employed by their organisations and the organisation that they work for, and the specific issues in their organisations (Olckers, 2011). Such possessiveness can cause an individual to evaluate a target more favourably than other things that he/she does not own or can easily obtain (Pierce et al., 2004). Psychological ownership is further a state of being an owner and having the right of possession (Pierce & Jussila, 2010).

The crux of psychological ownership is further based on the feeling of possessiveness and psychological attachment to an object or the target, either tangible or intangible

(Avey et al., 2009). This theory posits that developing feelings of ownership towards a target, individuals tend to experience a basic motivation to possess and control it, devoting significant energy and resource to it, and feel cognitively connected and emotionally attached to it (Klesel et al., 2016).

Previous studies suggest that the psychology of possessions proposes that feelings of ownership cause people to view both tangible and intangible possessions as part of the extended self (Barki et al., 2008). This suggests that IS, many of which are designed through creative human action (Klesel et al., 2016) are likely to become objects of the end-users' sense of ownership (Rey-Moreno et al., 2015). In addition, this was proposed by Pierce et al.'s (2004) research which constituted that individuals need to be in control of the object that directly affects them. The target or the object of ownership in the psychological ownership refers to whatever the object represents to an individual or a group (Matilainen, Pohja-Mykra, Lahdesmaki, & Kurki, 2017). In this study, a target of ownership can be classified as information systems such as FMIS that end-users use in municipalities for budget preparation, budget implementation, monitoring and control, and auditing and evaluation.

4.4. Paths through which a sense of ownership emerges

The paths through which psychological ownership emerge are adopted in the study. The paths through which a sense of ownership emerge include control of the target of ownership, coming to know the target of ownership intimately and investing the self (self-investment) in the target of ownership; and was introduced in the previous Chapter 3. The phenomenon of psychological ownership is rooted in a set of human motives; an individual may develop a sense of ownership for a variety of targets as long as the targets allow these motives to operate and to be satisfied (Pierce et al., 2009; Avey et al., 2009). Figure 4-1 illustrates the three paths through which an individual may undergo the development of psychological ownership over the target.

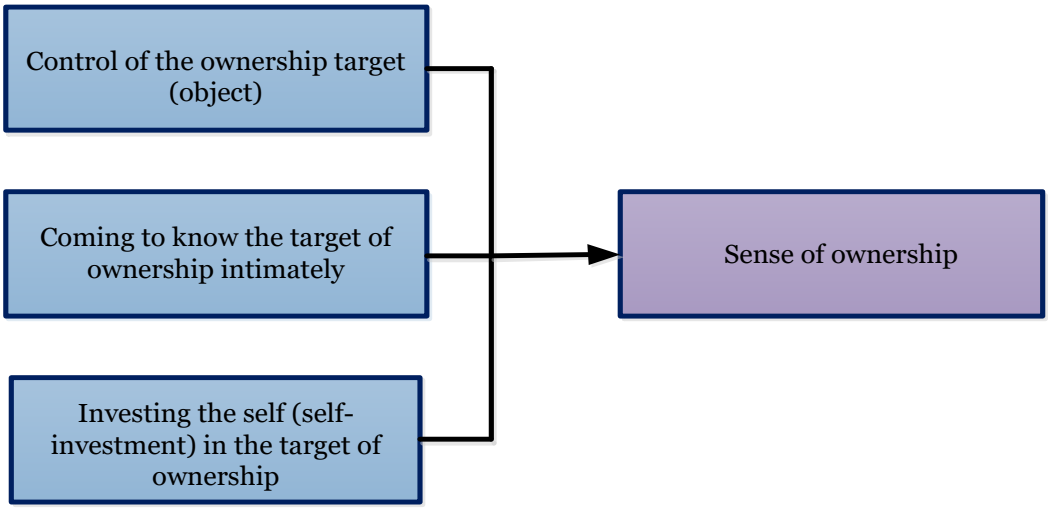

Figure 4-1: Paths through which a sense of ownership emerges (Pierce et al., 2001)

A sense of control over the target of ownership gives rise to a sense of ownership for the target (Han, Chiang, & Chang, 2010; Olckers, 2011; Klesel et al., 2016). The greater the amount of control a person gains over the target, the more they would psychologically experience as part of the self (Han et al., 2010). The material objects that are controlled become regarded as part of the self; the greater amount of control, the more the object is experienced as part of the self (Klesel et al., 2016). People are more likely to identify objects as part of themselves which could control and manipulate, or objects that could affect them, than objects outside their sphere of control (Olckers, 2011; Neubert, & Sarstedt, 2016).

Coming to know the target of ownership intimately implies that people develop a sense of ownership for certain objects through a living relationship with that object (Pierce et al., 2001; Avey et al., 2009). Individuals usually find themselves psychologically tied to things because of their active participation in, or association with those things (Olckers, 2017). The more information offered to the person about the target, then the better knowledge an individual has about an object, the deeper the relationship between the object and the self, therefore the stronger the feeling of ownership towards it (Ramos et al., 2014; Peng & Pierce, 2015; Aga et al., 2018). Through processes of association, an organisation can provide employees with a number of opportunities for getting to know the potential target of ownership such as the job, work projects, technologies for the workplace and team (Pierce et al., 2009; Barnard, van der Merwe, & Gerber, 2016). For instance, when employees are provided information about the potential organisational targets of ownership, this

occurs. For instance, with the participation of end-users in system development of the system that they will use at work, they are likely to feel that they know the system better and, consequently, may develop a sense of ownership towards it (Pare et al., 2006; Barki et al., 2008).

Previous research provides insights into the relationship between employees' work activities and psychological ownership (Avey et al., 2009; Pierce et al., 2009). The research argues that through employees' labour, they invest cognitive energy in the work activities that they achieve; consequently, these work activities then become representations of the self, much like their thoughts, words and emotions (Iqbal & Idrees, 2017). Hence, individuals own the objects they have created in much the same way that they own themselves (Klesel et al., 2016). The investment of individuals' energy, effort, time and attention in objects causes the self to become one with the object and to develop a sense of ownership toward the object (Avey et al., 2009).

Organisations usually provide opportunities for workers to invest themselves in different aspects such as their job, projects, work processes, systems, work teams, and, therefore, to experience a sense of ownership toward the target (Pierce et al., 2001). In this sense, employees are likely to develop a sense of ownership towards their work, systems for work processes, and the product of their labour (Avital & Vandenbosch, 2000). This is because the investment of the self comes in several forms including investment of one's own time, skills, ideas, and psychological, physical, and intellectual energies (Olckers, 2011). As such, a person may begin to experience that the target of ownership emerges from the self. This is because people's psychological ownership of a target can be stronger, the more they invest themselves in the target (Pierce et al., 2001).

4.5. Adopted framework for the development of a sense of ownership

The principles of psychological ownership have been extended (Avery et al., 2009; Rey-Moreno et al., 2015). The extended principles are based on an adaptation and interpretation of the concepts of the theory of psychological ownership (Pierce et al., 2009) and its further extension (Avery et al., 2009; Rey-Moreno et al., 2015). The model groups the concepts into behavioural determinants, relational dynamics,

contextual factors, mechanisms and direct routes to ownership and outcomes and effects of ownership. The extended principles are for the development of a sense of ownership about the target (see Figure 4-2). These principles are adopted to examine the development of a sense of ownership in end-user participation in FMIS development in municipalities.

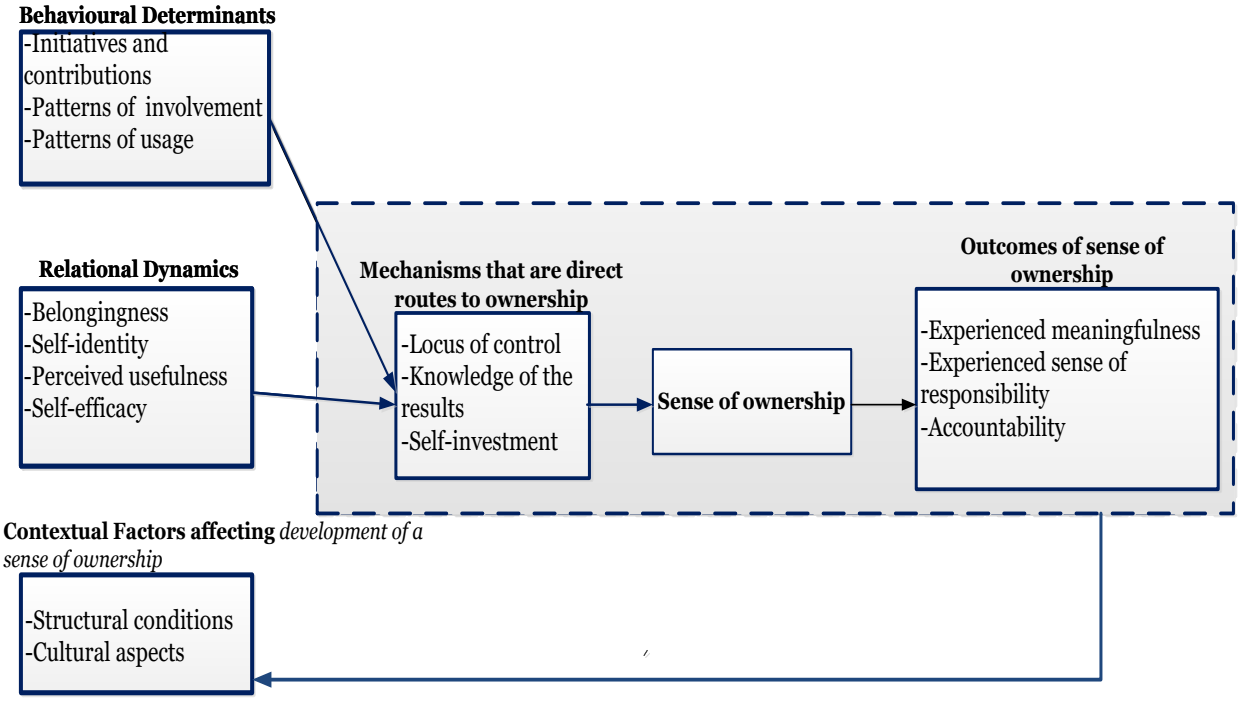

Figure 4-2: The development of a sense of ownership (Pierce et al., 2009; Avery et al., 2009; Rey-Moreno et al., 2015)

The model of principles suggests that it is likely that the development of a sense of ownership exists in both the target and the individual and that its appearance and manifestation is also strongly influenced by the given control to an individual to experience the target (Rey-Moreno et al., 2015). The model groups the elements of the theory of psychological ownership to discuss how a sense of ownership is achieved in a given situation. This model has been previously applied to a South African case to understand if and to what extent ownership of a community network was successfully transferred to local people (Rey-Moreno et al., 2015; van Rijn & Stappers, 2016). The categories of the model are discussed in the following sections.

4.5.1. Mechanisms to build a sense of ownership

Mechanisms to build a sense of ownership covers the most important mechanisms for cultivating ownership, which can be treated as direct predictors or indicators of

ownership of the entire initiative or parts thereof (Rey-Moreno et al., 2015). The mechanisms that are direct routes to ownership are the locus of control, knowledge of the results and self-investment (As discussed in Section 4.4).

A sense of ownership is influenced by the capacity building, empowered actions that bring control to the agent. In the study, this implies that the more users are empowered to take independent actions, the more they will be comfortable with the system. The power and control factor to trigger a sense of ownership refers to the perceived or actual control an agent has over directing the course of events by direct or indirect action and decision-making (Rey-Moreno et al., 2015). This study posits that when end-users perceive that they have control over the implemented system and discover the effectiveness and attractiveness of having to use these systems in the workplace, then they develop a sense of ownership towards the system which triggers a willingness to use these systems in the workplace and comply with the municipality financial management mandate.

The motivation in psychological ownership is the need to feel capable of interacting effectively in a setting (Olckers, 2011). The motivation factor to trigger a sense of ownership, is, in part, grounded in satisfying the need underlying psychological ownership (Avey et al., 2009). Arising out of motivational state, the individual needs to the underlying locus of control, self-investment and knowledge of the results (Pierce et al., 2004). The interactions with the target or object of ownership can lead to the fulfilment of the motives for a sense of ownership (for instance, the experience of competence) and to experiencing psychological ownership (Rey-Moreno et al., 2015).

The knowledge factor captures the degree of knowledge about the target of ownership (for instance, if there is a system to be developed for end-users in an organisation) and operational knowledge or skills covering certain areas vital for the advancement of the project (for instance, being involved in the development stages to know what to expect once the system is implemented) (Rey-Moreno et al., 2015). The self-investment factor indicates an attitude towards action by which the agent deeply engages herself/himself, willingly bringing in time, energy or even identity (Pierce et al., 2009). It can also denote a subjective perception of and attitudes towards activity

outcomes, which are seen and appreciated as fruits of one's creation or labour, or part of the self (Rey-Moreno et al., 2015).

4.5.2. Relational dynamics to build a sense of ownership

Relational dynamics capture the pattern of relatedness between the agent and the target. Specifically, the construct seeks to answer the question: what role, function or need does the target fulfil or help to fulfil, for the agent? (Rey-Moreno et al., 2014). The relational dynamics that trigger a sense of ownership in a given situation are self-efficacy, perceived usefulness and belongingness and self-identity (Pierce et al., 2009; Donetto et al., 2015).

Self-efficacy relates to an individual's belief that he/she can successfully implement action and be successful with a specific task (Van Dyne & Pierce, 2004; Avey et al., 2009). This self-efficacy component of psychological ownership says *"I need to do this task, I can do it, and I, therefore, own the responsibility for achieving success"* (Olckers, 2011, P.35). In the context of this study, it is assumed that if end-users of the system are involved in systems development stages, they would develop self-efficacy that they own the responsibility to use the system (Barki et al., 2008). Perceived usefulness as the trigger of a sense of ownership is the degree to which the target (e.g. the system) is perceived to meet collective and/or individual needs and goals (Rey-Moreno et al., 2015). The degree to which an agency develops a sense of ownership depends on the potential of the ownership target to satisfy the needs underlying psychological ownership (Pierce & Jussila, 2011).

Beyond belongingness being enhanced by physical possessions, belongingness in terms of psychological ownership in an organisation is understood as a feeling that an employee belongs in the organisation. When people feel like owners or important elements of the organisation, their need for belongingness is met by "having a place" in terms of their social and socio-emotional needs being met (Avey et al., 2009). The need to belong in a workplace may be satisfied by a particular job, work processes, work team, work unit, division, organisation or industry as a whole (Pierce & Jussila, 2011).

Similar to belongingness, self-identity argues that individuals use ownership for defining themselves to express their self-identity to others (Pierce et al., 2001; Avey et al., 2009). This is through conveying their personal values, character, attitudes,

education, membership and achievements by means of the items they purchase and display (Olckers, 2011). This is also for maintaining the continuity of the self across time (as the preserving of possessions allows individuals to maintain a sense of continuity extensions of themselves) (Avey et al., 2009). For instance, in teamwork (i.e. user involvement and participation in systems development) or a project, self-identity is attained through giving team members the reasons to take pride and joy in their contribution towards the project (Barki et al, 2008; Rey-Moreno et al., 2015).

4.5.3. Behavioural determinants of a sense of ownership

The behavioural determinants of an individual's sense of ownership towards the target are described as individuals' initiatives and contributions, patterns of usage for the target and patterns of involvement for the implementation of the target (Rey-Moreno et al., 2015). The behavioural determinant, through initiatives and contributions, covers the attachment for the individual's initiative and the rationale for maintaining one's involvement in the project. Others gain a sense of capability by feeling they cause things to happen and experience meaningfulness. Hence, possessions facilitate feelings of control and influence over both tangible and intangible targets (Buchem, 2012). For instance, end-user participation in system development would enable end-users to contribute, which can result in end-users being committed to using the system once it's ready for use. When individuals feel responsible for a target or object, they then invest themselves through their initiatives and become committed (Pierce et al., 2009).

Patterns of usage factor as the trigger of sense of ownership about the target (how and what extent the system would be used), and patterns of involvement, referring to types of activities conducted for the development of the system. The patterns of involvement have been operationalised in relation to the agent's degree of autonomy (Rey-Moreno et al., 2015). When there are clear patterns of usage of technology target of ownership, then it is likely for individuals to develop a sense of ownership. It is likely for the sense of ownership that an individual feels for the target when they are involved in the development of the target (pattens of involvement) (Barki et al., 2008). Patterns of involvement for the target of ownership could be the end-user participation which leads to the development of psychological ownership of the system (Klesel et al., 2016). Because, by being actively engaged, the end-user may feel that the resultant solution embodies approaches and solutions that reflect their

assumptions and objectives. Accordingly, that sense of involvement is likely to enhance their feelings of control about the target (Karahanna et al., 2015).

4.5.4. Effects and outcomes of a sense of ownership

Outcomes or effects of a sense of ownership are attitudes, states and behaviours developed as a consequence of building a sense of ownership (Rey-Moreno et al., 2014). These include the experienced sense of responsibility, experienced meaningfulness and accountability. Sense of responsibility refers to the degree to which an agent feels responsible for the object or target (the system) and/or for outcomes of one's own work. Possessions and feelings of ownership trigger a sense of responsibility for the object (Pierce et al., 2009; Avey et al., 2009). Possession causes individuals to protect and defend their ownership rights (Buchem, 2012). When people's sense of self is closely linked to the target, a desire to maintain, protect or enhance that identity will result in an enhanced sense of responsibility (Pierce et al., 2003).

Accountability is the implicit or explicit expectations that an individual may be called on to justify one's beliefs, feelings and actions (Avey et al., 2009). Accountability is viewed as the behavioural determinants of a sense of ownership about the target primarily through the expected right to hold others accountable and the expectation for one's self to be held accountable about the target of ownership (De Dreu & van Knippenberg, 2005). Expectations of the perceived right to hold others accountable and to hold one's self-accountable are consistent with Pierce et al.'s (2009) description of expected rights and responsibilities. Those individuals who experience a higher sense of ownership are expected to be able to call others to account for influence on their target of ownership (Avey et al., 2009). The expectation of information sharing and permission to influence the direction of the target are consequences of this expected right to hold others accountable (Pickford et al., 2016; Waheed, Abbas, & Malik, 2018). When the target of ownership is seen as an extension of the self, accountability for what happens to and with those targets has implications for what happens to and with the self. This is also evident in Pierce et al.'s (2009) use of descriptive behaviours such as stewardship and self-sacrifice to characterise those with high levels of sense of ownership.

4.5.5. Contextual factors affecting the development of a sense of ownership

Contextual factors are structural conditions which trigger a sense of ownership that is likely to have an impact upon the project and people's relation to the project. Contextual factors that may affect the development and emergence of a sense of ownership are structural conditions and cultural aspects (Pierce, 2009; Roser & Samson, 2009). Structural conditions imply that an agent's sense of ownership may be influenced by structural aspects of the situation, for instance, rules, laws and norms (Olckers, 2011). Other aspects that emerge include honesty, trust and respect, which positively shape contextualised factors of a sense of ownership (Rey-Moreno et al., 2014). In IS, it is stated that, if the end-user during participation in system development, trusts the intentions of the developer and feels respected, they are likely to be more willing to participate in a process (van Rijn & Stappers, 2016).

The cultural aspects of social context have a significant influence on the development of psychological ownership for individuals (Olckers, 2011). Culture is the collective programming of the mind that distinguishes members of one human group from another (Menard, Warkentin, & Lowry, 2018). Concept to self and socialisation are the two theoretical reasons why they believe culture will have an effect on psychological ownership (Pierce et al., 2001). This is because the concept of self is in part socially imposed and influenced by culture (Pierce et al., 2001). Secondly, psychological ownership is partly learnt through socialisation practices, which again are culturally determined (Roser & Samson, 2009). Culture is, therefore, a vital aspect that needs to be examined to better understand the development of a sense of ownership. Culture, which is reflected in customs, norms, traditions and beliefs, shapes the individual's self-concept and values with regard to control, self-expression and ownership (Olckers, 2011).

4.6. Application of the theory of psychological ownership in IS

Since the inception of the theory of psychological ownership, it has become the baseline model in the area of a sense of ownership and has been applied and tested in a variety of settings. These include rural communities (Rey-Moreno et al., 2015; Kelly et al., 2017), Small and Medium Enterprises (SMEs) (Ikavalko, Pihkala, & Kraus, 2010), large organisations (Peng & Pierce, 2015), the health sector (Misfud, Molines, Cases, & N'Goala, 2019) and the academic-industry (Cardoso, Rosa, & Videira, 2018;

Yim et al, 2018). Furthermore, the theory of psychological ownership can be used to explain end-user empowerment through a sense of ownership and the behavioural intentions to use technology or information systems (Kirk et al., 2015; Lee & Suh, 2015; Aga et al., 2018). Studies that applied the theory of psychological ownership are presented in Table 4-1.

Table 4-1: Studies that have applied the theory of psychological ownership

Author	Title of the study	Area of focus
Barki et al. (2008)	Linking IT implementation and acceptance via the construct of psychological ownership of Information Technology	End-users' behavioural determinants and behavioural determinants of psychological ownership in end-user participation in IT implementation
Barnard et al. (2016)	Psychological ownership: A human factor to consider for the success of technology entrepreneurial activities	Entrepreneurs' relational dynamics and mechanisms or routes to ownership
Avital and Vandenbosch (2000)	The relationship between psychological ownership and technology-driven value	The effects of psychological ownership on system value in an organisation
Marks and Davis (2012)	Does user participation lead to a sense of ownership for rural water systems?	The development of end-user's sense of ownership in community engagement
Aga et al. (2018)	Project beneficiary participation and behavioural intentions promoting project sustainability: The mediating role of psychological ownership	Rural communities' behavioural determinants and relational dynamics in project participation and sustainability
Zhao et al. (2016)	The effects of psychological ownership and use and acceptance on social media loyalty	Psychological ownership in social media can stimulate contributive behaviour within the virtual world.
Kirk and Swain (2018)	Consumer psychological ownership of digital technology	The lens of self-design to examine the relationship between consumer technology appropriation and psychological ownership
Brasel and Gips (2014)	Tablets, touchscreens and touchpads: How varying touch interfaces trigger psychological ownership and endowment	Consumers' relational dynamics and mechanisms as triggers of psychological ownership in technology use
Karahanna et al. (2015)	Psychological ownership motivation and use of social media	The use of social media platforms to align individuals' needs for psychological ownership and for maintaining continuity of self-identity
Pare et al. (2006)	The effects of creating psychological ownership on physicians' acceptance of clinical information systems	Psychological ownership of the system in association with end-user perceptions

There is still a paucity of studies that have applied the theory of psychological ownership to evaluate technology uptake in the public sector, with specific attention

to end-users of information systems in government departments in a developing setting (Ika & Saint-Macary, 2014). Previous research suggested future work about the subject of psychological ownership in the context of information systems, as well as more precise information on the topic of sense of ownership in end-user participation and perceived system success (Barki et al., 2008; Barnard et al., 2016). In addition, previous research suggested future work to integrate two research areas such as psychological ownership and IS discipline research, focusing on a public sector organisations context (Aga et al., 2018). It was emphasised that much still needs to be done to explore these two areas to further explicate the psychological ownership relationship with the development process and acceptance of technology (Kirk & Swain, 2018; Hooi & Cho, 2017).

4.7. Research critiques and limitations of the theory of psychological ownership

The concept of psychological ownership has been criticised as it may lead to other dysfunctional organisational behaviours in employees (Pierce et al., 2009; Olckers, 2011). The reason was that employees with a high degree of ownership may sometimes become over-possessive over the target (such as technology, e.g., a computer) (Pierce et al., 2009). The emphasis was that employees may resist sharing their technology tools with co-workers or may want to retain exclusive control over the target (Avey et al., 2009). However, this type of behaviour of not sharing technology tools such as computers among co-workers in the workplace is usually advisable due to information security and to hold employees accountable (Hassan, 2007).

Other authors are concerned that if psychological ownership is enforced at a managerial level, managers may resist interventions that are aimed at empowering their subordinates. This is because managers may feel a high degree of ownership towards the management of their work unit (Pierce & Jussila, 2011). This could inhibit the implementation of employee involvement and participation programmes in the organisation (Michelsen, Sundberg, Ekstrand, & Norlander, 2018). Furthermore, the concern was that psychological ownership about the target may not lead to organisational dysfunctional effects, but may lead to such effects if certain conditions are in place (Asatryan, 2006; Pare et al., 2006). Even though the theory

has been previously applicable to many disciplines and is flexible to explain a variety of contexts regarding ownership, the theory has been criticised for the following summarised limitations.

- At inception, the majority of readers found the theory of psychological ownership complex and verbose, thus requiring extra attention when trying to understand it.
- The concepts describing the theory of psychological ownership are not explicitly structured and therefore require attention when used in a context.
- The concepts of the theory of psychological ownership appear scant – since the theory originates from the psychology discipline, original authors barely talk about technology in their work and therefore the concepts need supplementation with other authors when studying IS artefacts.
- The theory of psychological ownership needs extra conceptualisation before applying it to the study (Olckers, 2011).

To address this critique, it is useful to create visual diagrams to illustrate relationships between the theory of psychological concepts to be used in the study (Bullock, 2015). This, however, might reduce rich descriptions and authentic voices so important in qualitative case study research, whereby the diagrams are considered too static. For instance, a respondent's interview can be reduced to just a dot position on the diagram, thus diminishing all the emotions an actor may have displayed. To mitigate over-reduction of collected data, it is vital to support the illustrations with evidence from empirical sources (for instance, documents, filed notes, transcripts) (Olckers, 2011; Bullock, 2015).

4.8. Summary of the chapter

This chapter provided a rationale for using the theory of psychological ownership as an appropriate theory for this study, to better explain the development of a sense of ownership among end-users of FMIS in municipalities in their participation in system development. The concepts through which sense of ownership included behavioural determinants, relational dynamics, contextual factors, mechanisms or routes to ownership and outcomes or effects of ownership, and detailed and particularised to empirical sources. Finally, the critiques of the theory of

psychological ownership were discussed together with possible ways to overcome its limitations.

Chapter 5: Research methodology

5.0. Introduction

The main aim of this chapter is to highlight the methods applied in this research project. In particular, in accordance to the primary research question, considerations for the research methodology are outlined, indicating case study strategies used within the confines of the interpretivism philosophy to suit the aim and objectives of this research.

Section 5.1 discusses the philosophical foundations of the study which focuses on the ontological assumptions and interpretive epistemology of the study. Section 5.2 discusses the type of research chosen for the study. Section 5.3 outlines the approach to theory. Research design and unit of analysis are discussed in Section 5.4. The sampling techniques and demographic characteristics of respondents are discussed in Section 5.5 and the research time frame is defined in Section 5.6. Section 5.7 discusses data collection methods adopted in the study. Data analysis methods are outlined in Section 5.8. Section 5.9 describes the validity and reliability for this study whilst Section 5.10 outlines ethical considerations in the study. Section 5.11 summarises the chapter.

5.1. Philosophical foundations

Philosophical assumptions are a unique worldview based on assumptions associated with the way a researcher acquire knowledge about the phenomena (epistemology) and the very nature of the researcher's view of the world (ontology) (Oates, 2006; Creswell, 2014). Ontology is concerned with the question of whether or not a 'real world' exists: does reality exist beyond human speech and cognition processes? The epistemology is dependent on the ontology in the sense that an ontological statement is a basis for discussing (epistemologically) to which ('real world') object human knowledge can possibly refer. Epistemology is concerned with how humans can achieve true knowledge. It specifically addresses the relationship between the object of knowledge and the knowledge acquired. Here, it elaborates the influence of the subject on the process of achieving knowledge: is knowledge potentially objective or subjective?

The ontological assumptions and epistemological assumptions for the study are discussed in the following sections. Table 5-1 summarises the characteristics of interpretivism, as used in this study, categorised into the nature of reality, the nature of knowledge and the relationship between the inquirer and the inquired-into (Niehaves, 2007).

Table 5-1: Characteristics of interpretivism (Niehaves, 2007)

Feature	Description
Ontology	Subjectivity
	Reality can be explored and described, and constructed through human interactions, and meaningful actions.
	Discover how people make sense of their social worlds in the natural setting by means of daily routines, conversations and writings while interacting with others around them. These writings could be text and visual pictures.
	Many social realities exist due to varying human experience, including people's knowledge, views, interpretations and experiences.
Epistemology	Events are understood through the mental processes of interpretation, which is influenced by interaction with social contexts.
	Those active in the research process socially construct knowledge by experiencing real-life or natural settings.
	Inquirer and the inquired-into are interlocked in an interactive process of talking and listening, reading and writing.
	More personal, interactive mode of data collection.
Methodology and methods	Data is collected through text messages, interviews and reflective sessions
	Research is a product of the values of the researcher.

5.1.1. Ontological assumptions

The ontological position of this study is that reality exists outside the mind of a researcher (Creswell, 2014). In this study, the view of reality is based on the assumption that access to reality is only given through social constructs (Niehaves, 2007). The researcher attempted to understand the phenomena of interest through the meanings assigned by people (Oates, 2006). Moreover, there is also a social world that is being constructed, shaped and influenced by our life experiences,

knowledge and desire (Oates, 2006; Niehaves, 2007). The subjective manner is applicable in this study by focusing on the meaning of the social phenomena of interest rather than measurements (Saunders, Lewis, & Thornhill, 2011). This research further took the position that one can only understand reality to a limited extent; no one can obtain the entire picture of a studied phenomenon (Myers & Klein, 2011). This implies that reality can be studied to a certain extent and generalisations can be made with a degree of probability (Saunders et al., 2011).

The social world view in research underlines how social situations should be studied in a manner that discloses their inner nature (Morgan & Smircich, 1980). There is a need to understand the roles that traditions, cultural aspects, language and symbols at play in the shaping of any given reality, and a need for generating ethnographic interpretations of particular conditions that may yield insight with regard to the way reality works (Creswell, 2014). Furthermore, it is critical to be aware of the philosophical commitments that one makes through choices of research paradigm, since this has a significant impact on how the researcher understands what it is they are reaching to investigate (Oates, 2006; Olaitan, 2014).

5.1.2. Interpretive epistemology

Interpretive research in information systems and computing is concerned with understanding the social context of an information system (Oates, 2006, p.292). The interpretivism view of the world is that individuals give meaning to the world by being part of the social world; removing oneself from the social world removes part of that meaning (Creswell, 2014). Interpretive inquiry usually focuses on human activity suited in context (Klein & Myers, 1999). The goal of the inquiry is to understand the cultural and historical viewpoints of individual participants (McDonald & Headlam, 2009; Creswell, 2014). The characteristics of people living in a world cannot simply be reduced to a set of independent objects as put forward by the positivist (Creswell, 2014). Rather the phenomena need to be understood as being dependent on human interests. Human interests not only channel our thinking, but also guide how we investigate the world "*(i.e. which questions we ask)*, and how we construct our knowledge *(i.e. how we formulate the answers found)*". Therefore, the context in which phenomena are being studied adds value (Klein & Myers, 1999; Blumberg, Cooper, & Schindler, 2008). This involves the process of knowledge acquisition of a phenomenon into the preconceptions of a researcher and

participants, and the common interpretations that evolve from their interaction (Klein & Myers, 1999).

Interpretive research using case studies and ethnographic studies must be conducted and evaluated against a set of Principles of Interpretive Research (Klein & Myers, 1999). Oates (2006, p. 292) identified a number of characteristics that are indicative of the interpretivist paradigm, and where applicable these have been associated with the principles listed in Table 5-1. These characteristics include:

- **Multiple subjective realities:** The individual perceptions about other individuals or groups do not assume a positivistic universal truth, but rather truth is constructed from their cultural viewpoint of the world in which they live. (Principle 1 & 6).
- **Dynamic, socially constructed meaning:** The perceptions of reality realised by an individual or a group remain dynamic if they are shared with others by using some form of communication medium that conveys their meaning and understanding. (Principle 1 & 4).
- **Research reflexivity:** The researcher needs to be cognisant of the fact that they bring innate bias to a research project and therefore need to reflect on their assumptions, beliefs, values and actions during the process of the research. (Principle 1, 3 & 7).
- **Study of people in their natural social setting:** The researcher does not view people in an artificial setting through a "one-way mirror", but seeks to understand how they are immersed in their natural environment to ensure a holistic viewpoint to the research. (Principle 1 & 2).
- **Qualitative data analysis:** The collection and analysis of the use of language, metaphors and visual representations are often done with the aid of qualitative data. (Principle 1 & 5).
- **Multiple interpretations:** Unlike positivist research, there are multiple explanations that arise from research conducted through the interpretivist paradigm. Whether a single explanation has a greater utility over any others will depend on how much evidence there is in support of it. *(Principle 1 & 6).*

This research project subscribed to the interpretive paradigm; on the variant of social construction. A social constructionist works on the assumption that individuals want to understand the world in which they live and work (Collis & Hussey, 2009). The

interpretivism paradigm was established, to identify the attitudes and beliefs of individuals, about the phenomena in a given context of the study. In this study, the researcher chose a social construction interpretive paradigm to investigate the development of a sense of ownership through end-user participation in FMIS development. Gaining insight into how people respond regarding the phenomena and gaining meaningfulness from their perspectives is important in interpretive research (Klein & Myers, 1999). In the study, this can result in a richer understanding of how end-users of FMIS in municipalities may gain a sense of ownership in participation in system development.

The interpretivist philosophy argues that human beings are not mechanistic and they have multiple realities which need to be understood within their context (Oates, 2006; Niehaves, 2007). This research is based on the belief that there exists a real physical world beyond our knowledge and comprehension. As such, knowledge and meanings are facts of interpretation and there is no objective knowledge that is independent of thinking. And if researchers are to understand the actions of research participants, they have to understand those actions in the way that they do themselves (Creswell, 2014; Collins & Hussey, 2014). As stated in the ontology section, the assumption of this study was positioned within the subjective ontology and for epistemology. The researcher interacted with end-users of FMIS in a municipality, to obtain subjective meaning on how their participation in system development would develop a sense of ownership. Due to the nature of research in IS, research is undertaken with some or other assumptions on the basis of what constitutes “valid research” and thereby demonstrates what research methods are appropriate (Myers, 1997). The researcher collected data from what works to address the research problem of this study (Niehaves, 2007). The research methods used in the study were closely associated with a human component such as interviewing end-users, observations of end-users during participation in system development and document analysis.

5.2. Qualitative research method

There are two possible research approaches for this study: quantitative and/or qualitative research methods (Saunders et al., 2011; Creswell, 2014). Table 5-2 summarises these approaches. Qualitative research methods mainly operate within a

social science context. This method enables researchers to study human behaviour and the reasons that determine certain human behaviour (Ormston, Spencer, Barnard, & Snape, 2013; Creswell, 2014). This is referred to as social and cultural phenomena. The focus of this method is to collect data that is based on the views of others who are influential in the field of study. In understanding the research problem, qualitative researchers use qualitative approach and methods to the inquiry, data collection in a natural setting sensitive to people and place under the study, and data analysis that is inductive and establishes patterns (Roux, 2005; Kinash, 2012; Creswell, 2014).

Table 5-2: Qualitative and quantitative approaches in social research (Creswell, 2014)

	Qualitative approach	Quantitative approach
Epistemological	Roots in interpretivism	Roots in positivism
The purpose	Constructing detailed descriptions of social reality	Testing a predictive and cause-effect hypothesis about social reality
Understanding	Participants' natural language is used to come to a genuine understanding of their world.	Suitable for a study of phenomena that are conceptually and theoretically well developed; seeks to control the phenomenon
Research design	Research design is flexible, unique and evolves throughout the research process. No fixed steps and design are completely replicable.	Research design is standardised, fixed/flexible and replicable.
Sample	Uses small samples	Uses large samples
Data sources	Data sources are determined by the information richness of settings.	Data is obtained systematically and in a standardised manner.
The unit of analysis	The unit of analysis is holistic, concentrating on the relationships between elements, contexts, etc. The whole is always more than the sum.	The unit of analysis is variables that are atomistic (elements that form part of the whole).
Results and findings	Enables findings to be generalised from one setting to another similar setting	Enables results to be generalised from the sample to the population
Reliability and	Produces result with high reliability	Produce result with high validity but

validity	but low validity.	low reliability

This research applied qualitative research methodologies. A qualitative research approach has the potential to provide an understanding of how end-user participation in system development could engender a sense of ownership to end-users of FMIS in municipalities. The study followed a qualitative research approach since it has a goal of facilitating the meaning-making process in a research study (Barks, 2013). Further, a qualitative research approach is valuable when there is little understanding of the phenomena of interest and, since it can be exploratory, it allows the researcher to be descriptive (McDonald & Headlam, 2009).

5.3. Approach to theory

The use of a theory in a study usually guides how a phenomenon is observed in a study and used as a lens for observing, interpreting and analysing data (Gregor, 2006; Yin, 2014; Reeves, Albert, Kuper, & Hodges, 2008). When selecting a theory or theories for a study, a researcher considers the roles of the theory which need to be in line with the research questions and objectives of the study (Yin, 2014). While there are different roles of the theory, previous research in social science research suggests five types of theories for analysing which can be applicable in IS research such as:

- Describing what
- Explaining (describing how and why)
- Predicting (what will be)
- Explaining and predicting (what is, how, when and what will be)
- Design and action (how to do something) (Gregor, 2006; Blaikie & Priest, 2019).

Exploratory research provides a better understanding of the research problem (Devi, Singh, & Naz, 2013). As such, research commonly begins with the exploratory phase to assess what the study is about. Depending on the aims and objectives of the study, it evolves into descriptive, explanatory or prescriptive phases (Saleh, Mavondo, & Ali, 2014). Considering that the study was premised in an interpretivism research paradigm, a descriptive approach to theory was considered appropriate to describe how end-user participation in system development engenders a sense of ownership in municipalities in South Africa. To obtain a holistic view of the problem area, the

study adopted a theory of psychological ownership that was used to gather data in the study.

There are three notable approaches to theory strategies: deductive, inductive and abduction (Saunders et al., 2011). Deductive and inductive research approaches to the theory are mirrors of one another. The former completes the research cycle by testing existing theory and associated propositions or hypotheses, while the latter generalises findings from empirical evidence to produce new theories (Collins & Hussey, 2014). A study may combine deductive and inductive (Saunders et al, 2011). Each approach to theory strategy is suitable for the specific aims of the study. In using a deductive strategy, a theory was described and questions for the data collection were developed using the theory. The collected data was analysed based on the adopted theory.

5.4. Research Design

This section discusses the research design employed in the study. The section further outlines the unit of analysis for the study and a summary of the sample of respondents.

5.4.1. Case study design

The study used a case study research design. Researchers apply a case study strategy on a real-life social phenomenon where they have little or no control over the contemporary events in the research context (Yin, 2014). When the focus of the study is on answering the "how" and "why" questions, the researcher should consider the use of case studies (Oates, 2006; Yin, 2014). In IS research a case study is mostly used in qualitative research (Benbasat, 1987; Myers, 2013). The approach has gained prominence in the IS domain (Keutel et al., 2014; Laumer et al., 2017; Iyamu, 2018). A case study research design was suitable for the study because the research question (how question) fitted well with the case study design (Oates, 2006; Yin, 2014). This strategy is appropriate for this study because the focus of the study is in the context of one province in South Africa.

Case studies can be intrinsic or instrumental (Baxter & Jack, 2008; Creswell, 2014; Hyett, Kenny, & Dickson-Swift, 2014). An intrinsic case study design is used to learn about the problem of a phenomenon and usually the researcher does not develop a

theory (Baxter & Jack, 2008). An instrumental case study design examines a phenomenon of interest to understand and explain a problem and may assist the researcher to refine a theory or theoretical framework of the study (Stake, 1995).

This study used an instrumental case study design to generate a deeper understanding of the development of a sense of ownership, through end-user participation in system development. The study aimed at developing propositions for explaining the development of a sense of ownership through end-user participation in system development to enhance continuous usage of the financial system in municipalities. The instrumental case study design was considered appropriate to develop descriptive propositions for the development of a sense of ownership in the context of user participation in FMIS development.

5.4.2. Rationale for a single case study design

A case study design can have single or multiple cases (Yin, 2014). A single case study focuses on one context and usually applies a holistic approach to gather in-depth insights from the phenomena (Oates, 2006; Myers, 2013; Yin, 2014). Single-cases are usually adopted to analyse unique or extreme cases and there is much focus on establishing the unit of analysis to demonstrate the uniqueness of the case (Oates, 2006; Myers, 2013; Yin, 2014). However, in the multiple-case study, different contexts for cases are analysed, concentrating on settings for each case and across settings (Yin, 2014). The results are compared to note the differences in contexts selected as cases (Oates, 2006). Appreciation of the differences in single-case and multiple-case studies designs influenced the selection of the case study design that was appropriate for this research study. The research used a case of the Western Cape local government. The in-depth focus on a single case yielded data collection that revealed the status of end-user participation in system development in municipalities and how end-users perceive their development of a sense of ownership in this regard.

A single-case study can be divided into several sub-units or parts which are examined separately to gather more details of the whole case (Keutel et al., 2014). Those sub-units within a single-case study can be analysed to gather more details on the case (Baxter & Jack, 2008; Laumer et al., 2017). The data that emerges from the sub-units can be analysed between the sub-units (single-case analysis) or across the sub-units

(cross-case analysis) to improve the quality of the results of the study (Oates, 2006; Baxter & Jack, 2008; Yin, 2014). Within the case of the Western Cape, the study focused on two district municipalities and two local municipalities as sub-units of observations.

The researcher observed, evaluated and reported on these parts of the case of the study, to gain multiple aspects of the development of a sense of ownership through end-user participation in system development within two districts and two local municipalities. The selected sub-units for the case study provided the researcher with various ways to study the phenomena of interest within their context of FMIS development in municipalities of the Western Cape (Baxter & Jack, 2008). The selected sub-units enabled the respondents to tell their stories regarding FMIS development in local and district municipalities (Yin, 2014). Through these stories, the participants described their views of reality which enabled the researcher to better understand the participants' actions (Rose, Sprinks, & Canhoto, 2015).

5.4.3. Rationale for selecting the case of Western Cape province

The study selected Western Cape as a case because it had the potential to offer richer information from a variety of actors in the case than could be expected from a typical case (Iyamu, 2018). The province is among the provinces of South Africa that have municipalities experiencing challenges in financial management. Out of 30 municipalities, 25 were facing poor financial management in consecutive reporting periods (See Table 5-3). Both district municipalities and local municipalities were experiencing challenges of financial management (Makwetu, 2019). The majority of the district and local municipalities presented incomplete annual financial statements to the Auditor-General of the country. The municipalities with poor financial management did not have supporting documentation needed to substantiate the information provided in annual financial statements during the financial reporting periods (Makwetu, 2019; Auditor-General South Africa, 2019). The Auditor-General report highlighted that local and district municipalities in the Western Cape experienced poor record management in financial reports and that contributed to the unfavourable audit outcomes (Auditor-General South Africa, 2019).

Table 5-3: Summary of challenges of financial management facing municipalities in the Western Cape (Auditor-General South Africa, 2019)

Financial reporting periods	Non-compliance with the legislation and internal controls	Failure to attain clean audit outcomes	Financially unqualified financial statements	Mismatch and incomplete disclosure of financial reports for financial reporting	Missing reports regarding performance of the municipality
2018/2019	79%	72%	93%	68%	89%
2017/2018	53%	98%	89%	51%	86%
2016/2017	79%	89%	93%	44%	62%
2015/2016	78%	61%	76%	71%	79%
2014/2015	72%	56%	70%	88%	91%
2013/2014	85%	90%	83%	71%	86%

The Western Cape was among the provinces with municipalities that have rolled-out FMIS and experiencing low uptake (National Treasury, 2018). The case of the province offered an opportunity to investigate hindrances to the uptake of FMIS in municipalities. The study selected municipalities that were still grappling with FMIS and still struggled with poor use and acceptance and that required re-implementation (Nabe, 2016). The sample of municipalities was four municipalities as sub-units of the Western Cape case study. Due to ethical reasons, the municipalities are anonymised as District Municipality A, District Municipality B, Local Municipality A and Local Municipality B. Based on section 88 of the Local Government Act of 1998, local municipalities are within the area of district municipalities.

5.4.4. Unit of analysis

A unit of analysis describes what the case study is focusing on (Oates, 2006; Yin, 2014). This research study uses Yin's (2014) general rule to identify a research unit of analysis. The general rule specifies that the definition of the unit of analysis is related to the way one defines the initial research question (Yin, 2014). A unit of analysis

formed by the research question assists the researcher to know where to go about getting answers for the research, with whom to talk and where to focus for the investigation (Oates, 2006; Yin, 2014). Likewise, the unit of analysis is simply the cases to be studied in research; its specification is necessary for the researcher to understand how the case relates to a broader base of knowledge (Hancock & Algozzine, 2017).

Within the case of the Western Cape district and local municipalities, the unit analysis was the development process of FMIS in municipalities. The study observed strategies followed in the development process, which stakeholders have an influence in the development and challenges encountered during the development, that leads to the re-implementation of FMIS for municipalities. The aim was to understand the role played by end-users in the development and, if no role is played, then to investigate how their participation in development would engender a sense of ownership to enhance uptake of FMIS in municipalities.

5.5. Sampling of respondents

There are two main sampling methods: probability and non-probability, depending on the type of research population (Myers, 2013). Probability sampling refers to the selection from a research population, respondents whose number and identities are known to and accessible to the researcher (Oates, 2006). On the other hand, non-probability was issued to selecting participants from the sample whereby the exact number and location of the population is not certain to the researcher (Bygstad & Munkvold, 2016). This sampling technique is subjective as the researcher has more control over the selection of the elements. The study selected participants of the study using a non-probability sampling technique (Saunders et al., 2011).

5.5.1. Purposive sampling

There are a number of non-probability sampling techniques such as convenience, purposive and quota sampling. This study used mainly purposive sampling. A purposive sampling technique was employed to purposefully select participants who could make a meaningful contribution, based on their experience and roles in relation to the study (Mills, Durepos, & Wiebe, 2010; Myers, 2013). Purposive sampling is based on the researcher's judgement, in line with a selected case for the study with a specific purpose in mind (Ritchie, Lewis, Nicholls, & Ormston, 2014).

Purposive sampling is often used when a researcher has clear and identified characteristics of participants expected to yield trustworthy descriptions (Myers, 2013; Yin, 2014). Such clear characteristics are usually used to identify a smaller representative subset that would enable a realistic element of generalisation about the target population (Saunders et al., 2011). This sampling strategy allowed the researcher to engage with respondents who had the right and rich knowledge about the focus of the study (Bygstad & Munkvold, 2016).

The identified sample must possess specific characteristics (Mbokane, 2009; Emmel, 2013). The selection of participants in the study was guided by the willingness of participants to participate in this research study (Mills et al., 2010). The study divided the sample into three groups. All three groups were part of the development process of municipal FMIS. These include:

- The project manager (coordinator) for the implementation of municipal FMIS, appointed by the provincial treasury of the Western Cape,
- End-users in the selected district and local municipalities and
- Developers of municipal FMIS for municipalities in the Western Cape.

We purposely decided who to include in the study, based on the respondents' ability to provide the required data. The selection of participants was based on their job descriptions, duties and responsibilities, expertise and experience in the FMIS development. This was done to ensure that information obtained from the respondents was accurate. The respondents are presented in Table 5-4.

Table 5-4: A sample size of respondents for the study

Respondents' identifier	Description of respondent and the segments of FMIS	Number
N=1: Exploration phase of the study		
Project manager for FMIS at the provincial treasury	The co-ordinator of the implementation of municipal management information systems appointed	1
N=16: End-users of FMIS in the four municipalities		
Budget Officer – for all selected municipalities	Budget Officers mainly used the system process for budget preparation for their municipalities.	4
Accounting Officer – for all selected municipalities	Accounting Officers were the key end-users in budget planning and	4

	execution processes.	
Internal Auditor- for all selected municipalities	Internal Auditors used system segment for monitory and control functions	4
Chief Finance Officers - for all selected municipalities	Chief Finance Officers were responsible for all processes of the financial systems in municipalities,	4
N=5: Developers of municipal FMIS for the Western Cape		
Business analyst	These formed the System Development (SD) team of FMIS for the Western Cape municipalities.	5
Systems analyst		
Database administrator		
Software developer		
Systems test analyst		

The project manager from the provincial Treasury Department of the province was selected for the exploration of the context of the study. The project manager was responsible for the overall monitoring of the implementation of municipal FMIS in the province. The Provincial Treasury for each province is responsible for monitoring that all municipalities comply with the MFMA (National Treasury, 2018). The project manager had been involved in the FMIS development life cycle. Since the project manager was in charge of all the system development processes and the SD team, it was important to include him for the holistic picture of the system development involvement. The project manager understood the development process of FMIS in the province. The project manager provided relevant information regarding end-users who were suitable for the study.

The category of end-users of FMIS had four end-users in each of the four municipalities. In total there were 16 end-users. These end-users were involved in financial management processes in their respective municipalities (see Table 15). The end-users were engaged to understand the challenges of implemented FMIS, and how end-user participation in the SD process of FMIS would influence the development of a sense of ownership to enhance the use and acceptance of the system in the municipalities.

The developers of municipal FMIS for the Western Cape were included in the sample to further understand the system development culture and how it would affect end-user participation. The Provincial Treasury identified developers of FMIS. The municipalities that participated in the study used one vendor company for the

development of their municipal FMIS. The sample for this category was five system development personnel. Their roles were business analysts, systems analysts, database administrators and software developers. These respondents were responsible for the various areas of FMIS development and were selected in the study to optimise the chances of gathering adequate and detailed information regarding FMIS development.

5.5.2. Demographic characteristic of respondents

The study had 16 respondents who were end-users of FMIS in municipalities and five respondents who were SD team members. The end-users in municipalities were Budget Officers, Accounting Officers, Internal Auditors and Chief Finance Officers. Table 5-5 presents the background characteristics of the end-users.

Table 5-5: Background characteristics of end-users

Characteristics	Respondents (End-users) 16		Characteristics	Respondents (End-users) 16
Age group:<=20	0		**Employment**	
21-30	3		**status:**	
31-40	6		Contract	4
41-50	5		Permanent	12
>=51	2			
Highest qualification:			**Position:**	
Diploma	2		Budget officers	4
Bachelor's Degree	7		Accounting officers	4
Honours	5		Internal auditors	4
Master's Degree	2		Chief finance officers	4
PhD	0			
Computer literacy:				
Yes	16			
No	0			

The majority of end-users were between 31 years and 50 years. There were no end-users younger than 21 years. The majority of end-users had bachelor's degrees. The Chief Finance Officers in all the four municipalities had tertiary qualifications; two of them had master's degrees. Of the end-users, 12 end-users were employed on a permanent basis; the majority of end-users did a course called Computer Literacy

and introduction to IS during their tertiary studies; in essence, all end-users of FMIS in municipalities in the province were computer literate.

In addition, the study had five respondents who were the SD team responsible for the development of FMIS for local government departments. These respondents were experts in the field of IT/IS development. The SD team included a business analyst, systems analysts, database administrators, software developers and systems test analyst. The business analyst and systems analyst were responsible for producing documentation for the planning phase and systems requirements specification phase, to ensure that FMIS requirements for the developments were identified correctly to meet the needs of end-users. The dataset administrator was responsible for the system design specifications for FMIS. Even though implementation, deployment and testing phases were excluded from the study, the software developer and system tester were also responsible for overlooking planning and system design specifications. Table 5-6 presents the background characteristics of the SD team.

Table 5-6: Background characteristics of the SD team

Characteristics	Respondents (SD team) 5	Characteristics	Respondents (SD team) 5
Age group:		**Employment status:**	
<=20	0	Contract	1
21-30	2	Permanent	4
31-40	3		
41-50	0		
>=51	0		
Highest qualification:		**Position:**	
Diploma	1	Business analyst	1
Bachelor's Degree	2	Systems Analyst	1
Honours	1	Database administrator	1
Master's Degree	1	Software developer	1
PhD	0	Systems test analyst	1

The sample of the SD team of FMIS for the municipality was between the age of 21 and 40 years. One respondent had a master's degree and others had degrees and an honours degree. Only one respondent was employed on a contract basis. In both groups of respondents, the majority of respondents had honours and bachelor's

degree qualifications. All the respondents had experience in the system development phases of project initiation of the system, system requirements specifications and system design specifications, which were applied for co-designing sessions in the study.

5.6. Data collection methods

Qualitative research advocates for multiple data collection methods for generating rich data that can uncover the causal mechanisms in a specific context of the research (Saunders et al., 2011; Creswell, 2014). In addition, a case study research strategy supports the use of multiple data collection methods (Oates, 2006; Yin, 2014). It is the responsibility of researchers to choose the most suitable data collection methods for the given research phenomenon, context cases and research questions (Myers & Klein, 2011). Multiple data collection methods supported the diversity of perceptions and multiple realities of the phenomenon (Oates, 2006; Myers, 2013; Yin, 2014). Data for the study was collected through semi-structured interviews, participants' observations during co-designing sessions and document analysis. Semi-structured interviews and participants observations during co-designing sessions served as primary sources of evidence for the study. Figure 5-1 summarises the data collection process for the study.

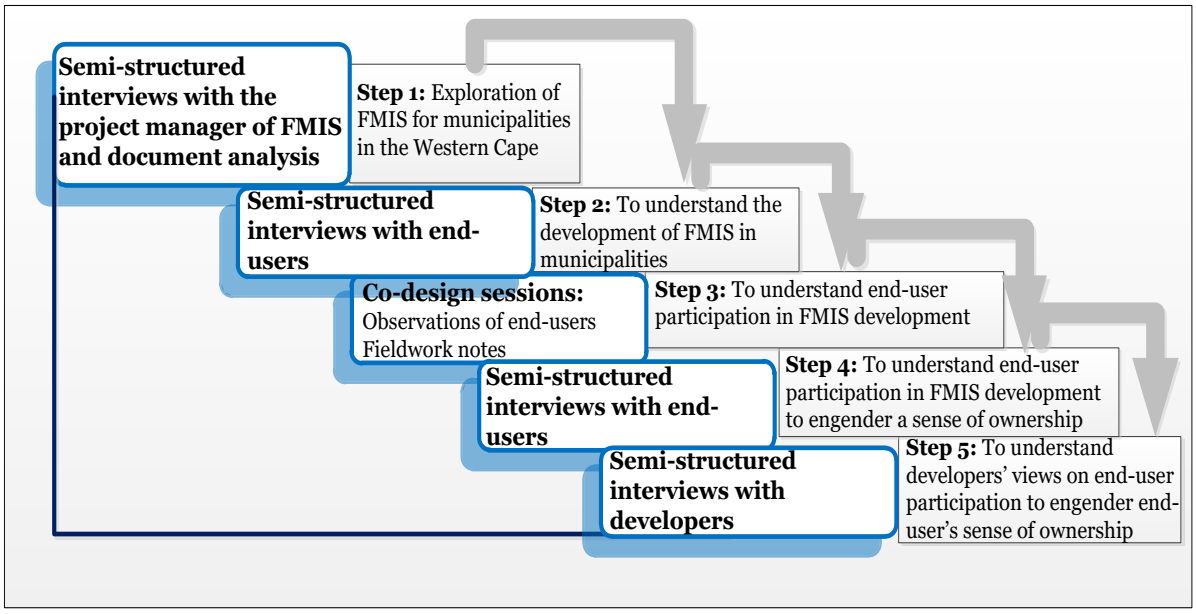

Figure 5-1: The process of data collection of the study

One of the dilemmas the design of the study had to consider was that the end-users had not participated in the system design before. It would, therefore, be challenging to engage with them on their feelings around the participation. A solution around this would be to adopt an action research approach to take the end-users through a design of a system. The study adopted a co-design session approach (Ledema, et al., 2010). This approach simulated a design session. Details of the co-design sessions are further discussed in Section 5.7.3.

The multiple data collection methods used in the study allowed for triangulation of data and therefore, the validity of the study. The study was cross-sectional (Saunders et al., 2011; Myers, 2013). The aim of the study was not to observe changing patterns of end-users in their participation in system development, therefore it was not necessary to employ a longitudinal time horizon. Another reason for adopting a cross-sectional approach was limited resources and time constraints. The data was gathered in two phases. The first phases were from March 2018 to June 2018 and the second phase was in August 2018. Table 5-7 further summarises the data collection methods used with their relation to the research questions of the study.

Table 5-7: Data sources and research questions

Research Sub-questions of the study	Data collection methods		
	Semi-structured interviews	Document analysis	Co-design sessions
RQ1: How do system owners exclude end-users of municipal FMIS in the implementation process?	X	X	
RQ2: How do end-users reactions to a lack of involvement in the SD process of FMIS affect a sense of ownership of end-users?	X	X	
RQ3: What are the influences of sense of ownership in end-user participation in the FMIS development process in municipalities?	X	X	X
RQ4: What are the hindrances to end-user participation in the SD process in municipalities?	X		

5.6.1. Semi-structured interviews

Semi-structured interviews are viewed *"as a hybrid type of interviews which lie in between structured interviews and in-depth interviews"* (Wahyuni, 2012, p.74). In

semi-structured interviews, a researcher may have a number of open-ended questions and may ask follow-up questions during the interview with the study participant (Myers, 2013). Semi-structured interviews provide the opportunity to probe for answers where the participant is to explain or build on their responses (Saunders et al., 2011; Wahyuni, 2012). This study used semi-structured interviews because they provided a useful platform for instant feedback and follow-up of questions and answers during the interaction between the researcher and participants of the study. Semi-structured interviews were conducted with the project manager of FMIS, end-users of FMIS and developers of FMIS. Interview instruments for data collection through semi-structured interviews are discussed in the following section.

5.6.1.1. Research instruments for semi-structured interviews

The study used different research instruments for a different group of different respondents: project manager, end-users and developers. The research instruments for end-users and the SD team were piloted at one district municipality and one local municipality before commencing the actual interviews. Data from the pilot instruments were transcribed by the researcher and checked by the supervisor. Changes were made in some areas that were not clear. The interview guides were further checked by the supervisor before data collection commenced. The structure of the research instruments is summarised in Table 5-8 and attached in Appendix E, F and G.

Table 5-8: Structure of the research instruments for the study

Parts of the research instruments	**Summary of interview details**
Semi-structured interviews for the exploration of the case of the Western Cape	
Project manager of FMIS development at Provincial Treasury	The role of provincial treasury in FMIS development for municipalities
	The appointed developers of FMIS for municipalities
	The list of municipalities that are still grappling with the implementation of FMIS
	Intended end-users of FMIS in municipalities
Semi-structured interviews about FMIS development (before co-designing sessions)	
End-users of FMIS in four municipalities	General demographic information of end-users
	The development of FMIS for municipalities

	The exclusion of end-users in FMIS development
	FMIS use in municipalities
	End-users interests in FMIS development
Semi-structured interviews about end-user participation to engender a sense of ownership (after co-designing sessions)	
End-users of FMIS in four municipalities	End-users' experiences of co-designing sessions: project initiation, system requirements specification and system design specifications
	End-user participation in FMIS development
	Outcomes of end-user participation to engender a sense of ownership
	Behavioural determinants of end-user participation to engender a sense of ownership
	Relational dynamics of end-user participation to engender a sense of ownership
	Mechanisms of end-user participation to engender a sense of ownership
	Contextual factors that may hinder the effectiveness of end-user participation in municipalities
Developers' views on the effectiveness of end-user participation in FMIS development	
Developers of FMIS of municipalities	General demographic information of the developers of FMIS
	End-users contributions in FMIS development
	Collaboration with end-users during FMIS development

The interview instrument for the project manager was developed for the exploration phase of the study. Exploratory interviews serve to develop more ideas for the investigation of the problem and to gather facts (Creswell, 2014). The aim of this interview was to understand the establishment of municipal FMIS. This initial phase of data collection assisted the researcher in getting familiar with the financial management mandate for municipalities in the province. The respondents of this phase assisted the researcher in mapping municipalities that are already involved with municipal FMIS. The respondent further assisted the researcher in locating specific developers that are responsible for the development of the financial system for municipalities.

Semi-structured interviews about FMIS development before co-designing sessions covered concepts about FMIS development, FMIS use and end-users' knowledge about the concept of end-user participation. The interviewee wanted to have a clear understanding of what was happening in municipalities regarding FMIS development, before embarking on co-designing sessions aimed at end-user participation to engender a sense of ownership to enhance the uptake of FMIS. The research instrument aimed at understanding:

- The development processes which were followed when the municipalities were implementing FMIS,
- The challenges facing end-users regarding FMIS use, and
- End-users interests in end-user participation in FMIS development.

The second phase of interviews with end-users after co-designing sessions were conducted after end-users participated had in co-designing sessions, discussed in the following section. The instrument of this phase was designed based on the theory of psychological ownership (recall Chapter 4). The aim of the interviews was to understand whether end-users gained a sense of ownership during the co-designing simulations of FMIS development. This was to understand whether end-user participation in FMIS development influenced a sense of ownership among end-users in municipalities.

The final research instrument focused on the developers of FMIS in the province. The interview instrument was about the developers' views on end-user participation in FMIS development. The interview questions for the SD team were developed in relation to the concept of end-user participation in FMIS development. This was to understand how much they value the need for end-user participation in system development for public sector organisations such as municipalities. This was to further understand the attitudes of the developers towards end-user participation as the strategy to enhance use and acceptance of the systems that they implement. This interview was conducted at the system development institution in a meeting room where the interviewer and the interviewee sat alongside each other.

5.6.1.2. Interview process

During the interview sessions, the research instruments were used to ensure that all relevant concepts were covered. The interviewer used the mirroring technique to probe deeper into the matter during the interview to get more detailed information. The interviewer also used 'off-the-sheet-questioning' (Myers & Newman, 2007) in trying to get to the roots of some issues. The interviewer was flexible in applying changes to the interview protocols based on emerging themes, so as to intensify the in-depth interview with the hope of excavating more of the underlying factors affecting FMIS development in municipalities. At the beginning of each interview, the following four steps were conducted:

1. Permission letters to carry out the study from the General-Director (GD) of the Western Cape and Head of the Department (HOD) at Provincial Treasury and the ethics approval letter from the University of Cape Town were presented to interviewees.
2. Consent was sought from the interviewees; they were assured that their identity and the identity of municipalities that they work for would be kept confidential and would not be disclosed in any discussion or reports produced.
3. The interviewer explained the importance of interviewees' participation and their responses in the study.
4. The interviewer explained in detail the purpose of the study and the aim of the study and outlined the importance of interviewees' contribution in data gathering to meet the objectives of this research.
5. The interviewer further explained how the data was intended to be formatted, structured and used, and how anonymity would be kept.

The interviews took place at the respondents' work premises. The interviews were conducted in English with a duration length ranging from 45 minutes to 90 minutes. Prior to the commencement of each interview, the interviewer asked for permission to tape-record the interview. The SD team accepted tape-recording while end-users declined this request, the reason being the security of their job, although written and verbal assurance regarding the protection of their identities were provided. The confidentiality and anonymity of the respondents were assured to ensure that respondents from the SD team are not inhibited in their opinions about FMIS development for municipalities, since recordings were not accepted for end-users in

municipalities. To overcome this limitation, the researcher took field notes during the interview. The field notes helped with the data analysis and also served as reminders of important points raised by respondents during interviews.

5.6.2. Co-designing simulation sessions

The study used co-design sessions to evaluate whether end-user participation in system development would work in municipalities in South Africa to psychologically empower end-users through a sense of ownership. It was necessary to establish the views of end-users to participate in co-design sessions of FMIS. Co-designing sessions were considered a good forum since they encourage flexibility and participants were able to react and respond to each other's remarks and contributions to tasks, which could yield more insights for the research.

A co-designing session is a research development process and philosophy where a researcher guides, encourages and empowers end-users to develop a service or product solutions themselves (Ylirisku, 2007; Bennis, 2015). Co-design can lead to innovations that may be better adapted to the context and be more likely to be adopted since value-chain people had invested resources such as time in their creation of the solution (Ledema, et al., 2010). Other studies have used co-designing sessions to engage with end-users of technologies during the development of these technologies. to understand their needs and concerns and to ensure that the new developments met their needs (Bennis, 2015; Sabater-Hernandez, et al., 2018). Co-designing sessions have been mostly used in the health research domain to collect data of the study to design pervasive health technologies for patients (Ledema, et al., 2010; Bennis, 2015).

5.6.2.1. Participants of co-designing sessions

Co-designing sessions were conducted on face-to-face interaction. Co-designing sessions allowed participants to hear the views of the FMIS development process from one another. The researcher in this case anticipated that the interaction of participants during co-designing sessions would illuminate the research study. Participants in co-designing sessions were selected based on their role in the FMIS development for their respective municipalities. The sessions were limited to a one-day workshop due to the availability of end-users at the time of the data collection period. Scheduling of the co-designing sessions was key in the process of conducting data collection. Scheduling co-designing sessions with end-users of FMIS in

municipalities was challenging. At first, end-users agreed that the co-designing sessions would be a three- day process and the three sessions were scheduled. When the time was close, the majority of end-users were unavailable. It was a challenge to identify a time when most of the end-users would be available; end-users indicated that they were busy during the time for the data collection of the project. The participants of the co-design sessions were:

- Sixteen end-users of FMIS, being four end-users from each of the four municipalities,
- Three members from the SD team such as business analyst, systems analyst, database administrator, software developer and system test analyst,
- The researcher facilitated the sessions.

Even though there were end-users and the SD team selected for co-designing sessions, the focus of the sessions was on the views, contributions, experiences and perceptions. End-users who participated in co-design sessions had never before participated in the development of the system. End-users were selected to participate because the municipalities that they worked for had failed FMIS and the system required re-implementation. The SD team participants were selected to provide clarity and contribute to the stages of system development for the sessions. The business analyst and systems analyst were selected to participate during project initiation and system requirements specifications sessions. The database administrator was selected to participate during project initiation and system design specification sessions.

5.6.2.2. Co-designing activities of FMIS development

End-users in co-designing sessions were required to use information from the phases of system development and analyse the existing way the system was implemented, suggest areas of improvement in each stage of the system development. Since there was one facilitator for each session, the sessions were conducted in one conference room at Provincial Treasury. Participants were put into four groups, based on the work processes of financial management in municipalities: Budget planning, budget execution, accounting and reporting, and monitoring and control. End-users in co-design sessions had no experience of participating in system development. The SD team members were divided among the four groups. Internet programmes such as YouTube tutorials were suggested for end-users to use for clarity of the phases of

system development. The aims of co-designing sessions in three stages of FMIS development are presented in Table 5.9.

Table 5-9: Data gathering through co-designing sessions of system development

Phases of system development	Aim of participation	Duration of sessions (hours)
Project initiation	The scope of municipal financial management facing municipalities	2
	Challenges of financial management in municipalities	
	Identification of stakeholders for FMIS development	
System requirements specification	Identification of functional requirements FMIS	3
	Identification of performance requirements for FMIS	
	Identification of operational requirements for FMIS	
	Use case diagrams for system requirements	
	Extended sequence diagrams of system requirements for the processes of financial management	
System design specification	Database design	3
	User interface design	
	Architecture design	

The co-designing sessions with end-users of municipal FMIS involved three system development phases: project initiation, system requirements specification and system design specification. Other phases of system development such as implementation and coding phase were excluded due to lack of expertise with programming languages among end-users. The SD team did not have much input during the co-designing sessions; they only participated when required to explain what each phase of the system entails.

5.6.2.3. Observations of participants during co-designing sessions

The researcher observed end-users FMIS during co-design sessions. The participant observation method was used to enhance the understanding of the research context, in particular to the description of the participants (Bennis, 2015; Salmi & Mattelmaki, 2019). Participant observation has been previously found useful in work re-design and in the development of new technology, in gaining contextual first-hand

information on the work activities the technology is aimed at supporting end-users (Bodker, Kensing, & Simonsen, 2011). During the co-designing of system development, the facilitator usually observes participants to assess whether the participants understand the development of FMIS (Bennis, 2015). Gestures and facial expressions of the participants are some of the features which researchers use (Salmi & Mattelmaki, 2019). In this study, the researcher used the observation method throughout the co-designing sessions (Arnott, et al., 2018).

The participant observation method was used to observe end-users during the co-designing phases of FMIS development (See Table 5-9). The researcher assumed the role of the participant-observer. The researcher took field notes during co-designing sessions. Observer bias was minimised by the facilitator, trying as much as possible to be non-judgemental and in exercising self-control of biases during co-designing sessions. The observations and field notes yielded some useful insights on components that generated some behaviour and actions relating to end-user participation in FMIS development to engender a sense of ownership. The data from the observation of end-users was categorised based on the concepts of the study. The observation of end-users was to understand whether end-users are able to carry out tasks required in each stage of system development or not. After co-designing phases of FMIS development, end-users were further interviewed as part of the follow-up and evaluation of their participation in FMIS development. This evaluation was prepared as the feedback form to capture end-users' perceptions of the influences of co-designing in their municipalities.

5.6.3. Documents analysis

The study used secondary data to gain an understanding of the historical background and context of municipal FMIS in the Western Cape. The sourced data was reviewed to triangulate findings, to add more comprehensive data and to cross-check the consistency of the research (Patton, 2002).

The documents were publicly available on the National Treasury website (www.treasury.gov.za). The research identified 13 documents. The research questions and objectives influenced the focus and use of documents in the study. The reviewed documents covered the period between 2004 and 2018. Documents

regarding financial management in municipalities in the Western Cape are summarised in Table 5-10.

Table 5-10: A summary of documents analysed for the study

Document identifier	Types of documents	Description
D1	Local Government: Municipal Systems Act (LGMSA) No.32 of 2000	These documents described the financial management for municipalities in South Africa and the importance of financial management in local government.
D2	The Public Financial Management Act (PFMA) No. 29 of 1999	
D3	2018 White paper on Local Government reform	
D4	Municipal Finance Management Act (MFMA) No. 56 of 2003	
D5	Local Government: Municipal Financial Management Act 56 of 2003	
D6	Enhancement of compliance and accountability circular	
D7	Accounting standards for FMIS circular	
D8	List of municipalities and the dates of the implementation of FMIS	
D9	Project Plan and Key Milestones for municipal FMIS	Documents that present decisions, and actions regarding the implementation of municipal financial management information systems
D10	Municipal Financial Systems and Processes requirements in support of mSCOA circular	
D11	Costing of the implementation document circular	
D12	Segment details of financial systems	
D13	Description of vendors of FMIS in South Africa circular	

Document analysis was not the main data collection method in this study. It was used to complement the other methods, especially on information about the development of municipal FMIS. The document review further assisted in understanding the financial management mandated for municipalities and challenges in the development of FMIS in municipalities engaged in the study.

5.7. Data analysis

The data collected was analysed deductively using thematic analysis (Saunders et al., 2011). Transcribing of collected data, data coding and thematic analysis are outlined in the following sub-sections. The data management was effected using NVIVO, a qualitative research software.

5.7.1. Data preparation

The data preparation entailed transferring answers from the interview questionnaires of comprehensive Microsoft Word, written texts and field notes taken during data collection with respondents who were end-users of FMIS. The data preparation further involved transcribing of recorded interviews with the SD team of FMIS development. The researcher sorted the data into a Microsoft Excel spreadsheet based on the concepts used to develop research instruments, explained in Section 5.6.1. The sorted data was anonymised to remove all names and personal information that may have been gathered during the interview process. Data from municipalities was denoted as District Municipality A, District Municipality B, Local Municipality A and Local Municipality B. Respondents who were end-users in these municipalities were denoted based on the work roles of end-users: Budget Officers, Accounting Officers, Internal Auditors and Chief Finance Officers. A considerable amount of time and effort was expended in this activity to ensure that all answers of respondents were captured onto the spreadsheet. In some instances, it was difficult to recall some answers, since the study did not record some interviews. To mitigate against this, the study had follow-up telephonic discussions with some respondents to make sense of the missing information.

5.7.2. Data coding

The data coding process is the identification of topics, issues, similarities and differences that are revealed by the respondents on the focus of investigation (Darke, Shanks, & Broadbent, 2013). The researcher was responsible for all the coding of the data, since data coding is subjective and consistency and reliability are maintained when one person performs the classification (Darke et al., 2013). To protect the confidentiality of the respondents, measures were applied not to identify the names of end-users and the names of municipalities. The transcribed data was organised into themes in NVIVO to find meaning and sample analysis. The codes were reviewed, refined and organised into themes. The themes that emerged were further

categorised into sub-categories, into new concepts and those already organised. Field notes taken during semi-structured interviews and co-designing sessions were analysed using the same codes and themes as those used for respondents' responses.

5.7.3. Thematic analysis

A thematic data analysis (Kiger & Varpio, 2020) was considered appropriate for the study. This study considered a thematic analysis across the four sub-units. A thematic analysis allowed for understanding the in-depth meaning of what had been said by the respondents in relation to the theoretical background of the research. A thematic data analysis technique is used for recognising and analysing patterns of significance and meanings in a dataset (Boyatzis, 1998; Gopeni, 2016). This analysis goes beyond counting unique words or phrases and focused on identifying and describing both implicit and explicit ideas. As summarised in Table 5-11, thematic analysis involves six steps (Darke et al., 2013; Braun & Clarke, 2006).

Table 5-11: Phases of thematic analysis (Braun & Clarke, 2006)

Phases	Description of phases
Familiarise yourself with the data	Reading and rereading of the data, noting down initial ideas
Generating initial codes	Coding interesting features of the data
Searching for themes in the data	Collating codes into potential themes; gathering all relevant to each potential theme
Reviewing themes in the data	Checking in that the themes work in relation to the codes extracts (level 1) and the entire dataset (level 2)
Defining and naming themes	Ongoing analysis to refine the specifics of each theme and the overall story the analysis tells; generating clear definitions and names for each theme
Producing findings	Selecting extract examples; the final analysis of selected extracts; relating back of the analysis to the research question and literature.

The thematic analysis allowed the researcher to be thoroughly immersed in the collected data from the case study of this research (Choi, Barratt, & Li, 2012; Vieira, & de Queiroz, 2017). The themes were developed to establish the meaning embedded in respondents' experiences and perceptions on the focus of the study. In developing the themes, the researcher was able to organise codes and compare them in terms of

similarities and differences. Consequently, the process of constructing the themes that emerged in the data resulted in the complete description of the phenomena being investigated. This was based on the focus of the study such as the development of FMIS, the exclusion of end-users in the development process of FMIS, end-user participation of end-users in FMIS development to engender a sense of ownership and hindrances of the effectiveness of end-user participation to engender a sense of ownership in municipalities. This allowed the researcher to report the experiences of the study participants who were captured during semi-structured interviews, co-design sessions and document analysis.

Furthermore, where sub-units for a single case study were used, a cross-case analysis should be considered in exploring similarities and differences in the sub-units of the case (Oates, 2006; Choi, Barratt, & Li, 2012; Yin, 2014). The cross-case analysis was used to determine where similarities and differences were across the two districts and two local municipalities in the Western Cape (Yin, 2014). The cross-case analysis was employed to build upon a theme in presenting findings from districts and local municipalities. The researcher accumulated knowledge through comparing and contrasting the four municipalities.

5.8. Validity and reliability

Validity and reliability were applied during the research design, data collection and data analysis to ensure the credibility of the research findings (Moret, Ruezel, Van Der Wilt, & Grin, 2007; Yin, 2014).

5.8.1. The validity of the study

Internal validity for a study, also known as credibility, is concerned with collected data accuracy to reflect from the observed social phenomenon, making sure that the research study is evaluating or testing what is intended (Yin, 2014; Bryman, Bell, Mills, & Yue, 2015). The careful selection of a case study reflects the first practical step towards internal validity in a case study research design (Oates, 2006; Yin, 2014). To establish a chain of evidence, the researcher followed the same logical order throughout the enquiry of the dissertation which started from the definition of the problem to the presentation of data in research findings (Yanow & Ybema, 2009).

To enhance validity, the study employed triangulation. Validation techniques that the researcher used included multiple sources of data collection, peer debriefing, member checking, the researcher's reflections and rich descriptions, as follows:

- Data was collected through multiple data sources such as semi-structured interviews, participants observations through co-designing sessions and document analysis.
- The researcher obtained feedback in terms of interpretations and varied perspectives from experts in academic engagements through blind peer-review during the publication of a manuscript in the following:
    - South African Journal of Information Management (SAJIM) 2019 and
    - African Conference on Information Systems and Technology (ACIST) 2017.

5.8.2. Reliability of the study

Reliability corresponds to the notion of dependability in qualitative research, which seeks to endure consistency, repeatability and replicability of research findings (Myers, 2013; Yin, 2014). Consistency is achieved by detailing the research design and procedures to enable other researchers to follow similar research guidelines with minimal errors or research bias (Golafshani, 2003). The study outlined a step-by-step account of the research process as well as provided the main research instruments used to gather empirical evidence. Reliability in qualitative research is also known as confirmability of research findings (Yanow & Ybema, 2009). This is the extent to which other researchers can confirm the same findings to ensure that they reflect the experiences and interpretations of research participants, rather than the researcher's preferred perceptions (Yin, 2014).

This research enhanced reliability through peer review or scrutiny in which the researcher engaged with other researchers and the research supervisor to evaluate research protocol, literature review and empirical findings. Suggestions from peer-reviews were discussed and applied in evaluating the research. Reliability is further concerned with the stability of findings (Moret et al., 2007; Yanow & Ybema, 2009). The procedures for conducting the study were documented to ensure that if the process were repeated, it should yield similar results and conclusions. The documented processes were followed all the time during the study to avoid biases

and to minimise errors (Myers, 2013). The researcher documented the procedures for conducting activities in the study.

5.9. Ethical considerations

This doctoral research project was approved by the university ethics committee at the University of Cape Town (UCT) (see Ethical Clearance Certificate in appendix A). The study was granted approval by the Director-General (DG) and Head of the Department (HOD) of the Western Cape province to collect data in local government departments in the province. The respondents of the study were only interviewed after they had given me, the researcher, their informed consent. The respondents were informed that their participation in the study was voluntary and could be withdrawn at any time. The identities of the respondents in the study were anonymised.

The study adhered to ethical requirements, responsibilities and agreements relating to the nature and context of this study for the entire duration of the study. Given the organisational setting and research context, there were a number of important ethical issues that were taken into consideration. First was the role and relationship between the researcher and participants. The role of participation in the research is important because of issues related to their willingness to participate and/or not participate, the protection of their identities, confidentiality, and anonymity and informed consent. Appendix D provides the information sheet together with the consent form. Moreover, as part of the organisational data that was collected through document analysis, no personal information was collected from the system, only information about the implementation of municipal financial management information systems that were collected.

This research was guided through basic ethical principles that include autonomy and respect for the dignity of persons, beneficence, non-maleficence and justice (Wassernaar, 2006). As such, fictitious names were used in the presentation of findings of the units of the case explored in this research. The purpose of the research and of the interviews was clearly articulated to each participant. Respondents knew they were being interviewed. The researcher conformed to the requirement of non-maleficence to avoid harm or wrongdoing to the researcher and participants. The

researcher provided identification documents and contact details of the University Ethics Committee to all participants ahead of the interviews for verification purposes.

5.10. Summary of the research methodology

This chapter explained the research methodology that was employed in this study. Table 5-12 summarises the measures, techniques and methods used in guiding this research's research methodology.

Table 5-12: Schematic summary of the research design

Sections	Summary
Research domain	End-user participation in system development to engender a sense of ownership in government departments
Research contribution	Description
Ontology	Subjective
Epistemology	Interpretive
Research approach	Qualitative
Approach to theory	Deductive
Research design	Single-case study: Western Cape municipalities
Sub-units of the single-case study	Two district municipalities and two local municipalities
Unit of analysis	The development of FMIS in municipalities
Sampling	One project manager, sixteen end-users and five developers of FMIS
Sampling strategy	Purposive sampling strategy
Research time frame	Cross-sectional
Data collection methods	Semi-structured interviews, co-design sessions and document analysis
Data analysis	Thematic analysis

Chapter 6: The development of FMIS in the selected municipalities

6.0. Introduction

This chapter presents the context of the study. Western Cape was used in the study, as an empirical setting of municipalities in South African provinces, to understand the theoretical context of the development of FMIS. The chapter describes the municipalities used in the study as well as the development processes FMIS followed. The findings in this chapter are based on the data, mainly collected through document analysis, that was publicly available on the national and provincial treasury websites as well as semi-structured interviews with the respondents of the study. The primary objective of the chapter is to establish the challenges relating to the development of FMIS in municipalities.

The chapter begins with Section 6.1 which presents the Background of Western Cape municipalities in the study. Section 6.2. outlines the status of FMIS and financial management in the municipalities in the province. Section 6.3. describes findings of the development of FMIS in the municipalities. Section 6.4 describes the findings of the challenges with the FMIS development for municipalities. Section 6.5 outlines the use of FMIS in municipalities. Lastly, Section 6.6 summarises the chapter.

6.1. Background of Western Cape municipalities in the study

This section describes the municipalities which were used in the study. The Western Cape comprises of 30 municipalities that are divided into one metropolitan, five districts and 24 local municipalities. The four municipalities in the study are presented in Table 6.1.

Table 6-1: Characteristics of municipalities of the study (STATS SA, 2011)

Description	District Municipality A	District Municipality B	Local Municipality A	Local Municipality B
Total population %	787 485	391 766	115 727	113 761
Demographics				
Black %	24.4	15.1	15.1	52.5
Coloured %	67.8	69	69	41.3

	7.7	15.6	15.6	6.2
Indian & Asian %	0.1	0.3	0.3	0.4
Dwellings				
Formal %	79	81.9	59.1	88.5
Informal %	21	18.1	40.9	11.5
Education				
Matric %	19.1	19.5	19.5	20.8
Higher education %	3.3	3.8	4.8	5
Languages				
Afrikaans %	73.5	75.8	44.9	79.3
English %	2.5	3	3.6	4.5
IsiXhosa %	20.9	13.1	46.7	11.7

District Municipality A: This municipality has an estimated population of around 787 485 of people living in the area (STATS SA, 2011). The municipality is situated next to the Metropolitan Municipality of the Western Cape and covers an area of 22 309 km^2. The municipality consists of five local municipalities (STATS SA, 2011). The municipality consists of four departments, being the Office of the Municipal Officer, finance and strategic services, community development and planning services and technical services (Malisa, Schwella, & Kidd, 2019).

Local Municipality A: This municipality is situated under District Municipality A. This municipality is renowned locally and internationally *inter alia* for its beautiful environment with a tourist attraction, historical buildings, wine farms, award-winning restaurants (Nelson, 2016). According to population growth estimates of a community survey, this local municipality has 176 543 people and 52 374 households (STATS SA, 2011). It is located 50 kilometres east of Cape Town and it covers approximately 900km^2 (Nelson, 2016). It is among the five municipalities within District Municipality A. The vision of the municipality, as stated in its IDP document, is to become an innovation capital of South Africa. Its mission is to deliver cost-effective services that will provide the most enabling environment for civil and corporate citizens in the Western Cape. The first value of the municipality is integrity which undertakes to perform the functions and operations of the municipality in an ethical and honest manner (Hillyer, 2018). The municipality focuses on accountability and pledges to perform the duties of the municipality in a manner that is open to oversight and public scrutiny (Nelson, 2016). The municipality also aims to transform the municipality and continuously review its systems, procedures and

processes to make them more responsive to the needs of the communities (Hillyer, 2018).

District Municipality B: This municipality is situated along the Atlantic west coast and it is about 70 kilometres north of Cape Town from its most southern end. There are five local municipalities under this district municipality. The main economic sectors that contribute to the country's Gross Domestic Product (GDP) are agriculture, fishing, local commerce and tourism counting as the most significant sectors (STATS SA, 2011).

Local Municipality B: This municipality is situated under District Municipality B (Chademana, 2018). The population of this municipality is estimated at 120 314. The largest contributor to the country's GDP and creation of employment in this municipality is the commercial services sector which retains the largest portion of working-class people at 41%, agriculture at 22%, government services at 17% and manufacturing at 13% (Malisa, Schwella, & Kidd, 2019).

6.2. FMIS and financial management in the municipalities

As the majority of municipalities in the Western Cape have not obtained clean audit outcomes due to unqualified financial statements in the 2018/2019 financial year, the National Treasury and provincial treasury of the Western Cape assessed FMIS compliance of the selected municipalities. Table 6-2 present audit outcomes of municipalities in the Western Cape.

Table 6-2: Summary of audit outcomes of the selected municipalities

Municipalities	Financial year-end periods					
	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
District Municipality A	Unqualified	Incomplete	Incomplete	Unqualified	Incomplete	Unqualified
District Municipality B	Unqualified	Unqualified	Incomplete	Unqualified	Unqualified	Unqualified
Local Municipality A	Unqualified	Incomplete	Incomplete	Unqualified	Incomplete	Unqualified
Local Municipality B	Unqualified	Incomplete	Unqualified	Unqualified	Incomplete	Unqualified

6.2.1. Accounting and reporting weaknesses

Even with FMIS, the four municipalities still face challenges in achieving the mandate of effective financial management. The Provincial Treasury and Auditor-General noted poor financial management in the four municipalities. Poor financial and economic reporting was raised as an important problem facing the municipalities. District Municipality A, District Municipality B and Local Municipality B were placed under administration during the 2018/2019 financial year. Local Municipality A was not placed under administration even though the municipality did not receive clean audit outcomes for the 2018/2019 reporting year. The municipalities received feedback on audit outcomes from the Auditor-General. The outcomes stated that municipalities did not have underlying documentation and supporting documents needed to determine auditing and evaluation for the financial year. The municipalities are still challenged with a poor budgeting system. The budgets the municipalities set were realistic but the expenditures were too high, hence there were irregular expenditures at the end of the 2018/2019 financial year.

6.2.2. Internal controls and financial accountability in the municipalities

With regard to the effectiveness of internal audit controls in municipalities, the findings of the study indicated that they are not as effective as they ought to be. FMIS are not effective in municipalities. End-users of FMIS in municipalities noted that their municipalities tried to comply with the required standards to minimise irregular expenditure. The provincial treasury noted that the four municipalities did

not comply with the regulation of using FMIS for budget planning and implementation, accounting and reporting, and auditing and evaluation (D13, Provincial Treasury).

Irregular expenditure in District Municipality A and Local Municipality B was caused by the municipalities not adhering to payment timelines as required in the MFMA Act 55 of 2003. MFMA require Budget Officers, Accounting Officers and Chief Finance Officers to take reasonable steps to ensure that cash flows and debts of municipalities are documented and presented for financial reporting. In addition, Provincial Treasury documents show that District Municipality B and Local Municipality A information in the asset registers was not aligned with the records in the general ledger documentation in the 2018/2019 financial year.

The Provincial Treasury was confident that FMIS has a good function for record-keeping for financial statements for accounting and reporting. However, the record-keeping of financial documents was found to be paper-based in municipalities even though FMIS were implemented. All the municipalities were still using old ways for financial documents achievements.

6.3. The development of FMIS in the municipalities

This section discusses how the FMIS for the municipalities in the study was developed. The development of FMIS in municipalities followed the top-down approach. Findings on communication and training strategies followed are also presented.

6.3.1. The SDLC model for FMIS in municipalities

The system development of FMIS in District Municipality A and Local Municipality A followed the waterfall SDLC model. The waterfall SDLC model is a linear sequential (non-iterative) SDLC model (Ali, 2017). The phases for the development process followed are analysis, design, coding, testing and implementation (Khan, Shadab, & Khan, 2020). Once the phase is completed, it cannot be repeated again, and the development process does not move to the next phase until and unless the previous phase is completely completed (Ali, 2017; Barjtya, Sharma, & Rani, 2017).

Following the waterfall SDLC model, FMIS for municipalities were implemented by external vendors who were appointed by the provincial treasury department. The

development team followed the stages such as analysis and requirements specifications, design, coding, testing and implementation phases. FMIS requirements were gathered by the business analyst and were analysed by the SD team. The requirements of FMIS were communicated with the project manager of the FMIS project that is based at the Provincial Treasury. Each phase of the FMIS development delivered a milestone to the National and Provincial Treasury. End-users in municipalities were not involved in the development of all modules of FMIS. End-users were only involved during the testing of the accounting system after the SD team had implemented the system. End-users such as the Accounting Officer pointed out that concerns regarding the implemented processes for budget planning and budget execution were not satisfactory.

> *"In our municipality, we did tell the vendors that our MSCOA accounting system is not going to help us in any way. To me, the system is complex and I did say that they need to edit some functions, but my concerns were not taken seriously hence our systems are going to be implemented again*" (Accounting Officer, District Municipality A).

The project manager of FMIS at Provincial Treasury mentioned that when FMIS were tested in municipalities, all functions of the system were working. He acknowledged that FMIS were well not received by employees in municipalities. The budget of FMIS development was increased because there was a need to re-develop the FMIS. The was no proper planning to capture the specific needs of each municipality regarding financial management. The strategic meetings for the planning were conducted at the National Treasury which is located in Gauteng province. Only Chief Finance Officers from metropolitan municipalities were invited to these meetings. No end-users from the district and local municipalities were invited to these meetings. Furthermore, the SD team mentioned that the contract that they signed with Provincial Treasury stated that they were employed to work closely with the project manager and then test the system with municipalities after implementation. The SD team further pointed out that the Provincial Treasury was happy with the system hence they only involved end-users in the testing phase in municipalities.

6.3.2. The role of different stakeholders in the development of the FMIS

The strategy applied in the development process of FMIS in municipalities was top-down. A top-down approach of FMIS focused on the top management of provincial treasury as the key actors of the development of FMIS and did not focus on the low-level staff who would carry out tasks after the system is ready for use. The development of FMIS was a top-down approach whereby the systems were developed with the involvement of the top management (National Treasury and Provincial Treasury) and then introduced to employees in municipalities afterwards. The developers implemented the systems without engagement with end-users; they communicated with Provincial Treasury and National Treasury:

> *"We followed on a big-bang implementation style of the financial systems, hired external vendors to develop packages and we trained intended users in municipalities. That did not work, and we had to go back and implement one module at a time and roll out the system per unit and department. Still, there is a problem of resistance and other systems are to be re-implemented"* (Project Manager, Provincial Treasury).

This means that systems were implemented with the involvement of the provincial treasury and external vendors who were appointed by the Provincial Treasury. However, there was no involvement of employees who were directly affected by the change. The development of FMIS for municipalities was focused on management awareness, focusing on the top management. The role of the Provincial Treasury and National Treasury in the development of FMIS was to ensure that the implementation of FMIS took place according to planned schedules and were in line with the municipal financial management framework (MSCOA chart) which outlines the financial management mandate for municipalities in South Africa:

> *"Financial systems implemented, based on the MSCOA chart as it is a business reform for our financial management. Many end-users don't know much about the MSCOA, it is us who are responsible for the MSCOA and usually MSCOA run in the background of these FMIS. These FMIS are implemented by appointed vendors and these systems are ERP systems and end-users have access to them, based on their roles and responsibilities when the system is already implemented"* (Project Manager, Provincial Treasury).

The involvement and prioritisation of stakeholders in the development of FMIS were not favourable for end-users of FMIS; their level of importance and influence was low, compared to external stakeholders such as National and Provincial and National Treasury (see Figure 6-1). Stakeholders who were involved in the development got rid of the old ways of financial management and existing systems in municipalities and end-users were transferred to the newly implemented FMIS.

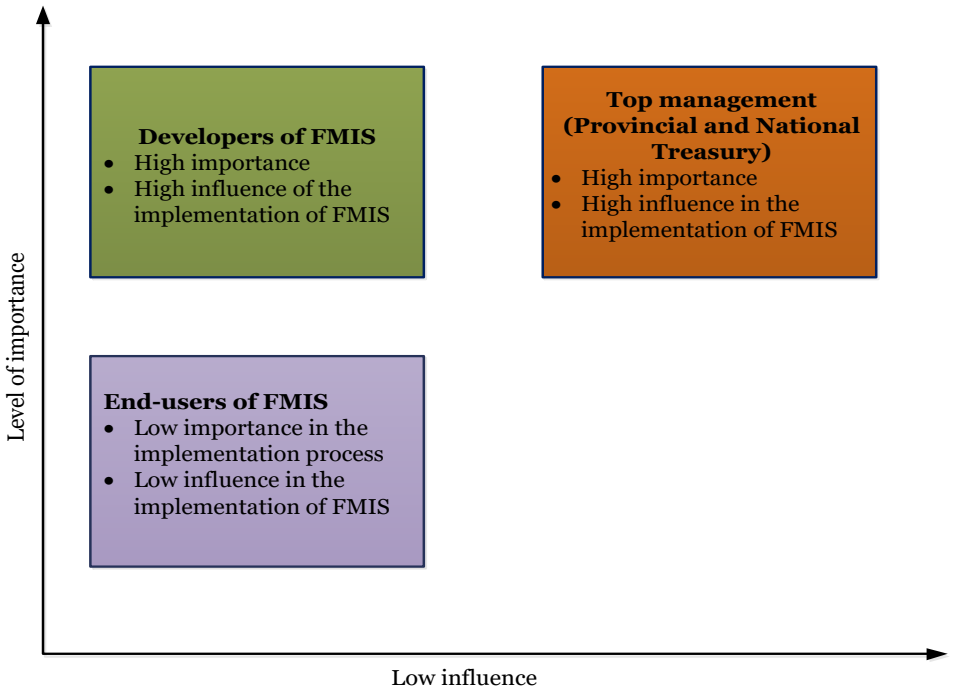

Figure 6-1: The influence of stakeholders in the development of FMIS

The National Treasury website provided the stakeholder identification and prioritisation in the system development for municipalities in the country (D9, National Treasury). National Treasury decided on which stakeholders are gathered to contribute in the development of FMIS for municipalities in the Western Cape. This was presented in the form of portfolio planning, key milestones and activities of the project plan of the FMIS. The main influence of stakeholders for the development project included the National and Provincial Treasury; external vendors were regarded as important stakeholders and decision-makers in the development processes of FMIS for municipalities. In the project milestones and activities for the system life cycle, there were Joint Application Design (JAD) sessions that could be used to allow end-users to identify the business and system requirements that they thought would be useful for their work processes (D9, Provincial Treasury). End-users were only listed to be involved during testing and training once the system was ready for use.

6.3.3. Communication during the FMIS development

End-users were asked about their understanding of the system development and whether the system development of FMIS was communicated to them. The development of FMIS was communicated with end-users in municipalities (D6,

National Treasury). Even though the documents mentioned that end-users of FMIS were aware of why the development took place, their responses showed that they were not aware of the development of FMIS. Some end-users showed an understanding of what system development entailed, even though they never took part in the system development in their workplaces in municipalities. Some of these end-users mentioned that during their school days they did have practical activities, which involved system development. End-users further noted that there was no clear communication from the project team and the top management. They claimed that communication was effective when they were about to receive training for the system.

> *"Most of the information was received via the emails, but there was no formal communication to us about the development of FMIS. We were briefed that we'll change to new financial systems that will be implemented. The Provincial Treasury attended meetings for this and all I know is that we were told that new financial systems will be implemented" (*Budget Officer, District Municipality B).

Some end-users felt that they somehow understood why they were not involved in system development stages because of some perceptions that they had. The Chief Finance Officer from Local Municipality B mentioned that they did not take part in the stages of system development because she thought that the process was more technical and there were people hired by the Provincial Treasury and the top management of the municipality to focus on that:

> "*Our municipality did not take part in the development stages, there were vendors hired to implement financial systems. The Provincial Treasury and the people who developed the system worked together; we were only engaged about the system when we were about to get training"* (Chief Finance Officer, Local Municipality B).

Time allocation to getting end-users involved in the development process of FMIS was limited. Communication was an issue during the development of FMIS. End-users claimed that there was formal communication about the milestones of the FMIS project, hence, communication during the project was poor. The top management was straightforward about the development process. The top management avoided questions relating to the development of FMIS for municipalities. They mentioned that they were always asked to refer their queries to the project manager, No one wanted to be open about the implementation process and when meetings involving employees in municipalities would take place. The focus was put on getting the system working so that end-users could start using these systems for their work processes. They pointed out that the issue that they thought

was common in municipalities in the province was on who was going to use these financial systems if the implementation was not done correctly because, currently, that was the issue end-users were highlighting.

6.3.4. Training of end-users of FMIS

End-users in municipalities were trained on how to use FMIS (D8, National Treasury). End-users mentioned that even though the training was provided to them, they did not understand the functionalities and, in particular, how to use them in their specific work processes of financial management:

> "*Most of us lack knowledge of our financial system and rely on vendors' assistance and that is the challenge that we are currently facing. The previous way we used to follow for budget implementation and financial reporting was much better. These are different from the way we work, and I do wish they looked at our previous systems before coming up with something different" (*Budget Officer, Local Municipality B).

Since they were not yet familiar with their financial systems, the end-users expected their training to have numerous handouts of training manuals. They criticised that the training did not include demonstrations of the actual financial systems. Instead, the trainers used Microsoft PowerPoint slides. They further added that there was no training evaluation so that end-users could give feedback. but they received certificates for attending the FMIS training. The end-users were struggling with the technical aspects of the system. End-users mentioned that they were not happy with the way the system was introduced to them after implementation, because they did not get the confidence that they were looking for in terms of using the system on their own:

> "*The project team pushed the numbers to go through training and not ensuring that we understood what we were trained on. There were no assessments after the training so that we could give our feedback or the evaluation of the system and their training. We have gone through a lot of upgrades with no specific manual"* (Internal Auditor, District Municipality A).

End-users further pointed out that their training took place too early before they could use the system. Some end-users did not immediately use the system after the training. The majority of end-users indicated that they would like to receive more training as this would enable them to better understand the systems for their financial management activities, even though these were given after implementation.

6.4. Challenges with the FMIS development for municipalities

There were a number of challenges with the SDLC model followed in the development processes of FMIS. These challenges were:

- Unable to implement changes to FMIS and
- Lack of end-user engagement during the development process of FMIS.

6.4.1. Ability to implement changes to FMIS

The development of FMIS for municipalities followed a waterfall SDLC model. The phases of FMIS development included system requirements specification and analysis, design, development, testing, deployment and maintenance phases. The planning phase of the system was not documented among other phases of the system. With the waterfall model followed, each phase of FMIS was completed before moving on to execute the next phase. End-users of FMIS were only involved during the testing phase of FMIS. During the testing phase, end-users made suggestions on how the functions of budget planning and execution could be improved. However, since the development of FMIS had used the waterfall model, such modifications were not possible. End-users were not pleased with the development of FMIS for their municipalities, as the changes they suggested to be made on the system were not taken into consideration:

> *"These vendors did not even bother to look at the feedback about the changes that we want regarding the segment of budget planning and execution functions on the system. Because during the training everything was still the same as the testing phase"* (Budget Officer, District Municipality B).

The waterfall model was not suitable for FMIS development because the system had complex work processes. The SD team mentioned that changes in the system based on what end-users suggested was not possible because the Provincial Treasury had approved all stages of the system and did not complain about the system. The SD team also mentioned that changes that end-users required were going to affect other functions. The team also noted that the budget for such modifications was not communicated with Provincial Treasury.

6.4.2. Level of end-user engagement during FMIS development

FMIS development for municipalities has a low level of end-user engagement. The engagement and involvement of the end-users were during the testing phase of the

system. End-users did not participate in the FMIS development that included requirements specifications and analysis, design and implementation, and deployment. End-users pointed out that they were asked to give feedback and comments when the system was ready for use.

> *"You know … The actual people that were regarded as important in the development of these financial systems don't know the detail behind and I think that's where we're lacking because it won't create problems to just involve at-least one employee that understands our work well … They just involve wrong people in this"* (Chief Finance Officer, Local Municipality B).

End-users of FMIS raised concern that there are always conflicts in their municipalities when important people who were supposed to be involved were excluded. End-users emphasised that those people who would use the system on a daily basis should be involved in every step, to make valuable contributions to the development. End-users also mentioned that involving them in FMIS development would give them a learning experience to get used to the system while it was being developed.

6.5. The use of FMIS in municipalities

The implementation of FMIS in municipalities was beset with a number of challenges. The challenges are presented here, based on attitudes towards developed FMIS, degree of use of FMIS, passive resistance towards FMIS, covert resistance towards FMIS and municipalities being unable to meet deadlines of financial year reporting.

6.5.1. Attitudes towards FMIS for municipalities

End-users of FMIS lacked interest in the system in their municipalities. End-users who were not interested in using FMIS in municipalities justified their behaviours by pointing out to the ways in which FMIS had been implemented.

> *"I think lack of interest in using our accounting systems here is caused by dissatisfaction with the functions developed and complexity. I feel like they were not interested in listening to us before implementing these systems and most of us are not interested in these systems"* (Budget Officer, District Municipality B).

The project manager of the FMIS project based at the Provincial Treasury highlighted that during the training, the end-users gave the development team negative energy and did not show any interest to processes of financial management through FMIS. End-users raised concerns that the way their financial management

processes were structured, it would be time-consuming for them to meet deadlines for the financial year-end. Some end-users complained that there was not enough time to learn to use FMIS; there was a lack of involvement during the development which led to their disinterested behaviours. End-users claimed that the SD team and provincial treasury did not invest time to understand the best ways to improve budget implementation work processes for municipalities.

6.5.2. Degree of use of FMIS

There is low usage of FMIS in municipalities in the Western Cape. Municipalities are unable to meet deadlines of financial reporting ever since FMIS were implemented in their municipalities. The Chief Finance Officers were supposed to use FMIS to approve the prepared budgets and then, within 14 days, post approved budgets and other budget-related documentation onto the municipality website so that it was accessible to the public, as well as send hard copies to the National and Provincial Treasury. Chief Finance Officers from municipalities complained about non-compliance of Budget Officers and Accounting Officers as some formulation of activities of the budget preparation process were conducted on paper-based processes. Chief Finance Officers complained about the same problem of non-compliance and incompleteness of activities when it was time to conduct approvals of municipal budgeting. This led to work performance issues because of incomplete work processes, as they could not approve most of the budget preparation activities due to incompleteness and paper-based work activities provided.

> *"I do meet my deadlines for the budget implementation process. .. but sometimes when it's teamwork, it's very challenging to meet deadlines as others often struggle with using the system … sometimes it's challenging to meet deadlines as I'd be required to wait for them"* (Accounting Officer, District Municipality A).

Municipalities that rolled-out FMIS had challenges of meeting deadlines for financial reporting. End-users complained that FMIS work processes lacked relevancy and had complexities compared to their usual ways of conducting activities of municipal financial management. End-users emphasised that the only solution for them to meet deadlines in the next financial years was to re-implement FMIS for their municipalities.

6.5.3. Passive resistance towards FMIS in municipalities

There was under-use, also known as limited use of FMIS in municipalities. All processes of FMIS such as budget planning, budget implementation, accounting and

financial reporting, auditing and evaluation were under-used across municipalities. The majority of end-users in municipalities were still operating on manual-work processes such as paper-based and the use of Microsoft Excel. End-users such as budget officers and accounting officers expressed minimal use of FMIS by choosing not to do budget planning and executions on the system. The Chief Finance Officers found their functions on FMIS easy to use compared to those functions of other end-users. The Chief Finance Officers had no problems with using functions of budget planning and implementation processes because their roles in these two processes were simple compared to the roles of other end-users. However, Chief Finance Officers could not use FMIS because their work activities, such as approval of planned budgets, depended on Budget Officers and Accounting Officers being able to complete their work activities.

> *"So, if both employees [Budget Officers and Accounting Officers] decide not to do allocations of expenditures on the system, then I won't be able to approve on the system"* (Chief Finance Officer, District Municipality A).

The majority of end-users expressed that the two main functions of municipal financial management were ignored by the implementers, hence they were problematic. They reported that the functions of the system were frustrating to a point that they ended up not using the system at all but decided to focus on old ways of processing budgets.

6.5.4. Covert resistance towards FMIS

The municipalities that tried to use the FMIS after they were implemented, presented covert resistance. End-users such as Budget Officers, Accounting Officers and Internal Auditors resisted FMIS through delegation, whereby they assigned responsibilities to fellow employees in the IT department to assist with capturing paper-based work activities from FMIS.

> *"In our municipality, we always depended on technical staff to assist with capturing of budget planning and execution activities so that this information can be ready for the Chief Finance Officer to do approvals"* (Accounting Officer, Local Municipality B).

End-users pretended to accept using new systems in both local municipalities even though they did not even know how to use FMIS on their own. These covert resistance behaviours were expressed through delegation. The top management was deceived into thinking that other municipalities were trying their best to use

implemented FMIS. Such covert resistance behaviour in end-users in municipalities was triggered by perceived force to use FMIS by municipal financial management.

6.6. Summary of the chapter

FMIS for municipalities were developed through following a waterfall system development strategy. The model followed in the development process of FMIS restricted end-users from participating and contributing to the development process of FMIS in municipalities. The development process of FMIS was a top-down approach in which the system was implemented in consultation with the top-management such as the Provincial Treasury, and then the system was only introduced to end-users afterwards. Challenges of FMIS in municipalities included disinterest behaviour to use FMIS, passive resistance, and municipalities unable to meet deadlines of financial year reporting.

Chapter 7: End-user participation to engender a sense of ownership

7.0. Introduction

This chapter presents the empirical findings on end-user participation in FMIS development to engender a sense of ownership of end-users in municipalities. This chapter presents a thematic analysis and cross-case analysis. The findings are presented into a meaningful category using the constructs of factors of sense of ownership in the proposed framework in Chapter 4.

Section 7.1 outlines co-designing sessions for the three phases of FMIS development-project initiation, system requirements specifications and system design specifications phases. Section 7.2. discusses mechanisms of end-user participation to trigger a sense of ownership. Section 7.3 presents the findings on relational dynamics for the development of a sense of ownership. Section 7.4. presents the findings on the behavioural determinants of sense of ownership. Section 7.5 presents findings on outcomes of effects of sense of ownership with specific to experienced meaningfulness, sense of responsibility and accountability: if end-users would participate in the development of systems, this would later affect their work processes. Section 7.6 discusses how contextual factors hinder the effectiveness of end-user participation in municipalities. Lastly, Section 7.7 provides a summary of the chapter.

7.1. Outcomes of the co-designing sessions

This section focuses on co-design sessions for end-user participation in FMIS development in three phases: project initiation phase of the system, system requirements specification phase and system design specification phase.

7.1.1. Session 1: Project initiation of the system

Session 1 focused on business requirements of financial management in municipalities, the scope of the problems and identification of stakeholders for the development of FMIS and the choice of SDLC model for FMIS development. The scope of the problem activity focused on the FMIS that failed and required re-implementation in municipalities. The business processes of financial management in municipalities served as a common reference for discussion among end-users for

this phase. The choice of an SDLC model activity required participants to brainstorm about how they wanted FMIS to be developed for their municipalities. For activities in this phase, end-users focused on business requirements specific to their respective municipalities. This was because the researcher noted that the business requirements and business problem for a district municipality might be different from those of the local municipality. During the activities of this phase, the SD team did not make contributions and end-users were able to complete activities regarding financial management in municipalities without requiring assistance from the SD team. The contributions of end-users are presented in Table 7.1 and illustrated in Appendix H.

Table 7-1: End-users contributions during the project initiation phase

Project initiation phase activities	Contributions of end-users
The choice of the SDLC process for FMIS development	End-users recommend a modified agile scrum model for FMIS development for their municipalities.
	End-users suggest the development of the prototype of FMIS be tested by employees before involving the costs of the actual system.
	End-users suggest a model that will allow them as employees to make suggestions and allow modifications in stages of the system.
	The model should allow municipalities to be involved in real-time communication and meetings during all the stages of the development.
	Municipalities should be allowed to see the results at every stage of development.
Business requirements and scope of the problem in participated municipalities	The municipality needs to improve its outdated financial systems.
	The developed financial systems are complex and time-consuming.
	End-users need new financial systems for the clear sequence so that their municipalities can deliver services to our citizens on time.
	End-users have been penalised with missing financial information in our balance sheets, statements of accounts and cash flow statements.
	End-users in municipalities are challenged with overspending of budgets.
	There is inaccurate information presented for auditing and evaluation in municipalities.
	Auditors in municipalities are not able to access the budget.
	Municipalities are currently placed under administration due to unable to deliver services to citizens
Identification of stakeholders for FMIS development	Government officials in municipalities working from budget planning to accounting and reporting can be key stakeholders in the development.

	External users: External Auditors from Auditor General of South Africa, Provincial Treasury and National Treasury.
	Vendors of FMIS

During the choice of the SDLC model for FMIS development activity, end-users seemed competent enough to complete the task involved. End-users were in control during this session as this phase involved the identification of the problems that municipalities are currently facing regarding FMIS. End-users convinced the facilitator that they understood problems facing municipal financial management. For instance, based on the SDLC models such as waterfall, iterative, spiral, V-shape and agile models that were presented during this session, end-users were able to select agile scrum as the suitable SDLC model that would be effective for the SDLC model. End-users were convinced that the agile scrum model would enhance FMIS development for their municipalities. The agile SDLC model emphasises real-time communication at all phases of the project (Barjtya, Sharma, & Rani, 2017). In agile, after every development iteration, end-users are able to see the results and understand if they are satisfied or not (Khan et al., 2020). The agile model allows the involvement of end-users in the development process of the system (Wasson, 2016).

End-users of FMIS further made model suggestions that were not presented as part of models to select from. End-users suggested that the development of FMIS should follow a Rapid Application Development (RAD) methodology. RAD methodology involves the construction of the prototype which has several stages known as requirements planning, user design, construction and implementation; it enables organisations to strategically develop systems faster while reducing development costs and maintaining quality (Wong et al., 2019). End-users mentioned that is important to first prepare a prototype that involves all stakeholders before involving costs.

> *"We've selected this method because I think it's what we need, I don't think it is right to give external people money to develop a system that will later not be used … I think this way of coming up with the prototype first with the involvement of employees is the one that will solve this problem of systems that are not used"* (Budget Officer, Local Municipality A).

During business requirements and scope of the problem activities, end-users were able to complete tasks without receiving assistance from the facilitator, and the SD team did not make contributions. End-users demonstrated leadership skills when

they brainstormed their municipalities' scope of the problem, mentioning the current status of their financial management issues. All end-users were familiar with the business case for FMIS and the identification of the problem that was currently facing financial management due to failed FMIS in their municipalities. They gave useful information about their work processes to the SD team. The SD team members and the facilitator were just observers during the discussion of the activities in this phase. End-users were able to point out concerns affecting their work processes in municipalities. End-users acknowledged the need for the development of new FMIS for their municipalities, due to problems experienced with previously developed FMIS.

When they were asked to identify vital stakeholders for FMIS development, the end-users included themselves in that category. They emphasised that end-users who were affected by the FMIS should be involved in the development of FMIS, based on the segments of the system that were aligned to their work process: budget planning, budget execution, accounting, reporting and auditing and evaluations. End-users mentioned that they would like to be involved in discussions and strategic meetings aiming at improving their work conditions such as the development of FMIS.

The involvement of end-users in the planning phase gave end-users the perception to believe that they have the power to identify their needs regarding FMIS for their work processes, and that they perceive control over their environment. The SD team suggested that it would not be difficult to engage with end-users in this phase for their project initiation documentation. The SD team pointed out that it would be helpful to work with end-users in this phase as they thought that it also reflected positively on their side of the development.

7.1.2. Session 2: System requirements specifications

Session 2 focused on the identification of functional requirements, performance requirements, operational requirements and other requirements such as the choice of tools and programming languages for FMIS. Functional requirements referred to what the FMIS should do and what end-users should be able to do on FMIS. Performance requirements referred to how well FMIS should perform the functions. Operational requirements referred to the identification of required characteristics that FMIS needed, to perform identified functions. Functional requirements were

discussed using a sequence diagram, use cases and activity diagrams, to identify the role for each type of end-user on FMIS. End-users brainstormed functional requirements based on each end-user's needs from the system, to complete financial management work processes in municipalities. The session also reflected on reflected existing financial management business processes. Outcomes of the identified requirements for FMIS are presented in Table 7-2 and illustrated in Appendix H.

Table 7-2: End-users contributions during system requirements specifications phase

System requirements activities for FMIS	Contributions of end-users
Identification of functional requirements of FMIS	Budget preparation functions: Annual budget formulation, supplementary of the budget, approval of the planning of budgets, preparation of annual procurement plan
	Budget implementation functions: Cash collection, payments, department and grant flow Loading invoices of planned budgets Procurement for annual service delivery to citizens The flow of expenditure of the municipality
	Accounting and reporting functions: Importing and exporting of financial reports available when needed for annual financial reporting Extraction of financial information for financial reporting
	Forecasting, and monitoring and control functions: Capital projects, debt management and cash flow management Checking of remaining budgets of the municipality Timely decision-making
	Auditing and evaluation functions: Extraction of municipal financial reports for auditing
Identification of performance requirements of FMIS	Response time: FMIS is to be designed to respond to the user at a maximum time of three seconds.
	Reliability: Whenever an end-user interacts with FMIS, it should always perform according to the end-user's configured work processes.
	Availability: FMIS should be available 24/7 to end-users and should be notified when the system is not available due to maintenance.
	Throughput: FMIS should perform every function that is required to perform.
Identification of operational requirements of FMIS	FMIS can be ASP.NET program
	The database server should be used to store end-users' information.
	FMIS should contain hardware and software specifications.
Other requirements:	Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS) were identified to be used in the creation of the look of the user interface of FMIS.

Identification of the tools and programming languages for FMIS	Hypertext Preprocessor (PHP) and JavaScripts were identified to be used by the developers in the creation of dynamic web pages of the system.
	The PHP was identified to be used in conjunction with MySQL to interact with the database of the system.
	Apache HTTP server was identified as a web application that also needs a host platform to be able to run on and the Apache HTTP server allows this.

During the identification of functional requirements activities, end-users were able to identify their system requirements. All of them in selected municipalities seemed competent, showing that they had the ability to learn. They showed a good level of competence and were willing to move to the next phase of the SD process because they found the system requirements phase interesting and suitable for them. While brainstorming this phase, the end-users got curious about what the next stage would be. This was mainly because they did not struggle that much in this session. In a short discussion, they mentioned that this phase was interesting and it made them feel like problem-solvers. This session, to an extent, attested that the phase of system requirements specifications had an influence on end-users' willingness to continue to participate in other stages of the SD process as they showed interest throughout the session.

During the identification of performance requirements, end-users emphasised that the task was straightforward, they did not struggle as anticipated. However, during the identification of operational requirements and identification of other requirements such as tools and programming languages for FMIS, end-users relied on using a search engine (www.google.com) and the SD team to complete activities. During the identification of other requirements, end-users relied on the SD team to complete the activity. The Database Administrator, systems analyst and software developer explained this activity to end-users during the session. End-users pointed out that the last two activities required more time for them to understand.

End-users such as Budget Officers and Accounting Officers in District Municipality B and in Local Municipality A acknowledged that their participation in session 2 was a meaningful experience. All end-users evaluated the phase as useful and recommended that employees who were affected by the system should be involved in this phase. They pointed out that being involved in the requirements' identification and specification of FMIS resulted in them putting more effort into them, as the

session resonated with what they already knew in their municipalities regarding FMIS:

> *"Employees would make a contribution in this phase because we [end-users] wouldn't want history to repeat itself. The financial systems that they previously implemented were frustrating everyone as they were too complex for their work processes, so if employees are given a chance to have a say on requirements that would be a very useful experience" (*Accounting Officer, Local Municipality A).

End-users such as Chief Finance Officer in District Municipality A and Internal Auditor in District Municipality B explained that even developers and other stakeholders that were regarded as priority stakeholders by the top management, would experience promising participation in the phase. End-users further added that this stage should focus on employees that would be affected by the end product. They emphasised that employees should know whether the documentation of the system was in line with what they believed to be their work processes, because it was not necessary to complicate the system for the employee, but should rather consider their needs so that it could be used fully.

7.1.3. Session 3: System design specifications

Session 3 was about the brainstorming of user interface design specification, database design and overall architectural design of FMIS. These three activities of this session were for the design scope and structure of FMIS, based on the identified requirements specifications in session 2. The user interface design of FMIS activity referred to the brainstorming of the visual part of the operating system and what end-users wanted to see when manipulating FMIS. Database design activity referred to the data that end-users wished FMIS to store. Overall, architectural design activity involved the description of how FMIS was organised and how its components interoperated. End-users' contributions during the activities of this phase are presented in Table 7-3 and in Appendix H.

Table 7-3: End-users contributions during system design specifications phase

System design specification activities	Contributions of end-users
Database design specification based on static structure diagram	*Municipal FMIS class and end-users relationships:* ○ FMIS attributes–municipality name(string), FMIS aim and objective (string), service delivery priority (string), description of each work process(string) ○ End-users class–Budget Officer, Accounting Officer, Internal Auditors and Chief Finance Officers attributes–Name and surname (string), employee number (integer), contact details

	(integer), work process (string)
	Budget preparation class attributes–Budget officer code (char), budget details (string), amount (double), service delivery category (string) and date (string)
	Budget execution class attributes-Budget officer code (char), accounting officer code(char), budget code(char), amount (double), service delivery category (string) and date (string)
	Approval of municipal budgets class attributes– Chief Finance Officer code(char), service delivery category (string), budgets details (string), budget code (char), amounts(double), approval date(string) and signature (string)
	Accounting and reporting class attributes–Internal Auditor code(char), Chief Finance Officer code (char), financial statements (integer/strings), categories (string), year (integer)
	Auditing and monitoring class attributes–Internal auditor code (char), audit level (string), audit type (string), underlying exception (exception), financial statements (integer/strings), categories (string), reporting year(integer)
User interface design specification	*Appearance specifications:* o Home page –There must be a home page about the aims and objectives of the municipality. The page should also have "contact us" options. o About the mandate of financial management pages–This page should require all end-users to read before registering on the system. o About municipal compliance page–A page explaining the importance of compliance with regulations of financial management. Every end-user needs to accept terms and conditions before proceeding to other pages. o Municipal FMIS pages–There must be a page for all the segments of financial management which are linked to end-users, based on their work functions. o Help option–This should contain FMIS end-user manual to guide end-users when in need of assistance.
	Forms on functions of FMIS: The forms will be designed for end-users to enter financial reports data in pre-defined forms based on budget planning and execution, accounting and reporting, auditing and evaluation.
	Navigation flow of forms: The forms should be navigated through navigation options available on the forms.
	Form interaction: End-users can interact with the forms on the systems and read content on the form and capture work activities required for each work process.
Architecture design specification	Software and hardware platform, operating system software requirements, application software requirements and network requirements

	Input devices (Hardware specifications for desktop computer): ○ Minimum: Intel Pentium® IV 2.0 GHz Processor, 2 GB RAM, 80 GB Hard Drive[1], 20X CD-ROM Drive, Ethernet 10/100 Network Card, 15 inch CRT/LCD Monitor, 32 bit, 1024 X 768 Resolution Capable Video Card, Intel USB Chipset with at least 2 powered USB 2.0 Ports[2] ○ Recommended: Intel Pentium D or Intel Core2Duo Processor, 4 GB RAM, 250 GB Hard Drive Raid Level 1or 5[1], DVD-ROM Drive, Gigabit Network Card, 17 inch LCD Monitor, 64 bit, 1024 X 768 Capable Video Resolution and Intel USB Chipset with at least 2 powered USB 2.0 Ports[2]

During the user interface design specification activity, end-users identified components for the user interface design specification which included the design of the appearance of FMIS, design of the navigation flow of forms or reports of FMIS, design for generating of forms, navigation flow of forms, interface and input devices. End-users seemed excited with this activity as they discussed what they wanted to see when they logged-in into the system. The brainstorming of this activity was based on the identified functional requirements presented in the previous section. For instance, for the appearance of FMIS, end-users mentioned that there should be a home page that would show the municipality's aims and objectives.

For the database design activity, end-users contributed to the drafting of database design in the form of a class diagram, using user interface specifications of their requirements that they had identified in session 2. Entity relationships of the database design were identified between end-users and the four processes of FMIS, such as budget planning, a budget execution segment, accounting and financial reporting segment, and auditing and evaluation segment. Again end-users seemed competent enough in brainstorming the class diagram for the database.

For the overall architectural design specification activity, end-users seemed confused with tasks that they were required to do. They felt that they did not have the necessary skills such as coding needed for the session. End-users complained that they were not familiar with the coding activities. Other end-users mentioned that they were tired and found this activity frustrating. Even though the majority of end-users did not show much expertise in this phase, they showed interest as they listened attentively and used YouTube and the internet, as extra-milestones to search for information when they needed to understand. There were knowledge gaps among the participants such as perception about technology, programming languages,

terminologies and jargon during this activity. End-users such as Chief Finance Officers did put some effort into brainstorming the session. The SD team shared some technological context with end-users and end-users, in turn, shared their contextual understanding during this phase. Furthermore, observation of this stage showed that as long as there is effective communication when some participants knew more than others during this stage, everyone was willing to participate.

7.2. Mechanisms of end-user participation on end-users' sense of ownership

Sense of ownership is reinforced by the three mechanisms: locus of control, knowledge of the results and self-investment (Rey-Moreno et al., 2015). In the study, mechanisms are those factors of end-user participation that cultivate a sense of ownership for the end product. The findings on mechanisms of end-user participation in FMIS development to engender a sense of ownership are summarised in Table 7-4 and presented thereafter.

Table 7-4: Mechanisms of end-user participation in relation to end-users' sense of ownership towards FMIS

Mechanisms of sense of ownership	Mechanisms of end-user participation on end-users' sense of ownership
Locus for control	Shared leadership during FMIS development
	Sense of authority during FMIS development
Knowledge of the results	The attitude of end-users and the SD team
	Critical awareness of the operability of the system
Self-investments	Quality assurance
	Perceived future use intentions

7.2.1. Locus of control

Locus of control is viewed as a personality attribute that describes the extent to which people generally develop the need to feel as if they are in control of the events in their lives (Amoura, Berjot, Gillet, & Altintas, 2016). This study postulates that the more the end-users experience a sense of control during FMIS development, the greater the sense of ownership they developed for the system. End-users mentioned that: shared leadership and sense of authority end-users experience during

participation in FMIS development, would likely influence their sense of ownership towards the system.

7.2.1.1. Shared leadership between end-users and the SD team

During the scoping of a business problem and the scoping of FMIS requirements, end-users were asking questions, observing and making suggestions on what should be included in the process. Leadership skills of the end-users were manifested during the planning and system requirements specifications phases in their ability to uplift each other. Responsibilities shifted during the design phase; end-users relied on the SD team for most design activities. The Chief Finance Officers felt proud to be able to contribute more during the design phase than other end-users, even though they lacked expertise.

> *"I can become like a mentor to other employees during the development processes. Since you asked us about the stages that we think we can contribute well on. I think specific tasks for us [end-users] should be outlined so that there won't be conflict as we won't just participate to learn but also to work on the development of the system as this will also help us to gain leadership skills"* (Chief Finance Officer, District Municipality B).

The SD team was concerned that the power relationship between them and end-users may affect the end-results of the development. They felt that it would be challenging for them to ensure that the deadlines of each stage of the SD process are met when personal power is on the end-user's side. The SD team further raised concerns that shared leadership during the SD process with end-users can sometimes lead to end-users abusing power and control that they will have, which may take away the focus of what is expected of end-user participation in the development process.

> *"When things go wrong in the development process of these financial systems, the top management will blame us developers, not end-users. So, I think it will be a bit tricky to play around shared leadership with users regarding developments of these systems. I am telling you if things go wrong with the process, users will not want to get involved"* (Business Analyst).

The power issues were raised by the SD team. They were worried about working with end-users when there is a high level of user involvement in the SD process. They were convinced that most end-users may say that they want to be involved in what is happening in the development process, but end-users would not want to touch any tasks during the execution of tasks until the system is finalised and ready for use.

However, end-users pointed out that for the future development process of their systems, they would gain a sense of ownership when it is not assumed that only the SD team should have more influence and control during the development. They felt like it would be useful if they could lead the first two phases of the development.

7.2.1.2. Sense of authority during FMIS development

End-users were granted complete authority during the sessions of FMIS development simulations to conduct feasibility sketching of setting objectives and priorities of their FMIS, describe requirements, database and flow specifications of the system. End-users assumed all the responsibilities and authority for making decisions about the logic of their FMIS. End-users felt that they have important responsibility and authority to make contributions during the SD process of their FMIS. They pointed out that they were given the authority to make decisions that were fundamental to their municipal financial management needs. However, they acknowledged exercising authority about executing changes to be made, as the system would still be the responsibility of the top management and the SD team.

> *"I know how thing work in this government sector, I don't think we [*end-users*] would be given an authority to decide necessary changes to the system once we're not happy with the final product of the system. Provincial treasury always has the authority to make drastic decisions about financial systems*" (Budget Officer, Local Municipality B).

End-users worry that in future developments in their municipalities, their responsibilities and authority during their participation might be limited and power would be given to the top management and the SD team. For some reasons, end-users pointed out that they had little hope that they would experience a sense of authority during future system developments in municipalities. They pointed out that the SD team might exercise control through coming up with unreasonable schedules, making it difficult for them to have time to participate in the SD process.

7.2.2. Knowledge of the results

Knowledge of the results construct posits that end-user participation is likely to offer end-users an opportunity to experience a wealth of knowledge about the functions of FMIS, to promote end-users' sense of ownership about the end product. It was evident that the attitudes of participants during the development and lack of awareness during end-user participation were likely to affect the development of a sense of ownership.

7.2.2.1. Attitude of end-users and SD team

There were no complaints from end-users regarding the tasks in the SD process. They pointed out that sessions were comprehensive and if involved more frequently, they would master all tasks involved. They further pointed out that they had negative attitudes before the SD process; as a result, they were not looking forward to these sessions because of previous disappointments in meetings that they had tried to arrange with the top management and the SD team so that they could raise their concerns.

> *"Knowing the results can change my behaviour and to respond to complexities that may arise from the implemented system … My attitude has been negative. I feel that our municipality does not take our concern serious … I so wish we can have an engagement that will be open for suggestions from the employee side … More positive to learn, I want to learn more about the system development, it sounds complex though. But the way you explain it, I think it would be understandable"* (Accounting Officer, Local Municipalities B).

There was blame-shifting from the SD team towards end-users. The SD team raised concerns with the attitudes of some end-users: that they were not able to provide feedback or comments in the peer review of the design specifications of FMIS.

> *"I don't think end-users such as internal auditors took the design phase to review what others had contributed during specifications because there was no feedback from them, they were just quiet and looked bored"* (Systems Analyst).

The SD team worried that end-users experiencing confusion during the design specifications of the SD might negatively affect those end-users taking all phases of the SD process seriously. They voiced that attitudes of those end-users that were focused might be negatively influenced by those resisting other stages of the SD process. These findings are similar to Han et al.'s (2010) research which argues that people develop favourable evaluation and attitudes towards the target of ownership, based on their level of involvement and participation that presented their "importance" contribution. This is similar to empirical findings in Rey-Moreno et al.'s (2015) research on community ownership over the rural community network. This attested that there is a need to ensure individuals captured positive attitudes and behaviour about the target so that they did not get negatively influenced by those with negative attitudes. This is because they are likely to develop a sense of ownership over the target which is vital for the acceptance and realisation of the target (Bano et al., 2017).

7.2.2.2. Critical awareness of the operability of the system

The budget officers complained about not receiving awareness or awareness pertaining to the SD process. They pointed out that if they were briefed about the tasks of the SD process, they would have prepared more, so that they could have more understanding of their segment of FMIS. They voiced that the most complex segment was the one for budgeting and required more attention when identifying its system requirements.

> *"I do wish they could do awareness education about what will be expected from us. So that we can prepare more and ensure that all requirements specifications are correctly done"* (Budget Officer, District Municipality A)

End-users commented that the SD process was crucial while learning about the operability of their FMIS. The Chief Finance Officers further voiced that those end-users who would say they did not experience awareness of groundwork happening with financial systems because of their ignorance.

> *"This brought awareness of our FMIS and as a Chief Finance Officer to be in the discussion of the various options that would make employees develop an interest in what financial systems do for municipalities"(*Chief Finance Officer, District Municipality B*).*

End-users pointed out that raising awareness about the new system in their municipalities usually took a year. The Chief Finance Officers mentioned that it was difficult to get Budget Officers and Accounting Officers to use previous financial systems. They felt that the SD process would at least bring people to light at the early stages of the implementation and be aware of what would take place, aware of what they were expected to do when the system was ready for use.

7.2.3. Self-investment

The study posits that when end-users realised that they have invested their efforts, time, energy and expertise during FMIS development, they are likely to feel a sense of ownership towards the system (Rey-Moreno et al., 2015). End-users pointed out that their efforts, time and contributions during FMIS development simulations were likely to facilitate quality assurance and influence future use intentions of the system. End-users voiced that their efforts, time and energy in FMIS development would be invested in quality assurance for the system which would affect future use intentions of the end product.

7.2.3.1. Quality assurance of FMIS

The previous FMIS end-users, more especially the Budget Officer and the Accounting Officers, complained about the poor alignment of the municipal financial management work process with FMIS processes. With their participation in SD, they brainstormed their business processes to the requirements specifications and design specifications of FMIS. They emphasised that their business processes for financial management needed more attention in their municipalities, and thereby it was important to explore them fully before implementing FMIS. End-users further mentioned that their participation in the development of their system would make them realise that they had a responsibility to ensure that their system was aligned with their work processes. They highlighted that there was a need for them to monitor the alignment of their business processes with the requirements of FMIS in their respective municipalities.

> *"I think this will help mostly those that are responsible for budget preparation and implementation* [Budget Officer and Accounting Officers] *to remember that they have the responsibility to monitor adherence to their work processes' quality assurance during FMIS development. And they can't complain about the system because they were involved in the processes … they are delaying us in most tasks"* (Chief Finance Officer, District Municipality B).

End-users specified that their FMIS should not contain errors, and specifying that their user interface would be useful for their municipal financial management processes. This is in line with Ullah and Lai's (2013) research which argued that it is a complex task to investigate business processes in the context of its alignment to an organisation's information systems, hence, organisations need to make use of employees in this regard. This is similar to Zakaria and Yusof's (2014) research, which emphasised that experts of business process modelling have indicated that most information systems' implementations were failing due to low and, in some cases, no end-user involvement. This is further similar to Begier's (2011) research which argues that due to close alignment of end-users' needs and expectations and those of the system where end-users participated, it was unlikely for business processes to keep on changing.

7.2.3.2. Future use intentions of FMIS

During design specifications, end-users were specific that FMIS should be user-friendly as they do not see a need for complicating a system that will end up having poor use intentions. They were specific that the functions of processes should be easy

to read. They pointed out that their participation in SD would make their voices heard and that would strengthen their intentions to use FMIS.

> *"You know us, employees we are not asking much in these systems, the only thing that we want is to be able to use the system for financial management. These systems are supposed to make things easier, not difficult*" (Budget Officer, District Municipality A).

The SD team felt that those end-users who contributed more during the development could get offended when their contributions were not appearing in the final product of FMIS and that could affect future use intentions of FMIS. They pointed out that when end-users realised that their contributions were excluded in the SD, they might get reluctant to use the final system. The Budget Officers and Accounting Officers were specific that if their views got rejected in the implementation of FMIS, that would affect future use intentions. They felt that their contributions were valuable and should be considered because they had been experiencing difficulties with the previous FMIS.

7.3. Relational Dynamics of end-user participation on end-users' sense of ownership

The Relational dynamics capture the pattern relatedness between the agent and target of ownership, answering the questions: what role, functions or need does the target fulfil or help to fulfil for the target? The constructs for relational dynamics are self-efficacy, perceived usefulness, belongingness and self-identity (Rey-Moreno et al., 2015). Relational dynamics of sense of ownership are summarised in Table 7-5 and presented thereafter.

Table 7-5: Relational dynamics of end-user participation in relation to sense of ownership

Relational dynamics of sense of ownership	Relational dynamics of end-user participation on end-users' sense of ownership
Belongingness and self-identity	Linkages between the end-user, municipality and the system
	Linkages between end-users and the SD team
Perceived usefulness	Competence
	System use and acceptance
Self-efficacy	System skills during FMIS development
	Tacit knowledge management

7.3.1. Belongingness and self-identity

This study posits that end-users participation in system development would lead to end-users developing a sense of ownership for the system, which could enable end-users to establish and maintain a sense of identity and belonging, thus satisfying the self-identity motive and having a place motive (Yim et al., 2018; Barki et al., 2008). It was evident that end-user participation in FMIS development is likely to trigger the linkages between the end-users, municipality and FMIS, and linkages between end-users and the SD team.

7.3.1.1. Linkages between the end-user, municipality and FMIS itself

End-users indicated that if they participated in the system development of their system, they would feel they belonged in their municipalities and that their presence in their municipalities was valued. End-users noted that the complexities that they experienced with the previous systems somehow reflected on their self-identification, as some of them were not able to meet deadlines because their jobs were something personal to them. They further emphasised that they would feel positive linkages between them, their financial systems and their municipalities that they work for.

> "*Engaging in system development would make me feel proud of my job and the municipality that I work for. This would mean that they see employees as important too and they value our opinions. To me, this would mean that the management sees what we do as important as their jobs, because things will never work well if people are not listened to when they have the problem but are not taken seriously; instead, they are told what to do*" (Budget Officer, District municipality A, Accounting Officer, Local Municipality A).

These findings are in line with Kirk et al.' s (2015) research findings on employee ownership which specified that employees sometimes link their job descriptions and organisations that they work for as their self-identification. So if things are not going well with their jobs, that also affects their self-identity and belongingness (Lee et al., 2001). These findings show that involving end-users in the development of systems that affect their work processes can motivate end-users to appreciate their jobs and be more willing to put effort into using the system. Even if the system is complex, if they were involved in the planning and execution stages, they are likely to accept it, because they know what to expect from it.

7.3.1.2. Linkages between end-users and the SD team

The requirements of the specification phase were noted to influence the interaction of end-users and the SD team. End-users felt that the requirements of the specification phase could be useful to maintain long-term relationships between end-users and the SD team. This is because their participation in system development would influence them to build a relationship with the SD team.

> *"I could gain the freedom to interact with developers as a form of practice to improve my skills. I would feel more socially involved and psychological empowered. You know sometimes when people do not engage with you about that they are developing, obvious the system won't be what we need"* (Accounting Officer, Local Municipality A).

End-users pointed out that if they were to participate in SD, they would develop the freedom to appropriate the technology. This, in turn, would affect perceived control over the system. They further mentioned that this would give them the freedom to appropriate the system by direct interaction with stages of system development.

> *"This would lead to us knowing how to find something on the system without having to disturb rules of the municipality and/or to depend on the assistance of the IT technicians in our municipality"* (Chief Finance Officer, District Municipality A).

These findings concur with Kirk et al. (2015) who found that technology development and designs that facilitate end-user interaction, permits and encourages people to focus on making their situations better. They then get used to enhance their feelings of discovery and intimate knowledge about the system and offer more options for the sense of control and manipulability of the system (Afzal et al., 2013; Li et al., 2015). These findings further concur with Lee, Kim, Shin and Hwang's (2018) research that argues that the process of individual appropriation of the system enhances the sense of ownership for technology.

7.3.2. Perceived usefulness

This study posits that the system can become personally relevant to its end-users when they involve themselves in it, thereby inducing end-users' feelings of sense of ownership and buy-in for the system (Yim et al., 2017). In this notion, perceived usefulness in this study is the degree to which end-users believe that the use of the system can assist them in their financial management work processes and enhance their performance.

7.3.2.1. Competence and system use and acceptance

End-users pointed out that by spending time in finding solutions of how their system was going to help them in their work activities, then they would be encouraged to appreciate system usefulness as they invested time and efforts in the development.

> *"As the employee, you always have a different expectation when the management says they'll introduce new systems; but if you're involved, you'll know what to expect from the perceive usefulness of the system" (Accounting Officer*, Local Municipality B).

End-users acknowledged that their participation would enable them to ensure that system requirement identified to meet their work processes. They pointed out that the system design would be based on their specific work processes–budget preparation, budget implementation, monitoring and control, and auditing and evaluation. End-users emphasised that interacting with the system components before using them in the workplace would make them more competent. They further indicated that the lack of use and acceptance towards the implemented system by employees did not usually mean that they were not competent enough to use the system. Sometimes the top management and developers usually did not raise awareness to them at early stages such as planning. They mentioned that they would feel more attached to the system and they would be able to use it properly as they would know all the aspects of the system.

> *"Involvement of us in the development of systems that affect our work processes can make us realise that we have influence over the system. I will know that I contributed to problem-solving so if there is a problem, I will not blame others. I think this can also contribute to the sense of competence of the employee because if the behaviour is negative, forget it, no one would be interested in any initiative"* (Chief Finance Officer, District Municipality B).

These findings are similar to Barki et al.'s (2008) research on system acceptance and psychological ownership which posited that because of end-user participation in system development, end-users may perceive that they have had a substantial influence in system development of their system, thereby developing a sense of ownership. This is similar to Yim et al.'s (2018) research on the effects of psychological ownership on beliefs about a cloud-based virtual learning environment. Their research findings found that when end-users are given incrementally more control over how the new technology is configured through hands-on activities such as designing data inputs for the system and designing the

user interface of their system, then their overall level of sense of ownership and satisfaction will increase. These findings are further in line with Pare et al. (2006) who noted the importance of psychological ownership in the acceptance of the system. Their study argued that a sense of ownership about the target such as a technology target is highly significantly associated with end-user participation, thus crucial beliefs drive technology use and acceptance behaviours among end-users.

7.3.3. Self-Efficacy

Generalised self-efficacy in the study refers to the belief that an end-user can believe that he/she has the ability to perform a particular behaviour and achieve the desired outcome across a variety of tasks and situations (Lee & Mendlinger, 2011; Kim, & Beehr, 2017). End-users revealed that their participation in FMIS simulation was likely to influence their system skills and knowledge management.

7.3.3.1. System Skills during the SD process of FMIS

The study revealed that end-user participation in the SD process would positively influence end-users' system skills enhancement. End-users pointed out that they would learn more about their system during task sketching during the SD process.

> *"I would learn more from being involved in the development processes of our FMIS to understand budget execution that I think are complex" (Accounting Officers*, District Municipality A).

End-users pointed out that participation would influence their innate perception of their skills level which would, in turn, enhance their confidence. They further mentioned that their participation would not only boost their computing skills, but also their set of knowledge and attitudes would also be enhanced to enable them to complete tasks efficiently and effectively. This finding is in line with Pierce et al.'s (2009) ownership findings which concede that to effectively develop the feelings of ownership, individuals need to be allowed to explore and enter the environment of the target, thus satisfying their innate need to be efficacious.

7.3.3.2. Tacit knowledge management

End-users of FMIS felt that in the future, the SD process would assist their municipalities to have knowledge creation and knowledge sharing for their tacit knowledge. The Chief Finance Officer pointed out that the SD process of the municipality may not suffer when one of the end-users is not available because others will be there to assist. They identified the SD process as the strategy to

facilitate knowledge management for their municipal financial management. End-users mentioned that since every stakeholder for SD is the main source of knowledge, so everyone would be able to learn from one another. They mentioned that this would enable the transfer of tacit knowledge to the SD team, since end-users are the ones that understand work processes in their municipalities.

End-users claimed that if they participated in the system development, the SD of their municipal FMIS would be able to capture relevant knowledge about their financial management work processes. End-users felt that the SD team lacked knowledge of what was happening in their district and local municipalities with regard to financial management activities. This was the reason the system was not successful.

> *"I think my knowledge about the system would be created if this participation will offer a form of learning. I think most of the employees would benefit from this because there is a lot that we don't understand about these systems that are supposed to be used by us of which I think is contributing more to complexities" (Budget Officer*, District Municipality A).

These findings are similar to Grover and Froese's (2016) research on knowledge management platforms which argue that there should be strategies to facilitate collaboration among stakeholders to be able to capture and share tacit knowledge among employees. Because tacit knowledge is highly difficult to communicate with others when everyone has isolated work activities in an organisation (Rafiq, Bashar, & Shaikh, 2014). Kucharska and Kowalczy (2016) further argue that employees need to feel valued that they are part of the organisation and that they can participate in the decision-making of the organisation to feel challenged and rewarded. This participation may influence the way information and knowledge are shared throughout the organisation.

7.4. Behavioural determinants of end-user participation on end-users' sense of ownership

Behavioural determinants of a sense of ownership include end-users' initiatives and contributions, patterns of involvement and patterns of usage (Rey-Moreno et al., 2015). The findings on behavioural determinants of end-user participation to trigger a sense of ownership are summarised in Table 7-6 and presented thereafter.

Table 7-6: Behavioural determinants of end-user participation in relation to sense of ownership

Behavioural determinants of sense of ownership	Relational dynamics of end-user participation on end-users' sense of ownership
End-users' initiatives and contributions	Self-confidence
	Self-worth
Patterns of involvement	Conflict management
	Workflow
Patterns of usage	Compliance with the system
	Work ethic and teamwork

7.4.1. End-users' initiatives and contributions

Initiatives and contributions construct posit that sense of ownership emerge as end-users own their labour during participation, because the end product of the system will likely embody their initiatives and contributions. Initiatives and contributions posit that when end-users perceive their contributions and initiatives in the developed system that they participated in its development, their sense of ownership is likely to be triggered. End-users pointed out that their contributions during co-designing simulations enabled them to gain self-confidence and self-worth.

7.4.1.1. Self-confidence

During the planning phase, requirements gathering and requirements specification, the internal auditors were excited with the use of Visio programmes to complete tasks. They were excited that they were able to use the SD programmes to sketch for requirements specification for their system. They pointed out that their confidence was boosted by the fact that they were already familiar with using Visio for tasks. However, the SD team felt that the confidence of end-users in the design specification of FMIS was affected by a lack of knowledge in using programmes for design specifications such as Unified Modelling Language (UML).

> *"They could roughly understand our UML design explanations, hence we thought that they should not focus on it because we did not want them to feel frustrated and demotivated to continue with the session" (Database Administrator).*

The involvement of end-users in the SD process of FMIS was found to increase confidence and provide sufficient technical knowledge to reduce outside dependency.

Other end-users felt a boost of confidence, were socially involved and were less shy during the SD process of FMIS. The Chief Finance Officers felt that they knew how to communicate with other participants such as the SD team and were psychologically empowered to take control of the development process of their FMIS. They often had a feeling of accomplishment and felt confident with their contributions made in requirements specification and design specifications of FMIS.

7.4.1.2. Self-worth

Communication among end-users during the SD process eroded self-worth in those end-users from Local Municipalities A and B. They felt that those from District Municipalities can sometimes make them feel inferior since their municipalities operated under district municipalities. They pointed out that end-users from district minimalities, more especially the Chief Finance Officers, can sometimes destroy their confidence because they always wanted to control discussions that are focusing on local municipalities.

> *"The implementation of these financial systems need input from people who understand the work processes more. So, if for this involvement we will be treated equally without having to fight but to work well together and not look down on others and value our contributions, obvious we'd be proud" (Accounting Officer,* Local Municipality B).

Those end-users responsible for budget preparation and budget execution work processes in municipalities mentioned that their contributions in the SD process would make them proud as long as they were treated as important as everyone else. They further stated that if the SD team would continue to work closely with them when implementing FMIS, the systems would be usable across municipalities. This finding is similar to Kim and Beehr's (2017) observations of self-worth. Empirical observations implied that achieving a task in a given situation can sometimes determine an individual's self-worth because individuals are able to use their achievements to determine someone's self-worth, whether it's their own worth or someone else's worth.

7.4.2. Patterns of involvement

Patterns of involvement are viewed as a set of empowered actions that enhance individuals' sense of ownership. Reflecting the involvement of individuals in implementations affecting their work supposedly led to proactive behaviour (Carless, 2004). It was evident that if end-user participation contains patterns that eliminate

conflict among participants and in municipalities, then participation is likely to engender a sense of ownership.

7.4.2.1. Conflict management

Findings of the study revealed that end-user participation in system development would enable end-users to exercise their influence during the system development process, which would reflect on satisfactorily conflict management. End-users mentioned that if they participated in the development of their systems, that would contribute to constructive conflict between them, vendors and the Provincial Treasury which is the contractor responsible for the development of the financial system. They further pointed out that this would enable all stakeholders in their financial management systems to engage and communicate to develop a shared understanding of the system. They further mentioned that their participation in system development would contribute to their sense of mutual trust among stakeholders of the system, such as developers of the system, end-users and their top management, which is the Provincial Treasury.

> *"This will help us build a good relationship between us employees* [end-users] *because we fight sometimes because of these systems more especially other employees [*such as Budget Officers and Accounting Officers] *could not use the system for their budget execution which causes problems for the next employees* [such as Internal Auditors and Chief Finance Officers]" (Internal Auditor, Local Municipality B).

However other end-users mentioned that their participation in system development would cause conflict. They pointed out that their participation in their financial systems would enable all end-users to voice their opinions and perform behaviours (thereby exercise influence) and that may lead to conflict with other end-users, developers and the Provincial Treasury.

> *"I think other employees would not support participation in system development since they are scared of conflict that may arise. However, I think that kind of conflict can benefit our municipality because it will offer a deeper discussion which will later lead to a stronger solution for our financial system. If they keep on doing these implementations on their sides, employees will never be happy and its waste of resources as these systems will not be used"* (Accounting Officer, Local Municipality B, Internal Auditor, District Municipality B).

These findings are in-line with Vezzoli, Ceschin, Deihl and Kohtala (2015) who argue that end-user participation in system development is likely to lead to conflict in system development stages. This is similar to Dwivedi et al.'s (2019) research on IS

failures and successes which found that during the initiation phase of SD, end-user participation may assist in familiarising users with systems requirements specifications. As stages progress, end-user participation may produce more conflict, as end-users may become more comfortable and make critical comments. Over the same period of time, influence becomes a less direct contributor to conflict.

7.4.2.2. Workflow

Findings of the study showed that end-user participation in system development would boost workflow in different processes of financial management in municipalities. End-users pointed out that if they participated in the development of their systems, they would bring improvements to their municipalities. This would be in such a way that there would be a flow between employees involved in financial management needed to accomplish the good quality of their financial management in their municipalities. Other end-users further mentioned that with the previous systems they experienced problems with workflow in their financial management systems because others were not able to use the system, which affected flow in their work activities.

> *"Alignment is what I think most of our municipalities lack when it comes to the implemented systems, work processes and employees. So, I think there is a need to really focus on these three things because I think that's why we have problems here. I think our participation in the development of our systems would suit us because we really need help to ensure that vendors implement systems that we need to achieve our work processes"* (Chief Finance Officer, Local Municipality B, Internal Auditor, Local Municipality A).

These findings are similar to Linda's (2012) research which suggests that organisations need to make use of employees' knowledge of their work processes and to initiate impromptu conversations to actively flag and adjust problems that go unnoticed by developers of their systems, which affect the workflow of the employees. Ruighaver et al. (2007) further note the importance of end-user participation in system development to influence workflow. The research concedes that end-user participation would be applied as an accountability strategy that may serve an organisation as a mechanism for bridging discrepancies between actions by developers of systems and expectations of end-users.

7.4.3. Patterns of usage

End-users mentioned that if the development team would work closely with them and consider their contributions, they would not see any faults that could cause them to resist using the system. End-users identified compliance with the system, work ethic and teamwork as factors that can be influenced by participating in FMIS development.

7.4.3.1. Compliance with the system

The study found that end-user participation in system development would lead to end-users of financial systems in municipalities committed to using the system. End-users pointed out that their participation in system development would help them develop a perception that they have compliance responsibility to use the system once it is implemented and introduced to them.

> *"I think my participation as an employee who conducts budget planning for financial management will ensure that all requirements of the system are incorporated into budget planning business processes. This will bring light to me that I have a responsibility to ensure compliance once the system is introduced"* (Budget Officer, Local Municipality B).

End-users in municipalities mentioned that their opportunity to participate in system development would be a way of bringing them together as a team as employees involved in financial management. They acknowledged that this would provide a single view of the development of systems that affected their financial management work processes in their municipalities.

7.4.3.2. Work ethic and teamwork

End-users reported that work ethic and teamwork were missing in their financial management implementation. They pointed out that they would hope that their participation in the development of their systems would lead to teamwork. They further suggested that even if sometimes they don't participate in a face-to-face interaction, it would be nice if developers and provincial treasury would keep the communication going, even via email, so that they are not always left out in important aspects regarding their systems.

> *"Yes, involving us will save time, When the system is ready we will all be on the same page and there will be order in the workplace, unlike when the system is implemented without us knowing and then we get commanded to attend training that will not even help because of being lost"* (Chief Finance Officer, Local Municipality A).

This is similar to Mustafa, Glavee-Geo and Rice's (2017) findings which found being receptive to feedback and assistance during an engagement, team members may be valuable for work processes, resulting in a learning experience.

7.5. Outcomes of end-user participation on end-users' sense of ownership

Outcomes of sense of ownership are those factors that arise from end-user participation. End-users experienced meaningfulness, a sense of responsibility and accountability. Findings are summarised in Table 7-7 and presented thereafter.

Table 7-7: Outcomes of end-user participation in relation to sense of ownership

Outcomes of sense of ownership	Outcomes of end-user participation on end-users' sense of ownership
Experienced meaningfulness	Sense of meaning during project initiation of the system
	Sense of meaning during system requirements specifications
	Sense of meaning during system design specifications
	Continued learning and self-development
Experienced sense of responsibility	Problem-solving
	Decision-making
Accountability	End-user expectations to use FMIS
	Municipal consequence management
	Self-belief

7.5.1. Experienced meaningfulness

For experienced meaningfulness, the study evaluated whether end-user participation was meaningful, valuable and worthwhile to end-users' sense of ownership towards the system. The end-users experienced meaningfulness during co-designing sessions of the three stages–project initiation, system requirements specifications and system design specifications. It was also evident that when end-users felt motivated through learning about the system during the planning of the system development, requirements gathering and design specifications, they experienced self-development and enhanced self-esteem.

7.5.1.1. Sense of meaning during project initiation

The overall performance of end-users during project initiation was satisfactory. End-users were able to provide relevant information about their municipal financial management and were able to define the scope of financial management, based on

their municipalities' needs. However, before the session started, end-users lacked information as to what they were expected to do during this phase, even though they were given instructions. However, they started coping as time went by.

End-users were familiar with the tasks involved during this phase. They emphasised that they were the ones that were familiar with financial management for their municipalities and they understood their work processes better. They mentioned that if they could be involved in this phase when their municipalities implement new systems, they would put more effort into it. This was because they knew how it felt to be left out in the development process that will fail to meet the needs for their work processes.

> *"I think it's best to involve us in the planning phases because most of us contributed in tasks of this session and we were able to provide developers with relevant information that we think is important for the planning of our financial systems"* (Budget Officer, District Municipality A).

End-users further mentioned that they should be the ones mostly involved in the planning phase of the SD process of their financial systems, because developers of the system would get useful information at the initiation stage, before they could start to think about the implementation of the system and involve resources in the process.

> *"I think it would be more useful to involve us in the planning because we're the ones that know the problems with our financial management processes and where they need to have an integrated system. Implementers need to be in touch over emails also"* (Budget Officer, Local Municipality B).

The SD team raised concerns and did not know how to benefit from their interactions with end-users during this phase and how to obtain feedback from these end-users. They pointed out that they were used to interacting with the top management (Project Manager from Provincial Treasury) responsible for the overall SD process of municipal financial systems regarding the planning phase of the SD process.

> *"I think user participation to the planning phase before we can start with system requirements would need to be the first draft phase of planning and then we can take what they have drafted to the management [Provincial Treasury] that employed us to develop systems for municipalities"* (Business Analyst).

The SD team acknowledged the contributions of end-users during this phase; however, they raised concerns about the quality of contributions of this phase. They

further added that they know end-users can behave differently when their actual involvement in SD takes place; some might not be available when they are needed for sessions and that will lead to time constraints and delays for the process. Furthermore, they felt that if end-users would be involved in the SD process, the top management would need to re-evaluate the budget for their company because involving end-users in SD would mean more costs and methods for training users about the SD processes.

7.5.1.2. Sense of meaning during requirements specifications of FMIS

FMIS system requirements processes were gathered and end-users' needs were understood by the SD team. This included scoping of functional requirements, operational requirements, performance requirements and the sequencing if FMIS requirements on what they want the system to do, based on their specific work processes. End-users were eager to participate in this phase because they wanted to influence the outcome of their system. End-users pointed out that the requirements gathering phase should also focus on them as they are always affected by the end-result because *"you cannot read people's minds and make assumptions that they would accept what is introduced to them"* (Budget Officer, Local Municipality B). They further mentioned that their participation in requirements gathering would be a meaningful experience if the SD team, in their requirements elicitation and analysis, would emphasise on what end-users need to focus on and be explicit about the system benefits on their work processes.

> *"I think developers need to be sure of whether what they are analysing in requirements specification is in line with what they believe to be our work processes. It is important to build the right system otherwise it will be a useless system at the end. It is not necessary to complicate the system, for us rather consider our needs so that it can be used fully"* (Accounting Officer, Local Municipality B).

Both end-users and the SD team raised concerns that the system requirements specification phase for FMIS was time-consuming compared to other stages. The SD team felt that the group had many end-users; they advised on reducing the number of end-users in requirements specification to ensure that correct requirements were captured. The SD team complained that involving all end-users in budget preparation, budget execution, accounting, and financial reporting and auditing and evaluation in one focus group was too large. Some requirements could be missed out. They pointed out that other end-users were talking too much compared to others,

hence that might affect the quality of requirements for each segment of FMIS. Other end-users also raised concerns that their individual voices could only be heard when working with small groups. It was suggested that it would be helpful to reduce the size of the team participating in SD for requirements gathering and it should be divided based on processes of FMIS, so that it could be easier to capture and analyse requirements.

> *"I think this phase would be meaningful if the development team could involve at least one of us in each segment of the system (i.e. one key end-user in system requirements for budget planning, one end-user in system requirements for budget execution and so on)"* (Chief Finance Officer, District Municipality A).

Apart from issues of the group size of the session during this phase, end-users did not feel inadequate or intimidated. They engaged fully with tasks even though they were not given specific guidelines on how to deal with requirements specifications. End-users communicated well with one another but the perception of poor communication between them and the SD team ran both ways, to some extent, for future interactions. These findings are similar to Song (2017) who noted the importance of specifying system requirements from the end-user's side and that it could not be ignored. This is similar to Bano et al.'s (2017) research on user involvement in software development, which argues that work activities and system requirements need to collaborate and not just find good reasons for developing a system but miss the vital arising problems. This is further similar to Aidemark, Askenas, Nygardh and Stromberg's (2015) research which suggested that end-users and system developers need to accommodate face-to-face interaction regarding functional requirements of the system before it can be developed.

7.5.1.3. Sense of meaning during design specifications

End-users were willing to participate in the system design specification phase, even though they could not scope the structure of FMIS due to a lack of expertise in design. They tried to come up with the layout of what they wanted the interface of the system to present. Even though end-users acknowledged experienced meaningfulness in their participation in this phase, they suggested that the SD team needed to lead this phase as end-users were not familiar with the required design specifications of FMIS. Other end-users were concerned that this phase might need technical skills of the SD team, unless there could be ways to simplify this phase so that they could learn and be able to contribute fully where they could:

> *"You know as long as they can give us design graphics in dummy screens to show us how our financial processes will look like even if they can do that via email. Then they can give us to evaluate them based on our needs. I also think developers should lead the design of our financial systems as long as they are able to keep us in the loop"* (Chief Finance Officer, District Municipality B).

Some end-users did not understand the task modelling that was used in design specifications for architectural design for the system. They mostly focused on the organisational aspect during the design, rather than technical aspects, as they felt like its tasks were structured for the SD team, as they believed that the database administrator, systems analyst and software developer were expert in system design specifications. During this phase, other end-users were reluctant to talk to the SD team about confusing concepts. End-users were reluctant to let the researcher watch them while they were completing the tasks for design specifications of FMIS. They rarely did the given tasks of design specifications when the researcher came to check the progress; they only worked when they were left alone. Other end-users raised concerns about not being familiar with the representation of their problems into a systematic language for the SD team. They pointed out that in the future they would need training before starting to work on tasks, because they are doable but they needed to learn about the design phase before contributing to it.

> *"Someone like me is not a specialist in prototyping designs of systems and then has to know, has to sort of learning how to interpret what is needed for the design, that could be time-consuming unless the SD team would be willing to accept us as part of the team and be willing to interact with us because we really need to be hands-on in the development of these systems"* (Chief Finance Officer, Local Municipality A).

These findings are in line with Bennis's (2015) research which found that system developers should work closely with end-users and should be willing to amend system design reasonably to meet needs better. This is further similar to Abelein and Peach's (2015) findings which found importance in direct and indirect involvement of end-users in the system design. The study emphasises that developers should keep in touch with stakeholders to ensure that there is no change in expectations.

7.5.1.4. Continued learning and self-development during the stages of FMIS development

All end-users who participated in co-designing sessions highlighted that they had been empowered and were positively influenced by their participation in development simulation for their financial system. *"I want to learn more about our MSCOA financial systems, I definitely would like to attend more development*

sessions in the future" (Budget Officer, Local Municipality B). End-users acknowledged that they had a chance to learn about FMIS specifications on what the phases of the system mean to their work processes. Interactions with other participants during project initiation, requirements specifications and design specifications allowed end-users of FMIS and the SD team to deepen their understanding of all processes of financial management from budget planning, budget execution, accounting, financial reporting and to auditing and evaluation.

Numerous end-users felt that they had evolved after their participation in sessions of the SD process. Some of the end-users were able to determine and reflect how they would use FMIS in their municipalities after implementation. They mentioned that they were likely to develop motivated behaviour to channel use conduct of the system when it was ready for use. They felt that their participation in FMIS development would influence them to use FMIS more effectively, without having to ask for assistance from technicians when they experienced difficulties in their municipalities.

> *"Being taken seriously to a point of being included in platforms of the implementation of our financial systems will contribute to my self-enhancement. I would be able to teach myself and also other employees that I use these systems with, not to depend on others when I do not know some of the things" (Budget Officer*, Local Municipality B).

With the knowledge that end-users acquired during the SD process which allowed them to freely express their needs regarding FMIS for their work activities, further brought a high degree of happiness. They pointed out that their social capital in their municipalities and in their workplace was likely to increase.

> *"I think this participation in the development stages of systems would ease the stressfulness of the experiences that we previously had whereby our financial processes of the system did not speak to our usual work processes. We were forced to adapt to the system that is delaying us to do our work activities even though they were not aligned with what we believe financial management processes are supposed to be achieved*" (Budget Officer, Local Municipality B).

Qui's (2018) empirical findings pointed out that an organisation needs to be aware that employees' self-worthiness usually fluctuates, depending on their recent experience. Hence their participation in a situation needs to have qualities of self-development that would encourage them to handle challenges on their own. The positive self-esteem of the end-user of technology may be significantly influenced by interpersonal communication in a co-creation with others (Sadeh & Karniol, 2012).

This implies that participation in SD usually involves not only one end-user but a collaborative process with other end-users and other stakeholders such as the SD team. Stakeholders may influence each other in the enhancement of their self-esteem towards the system. This concurs with Misfud et al.'s (2019) empirical findings which argue that user involvement in SD processes enables them to gain knowledge that enhances their self-esteem on a personal level. However, people with low self-esteem may be motivated differently (Buchem, 2012).

7.5.2. Experienced sense of responsibility

Experienced sense of responsibility evaluated whether end-user participation could lead to behavioural outcomes which influence end-users to be personally responsible for the developed system. End-users revealed that being able to contribute to problem-solving and decision-making enabled them to gain a sense of responsibility.

7.5.2.1. Problem-solving

Enabling end-users to contribute to FMIS development simulation influenced end-users' cognitive skills such as to think and pay attention to issues that may arise when using their FMIS. End-users pointed out that their participation in SD influenced them to be able to think outside the box and readied them to be able to respond to problems that may arise regarding SD of their municipal financial systems. Being exposed to different sessions of co-designing simulations enhanced end-users' problem-solving skills. Problem-solving skills were often inculcated through group-work interactions and discussions that end-users had with the SD team during the phases of SD.

> *"You know generally, solving problems is not that complex, it requires working together as a team, not in silos like it was with our previous projects for our financial systems for our municipalities*" (Budget Officer, District Municipality A).

The sessions were structured to influence end-users to contribute to the development process. It was thought that end-users should be given an opportunity to use their knowledge of financial management work activities to influence the planning phase, system requirements specifications and design specifications. The SD team viewed end-users' contributions during the SD process as grounds for the work to be done for other stages of the SD process.

During design specification, end-users felt responsible to continue with the tasks of design specifications, even though they were struggling due to lack of expertise. They

felt that they were better able to think logically regarding their municipal financial systems after having learnt the basic principles of the planning phase, requirements specifications and design specifications of the SD process.

7.5.2.2. Decision-making

After having completed the sessions of the SD process, end-users pointed out that they felt empowered to make decisions to influence the development of their FMIS. They felt motivated after their participation; they wanted to do whatever was possible to get their municipal financial system in order. End-users felt that making decisions during the planning phase and requirements specifications phases were their statutory right, as they pointed out those two phases felt like they should be involved in and make key contributions. They pointed out that their participation in SD of their systems enabled them to influence the sound and relevant decisions for their FMIS through active contributions in stages of SD. Being able to make decisions regarding tasks during the SD process made end-users feel like they are part of the SD team.

> *"For me, I think contributing to the development of our financial systems should allow us to contribute to the decision-making and it should be employee-oriented. In future, I think Provincial Treasury should allow even if it's one of us to be amongst the leaders of the development and integration process that can help too so that we can also feel that we belong in this process"* (Accounting Officer, Local Municipality B).

The employment status among end-users affected decision-making during the SD process of FMIS. The Chief Finance Officers acted as if they were in better positions to influence decisions regarding their municipal financial systems. The Chief Finance Officers from all the four municipalities had more influence in the planning phase and requirements gathering. Most of the time during brainstorming of sessions, they tried to represent other end-users. They spoke about everything and sometimes Budget Officers were not given a chance to talk, even if the discussion was about budget preparations work processes. Budget Officers and Accounting Officers seemed not used to making decisions while the Chief Finance Officer was present in the discussion; they still directly turned to ask the Chief Finance Officer to make decisions during SD, kept quiet and accepted the views of the Chief Finance Officer.

> *"I think these sessions with the development team will be very useful as long as roles and responsibilities of everyone involved are outlined so that we don't feel like we're just attending training that we previously attended which didn't help us and we*

> *were not allowed to voice out our concerns. The process should not be one-sided"* (Budget Officer, Local municipality A).

Employee participation in decision-making processes significantly contributes to a sense of belongingness if a shared decision is recognised (Han, Chiang, & Chang, 2010; Kamal et al., 2015). This is similar to Kim and Patel's (2017) who noted the importance of participative decision-making in satisfying needs of human growth such as self-concept and self-efficacy. These findings concur with Han et al.'s (2010) observations which pointed out that optimising the level of involvement and participation in municipal decision-making provides opportunities to open up the decision process. Similarly, Olckers (2011) reported positive finding employee participation in decision-making to influence organisational commitment.

7.5.3. Accountability

In this study accountability as the trigger of sense of ownership posits that end-user participation in system development with responsibilities would influence end-users to develop some kind of emotional attachment and responsibility towards the results of the new system (Ruighaver, Maynard, & Chang, 2007). End-users mentioned that if they could participate in the development process, they would feel accountable and not feel forced to use the system in municipalities, because they would already know what to expect from the system.

7.5.3.1. End-user expectations

Findings of the study showed that end-user participation would bring a high end-user's expectation of improvement of efficiency of the system and quality of the system, for all aspects of financial management in municipalities. End-users mentioned that, with their previous financial systems, they had less positive expectations and if they were given an opportunity to participate in system development, they "hope" for the system once it is ready for use would be more efficient. This statement of "hope" implies the need for a better system for financial management in municipalities for end-users.

> *"I think our expectations for the new system would be positive and the content of the system would be better if we get involved because everyone will have time to look at the financial management processes for the system, that would be great"* (Chief Finance Officer, District Municipality B).

The study found the importance of ensuring the correctness of end-users' expectations. End-users mentioned that their participation in system development

would ensure that their expectation for the system is not assumed by the development team.

> *"National and Provincial Treasury like to assume that we know what to expect from these financial systems that they lead implementation without involving us, so I think things would be better if we're given a chance to participate at early stages because we'll be clear of what to expect from the system"* (Chief Finance Officer, Local Municipality B).

These findings are in line with Kylberg, Haak and Iwarsson's (2018) research on service end-users involvement which argues that expectations of end-users usually influence the satisfaction of the system. When end-users' expectations about the system are assumed or estimated and are not confirmed by end-users, they might turn out false, which would have a negative influence on the satisfaction of end-users (Kylberg et al., 2018).

7.5.3.2. Municipal consequence management

Findings of the study revealed that involving end-users to participate in the development of the system might assist each municipality in having a robust, transparent and consistent practice managing consequences of non-compliance with the implemented systems for their financial systems. End-users mentioned that their participation in system development would aid their municipalities to be held accountable to use the system once it had been implemented, as they would have clear expectations from the systems since they would be involved in the system development stages.

> *"All of us in each municipality will know what is expected from us and what the consequence is if we do not use the system once its ready for use… I think involving us in the development would bring some encouragements to try to be accountable and use the system because everyone will know what to expect from the system"* (Budget Officer, District Municipality B).

This finding is similar to Smith and Bititci's (2017) research which argues that applying appropriate consequence management strategies for employee accountability usually results in employees getting encouraged and committed to doing what they're supposed to be doing.

7.6. Contextual factors that may hinder end-user participation in municipalities

Contextual factors in the study are the factors that are likely to act as barriers or facilitators for developing a sense of ownership about the target of ownership (Pierce et al., 2009). Contextual factors may be structural conditions and/or cultural aspects. The latter may include organisational structure such as physical barriers to participating in the project's activities due to boundaries and cultural aspects (Olckers, 2011). The former may include socio-cultural aspects such as customs, socialisation practices, for instance, hierarchical decision-making patterns and socially structured collective types of ownership (Rey-Moreno et al., 2015). The findings on contextual factors that may hinder the effectiveness of end-user participation in municipalities are summarised in Table 7-8 and presented thereafter.

Table 7-8: Contextual factors that could hinder end-user participation in municipalities

Contextual factors of sense of ownership	The contextual factor that may hinder end-user participation in municipalities
Structural conditions	Standardisation and lack of stakeholder collaboration in the government sector
	The top-down approach and complex job-design across tiers of government
Cultural aspects	Political interferences across the three tiers of government
	Leadership style approach across three tiers of government

7.6.1. Structural conditions

The study viewed structural conditions as existing rules, hierarchy and norms in municipalities that may hinder the effectiveness of end-user participation to influence the development of end-users' sense of ownership (Olckers et al., 2011). End-users raised concerns that standardised structures which inhibit collaboration and the top-down approach with complex job design tiers of government – national, provincial and local governments – are likely to hinder end-user participation in municipalities.

7.6.1.1. Standardisation and lack of stakeholder collaboration across three tiers of government

End-users were concerned that the success of their participation in the SD process of their FMIS could be affected by inhibitors associated with standardisation and complexities in the job-design. The implementation of FMIS in the public sector involves different parties across national and provincial government departments. End-users mentioned that the application of end-user participation in the SD process of municipal FMIS may encounter legal and policy barriers from the top management such as national and provincial governments. Ideas for change implementation for any IS, especially financial systems, usually gets interrogated based on the existing policy implications of the public sector regarding e-government implementation. End-users further added that the existing e-government regulations lack stakeholder collaborations, more especially when it comes to municipal FMIS. They were concerned that if there were a suggestion of involving municipal end-users of FMIS in the SD process, this would mean that the Legislature with National Treasury (the national government departments) and policymakers would be required to update the regulations around the SD process of municipal FMIS to recognise end-user involvement and participation in SD process.

> *"It will probably be difficult to implement this strategy of end-user participation to work closely with our vendors due to lack of adequate collaboration mechanisms and frameworks in place to cater for implementations with employees from municipalities"* (Chief Finance Officer, District Municipality B).

Integrating end-user participation across municipalities would be an inhibiting factor. End-users further mentioned that even though they acknowledge end-user participation to align their work process with the processes of FMIS in their municipalities, there could be some inhibitors from other employees in other municipalities. They felt that such resistance would contribute to the top management not agreeing to implement end-user participation in municipalities, because the FMIS SD process for municipalities needs to be the same across municipalities. They also pointed out that other provinces might not like the idea of changing things around the implementation of their FMIS.

7.6.1.2. Top-down approach and complex job-design across tiers of government

End-users pointed out that their minimum access to the SD process of their previous systems could contribute to barriers to their participation in the SD process. End-

users pointed out that everything involving change implementation for their municipalities usually gets planned and decided from national, then moves to provincial departments and then moves to their municipalities. They were concerned that it was quite difficult to implement something new at the local government level due to a lack of support from the top management, especially if the idea about the implementation was not from the top.

> *"Even if we can come up with the good ideas for the system, if Provincial Treasury does not support the idea, then would be a waste of our time. It would be helpful if they can include national and provincial as our top management during our participation in FMIS development so that they can note the importance of this strategy"* (Accounting Officer, District Municipality A).

End-users pointed out that top management of their municipalities tended to agree and accept suggestions made by employees in meetings. They pointed out that this has had a negative effect because most of the time they agree on something that they are actually disagreeing with internally, knowing that they will not implement it; they are just agreeing to be done with the discussion. They further pointed out that decision-making regarding any change implementation in their municipalities is usually based on the objectives of the strategy being recommended. These recommendations are usually conducted by provincial departments which are regarded as the top management municipalities. They further mentioned that their participation would not be effective if there is no commitment from the top management.

7.6.2. Cultural aspects

Cultural aspects affecting the development of a sense of ownership are viewed as those cultural beliefs existing in an organisation that have collective programming of the mind which distinguishes members of one human group from another (Pierce et al., 2001). End-users pointed out that leadership style and political interferences across the tiers of government are likely to affect the effectiveness of end-user participation in municipalities.

7.6.2.1. Leadership style approach across three tiers of government

End-users were concerned that linkages of leadership style across national treasury, provincial treasury and municipalities regarding FMIS development might affect the development of their sense of ownership during their participation in the SD process of their FMIS. End-users were concerned that the top management during the SD

process may confuse leadership with positions. They pointed out that national and provincial governments often occupied positions of authority and they may want to exercise such control during end-user participation in the SD process. They were concerned that such control from the top management may affect their feelings of ownership during the SD process.

> *"I think this participation could work well if there could also be an exercise to give strategic direction for our participation in the development because when the top management is present, other employees might not want to engage in the implementation of financial systems, due to previous encounters with top management"* (Accounting Officer, Local Municipality A).

These findings are similar to Fletcher and Webb's (2017) research which argued that collaboration that involved many different people such as employees, employers and external people usually work well when there is collective leadership. This is a climate of self-determination where employees receive support during the collaboration that can also lead to employees gaining a sense of ownership and be motivated to do better (Ghafoor, Qureshi, Khan, & Hijazi, 2011). These findings are in line with Alok (2014) and Stander and Coxen (2017) who revealed the importance of a good leadership style as a tool for organisational performance and employee satisfaction.

7.6.2.2. Political interference across the three spheres of government

End-users were concerned that their participation in the SD process could require more time for the development of their FMIS. They were concerned that the contributions that they made to the SD process would need to be reviewed at the national and provincial treasury before they could be used for the design and implementation of FMIS.

> *"This would probably take years before it gets approved at provincial and national, and the systems will long be been implemented without our involvement"* (Budget Officer, Local Municipality).

End-users of FMIS pointed out that their participation in the SD process may still have the effect of *"no changes"* to the current ways of FMIS development, because of political interferences. They pointed out that the higher tiers of government have more influence in the SD process of FMIS. They acknowledged that most projects involving IS implementation for their municipalities are usually managed at national and provincial levels. They further added that the SD team to develop their IS are

usually selected on a tender basis by the government officials for attaining personal gains. To achieve personal gain, they set closed allies in the implementation processes with no involvement of end-users in municipalities, hence there might be no effect from their participation in the SD process.

7.7. Summary of the Chapter

Observations of end-users during the initiation phase, system requirements specification and system design specification showed coping behaviours of end-users. They also experienced complexities with the designing phase as they lacked knowledge of coding languages that were required for the phase. Evidence for open-ended interviews with end-users was for the development of a sense of ownership in a case where end-users would participate in the development of their systems. The thematic analysis was formulated through multi-dimensions of ownership of the theory of psychological ownership, which included behavioural determinants, relational dynamics, mechanisms, contextual factors and outcomes of sense of ownership. The findings show that end-user participation in the development of their system could trigger a sense of ownership. However, end-users mentioned that if motivation were in conflict with the end-user's established expertise, they could discourage them. One of the findings from this research is that sense of ownership is a vital element to take into account when looking at how end-users may receive, appropriate, take actions with and, eventually, sustain externally initiated interventions in their participation in system development.

Chapter 8: Discussion of the research findings

8.0. Introduction

This chapter discusses the research findings of the study. Chapter 6 gave an overview context of municipal FMIS and also reflected on findings on how FMIS were implemented in municipalities. Chapter 7 further presented findings based on the adopted theory of psychological ownership which we used in the study as the theoretical framework. Chapter 8 focuses on how end-user participation in the SD process of FMIS influences the development of a sense of ownership among end-users in municipalities. This chapter seeks to answer the research questions of the study. The chapter draws on research findings presented in the previous chapters and previous literature studies.

The chapter is divided into seven sections. Sections 8.1 to 8.4 discusses the respective research sub-questions. Section 8.1 focuses on how the system owners exclude end-users from the implementation of FMIS in municipalities. Section 8.2 discusses key findings on how end-users react to not being involved in the implementation of FMIS. Section 8.3 concentrates on the discussion on how end-user participation in the SD process of FMIS affects end-users' sense of ownership. Section 8.4 discusses end-users' perceptions of the factors affecting the success of end-user participation in municipalities. Finally, Section 8.5 addresses the main research question, i.e. How does end-user participation in FMIS development engender a sense of ownership in end-users in municipalities in South Africa? Section 8.6 summarises the discussion of empirical findings in the study.

8.1. How the system owners exclude the end-users from the implementation of FMIS

There is a general notion that end-user involvement is critical to the success of an information system implementation (Imahanyehor, 2011; Nurhayati & Mulyani, 2015). The involvement of end-users is needed in the development of information systems because the system will not be effective in helping any work processes when the determination does not involve end-users (Nurhayati & Mulyani, 2015). The involvement of end-users in the development of IS can be a consultative, informative, representative and participative involvement (Imahanyehor, 2011; Zhang et al.,

2015). “Informative and consultative” have been criticised for not giving end-users the ability to actively influence and have control during the development process (Zhang et al., 2015; Bano et al., 2017). “Representative and participative” involvements allow end-users to have influence and control in the development of IS. The contributions provided could be a form of influence, because without end-users’ contributions in the development process there is a high chance of system failure (Peng & Pierce, 2015). Previous reviews have raised concerns and voiced that little or no participation of end-users in the implementation of IS in the public sector has affected the uptake of IS in developing countries (Ika & Saint-Macary, 2014; Ngoepe, 2016; Okereke, 2017). We, therefore, investigated the manifestation of non-involvement of end-users in the implementation of FMIS in the public sector. The investigation focused on how system owners exclude the end-users from the SD process of FMIS in the public sector, specifically in municipalities, the lowest-level tier of the public sector in South Africa. This section, therefore, seeks to answer the research sub-question 2:

How do system owners exclude end-users of municipal FMIS in the implementation process?

The findings of the study showed that there was no representative or participative involvement of end-users during the implementation of FMIS for municipalities. The following three key themes were identified in answering sub-question 1:

- The top-down approach in the SD process of FMIS,
- Communication during the SD process of FMIS and
- Capacity building and training of end-users of FMIS

The findings of the study showed that municipal FMIS were implemented following a top-down approach, the communication was poor, the SD process and training provided during post-implementation was not enough to influence the use and acceptance of FMIS. These findings are further discussed in subsequent sub-sections.

8.1.1. Top-down approach in the SD process of municipal FMIS

We found that the approach followed in the SD process of municipal FMIS was not participative nor representative. The SD process of FMIS followed a top-down approach, which is a linear process, where the FMIS were implemented and then introduced to end-users afterwards. Strategic decisions regarding the

implementation and change management of FMIS were made by the executive top management of the Provincial Treasury of the Western Cape and National Treasury in South Africa. In this approach, the executive level decides how to prioritise, manage and conduct everyday processes for the system (Sachdeva et al., 2018). Processes about the SD process in a top-down approach are usually streamlined and communicated to stakeholders who are identified by the top management (Liedl, 2011; McDermott et al., 2015). Consequentially, strategic decisions about the system are created from the top management. Employees, who will be the end-users of the system, are usually trained and offered a manual of how the system will operate (Feikas, et al., 2011). The developed FMIS could not achieve the desired functionality and impact on municipal financial management that was originally anticipated. The SD process of FMIS in municipalities did not involve end-users in the stages of the SD process.

> *"In our implementation style of financial systems, we hired external vendors to develop packages and we trained intended users in municipalities on everything. That did not work because employees were not happy with implemented financial systems. We had to go back and implement one module at a time and roll out the system per unit and department. There is a problem of resistance and other systems are to be re-implemented"* (Project Manager based at Provincial Treasury of the Western Cape).

The FMIS were developed by the SD team who specialised in developing IS for government departments in South Africa. The SD process of FMIS for municipalities was influenced by the National Treasury in South Africa, Provincial Treasury of the Western Cape and vendors who they appointed, and end-users had no influence. The SD team implemented the FMIS without engagement with end-users. Instead, the SD team communicated with top management such as National Treasury and Provincial Treasury. FMIS was implemented with the involvement of the Provincial Treasury and SD team who were appointed by the provincial treasury; there was no involvement of end-users who were meant to be directly affected by the system. The development of FMIS for municipalities focused on management awareness at a broader administrative and council level; there was nothing said about actual end-users in the planning. We therefore propose:

Proposition 1a: *The SD process is a top-down approach which excludes end-users from participating in the SD process*

End-users experienced difficulties in using FMIS for their work processes due to the top-down approach. Previous research mentions the bottom-up approach of implementation as one of the challenges impeding the use of new IS in the government sector (Combaz, 2015; Nabe, 2016). We recommend that when municipalities are implementing new information systems, there should be a participative involvement of employees in the SD process. End-users may either take active roles or they may be involved as providers of information, commentators, or objects for observations of the IS. Employees' contributions in the implementation of IS should be taken seriously by the system development team (Feikas, et al., 2011). Employees need to be a part of the SD process and they need to be heard, since people are more likely to accept the forthcoming change if they know what to expect from the system.

8.1.2. Communication during the SD process of FMIS

We found that there was no communication with end-users during the SD process of municipal FMIS. The communication during the SD process was between the National Treasury, Provincial Treasury and system development team. The National and Provincial Treasury did not communicate with all end-users during the pre-implementation and implementation process; they only communicated with Chief Finance Officers of municipalities. They only communicated effectively with end-users during post-implementation when the system was ready for use and training needed to take place. The communication with the Chief Finance Officers in each municipality during the pre-implementation of FMIS was via emails. The communication was about notifying municipalities that there would be a project of implementing new FMIS for municipal financial management. There was no communication outlining the roles of end-users in the process.

> *"Information about implementation was received via the emails, [however] there was no formal communication to the end-user something like a meeting. We were briefed that we will change to new financial systems. Provincial Treasury attended meetings for this and all I know is that we were told that new financial systems will be implemented. No vision for this was shared formally"* (Chief Finance Officer, District Municipality B).

End-users had expectations that the National and Provincial Treasury would be communicated with them individually, based on their roles in work processes of municipal financial management. The top management and the SD team made

decisions regarding the processes of FMIS. Lack of communication with end-users during the SD process was also found to have contributed to drawbacks in the development of FMIS in municipalities.

> *"The municipal financial systems are implemented based on the reforms of municipal financial management. Many end-users don't know much about the implementation of these financial systems because, usually, it is us [provincial treasury] who are responsible for the implementation. These systems are developed by appointed vendors and end-users only have access to these systems when they are ready for use based on their roles and responsibilities"*(Provincial Treasury of the Western Cape).

During the post-implementation of FMIS, end-users received effective communication when they were about to receive training on how to use the system. End-users pointed out that poor communication during the SD process isolated the top management from the municipalities and this hindered the uptake of FMIS in municipalities. Strategies in place during pre-implementation, SD process and post-implementation created communication breakdown between municipalities, top management and the SD team.

The use of threats for end-users to attend training for FMIS intimidated end-users in municipalities further, driving them to not use FMIS. The use of threats has never been a good tactic when trying to influence end-users to use a new system, because it can cause the end-user to lose a sense of ownership of the implemented system and they regard this system as imposed (Donoso et al., 2014). Other studies argue that communication and participation are closely linked activities for the success of the uptake of the system (Gopeni, 2016; Yim et al., 2017). In the context of end-user participation in the SD process, this link is defined in terms of end-users' involvement in, ability to voice or present contributions, in any form of engagement, in a dialogical manner (Nurhayati & Mulyani, 2015), to influence the utility of their inputs in the decision-making processes to achieve sustainable results (Han et al., 2010; Lee & Mendlinger, 2011). To encourage participative engagement, the platform for communicating change should encourage and create a conducive environment for people to express their views of any decision that will later affect them (Balje, Carter, & Velthuijsen, 2015). This also includes encouraging management to provide timeous feedback, including negative feedback. Employees like to be given feedback on issues or decisions that affect them (Donoso et al., 2014). We therefore propose:

Proposition 1b: *Poor communication between end-users, top management and the SD team during the SD process of FMIS influences poor uptake of IS in municipalities.*

8.1.3. Training of end-users before using the system

The end-users of FMIS were trained before they were required to use the systems. They did not understand the rationale for implementing FMIS as they felt that they are not useful for their work processes. Some end-users complained of inadequate training that they were given in relation to the use of FMIS. The reason for this could partly have been that there was limited end-user training and consultation before the SD process. Further, some end-users complained about the quality of training that they attended for post-implementation of the system. End-users felt that the Provincial Treasury did not invest much in the training of FMIS.

> "*The project team pushed the numbers to go through training and not ensuring that we understood what we were trained on. There were no assessments after the training so that we can give our feedback or the evaluation of the system and their training. We have gone through a lot of upgrades with no specific manual"* (Internal Auditor, District Municipality A).

End-users were concerned that the training provided to them was not hands-on, rather it was just to watch the SD team demonstrate how to use FMS and talk. Further, they felt that the training manual provided was not comprehensive enough for their level of skills and knowledge. It is easy for end-users to forget how to use the system, even after receiving training. However, having a clear change implementation which involves setting clear objectives and challenging targets, empowering action, involving people such as end-users and coaching, there are high chances of successful implementation (Thilo et al., 2017). Hendricks (2012) mentioned that end-users in the public sector are different from those of the private sector. He emphasised that to build the necessary capacity in the government sector, it is vital to create a learning environment early in the project of financial systems and to treat the whole process as a learning opportunity, with training being part of an ongoing process. Such capacity building should be provided to end-users and should teach these end-users how to use the new system and how it will affect business processes.

In this regard, end-users mentioned that the training was not useful as they were still experiencing complexities with the systems, hence, they decided not to use them. They were hoping for well-defined training for their FMIS to assist them to build

confidence and develop skills. This is similar to the studies conducted in Kenya, Tanzania, Malawi, Uganda and Ghana. The majority of these African countries found that FMIS for the public sector did not give satisfaction to their clients (Mwangi et al., 2018). South Africa had the benefit of learning from experiences in other developed and developing countries in an African context, to avoid repeating the same mistakes that other developing countries experienced. The study found that the user capacity of Kenyan financial systems for the public sector had complexity, lack of a clear picture of what their users would derive from the system and lack of top management support (Mwangi, Kiarie, & Kiai, 2018).

Although end-users were trained on how to use the system, the training was too little and too late to enable the end-users to uptake the system. Without participative involvement of end-users in the implementation, training may be ineffective to influence end-users to use the system (Ika & Saint-Macary, 2014). This reiterates the importance of end-users being involved in the SD process, so that system requirements would have been met and alignments brought to work processes before they are given the training to use the implemented system (Bennis 2015). Furthermore, to a large extent, system implementation in municipalities mainly focused on the success of the system implemented, not on the impact the change had on the employees. Not involving employees in making decisions that affect their work processes may create a misalignment of the new system with the work activities of employees (Holgersson 2014). This has the potential to create uncertainty and a lack of trust in the outcomes of implementation. We therefore propose:

Proposition 1c: *Participative involvement in conjunction with training may influence the uptake of FMIS in municipalities*

8.2. End-users' reactions to not being involved in the implementation of FMIS

End-users of information systems react in different ways to a newly-developed system (Samhan, 2018). They may reject it completely, partially use the functions of the system, actively and passively resist it, unwillingly accept it or embrace it fully (Kim & Kankanhalli, 2009). With not involving end-users in the implementation of IS, different concepts of end-user's decisions to use or not to use the implemented

system were described in IS adoption and implementation reviews. These sometimes include adoption, non-adoption, resistance and rejection (Kim & Kankanhalli, 2009; Laumer et al., 2016; Samhan, 2018). This section answers the following research sub-question:

How do end-users' reactions to lack of involvement in the SD process of FMIS affect a sense of ownership of end-users?

The end-users of FMIS in municipalities exercised resistance towards the system. End-user resistance is described as the behavioural expression of the end-users' opposition to using the implemented system (Laumer et al., 2016; Haddara & Moen, 2017). The findings showed that passive resistance, covert resistance and adoption towards FMIS in municipalities and the consequence of not involving end-users were as follows:

- Passive resistance was experienced by conducting municipal financial management work activities through paper-based and Microsoft excel.
- Passive covert resistance towards the system was experienced through end-users' dependence on technicians to complete tasks on the system on their behalf.
- Individual adoption of FMIS: End-users such as Chief Finance Officers adopted the FMIS.

The findings of the research sub-questions are further discussed in the following sections based on passive, covert resistance, individual adoption of FMIS and consequences of not involving end-users in the implementation.

8.2.1. Passive resistance

When a system is introduced in the workplace, end-users may be affected as they try to balance the status quo and the integration of the new system into their work activities (Lapointe & Rivard, 2005). This indefiniteness could result in emotional stress, leading to the manifestation of passive resistance behaviours (Laumer et al., 2016). Empirical findings of the study show that end-users presented passive resistance through the minimal or limited use of FMIS. End-users expressed minimal use by choosing to ignore many functions of FMIS such as budget planning and budget execution work processes. For these main functions of FMIS, municipalities are still operating on manual work processes such as paper-based work and the use

of Microsoft excel. End-users such as Budget Officers and Accounting Officers expressed dissatisfaction with the usability of FMIS and lack of specific functions for their work activities. Some end-users reported that the functions of the system were frustrating to a point that they ended up not using the system at all.

> *"I don't understand why there is a need to integrate the system into our work processes if they are going to frustrate us more"* (Budget Officer, District Municipality A).

When employees feel excluded from the change process that affects their work processes in the workplace, they tend to passively resist implemented change (Kim & Kankanhalli, 2009). In the case of FMIS implementation in municipalities, the change process normally involves the top management which is the National and Provincial Treasury. However, the employees who are end-users of FMIS do not take part in the SD process of FMIS. End-users raised concerns that the top management should consult them for their point of view on things regarding their municipalities and, therefore, in such important change such as FMIS implementation, they should have been involved. The fear of losing influence over their municipal financial management work processes also contributed to passive resistance over the implemented FMIS.

8.2.2. Covert passive resistance

Passive covert resistance which is a type of passive resistance is not easy to detect when it occurring towards the newly implemented IS (Samhan, 2018). In covert resistance, end-users may seem happy and willing to use the implemented system, while they are not using the system (Kim & Kankanhalli, 2009). Some end-users of FMIS presented covert resistance behaviours by pretending to use FMIS in their municipalities. End-users felt that they did not have the required skills to use the system and that the training that they had received was inadequate. For some employees such as Internal Auditors responsible for accounting and financial reporting and Accounting Officers responsible for budget implementation work processes felt that being part of the implementation process of their FMIS meant acquiring new skills to be able to use the new system. The fear of comprehension that one does not have what it takes to learn these new system skills may translate into covert resistance (Lapointe & Rivard, 2005). End-users resisted FMIS through

delegation, that is, assignment of responsibility to fellow employees, a technician or an ICT expert to do required work on their behalf:

> *"In our municipality, we always depended on technical staff to assist with capturing of budget planning and execution activities so that this information can be ready for the Chief Finance Officer to do approvals"* (Accounting Officer, Local Municipality B).

In some cases, end-users indicated that they normally conducted work activities manually; they asked technical staff to transfer activities into FMIS. Conducting financial management work activities manually was a time-consuming process across all working processes of municipal financial management. The Budget Officers and Accounting Officers complained that FMIS systems were complex for their work activities. Convert resistance towards FMIS was triggered by the lack of relevance of the FMIS to their work activities of municipal financial management, hence they needed more time to master all functions of the system. This means that end-users expressed resistant behaviour, whereby they complained about complexities and then depended on the technical staff in their municipalities for assistance.

In some municipalities such as local municipalities, end-users pretended to accept to use new FMIS although they did not even recognise its significance to their work processes. End-users in municipalities used covert resistance behaviours to appease FMIS advocates. The covert resistance behaviours were expressed through delegation such as the top management was deceived into thinking that other municipalities were trying their best into using implemented FMIS. Such covert resistance behaviour in end-users in municipalities was triggered by perceived force to use FMIS by municipal financial management. The resistance to FMIS may be due to the underlying, unresolved non-involvement of end-users in the implementation (Samhan, 2018). We postulate that it is important to know that resistance towards an IS may be hidden through falsified acceptance behaviour such as pretence to use the system (Kane & Labianca, 2011).

8.2.3. Individual adoption of FMIS

In an IS environment, not all end-users adopted the system willingly and not all intended end-users resisted the system (Haddara & Moen, 2017). Adoption of information systems is not a collective experience but rather an individual experience towards the implemented system (Samhan, 2018). In this study, some end-users

adopted the implemented FMIS although some resisted FMIS. End-users such as the Chief Finance Officers across municipalities adopted the implemented FMIS. The Chief Financial Officers in municipalities were willing to use FMIS in all functions of FMIS. Chief Finance Officers explained that they knew where to perform their work activities on FMIS for approving all municipal budget activities.

However, the circumstances and resistance behaviours of the key end-users such as Budget Officer, Accounting Officers and Internal Auditors to FMIS functions reduced their ability to use FMIS. They were hindered from using FMIS because their work activities depended on other end-users being able to complete their work processes. For instance, if the Budget Officer did not use FMIS for budget planning and execution, then the Chief Finance Officer could not execute approval activities on budget planning and execution.

> *"So, if both employees [Budget Officers and Accounting Officers] decide not to do allocations of expenditures on the system, then I won't be able to approve on the system"* (Chief Finance Officer, District Municipality A).

In other cases, end-users are most likely not to have another choice than to use the implemented system (Haddara & Moen, 2017). The approval of work activities can only be done on FMIS, manual approvals are not possible because they are considered sensitive and confidential tasks. The Chief Finance Officers are supposed to perform approvals on FMIS and then within 14 days post the budgets and other budget-related documentation to the municipality website so that it is accessible to the public, as well as send hard copies to National and Provincial Treasury departments. Due to the resistance of other end-users, Chief Finance Officers could not complete their tasks on the FMIS because of missing information provided by Budget Officers and Accounting Officers on budget execution.

The Chief Finance Officers found their functions on FMIS easy to use compared to those functions of other end-users. This implies that the reason other end-users resisted FMIS and others adopted FMIS might vary between different functions of the system. If organisations such as municipalities could be aware of this, then they might align their implementation processes to different end-users' needs to reduce non-adoption towards the implemented system (Haddara & Moen, 2017). Additionally, before the implementation of FMIS took place, those Chief Finance Officers in District Municipalities were partially involved in meetings regarding the

implementation of FMIS. This could be the reason behind the acceptance of FMIS by Chief Finance Officers in municipalities. Previous research argues that end-users involved in the implementation process, even if it's only a little involvement, are likely to accept the implemented system for use (Haake et al., 2018). However, lack of user involvement in the implementation process of IS makes developers of the system not to take into account existing problems facing employees and can incorrectly identify the requirements of the new system (Samhan, 2018). The lack of involvement of other end-users in the implementation affected the adoption of FMIS. This research therefore proposes:

Proposition 2: *Lack of end-user involvement in the implementation may lead to resistance and affects the adoption of FMIS.*

8.3. The development of a sense of ownership through end-user participation in the SD process of FMIS

In an emerging technology context, the concepts of psychological ownership such as having a sense of ownership of the system is considered an important factor affecting end-users to adopt IS (Chen et al., 2016; Kim et al., 2016). When end-users have a sense of ownership towards the system, they are likely to adopt the implemented system in the workplace (Kirk et al., 2015). Previous research mentions that end-user participation in the SD process of the system gives them influence and control which can result in the end-users feeling that the system is an extension of the self and thus allows the development of a sense of ownership (Hooi & Cho, 2017). When people invest resources in a relationship, they are likely to become committed to it (Chen et al., 2016). This implies that when end-users participate in the SD processes, they are likely to become committed to using the system (Kwon, 2020). However, research shows that end-users in government departments do not always participate in the SD process of their systems. This shows that the research gap to be investigated resides in the lack of end-user participation in the SD process to influence the development of a sense of ownership. This section answers the following research sub-question:

What are the multi-dimensions of sense of ownership in end-user participation in the FMIS development process in municipalities?

The end-users participated in three SD sessions for the three stages of the SD process, i.e., project initiation, system requirements specification and design

specification stages. During project initiation, end-users were responsible for providing scope about FMIS based on their municipalities. System requirements specification session involved the scoping of functional requirements, operational requirements, performance requirements and information flow of FMIS, based on municipal financial management work processes. The system design specifications session involved the identification of the graphic user interface, sketching of the database design and architectural design of the systems. We used the theory of psychological ownership to determine how the sense of ownership emerged in the end-user participation in the SD stages. The three key findings of this research sub-question are that the end-users experienced:

- Sense of responsibility in the form of decision-making and problem-solving during the SD process,
- Meaningfulness in the form of collective learning during the SD process, and
- Sense of control through shared leadership and sense of authority between end-users and the SD team.

These findings are discussed in the following sub-sections.

8.3.1. Sense of responsibility during end-user participation in the SD stages of FMIS

Previous research emphasises that when employees experience a sense of responsibility towards the target of ownership (such as resources of the organisation), they are likely to gain a sense of ownership towards the target (Rey-Moreno t al., 2015; Pierce et al., 2009). In this study, it was expected that the more end-users experienced a sense of responsibility during participation in the SD process, the more they would gain a sense of ownership of the system. The end-users experienced a sense of responsibility through problem-solving and decision-making during sessions of project initiation, system requirements specifications and system design specifications. During the project initiation phase, end-users were able to brainstorm the scope of business problems based on the challenges they were experiencing in financial management in municipalities. During design specification, end-users mentioned that they felt responsible to continue with the tasks of requirements specification and design specifications, even though they struggled with the design phase due to lack of expertise. Being exposed to different sessions of SD enhanced end-users' problem-solving skills. They felt that they were better able to think logically regarding their municipal financial systems after having learnt the

basic principles of the planning phase requirements specifications and design specifications of the SD process. Problem-solving skills were often inculcated through group work interactions and discussions that end-users had with the SD team during the phases of SD.

These findings are similar to Han et al. (2010) who found that employee participation in decision-making processes significantly contributes to a sense of ownership if the shared decision is recognised during the process. Amoura et al. (2016) emphasised that to develop a sense of ownership for the system, end-users need to be given responsibilities during the system development process. When end-users are given responsibilities during the development of the system, they feel accountable for the system when it is ready for use (Kwon, 2020; Sadeh & Karniol, 2012). We therefore propose:

Proposition 3a: *A sense of responsibility through problem-solving and decision-making in end-user participation in the SD process engenders a sense of ownership.*

8.3.2. Experienced meaningfulness through collective learning during the SD process

When end-users feel that their participation in the SD process is meaningful, they are likely to develop a sense of ownership of the system (Amoura et al. 2016). In this study, the experienced meaningfulness was formed through a community of practice during end-user participation in the SD process. End-user participation in the SD process triggered meaningfulness through collective learning and knowledge sharing during planning, requirements specifications and design specification phases. Learning during the SD process influenced end-users' self-developments. End-users pointed out that their involvement in the SD process enabled them to learn new skills. End-users were able to learn from one another and the SD team during the SD process.

> *"I think [if they involve us] …, we would be able to contribute to the design of functions for our financial systems. This would enable us to learn more … most of us never thought that there was a way to involve us in the implementation stages. I think it's a good idea because it's us who are supposed to use the system so we should have a say and we would benefit more knowledge"* (Budget Officer, Local Municipality B).

The participation of end-users in the SD process can increase confidence and provide sufficient technical knowledge to reduce outside dependency. Some end-users felt a

boost of confidence, became socially involved and were less shy during the SD process after they started working on tasks. End-users pointed out that they would gain more confidence when knowing that they made some valuable contributions to the development of their FMIS systems that they were using in the workplace. End-users further mentioned that their confidence to use the system was not the main focus in the developed system, hence they felt if they could participate in future SD processes, things would be better.

End-users emphasised that most end-users lack self-confidence in their municipalities when it comes to using financial systems. This is because they depended on the IT department in their municipalities. They knew that they would always be available to assist them. However, this was eroding their computer self-efficacy, even with small tasks on the system. This finding is similar to Morin et al. (2017) when they posited that achieving a task in a given situation can sometimes determine an individual's self-worth and confidence, because individuals usually apply their achievements to determine someone's self-worth, whether it's their own worth or someone else's worth.

End-users further pointed out that their participation in SD stages of their financial systems would help them to solve the challenges of performance that they experienced. The performance challenges included failing to finish work activities within their specified time, because other people were working on a paper-based system for their financial management work processes. They believed that the SD team made assumptions about how their work processes should look and that was what caused problems in their work processes of financial management. When going back to their municipalities, end-users mentioned that they would have a lot of advantages to help with the rollout of their financial systems. They pointed out that with the experiences during the stages of the SD process, they gained confidence.

This research posits that a sense of ownership of end-users is a vital element to consider when looking at how end-users may learn, receive, appropriate, take actions with and, eventually, sustain externally initiated interventions in end-user participation in the SD process. This research showed that it is vital to clarify that factors such as self-efficacy and continued learning can be treated as triggers of end-users' sense of ownership in participation in the SD process, for instance, a high

degree of empowerment is likely to couple with a high degree of control and highly assumed responsibility. This study therefore proposes:

Proposition 3b: *End-user participation in the SD process influences meaningfulness through collective learning which triggers a sense of ownership*

8.3.3. Sense of control through shared leadership during the SD process of FMIS

This study assumes that the more the end-users experienced a sense of control during stages of the SD process, the greater they would develop a sense of ownership for the system (Rey-Moreno et al., 2015). In this study, the end-users experienced a sense of control through shared leadership during the SD process. The findings further showed that there was no shared leadership between end-users and the SD team during the SD process; the SD team exercised power from their knowledge and expertise with SD. On the other hand, the end-users were worried that the SD team might want to control them during SD processes in the future. The end-users pointed out that if the leadership could be shared during their participation in stages of SD processes, they would gain a sense of ownership of the system. End-users mentioned that their participation in the SD process would enable them to gain leadership skills and enhance their commitment towards the system use.

Other end-users emphasised that leadership should be shared among participants who play an important role in each stage of system development. This is because the team leader in the previous financial systems was only shared between the top management (National and Provincial Treasury) and the SD team. They indicated that with the previous financial systems, there was no shared leadership regarding deciding which features employees needed in the system to improve the effectiveness of their work processes. Moe, Dingsoyr and Kvangardshes (2009) emphatically argue that the team leader should rotate among different stakeholders of the system development team such as the system development personnel, management and end-users of the system, to achieve use and acceptance. Similarly, Yildiz and Yildiz (2016) found that when a team and team leaders share leadership, leadership is rotated to the person with the key knowledge, skills and abilities for the particular issues facing the team at any given moment; this usually leads to favourable outcomes.

A sense of authority increased end-users' locus of control during participation in the SD process. For instance, end-users are likely to experience locus of control in their SD process if they are given a chance to learn how the system will impact their work processes. Furthermore, they perceive control when they believe that they are the principal judges of their system development (Kaasinen, et al., 2015). The end-users pointed out that their freedom to sometimes feel in charge during the SD process would enhance their perceived control. Furthermore, they felt that their participation would challenge them to practise control in solving problems, instead of depending on people who are regarded as people with skills of the system.

The findings discussed in this section are similar to Pacheco, Lunardo and dos Santos's (2013) argument that perceived control can be enhanced through increasing the predictability of the implementation process of the system which can be achieved by giving end-users more information of what is expected in the implementation stages (Pacheco et al., 2013). Furthermore, this is in line with Amoura et al. (2016) who argue that employees in an organisation with decreased perceived control during change implementation may affect employee performance, increase stress levels, withdrawals and lack of trust. We therefore propose:

Proposition 3c: *shared leadership and sense of authority during end-user participation may affect that of the system of the end-user's sense of ownership*

8.4. The hindrances of end-user participation in the SD process in municipalities

Strategies for implementing new information systems in an organisation or in the workplace usually require buy-in from employees who will use the system for work processes (Purwanto, 2018). End-user participation, a strategy for implementing IS for an organisation, could work to facilitate buy-in from employees (Kimaro & Titlestad, 2008). However, when it is employees who belong to an organisation with complex structures, end-user participation is likely to face some challenges (Kilpatrick, et al., 2017). Previous research specifies that organisations with high power distance among divisions of the organisation may have limited power, given that employees are involved in decision-making such as participation in the implementation of IS to be used in the workplace (Matende et al., 2015). End-user participation in the SD process may be affected by factors such as organisational

factors e.g., cultural aspects, political and structural conditions within the organisation (Kilpatrick, et al., 2017). To understand whether end-user participation in the SD process could work well or not in municipalities, we investigated research sub-question 4:

What are the hindrances to end-user participation in the SD process in municipalities?

We found that end-user participation in the SD process of FMIS in municipalities could be effective in municipalities. End-users pointed out that their participation in the SD process would assist their municipalities in implementing systems that would be usable for their municipal financial management. However, other end-users were concerned that end-user participation might not work in their municipalities. The key findings in this sub-question included standardisation and lack of stakeholder collaboration across tiers of government, complex job-design across tiers of government, and a leadership style approach across tiers of the government. The key findings to these research questions are summarised in Table 8.1 and discussed in the following sub-sections.

Table 8-1: Hindrances of end-user participation municipalities

Key Themes	Summary of the Findings
Standardisation and lack of stakeholder collaboration across tiers of government	End-user participation in the SD process in municipalities would be affected by the job-design across government spheres which are characterised by standardisation.
Complex job-design across tiers of government	End-user participation in the SD process would be affected by the way municipalities are structured and power relations across tiers of government.
Leadership style approach across tiers of the government	End-user participation would be useful in municipalities if it is structured in a way to facilitate shared leadership among end-users, top management and developers during the SD process.

8.4.1. Standardisation and lack of stakeholder collaboration across tiers of government

We found that the effectiveness of end-user participation in the SD process could be hindered by the standardisation and the way FMIS are supposed to be implemented across municipalities in South Africa. Municipalities in South Africa are set to follow the same style of the implementation and the FMIS need to be standardised across

municipalities (National Treasury, 2018). End-users of FMIS are concerned that the end-user participation in the SD process of FMIS may encounter legal and policy barriers from the National Treasury in South Africa. National Treasury in South Africa introduced legislation for the implementation of FMIS across municipalities that require all municipalities across provinces in South Africa to implement and configure FMIS according to the standards set for municipal financial management (National Treasury, 2018). End-users were concerned that the ideas regarding the implementation of FMIS usually get interrogated based on the existing policy implications of the public sector regarding e-government implementation:

> *"It will probably be difficult to implement this strategy of end-user participation to work closely with our vendors due to lack of adequate collaboration mechanisms and frameworks in place to cater implementations with employees from municipalities"* (Chief Finance Officer, District Municipality B).

End-users further added that the existing e-government regulations lack stakeholder collaborations, more especially when it becomes municipal FMIS. They were concerned that if there would be a suggestion of involving municipal end-users of FMIS in the SD process, this would mean that the Legislature with National Treasury (the national government departments) and policymakers would be required to update the regulations around the SD process of municipal FMIS, to recognise end-user involvement and participation in the SD process. End-users further pointed out that their participation could be effective at an individual level in their municipalities. However, there is a need to balance standardisation and involvement across all departments. This is because strategies for implementation for municipalities are usually implemented and handled at national and provincial government departments.

8.4.2. Complex job-design across tiers of government

The effectiveness of end-user participation in municipalities can be affected by complex job design. End-users are concerned that everything involving change implementation in their municipalities usually gets planned and decided from national then moves to provincial departments and then moves to their municipalities:

> *"Even if we can come up with the good ideas for the system, if Provincial Treasury does not support the idea, then would be a waste of our time. It would be helpful if they can include national and provincial as our top management during our*

> *participation in FMIS development so that they can note the importance of this strategy"* (Accounting Officer, District Municipality A).

They pointed out that whenever the local government (municipalities) is planning on introducing something new that involves e-government implementation for their work processes. They were concerned that it was difficult to implement something new at the local government level, due to a lack of support from the top management, especially if the idea about the implementation was not from the top. These concerns were raised concerning complex processes, political forces and administrative dimensions across national government departments, provincial and local government departments (municipalities). Holgersson (2014) notes complexities with engagement to employees that belong in the public sector. This is even more true to government departments, since they have some specific complicating characteristics, including a wide range of roles, responsibilities and disciplines, the legislation and regulations involved and the costs in the case of failure (Karlsson et al., 2012; Zulu, 2014).

8.4.3. Leadership style approach across tiers of the government sector

End-users were concerned that linkages of leadership style across national treasury, provincial treasury and municipalities regarding FMIS development might affect the development of their sense of ownership during end-user participation in the SD process of their FMIS. They were concerned that leadership style might affect end-user participation in municipalities because leadership in the public sector is shared across national, provincial and local government departments. End-users were concerned that the top management during the SD process may confuse leadership with positions:

> *"I think this participation might work well if there could be a strategic direction for our participation in the development because when the top management is present, other employees might not want to engage in the implementation of financial systems due to previous encounters with the top management"* (Accounting Officer, Local Municipality A).

They raised concern that national and provincial governments often occupy positions of authority and they may want to exercise such control during end-user participation in the SD process. They were concerned that such control from the top management may affect their feelings of ownership during the SD process. Previous

research argued that collaboration that involved many different people such as employees, employers and external people usually works well when there is collective leadership, a climate of self-determination where employees receive support during the collaboration, that can also lead to employees gaining a sense of ownership and being motivated to do better (Fletcher & Webb, 2017). This is similar to Yusuf et al's (2018) empirical findings which showed the importance of good leadership style as a tool for organisational performance and employee satisfaction.

8.5. Main research question of the study

The main aim of this study was to investigate the research question: *How does end-user participation in system development engender a sense of ownership to end-users of financial systems in local government departments in South Africa? T*o meet the objectives of this research, four sub-questions discussed in the previous sub-questions were formulated. The previous sections focused the discussion on addressing four research sub-questions of the study. The focus of the discussion was to address the research sub-questions in line with the key thematic outcomes presented in the findings, to summarise how end-user participation in the SD process engenders a sense of ownership among end-users of FMIS in municipalities in South Africa. The first sub-question investigated how end-users of FMIS were excluded in the implementation. We found that end-users were excluded through the top-down approach in which the strategic decisions regarding the implementation of FMIS were made from the executive top management of the Provincial Treasury of the Western Cape and National Treasury in South Africa. There was no communication with end-users during the SD process of FMIS. The communication about the implementation of FMIS was between National Treasury, Provincial Treasury and the system development team. With regard to training, end-users were offered training, but they were concerned that the implemented systems, without their involvement, were not aligned with their work processes.

The second sub-question focused on the reactions of end-users to not being involved in the implementation of FMIS that they are supposed to use for their work processes. We found that passive resistance and passive covert resistance towards FMIS were experienced through conducting financial management work processes on paper-based processes and some end-users depended on technicians to complete

tasks. We found that only a few end-users adopted FMIS. With experienced passive resistance, passive covert resistance and adoption of FMIS, there were consequences involved. Firstly, with not using the functions of the system, this resulted to poor adherence to financial reporting frameworks and regulations. End-users ignored the prescribed rules set by top management such as the National and Provincial Treasury and applied non-compliance with internal and external controls of municipal financial management.

The alignment standards set for all municipalities were not followed due to conducting work processes manually. Secondly, because other end-users conducted work activities manually, then moved captured work into FMIS with the assistance of technical staff, this affected all processes of municipal financial management in meeting necessary deadlines set for all local government departments in South Africa. The following consequences are facing municipalities:

- The mandate of municipal financial management was not achieved with implemented FMIS in municipalities.
- Municipalities were placed under administration even though they were aimed at reducing poor financial management in municipalities.
- Not involving end-users in the implementation of FMIS so that existing problems facing employees in municipalities led to re-implementation requests for FMIS across municipalities, as the majority of end-users were not satisfied with the implemented FMIS.

Previous research emphasises the importance of involving end-users in the implementation of information systems to reduce the frustrations of end-users as well as developers (Kujala, 2003; Holgersson, 2014). For the re-implementation of FMIS, the top management need to consider end-user participation in the SD process. Employees in the public sector get more comfortable with what they know and, in most cases, they are hesitant about new technology advancements, lest their incompetence are revealed (Combaz, 2015). Involving such end-users in the implementation could help them feel comfortable with interacting with the system (Feikas, et al., 2011).

The third sub-question focused on how end-user participation in the SD process engenders a sense of ownership among end-users of FMIS in municipalities. A theory

of psychological ownership was adopted to determine how the sense of ownership emerged in end-user participation in the SD stages of FMIS in municipalities. End-users were involved in three system development sessions – project initiation phase, system requirements specification phase and system design specification phase. Through their participation in sessions of the SD process, we found that end-users gained a sense of ownership in the form of a sense of responsibility, meaningfulness through collective learning during participation and locus of control through shared leadership. However, we discovered that end-user participation might work and might not work in municipalities due to hindrances such as standardisation and lack of stakeholder collaboration across tiers of government, complex job design and leadership style approach across tiers of government. The hindrances of end-user participation in the SD process were discussed in sub-question 4.

In a discussion of research findings, we suggested seven propositions. The propositions were validated using existing literature on end-user participation in system development. The summary of propositions is as follows:

- **Proposition 1a:** The SD process of a top-down approach excludes end-users from participating in the SD process.
- **Proposition 1b**: Poor communication between end-users, top management and the SD team during the SD process of FMIS influence poor uptake of information systems in municipalities.
- **Proposition 1c:** Participative involvement in conjunction with training may influence the uptake of FMIS in municipalities.
- **Proposition 2:** Lack of end-user involvement in the implementation may lead to resistance and affects the adoption of FMIS.
- **Proposition 3a:** Sense of responsibility through problem-solving and decision-making in end-user participation in the SD process engenders a sense of ownership.
- **Proposition 3b:** End-user participation in the SD process influences meaningfulness through collective learning which triggers a sense of ownership.
- **Proposition 3c:** Effects of shared leadership and sense of authority during end-user participation may affect the development of end-users' sense of ownership.

8.6. Summary of the chapter

This chapter discussed the results of the study. The focus was to address the research questions of the study in line with the key thematic outcomes in the findings, to summarise how end-user participation in the SD process engenders a sense of ownership in municipalities. In light of the findings of the study, seven propositions were suggested. The following chapter concludes the study and makes final remarks.

Chapter 9: Conclusions

9.0. Introduction

This dissertation investigates how end-user participation in the SD process engenders a sense of ownership among end-users of FMIS in municipalities. Chapter 8 discussed the findings on research questions and suggested seven propositions and implications on end-user participation in the SD process of FMIS. This chapter summarises the dissertation.

Section 9.1 presents a summary of the problem statement and objective. The research design is summarised in Section 9.2 and a summary of the research findings is outlined in Section 9.3. Contributions made by this research are discussed in Section 9.4. Limitations encountered in the study are presented in Section 9.5. Section 9.6 outlines the recommendations and suggestions for future research are discussed in Section 9.7. Lastly, the self-reflection of the research process and the final word are discussed in Section 9.8.

9.1. Summary of problem statement and objective

The South African public sector has long been concerned with poor financial management in South Africa. The Auditor-General has highlighted municipalities facing financial management and administration challenges. The National Treasury in South Africa undertook to implement FMIS across the municipalities in the country. The aim of these information systems interventions was to enhance efficiency, effectiveness, accountability, transparency, compliance, the security of financial data management and comprehensive financial reporting in municipalities. Although FMIS have been initiated, municipalities are currently grappling with the introduction of FMIS as a tool through which financial management is achieved and improved. The uptake of FMIS in municipalities is low and some municipalities require reimplementation due to complaints of end-users that FMIS are not aligned with work processes of municipal financial management.

Lack of sense of ownership towards FMIS has been found as a contributing factor to end-users being reluctant to adopt the system. Previous research notes that employees' sense of ownership towards a system that they use in the workplace could

increase when they were involved in the development process of the system. Employees in municipalities are not usually involved in the implementation of FMIS. Studies on factors affecting the intake of information systems in the public sector mostly focus on infrastructure, finance, organisation barriers such as policies and legislation. However, there is still a dearth of studies on the end-users' perspective such as lack of sense of ownership. The research question for this research study was:

> *"How does end-user participation in system development engender a sense of ownership of financial systems in municipalities in South Africa?"*

This was evaluated by studying the influences of the development of FMIS in municipalities, challenges facing the uptake of FMIS in municipalities, as well as how end-users gain a sense of ownership to enhance use and acceptance of FMIS. The study demonstrated a link between end-user participation and a sense of ownership to influence the uptake of information systems in government departments such as municipalities. This research posits that a sense of ownership of end-users is a vital element to consider when looking at how end-users may learn, receive, appropriate, take actions with and, eventually, sustain externally initiated interventions in end-user participation in the SD process. The primary research question was answered through four sub-questions.

- **Sub-question 1:** Identified ways in which system owners exclude end-users of municipal FMIS in the implementation process.
- **Sub-question 2:** The reactions of end-users to not being involved in the implementation process of FMIS affected the emergence of a sense of ownership.
- **Sub-question 3:** Examined multi-dimensions of a sense of ownership in end-user participation in the development process of FMIS in municipalities.
- **Sub-question 4:** Focused on the hindrances to end-user participation in the SD process in municipalities.

The objective of the study was to analyse the triggers of a sense of ownership in end-user participation in the SD process of FMIS in municipalities. The intermediate objectives included the analyses of challenges facing end-users with the current style of SD process of FMIS followed by municipalities, influences of sense of ownership in

end-user participation and hindrances to end-user participation in the SD process in municipalities.

9.2. Recap of the research design

The study was qualitative, deductive and followed the interpretive research epistemology. A case study research design was employed using a single case study of the Western Cape province in South Africa. The units of observation included two district municipalities and two local municipalities. The case selection of the Western Cape was carefully thought through after we discovered evidence of the phenomenon under investigation in provinces in South Africa. The instrumental case study design was considered to develop descriptive propositions for end-user participation in FMIS development to engender a sense of ownership of end-users and influence the use and acceptance of FMIS.

Data was collected through semi-structured interviews, observations of end-users during co-design sessions of FMIS development and document analysis. The researcher used multiple sources of data gathering and allowed triangulation, to validate and confirm the reliability of the research findings of the study. Semi-structured interviews were useful in three ways in the research. Firstly, it was important to interview the project manager of FMIS and end-users to explore the overall mandate of financial management of municipalities and to get familiar with the FMIS development process in two districts and two local municipalities in the Western Cape. Secondly, structured interviews were useful to investigate whether end-users gained a sense of ownership after they participated in co-designing sessions of FMIS development facilitated by the researcher. Thirdly, it was crucial to interview the SD team to have a clear picture of how much they value the importance of end-users participation in system development stages.

Co-designing sessions involved three phases of FMIS development–project planning, system requirements specifications and system design specifications. The study found it necessary to observe end-users during co-design sessions to establish the views of end-users regarding participation in FMIS development. Co-design sessions were useful in the research to evaluate whether participation of end-users in FMIS development would work in municipalities to psychologically empower end-users through a sense of ownership to enhance the use and acceptance of FMIS. The

constructs that informed semi-structured interviews after co-design sessions were drawn from the theoretical background theory of psychological ownership. The theory was used to describe how end-user participation in FMIS development engenders a sense of ownership among end-users in municipalities. The theoretical background had five constructs: behavioural determinants, relational dynamics, contextual factors, mechanisms or direct routes to ownership and outcomes or effects of ownership. Thematic data analysis was appropriate for the study. This study further used a cross-case analysis; in addition to the thematic analysis, research findings were presented across the four subunits of the single-case study of the research.

9.3. Summary of the research findings

Findings of the study revealed that the development of a sense of ownership is a complex phenomenon that can be caused by many factors, and its effectiveness in a public organisation such as municipalities may be influenced and affected. The findings of the study unfolded into four important aspects:

- The exclusion of end-users in the development processes affected the development of a sense of ownership towards FMIS.
- When end-users feel excluded, and when they lack control and influence over the development of FMIS that they will use in the workplace, end-users presented behavioural expressions that showed rejection towards the end product.
- End-users are likely to gain a sense of ownership when they participate in FMIS development.
- However, it might be challenging to exercise end-user participation in local and district municipalities.

Research findings revealed that end-users of FMIS in municipalities are excluded in the development process of FMIS. In municipalities, there is no participative involvement of end-users in the implementation of FMIS. The systems are developed following a top-down approach and there was no communication with end-users during the development process. Even though end-users were trained before system use, end-users did not understand the rationale for implementing FMIS for municipalities. The end-users felt that FMIS was not aligned with municipal work

processes. The study confirms the existing studies that involving end-users in the development process of the system that end-users will use in the workplace has often been taken for granted in the public sector in South Africa.

The study found that the majority of end-users resisted using FMIS due to exclusions that arose in the SD process of FMIS in municipalities. Lack of end-user participation in FMIS development led to passive and covert resistance. FMIS in municipalities is affected with minimal use in which end-users choose to ignore the use of system functions, budget planning and budget execution. For these work processes, municipalities in the Western Cape are still operating on manual work processes; some end-users normally depend on technical staff to transfer prepared work manually into the system. In addition, some end-users pretended to use FMIS although they acknowledged a lack of recognition of the significance of FMIS to their processes in municipalities. Not involving end-users to participate in the development process has been existing in public sector organisations. This has also been evident in previous reviews, which raised concerns and voiced that lack of end-user participation in information systems development in government departments has previously affected the way end-users respond to the end-product, such as alack of sense of ownership towards the system (Ika & Saint-Macary, 2014; Ngoepe, 2016; Okereke, 2017).

We found that end-users are likely to gain a sense of ownership when they participate in FMIS development. End-users acknowledged that the more they are given an opportunity to contribute to the FMIS development, the more there is a chance for end-users to commit to using the end product of the system. It was evident that by allowing end-users to participate in FMIS planning, system design specifications and system design specification phases, they are able to experience a sense of responsibility through problem-solving and decision-making of activities involved in these phases. Findings revealed the importance of allowing end-users to learn different aspects of the system while it is being developed in order to gain a sense of ownership. End-users of FMIS revealed that the more they contribute to the development, they learn new skills, feel psychologically empowered and boost their confidence towards the system. Findings revealed the importance of shared leadership for end-users to develop a sense of ownership towards FMIS. The end-users emphasised that with shared leadership during end-user participation in

phases of FMIS development, they are likely to have an influence on how the system is developed to suit work processes.

However, even though end-user participation is likely to influence the development of a sense of ownership, empirical findings also revealed that end-user participation in organisations with complex structures such as municipalities could be hindered by a myriad of factors. Factors such as standardisation and lack of stakeholder collaboration across tiers of government, complex job-design across tiers of government and leadership style approach across tiers of government have been stated by end-users to be hindrances that may face their participation in the development process of FMIS. End-users revealed that municipalities are standardised to follow the same development style for information systems such as FMIS. And end-users participating in the development may have policy implications. It was also found that since there are National and Provincial-level Treasuries set to lead the development of FMIS for municipalities, it might be challenging to facilitate collaboration across three tiers of government – national government departments, provincial government departments and municipalities.

9.4. Contributions of the study

This study made three types of contributions: methodological, theoretical and practical contributions. This study, as a research epistemology of interpretivism, attempted to gather in-depth understanding and meaning of the social phenomenon, whilst suggesting that the knowledge of reality is socially constructed by a human actor within a context (Niehaves, 2007). Since end-user participation in system development to engender a sense of ownership in public sector organisations such as municipalities is a complex phenomenon, qualitative research methods for data collection such as co-designing sessions best explained the nature of the investigation. Co-designing sessions of FMIS development phases – planning, system requirements specifications and system design specifications, provided useful methodological insights to the case study of the public sector organisations such as municipalities in the Western Cape. Even though co-designing sessions are mostly used in the health research domain, the sessions enabled the study to gain contextual first-hand experiences of end-user participation in FMIS development.

The theoretical contribution of the research emerges from the use of the theory of psychological ownership in the IS research domain, to explain how end-user participation in system development engenders a sense of ownership in end-users of IS such as FMIS in municipalities. Given the lack of evidence-based studies in developing countries, focusing on the end-user perspectives regarding factors affecting poor uptake of IS in government departments to better meet end-users halfway, this research made a descriptive contribution on the concept of sense of ownership. There is a dearth of studies examining how end-users of information systems in government departments in developing countries can be empowered through a sense of ownership to enhance the use and acceptance. In response to this research gap, this research study brought back the concept of end-user participation and adds to the body of IS knowledge by examining end-user participation as a systems development strategy to engender a sense of ownership to end-users of FMIS in government departments. The study also derived research propositions to explain how the system owners exclude end-users in the implementation process of FMIS, end-users reactions to not being involved in the implementation process of FMIS, end-user participation in the development process of FMIS to engender a sense of ownership, and the hindrances to end-user participation in the development process of FMIS in municipalities.

This research could be significant to the wider arena of government departments in the top, middle and low-levels governments in developing continents such as Africa. This can be drawn on theoretical and practical insights to help address social inconsistencies and inequalities across government departments, to bring about the development and use of new technologies in everyday work practices. Stakeholders in government departments and IS experts would apply the research findings to understand and influence the uptake of information systems in government departments. This would also be applied to understand end-users' perspectives; this, therefore, formulates the practical contribution of the study. The study provides a platform to listen and hence to inform on, better strategies that could help improve the development of a sense of ownership in end-users of FMIS, at the same time increasing the update of FMIS in government departments in developing countries and similar settings. Such practical contributions could inform change management strategies, policies and processes appropriate for government departments in

developing countries during the implementation of IS, thus assist to improve uptake of systems such as FMIS.

9.5. Limitations of the study

The aim of the study was to build a comprehensive, context-bound explanation of user participation in the development of FMIS and how that engenders a sense of ownership among end-users in municipalities. To obtain an understanding of complexities inherent to different municipalities across provinces in South Africa, a multiple case study design would have been ideal. Since the study utilised information based on the experience of only four municipalities in one province, the results may not be generalisable to all municipalities in the country.

Since all nine provinces are currently faced with challenges of financial management, the selection of the province to focus on in the study was challenging. Initially, we wanted to select at least two provinces to conduct comparative case studies. Specifically, the study wanted to conduct a comparative multiple case study of the Western Cape and Eastern Cape province. We then applied to Eastern Cape and Western Cape for getting approval to conduct research in these two provinces. The two provinces were selected because they were in the process of re-implementing FMIS which had been rejected by end-users in municipalities. Since the development of FMIS for municipalities is handled at Provincial Treasury, the process of getting permission is handled at the provincial level of government. The process of getting permission in the provinces proved to be difficult and time-consuming. At the Eastern Cape province, it was difficult to get hold of the relevant contact at the provincial-level. After efforts of getting in contact with the province, we were not granted permission to conduct the research focusing on the development of FMIS in municipalities. The reason for rejecting was that they do not want their municipalities to be compared with those of the Western Cape province. We only managed to get approval from the Western Cape province.

To overcome the limitation experienced in the Eastern Cape, the study used a case study of the Western Cape which had four units of observations – two districts and two local municipalities. The municipalities were suggested by the Provincial Treasury of the Western Cape. The suggested municipalities were those that the Provincial Treasury pointed out that were experiencing challenges with the

implementation of FMIS. The researcher was restricted not to select any other municipalities in the Western Cape. Even though the study was granted permission to conduct the research in municipalities in the Western Cape, the researcher was not granted permission by the Head of the Department (HOD) of Western Cape Provincial Treasury to use a recording on employees in municipalities during data collection of the study.

During semi-structured interviews and co-designing sessions, we were requested not to use audio recording with municipalities, due to the sensitivity of FMIS and financial management processes, and regulations of privacy and confidentiality for municipalities. Although the circumstances with regard to recording employees in government departments did not occur, the researcher was able to capture as much information needed for the study. Field notes were useful and observations of end-users during co-designing sessions were useful to overcome this challenge. It would have been ideal to record responses of end-users during co-design sessions so that the researcher could capture all important aspects and not only depend on the sketching of sessions. Furthermore, time constraint was a challenge that the researcher encountered in achieving a full assessment that would encompass many other municipalities in the Western Cape regarding end-user participation in FMIS development.

9.6. Recommendations

The study sought to investigate factors and challenges affecting the post-implementation of FMIS for municipalities. This research found that the development of FMIS in municipalities did not consider the overall process of IS change implementation to achieve successful implementation of FMIS. The development process of FMIS mainly focused on the success of the system with little consideration of end-users' needs, hence resistance challenges were encountered. The first recommendation of the study based on empirical findings are:

- **Recommendation 1:** Whenever implementing information systems for the public sector departments, employees who will be affected by the end product should be involved in the planning, system requirements gathering and system design specifications phases.

FMIS should be implemented through effective communication and coordination among the system development team and end-users to enhance uptake. Employees in municipalities need to be a part of the information systems development process and they need to be heard, because people are more likely to accept change if they know what to expect from the implemented system. This research, therefore, recommends that:

- **Recommendation 2:** To enhance the uptake of information systems such as FMIS, project management should involve end-users in the development process of the system.

This research reiterates the importance of end-users being involved in all the stages of system development, so that system requirements would have been met (Bennis 2015). Not involving employees in making decisions that affect their work processes may create a fear of the unknown (Holgersson, 2014). Furthermore, to a large extent, system development in municipalities has mainly focused on the success of the system implemented, not on the impact the change has had on employees. This relates to uncertainty and lack of sense of ownership towards the outcomes of the system. Findings of the study show that involving end-users in information systems development is likely to trigger end-users' sense of ownership towards the system.

One of the findings of this study is that the sense of ownership of end-users is a vital element to take into account when looking at how end-users may receive, appropriate, take actions with and, eventually, sustain externally initiated interventions in participation. Sense of ownership in this research captured the degree to which the system such as FMIS can be perceived as one's own, individually and/or collectively in an organisation such as municipalities. This research showed that it is vital to clarify multi-dimensions of sense ownership such as to include behavioural determinants, relational dynamics, contextual factors, mechanisms or direct routes to a sense of ownership and outcomes or effects of sense of ownership. Thirdly, we recommend that:

- **Recommendation 3:** To psychologically empower end-users to better realise their confidence to use the system, end-user participation should be treated as a required strategy for public sector organisations.

Previous research such as Rey-Moreno et al. (2015) further specify that to foster empowerment, information systems projects and programmes should be designed to be ownership friendly, which means involving all stakeholders, such as end-users, from the start of the development. For this empowerment to take place, it is, therefore, important to co-design and co-create with end-users from the beginning, to understand who the end-users are and their motivation, incentives and demands.

9.7. Suggestions for future research

This study serves as a foundation for further studies, focusing on FMIS development for municipalities. The study conducted a single case study of the Western Cape district municipality and local municipalities in the Western Cape. Due to the fact that the selected municipalities are situated in the same location and are using one company that developed their FMIS systems for financial management, it was not possible to conduct a comparative study. For future research, we suggest an expanded case study research which can compare provinces in municipalities in South Africa, because all municipalities in the country are facing challenges of low uptake of FMIS and FMIS in municipalities are to be re-implemented. We further suggest an expanded case study research that includes a broader sample of municipalities. It is clear that due to limited research on user participation in information systems development in municipalities, through only this research, it cannot yet be argued that a saturation point of influencing a sense of ownership through end-user participation to enhance uptake, has not been reached in terms of the results. Therefore, the inclusion of more cases would strengthen the results and body of knowledge. This study would, however, provide an ideal methodological framework and conceptualisation to use for future research and, thereby, also allow for comparison of results.

Secondly, the study found that the strategy of end-user participation in system development might not work in all municipalities in South Africa. Factors such as standardisation and lack of collaboration across the three tiers of government (national, provincial and local), complex job-design and leadership style were found to have a possibility to hinder end-user participation in municipalities. This research only dealt with the *"what"* question to the hindrances of end-user participation in municipalities. The next logical step for future research would be to explore the

"*how*" question to overcome these hindrances of end-user participation in the public sector. There is, therefore, a need to investigate the terms of IS Policy implementation and legal context for municipalities in South Africa.

9.8. Self-reflection and final word

I began this research with an empirical problem in mind regarding the low uptake of information systems across low-level government departments such as municipalities in South Africa. Even though there was little understanding as to why end-users in municipalities are not using information system, implemented at high costs for work processes, the concept of lack of sense of ownership as an attributing problem to low uptake of FMIS unfolded and formed a practical problem that needs to be investigated. The constant self-awareness and reflections of the research process allowed me to critically investigate, analyse the decisions and choices I made throughout the research process and the impact on the phenomena of interest in the study. Carrying out this investigation of the research has been important to me as an emerging researcher in IS research domain. During the course of the study, I reflected on the views of end-user participation practices and their interrelations with end-users' sense of ownership towards the end product of the system. At the time of data collection, I knew that I'd have to conduct co-designing sessions with end-users of FMIS in order to observe whether they are able to contribute to the phases of system development. It was interesting to observe end-users from the public sector participating in co-designing sessions of system planning, system requirements specifications and system design specifications.

Previous research has outlined useful guiding principles for qualitative research to be used as reference points of self-reflection on the research process (Myers & Klein, 2011; Sarker, Xiao, & Beaulieu, 2013). Self-reflections on the overall research process of the study can be based on eight guiding principles of variety, internal coherence, relevance, theoretical engagement, transparency and clarity, self-criticality and dignity (Myers & Klein, 2011; Cecez-Kecmanovic, 2011). These principles of self-reflection are outlined in Table 9-1 reflecting on the research process in this study.

Table 9-1: Reflection on the research process

Guiding principles	Reflection for the research process in the study
Principle of variety	At the beginning stages of the research, the researcher was aware that the study is likely to subscribe to qualitative research methods. Hence, qualitative research methods informed how the research questions were framed, the data collection instruments and the process of data analysis.
Principle of internal coherence	The study aimed at achieving internal coherent in linking the components of the research, such as the theoretical background of the theory of psychological ownership, to inform data collection and analysis of the research.
Principle of relevance	The researcher was aware of the relevance of the study and ensured that the topic was drawn to the persistence of the research problem in the previous reviews; this was highlighted by experts in the field of IS domain.
Principle of theoretical engagement	The theory of psychological ownership guided the study in investigating how end-user participation in FMIS development engenders a sense of ownership in municipalities. Themes that emerged on end-user participation to engender a sense of ownership were presented through constructs of the theoretical background of the study.
Principles of transparency	The research activities were clearly defined, documented as outlined in the research methodology chapter, details on where, how, with whom, and when the data was collected and then analysed. The study further highlighted to demonstrate how the conclusions from the findings were drawn.
Principles of clarity	Clarity was achieved through appreciating the contributions of respondents during data collection; the researcher took a neutral position when interpreting the research data.
Principle of self-criticality	The researcher ensured that there was no systematic distortion of narratives from the collected data through semi-structured interviews and observations of end-users during co-designing sessions.
Principle of dignity	The study ensured that research findings were presented in an ethical manner to outline what was happening in the development of FMIS in municipalities, and how end-user participation may engender a sense of ownership; while maintaining the confidentiality of the respondents.

The study provided valuable insights that the development process of information systems like FMIS for South African municipalities has followed: a top-down approach which has been one of the attributing barriers to lack of sense of ownership in end-users and poor uptake of the end product. A top-down approach followed in the development of information systems does not give end-users an opportunity to be involved and participate in the development. Even though such barriers such as lack of end-user participation exist in government departments, end-users are interested in contributing to how the systems affect their work processes. They attested that it is possible to gain a sense of ownership in end-user participation. Thus, key lessons learned from the study is that implementing the strategy of end-user participation in government departments may be challenged, due to existing standardised structures, policies and regulations of system development across tiers of government in South Africa.

In closing, the study has challenged me and changed my way of thinking as a researcher. While this research has made some contributions to practise methodology and theory in IS research, however, without the collective effort of the respondents, researcher and supervisor, these contributions would not have been produced. This research has been an eye-opening experience for my career development. I have learned the importance of understanding within the context and realised that judging things in isolation can be misleading when you are a researcher.

The pandemic time of the COVID 2019 that affected the world happened in the final year of my PhD studies and that changed the academic year. However, the PhD journey taught me that: *"Despite what may affect people in the world, the PhD journey does not stop; rather stay focused, no matter what"* (Gcora, 2020).

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APPENDIX "X"

Appendix A: Ethics Approval Letter

Faculty of Commerce
Private Bag X3, Rondebosch, 7701
2.26 Leslie Commerce Building, Upper Campus
Tel: +27 (0) 21 650 4375/ 5748 Fax: +27 (0) 21 650 4369
E-mail: com-faculty@uct.ac.za
Internet: www.uct.ac.za
@Commerce_UCT **UCT Commerce Faculty Office**

23/04/2018

Ms Nozibele Nozibele
Department Of Information Systems
University of Cape Town

REF: REC 2018/004/021

Dear Nozibele Nozibele

A Contextual Co-design (CCD) Approach as a Systems Development Strategy to Engender a Sense of Ownership to Information Systems End-Users in Government Departments in South Africa

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid for 1 year and may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants. The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

Modie Sempu
Administrative Assistant
University of Cape Town
Commerce Faculty Office
Room 2.26 | Leslie Commerce Building

Office Telephone: +27 (0)21 650 2695
Office Fax: +27 (0)21 650 4369
E-mail: modie.sempu@uct.ac.za
Website: www.commerce.uct.ac.za<http://www.commerce.uct.ac.za/>

Appendix B: A letter seeking permission to conduct the study

UNIVERSITY OF CAPE TOWN

Department of Information Systems
Leslie Commerce Building
Engineering Mall – Upper Campus
OR Private Bag – Rondebosch 7701
Cape Town
South Africa

Telephone: +27 21 650-2261
Fax: +27 21 650-2280

The Head of Provincial Treasury
Western Cape Provincial Treasury
15 Wale Street
Legislature Building
Cape Town
8001

Institutional Permission Letter for Approval to Conduct Research at Provincial Treasury of the Western Cape

I am Nozibele Gcora, a PhD student at the University of Cape Town in Information Systems Department. I am preparing to begin work on data gathering for my research project which is titled: **"Towards a Contextual Co-Design (CCD) as a systems development strategy engenders a sense of ownership among end-users of Information Systems in government departments in South Africa".** This project is a requirement for the award of the PhD Degree, and it is designed to enhance awareness of the benefits of Information Systems in the public sector.

This research project has become necessary as government departments in South Africa are now becoming innovative and digitally-driven, and have implemented Information Systems such as Municipal Regulations on a Standard Chart of Account (MSCOA), Electronic Document and Record Management Systems (EDRMS), Knowledge Management Systems (EKMS), Content Management Systems (ECMS) and Enterprise Resource Planning System (ERP) to formalise the management of structured and unstructured content within the government departments. At the current phase of the research project, I am interested in Provincial Treasury. This study aims to come-up with ways to empower end-users of Information Systems in government departments such as MSCOA end-users to better understand Information Systems and reduce chances of implemented systems not being used and accepted by anticipated end-users. This research is conducted because the concept of end-user participation to improve

end-users' in-depth understanding of systems that affect their work processes has previously focused in the private sector than public sector.

Kindly note that this research will not require any confidential information, however all data provided by participants will be held and used with utmost confidentiality. An Ethical Clearance certificate will be provided to participants.

After the thesis is complete, the research report will be presented at International Conferences, peer reviewed international journal. Please also note that this study has been approved by the Commerce Faculty Ethics in Research Committee.

I would appreciate it if you grant me the permission to undertake this research at your government departments. Thank you for considering this request.

Your Faithfully

Nozibele Gcora
Principal researcher, PhD Candidate
Email: GCRNOZ001@myuct.ac.za
Phone No.: +27711166491

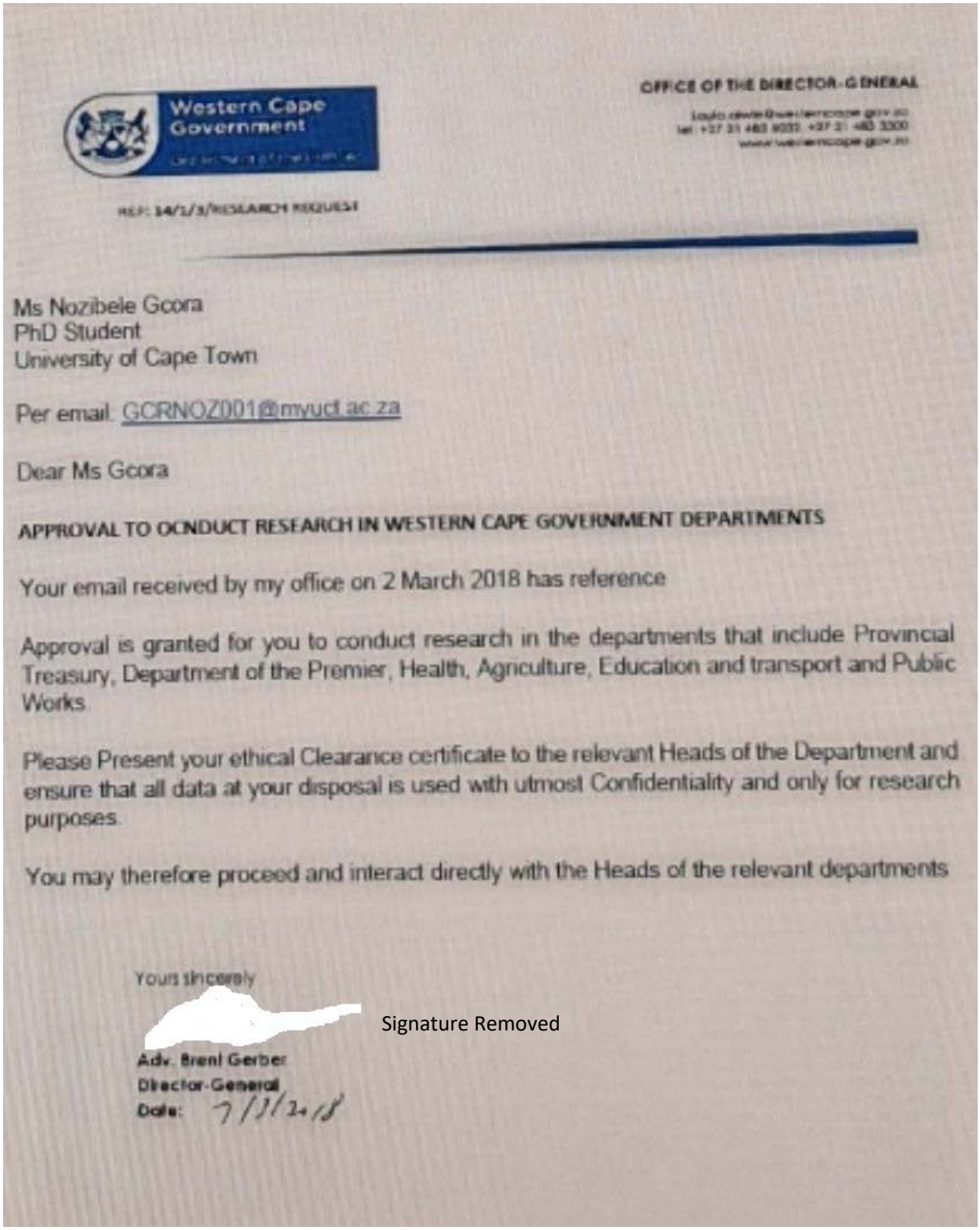
Signature:

Signatures Removed

Professor Wallace Chigona
PhD Research Supervisor
Wallace.chigona@uct.ac.za
Phone No.: 021 650 4345

Signature:

Appendix C: Authorisation to conduct the study in Western Cape Government departments



Western Cape Government

OFFICE OF THE DIRECTOR-GENERAL

REF: 14/1/3/RESEARCH REQUEST

Ms Nozibele Gcora
PhD Student
University of Cape Town

Per email: GCRNOZ001@myuct.ac.za

Dear Ms Gcora

APPROVAL TO OCNDUCT RESEARCH IN WESTERN CAPE GOVERNMENT DEPARTMENTS

Your email received by my office on 2 March 2018 has reference

Approval is granted for you to conduct research in the departments that include Provincial Treasury, Department of the Premier, Health, Agriculture, Education and transport and Public Works

Please Present your ethical Clearance certificate to the relevant Heads of the Department and ensure that all data at your disposal is used with utmost Confidentiality and only for research purposes.

You may therefore proceed and interact directly with the Heads of the relevant departments

Yours sincerely

Signature Removed

Adv. Brent Gerber
Director-General
Date: 7/3/2018

Appendix D: Participant Consent Form

UNIVERSITY OF CAPE TOWN

Department of Information Systems

Leslie Commerce Building
Engineering Mall – Upper Campus
OR Private Bag – Rondebosch 7701
Cape Town
South Africa

Telephone: +27 21 650-2261
Fax: +27 21 650-2280

Informed Consent Form

I am a Nozibele Gcora, PhD student in the Department of Information Systems at the University of Cape Town in Cape Town. I am currently undertaking a research study on user participation technique can be applied as a systems development strategy to engender a sense of ownership among end-users of Information Systems (IS) in government departments in South Africa. The University of Cape Town Ethics in Research Committee has approved this research and the Officer of the Director General of the Western Cape granted permission to conduct research in government departments.

The purpose of this study is to explore how user participation in IS development influences the end-user's attitude such as sense of ownership to use IS. The intention of this study is to increase the likelihood of confidence and sense of ownership in end-users to use IS in government departments such as municipalities. In achieving the mentioned principles, the study will first assess how end-user participation in systems development affect end user's attitude to use IS in government departments. This can be achieved by conducting one-on-one interviews and co-design sessions with the selected participants across the institution.

Your participation in this research is voluntary. All information will be treated in a confidential manner and will be used exclusively for the purpose of this study. No individual names and names of government departments will be recorded or published. You will not be requested to supply any identifiable information, ensuring anonymity of your responses. The interviews will take approximately **45 minutes** at you department.

Should you have any questions or concerns about this study, please contact Gcora Nozibele at cell: 0711166491, e-mail: GCRNOZ001@myuct.ac.za.

By signing this participant consent, you are agreeing to participate in a research project entitled "End-user participation in FMIS development process to engender end-user's sense of ownership in municipalities of South Africa" conducted by Nozibele Gcora as requirement for the course entitled PhD in Information Systems. You can choose to withdraw from the research at any time for whatever reason, in accordance with ethical research requirements.

Signature of participant	**Date:**……

Appendix E: Interview instrument for the project manager of FMIS development

This interview guide is part of a thesis being conducted by Nozibele Gcora, a PhD in Information System student at the University of Cape Town. The interview questions are focusing on **"How end-user participation in Financial Management Information Systems (FMIS) development engenders a sense of system ownership in municipalities".**

The interview will take approximately 45 minutes and some questions will be guided and directed by participant's responses. Your responses and identity are confidential and will not be used in any way against you, You allowed to withdraw from this interview at any time.

Questions for the exploration phase of the study

1. What is the role of provincial treasury and national treasury in FMIS development?
2. Is there a difference in roles played by National and Provincial Treasury in the development of FMIS for municipalities?
3. Describe your role in the development of FMIS for municipalities?
4. Which municipalities are involved in the implementation of FMIS
5. Who are the developers of FMIS for municipalities in the province?
6. Who are the specific end-users of FMIS in municipalities?
7. Is there a hierarchical level of end-users of FMIS in municipalities?

Appendix F: Interview instrument for end-users of FMIS in municipalities

This interview guide is part of a thesis being conducted by Nozibele Gcora, a PhD in Information System student at the University of Cape Town. The interview questions are focusing on **"How end-user participation in Financial Management Information Systems (FMIS) development engenders a sense of system ownership in municipalities".**

The interview will take approximately 45 minutes and some questions will be guided and directed by participant's responses. Your responses and identity are confidential and will not be used in any way against you, You allowed to withdraw from this interview at any time.

Municipality identifier:.....

Tick and fill in where applicable

Demographic information

1. Age-group: 16-20 ☐ 21-30 ☐ 31-40 ☐ 40-50 ☐ 51 and above ☐

2. Highest level of education completed: Degree ☐ Honours ☐ Masters ☐ PhD ☐

3. Computer Literacy: No ☐ Yes ☐

4. Employment Status: Contract ☐ Permanent ☐

5. Employment position: Budget officers ☐ Accounting officers ☐ Internal auditors ☐ Chief finance officers ☐

The development of FMIS for municipalities

1. How can you describe implemented FMIS for financial work processes in your municipality?
2. Describe how FMIS were implemented in your municipalities?
3. How much training have you received for use of FMIS?
4. How would you rate the trainers of FMIS?
5. Can you describe communication strategy followed during FMIS development?

FMIS use in municipalities

6. Explain how you use FMIS for financial management?
7. Describe the features of FMIS and how much confidence do you have in using FMIS?
8. How has the use of FMIS influenced carrying out your work activities?
9. Are all intended end-users of FMIS using these systems in your municipality?
10. What could be the reasons for you to consider not to use FMIS?
11. Which processes have you considered to report your concerns about FMIS usage for municipal financial management?
12. What are your perceptions regarding end-users resistance behaviour towards the usage of FMIS?

End-user participation in FMIS development

13. What role did you play in the development process of FMIS?
14. What could be the reason for you not to participate in the development process of FMIS?
15. What could be the reason for provincial treasury and national treasury to consider not to involve you in the development process of FMIS?
16. Why it is important for end-users to play a role in system development?
17. Would you advise other employees to take part in system development and decision making of the systems that will affect their work processes?

End-user participation in system development to engender a sense of ownership (Simulation of end-user participation)

The following questions are a follow-up after the simulation of end-user participation in FMIS development (through co-design sessions). This is to understand if end-user participation in system development would influence end-user's sense of ownership.

Relational dynamics of end-user participation in FMIS development to engender a sense of ownership

Relational Dynamics in the study are those patterns that can trigger a sense of ownership, these include self-efficacy, belongingness, self-identity and perceived usefulness.

Statement	Agree or	Support your answer

	disagree	
18. Participating in FMIS development makes me feel confident that I can make suggestions about ways to improve the system that we use in the workplace.		
19. Participation in the development of FMIS that I'll use in the workplace makes me feel "at home" in the workplace		
20. Being involved in the FMIS development make me feel that there is a strong connection between me as an employee and the top management.		
21. Participation in FMIS development made me have a comprehensive understanding of the functions of the system.		

Mechanisms of end-user participation in FMIS development to engender a sense of ownership

Mechanisms test whether end-user participation enables end-users to gain a sense of control, sense of motivation, knowledge and self-investment.

Tick and fill in where applicable

Statement	Agree or disagree	Support your answer
22. I felt in control during my participation in FMIS development		
23. Participation in FMIS development make me feel motivated and empowered to be a better end-user of technology		
24. Participation in FMIS development enabled me to gain a depth of knowledge regarding the system.		
25. I influenced decision-making during participation in FMIS development		

Behavioural determinants of end-user participation to engender a sense of ownership

Behavioural determinants include accountability, patterns of involvement and patterns of usage that could trigger a sense of ownership during participation in FMIS development.

Tick and fill in where applicable

Statement	Agree or disagree	Support your answer
26. My interaction with the development team during FMIS development made things clear and understandable.		
27. Participation in FMIS development make me look forward to using a system		
28. Participation in FMIS development influence me to be accountable to use the system when it is ready for use.		
29. Participating in FMIS development will make me find the system easy to use		

Behavioural Outcomes of end-user participation in FMIS development on end-users' sense of ownership

Behavioural outcomes focus on the identification of results of end-user participation that may and/or may not trigger end-users' sense of ownership. These include a sense of responsibility, experienced meaningfulness and end-users' initiatives.

Tick and fill in where applicable

Statement	Agree or disagree	Support your answer
30. Participation in FMIS development make me feel responsible to strive to contribute to the effectiveness of financial management of the municipality		
31. Participation in FMIS development offered meaningful experience, I'd do it again.		
32. Participating in FMIS development improves my system use experience		
33. Participating in FMIS development increases my skills towards the system		

Contextual factors of end-user participation in FMIS development to engender a sense of ownership

Contextual factors are structural conditions and cultural aspects that may positively and/or negatively impact the development of a sense of ownership.

Tick and fill in where applicable

Statement	Agree	Support your answer

	or disagree	
34. Participating in FMIS development makes my work interesting		
35. Cultural aspects in my municipality may affect the end-user participation		
36. Regulations in my municipality may affect end-user participation		

Appendix G: Interview instrument for the SD team involved in FMIS development for municipalities

Tick and fill in where applicable

Demographic information

1. Age-group: 16-20 ☐ 21-30 ☐ 31-40 ☐ 40-5☐ 51 and abov☐

2. Highest level of education completed: Diplom☐ ☐egree ☐Honours Mast☐ PhD

3. Employment Status: Contract ☐ Permanent ☐

4. Employment position: Business analyst ☐ Systems analyst ☐ Database administrator ☐ Software deve☐er Systems test a☐yst

Questions about FMIS and end-user participation

6. What is your view on end-user participation in system development?

5. When you were in the process of developing FMIS, why didn't you consider to involve end-users in the process?

7. Was the simulation of end-user participation in FMIS development useful to you? Please support your answer

8. Would you consider involving end-users in system development in the future and why?

Appendix H: Co-designing sessions

End-users of FMIS such as Budget officers, Accounting officers, Internal auditors, Chief finance officers in municipalities of the study gathered in this scenario which was about municipal business requirements for FMIS , the scope of the problem that municipalities were facing about the previous failed financial systems

SCENARIO 1

BRAINSTORMED PROJECT INITIATION OF THE FINANCIAL SYSTEM TO BE DEVELOPED BY END-USERS

District Municipality A

"Our municipality needs to improve its financial systems to fight corruption and enhance development as we have outdated systems for our financial management processes. We need new systems to ensure that there is transparency, accountability and efficiency".

District Municipality A

"Our municipality needs new systems for financial management so that our municipality can have clean audit outcomes and administration. We want to be able to comply with the outlined financial mandate of all municipalities in South Africa"

Local municipality A is under District Municipality A

(1) Business context, business requirements and scope of the problem

Local municipality B is under District Municipality B

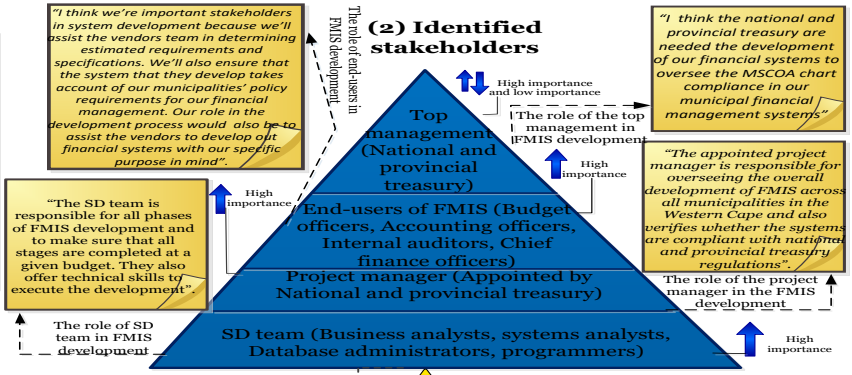
Local Municipality A

"We need new financial systems to ensure clear sequence for our financial systems so that our municipality can deliver services to citizens at a correct budget without mismatches and also outline municipal standards such as MSCOA chart compliance for financial management"

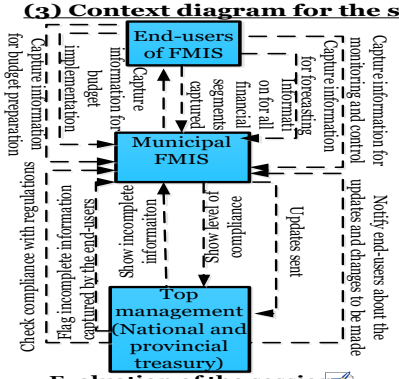
Local Municipality B

"We need integrated systems for our financial activities so that the district municipality that we are reporting to and other stakeholders can have access to verify how we use our funds and deliver services to citizens of our municipality"

(2) Identified stakeholders

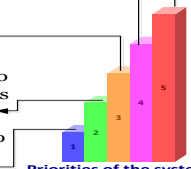


(3) Context diagram for the system



(4) Priorities of the system

- We need to be able to process budget activities that's what we're mostly struggling with in our municipalities
- The FMIS must be user friendly, there is no need to complicate these financial systems
- The FMIS should be able to notify end-users about the financial management activities that errors before proceeding to another activity.
- The system should not allow the end-users to start another activity while the first activity is still pending
- The FMIS should also allow the end-user to get updates



Priorities of the system

Evaluation of the session

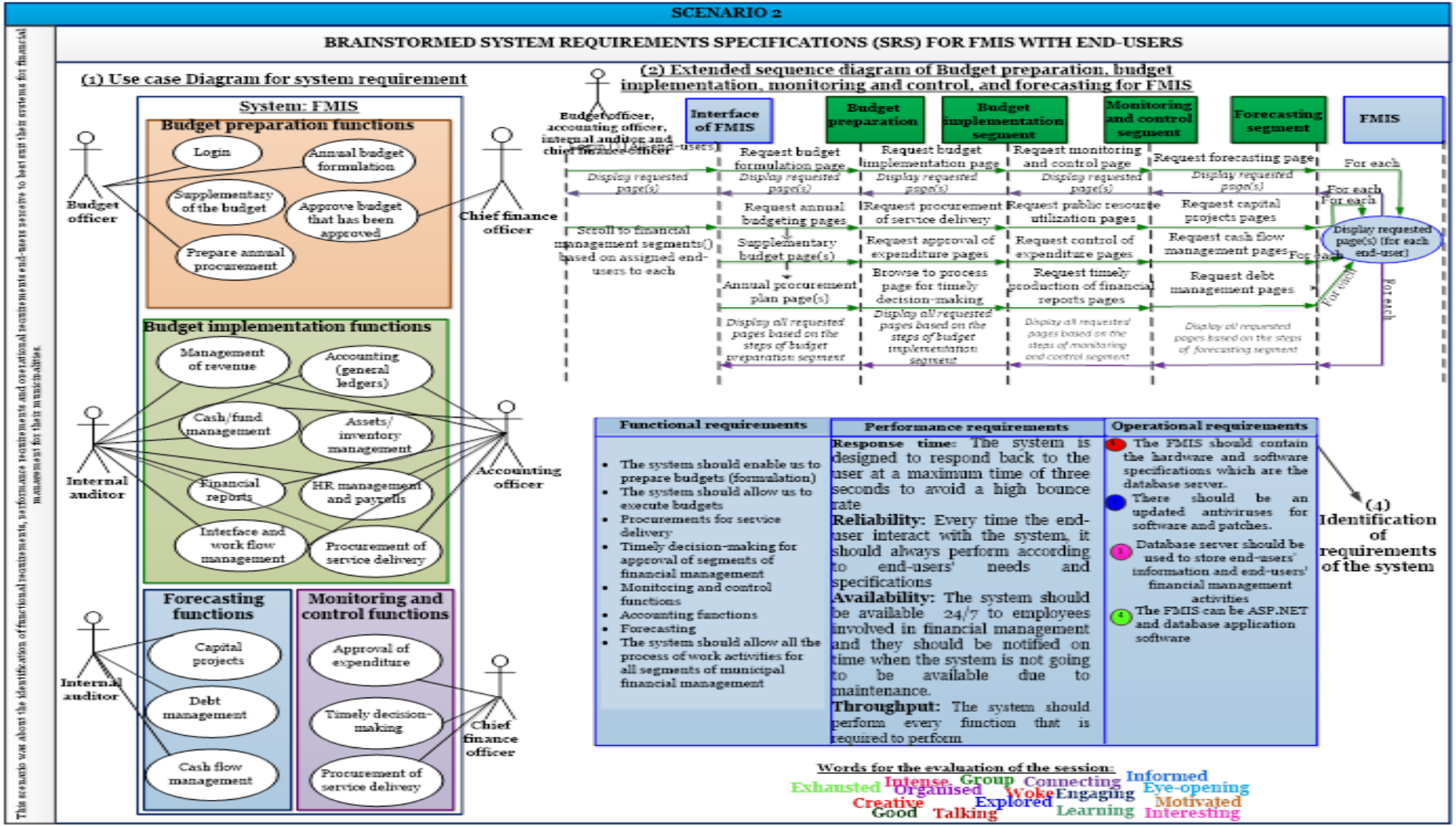
Important points

- It should be a key to ensuring that municipalities and FMIS are aligned to the compliance requirements of the regulation and achieve the final date for minimum compliance
- Kick off engagements with municipalities, developers, project manager and other stakeholders
- Provincial treasury should open up a discussion on regulation and commissioning of FMIS and change management strategies in place
- Briefing of the SD team as to development of FMIS and initial evaluations of system functionality.

(6) Scope and limitation of subsequent release

The system will have major features:

- ☑ Budget preparation interface
- ☑ Budget implementation interface
- ☑ Approval of budgets interface
- ☑ Procurement of service delivery interface
- ☑ FMIS Monitoring and control interface pages:
- ☑ Municipal funds and resources utilization
- ☑ Control of expenditure interface
- ☑ Timely production of financial reports interfaces
- ☑ FMIS Forecasting linker to pages interface :
- ☑ Municipal capital projects
- ☑ Cash flow management interface
- ☑ Debt management interface


SCENARIO 2
BRAINSTORMED SYSTEM REQUIREMENTS SPECIFICATIONS (SRS) FOR FMIS WITH END-USERS
This scenario was about the identification of functional requirements, performance requirements and operational requirements and end-users scenario to best suit their systems for financial management for their municipalities.
(1) Use case Diagram for system requirement
System: FMIS
Budget preparation functions
Login
Annual budget formulation
Supplementary of the budget
Approve budget that has been approved
Prepare annual procurement
Budget implementation functions
Management of revenue
Accounting (general ledgers)
Cash/fund management
Assets/ inventory management
Financial reports
HR management and payrolls
Interface and work flow management
Procurement of service delivery
Forecasting functions
Capital projects
Debt management
Cash flow management
Monitoring and control functions
Approval of expenditure
Timely decision-making
Procurement of service delivery
Budget officer
Internal auditor
Accounting officer
Internal auditor
Chief finance officer
(2) Extended sequence diagram of Budget preparation, budget implementation, monitoring and control, and forecasting for FMIS
Budget officer, accounting officer, internal auditor and chief finance officer
Interface of FMIS
Budget preparation
Budget implementation segment
Monitoring and control segment
Forecasting segment
FMIS
Request budget formulation page
Request budget implementation page
Request monitoring and control page
Request forecasting page
Display requested page(s)
Request annual budgeting pages
Request procurement of service delivery
Request public resource utilization pages
Request capital projects pages
Scroll to financial management segments() based on assigned end-users to each
Supplementary budget page(s)
Request approval of expenditure pages
Request control of expenditure pages
Request cash flow management pages
Annual procurement plan page(s)
Browse to process page for timely decision-making
Request timely production of financial reports pages
Request debt management pages
Display all requested pages based on the steps of budget preparation segment
Display all requested pages based on the steps of budget implementation segment
Display all requested pages based on the steps of monitoring and control segment
Display all requested pages based on the steps of forecasting segment
For each
Display requested page(s) (for each end-user)
Functional requirements
The system should enable us to prepare budgets (formulation)
The system should allow us to execute budgets
Procurements for service delivery
Timely decision-making for approval of segments of financial management
Monitoring and control functions
Accounting functions
Forecasting
The system should allow all the process of work activities for all segments of municipal financial management
Performance requirements
Response time: The system is designed to respond back to the user at a maximum time of three seconds to avoid a high bounce rate
Reliability: Every time the end-user interact with the system, it should always perform according to end-users' needs and specifications
Availability: The system should be available 24/7 to employees involved in financial management and they should be notified on time when the system is not going to be available due to maintenance.
Throughput: The system should perform every function that is required to perform
Operational requirements
The FMIS should contain the hardware and software specifications which are the database server.
There should be an updated antiviruses for software and patches.
Database server should be used to store end-users' information and end-users' financial management activities
The FMIS can be ASP.NET and database application software
(4) Identification of requirements of the system
Words for the evaluation of the session:
Exhausted
Intense
Group
Connecting
Informed
Organised
Woke
Engaging
Eye-opening
Creative
Explored
Learning
Motivated
Good
Talking
Interesting

This scenario contributed to the drafting of database design in the form of a class diagram, user interface specifications Based on the Identified FMIS requirements

SCENARIO 3

BRAINSTORMED SYSTEM DESIGN SPECIFICATION (SDS)

Graphic User Interface (GUI) Design

- **Appearance**
  - There must be a home page about the municipality aims and objectives → Home page
  - There must be a home page for all the segments of municipal FMIS → Municipal FMIS pages
    - Back end pages → Budget preparation page
    - Back end pages → Budget execution page
    - Back end pages → Approval of municipal budgets page
    - Back end pages → Monitoring and control page
    - Back end pages → Forecasting page
  - Page containing the mandate of municipal financial management → About financial management page
  - Help options available for end-users → Contact us pages
  - A page explaining the importance of compliance with regulations of financial management → About municipal compliance
  - Help option
- **Navigation flow of forms**
- **Generate reports/ forms such as financial statements**
- **Interface devices**
- **Input devices**

Hardware specifications for desktop computer

Minimum	Recommended
Intel Pentium® IV 2.0 GHz Processor 2 GB RAM 80 GB Hard Drive[1] 20X CD-ROM Drive Ethernet 10/100 Network Card 15" CRT/LCD Monitor 32 bit, 1024 X 768 Resolution Capable Video Card Intel USB Chipset with at least 2 powered USB 2.0 Ports[2]	Intel Pentium D or Intel Core2Duo Processor 4 GB RAM 250 GB Hard Drive Raid Level 10r 5[1] DVD-ROM Drive Gigabit Network Card 17" LCD Monitor 64 bit, 1024 X 768 Capable Video Resolution Intel USB Chipset with at least 2 powered USB 2.0 Ports[2]

Database Design: Class diagram

Budget preparation segment
End-user code: **Integer**
Budget details: **String**
Amounts: **String**
Service delivery cat: **String**
Date: **String**

Budget execution segment
End-user code: **Integer**
Budgets codes: **Integer**
Amounts: **Integer**
Service delivery cat: **Integer**
Date: **String**

Approval of municipal budgets
End-user code: **Integer**
Service delivery cat: **String**
Budget Details: **String**
Amounts: **Integer**
Approval Date: **Integer**

Monitoring and control , and Forecasting
End-users code: **Integer**
FMIS financial statements: **Int/ Strings**
Categories: **String**
Year: **Integer**

End-users
Name and surname: **String**
Job title: **String**
Employee Number: **Integer**
Work process: **String**

Municipal FMIS
Municipality name: **String**
FMIS aim and objective: **String**
Service delivery priority: **String**
Description of each segment: **String**

Contains (0…* / 1…*, 1….* / 1…*, 1…* / 1…*, 1…* / 1…*, 1…* / 1…*)

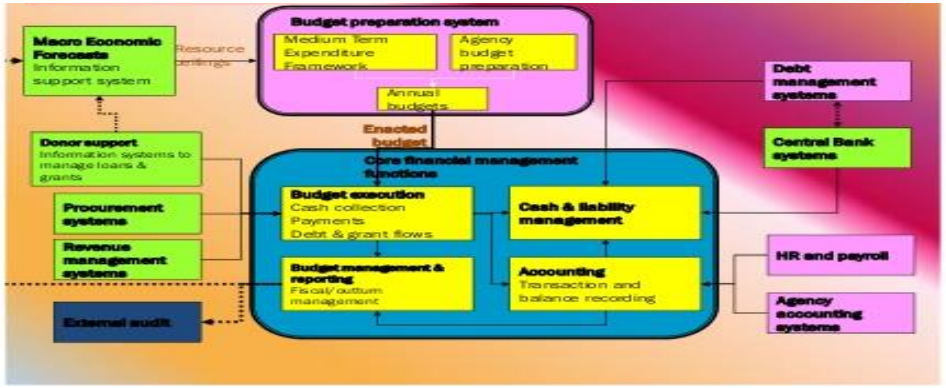
Budget officer
Name and surname: **String**
Employee number: **Integer**
Contact details: **Integer**
Budget planning code: **Integer**

Accounting officer
Name and surname: **String**
Employee number: **Integer**
Contact details: **integer**
Budget implementation code: **Integer**

Internal auditor
Name and surname: **String**
Employee number: **Integer**
Contact details: **Integer**
Monitoring and control code: **Integer**

Chief finance officer
Name and surname: **String**
Employee number: **Integer**
Contact details: **Integer**
approvals code: **Integer**

Architecture Design



Comments

Design class diagram narrative
Target database selection
Features of the SQL management studio
Relational database model diagram
Relational model schema
Attribute framing
Backup and recovery

Developer's comment

"For us end-users we are not experts in this"...**End-users**