



Analysing technology acceptance by social workers in South Africa

W Roestenburg

 [orcid.org 0000-0002-8079-0967](https://orcid.org/0000-0002-8079-0967)

Mini-dissertation accepted in partial fulfilment of the requirements
for the degree *Master in Business Administration* at the North-
West University

Supervisor: Dr JA Jordaan

Graduation: June 2021

Student number: 13285262

ACKNOWLEDGEMENTS

This dissertation was written during a challenging and uncertain time in world history. In March 2020 the COVID-19 pandemic brought South Africa to a level 1 lockdown. For many, this period was filled with expectations of disaster, a disaster that now continues to cause havoc as repeated waves of the disease continue to kill thousands, indeed millions across the world. COVID changed the world of work and had a direct impact on the writing of this dissertation and the findings of this research. I thank the following:

My beloved wife Susan, my sons Willem-Jan and Janus, who lived with us at home throughout COVID, for allowing me the time to write this paper, their patience during this process was incredible.

Dr. Johannes Jordaan, our operations management professor in the NWU MBA programme, for support and encouragement regarding this topic and superb supervision management!

All social workers who actively assisted in distributing the research invitation and for completing the survey. Without your contribution, this research would not have been possible

Dr. Erika Fourie for conducting the statistical analysis during a very busy time for all of us

Suzette Oosthuizen for acting the role of “manager” in the preliminary video recording

ABSTRACT

Social service organizations have characteristics different from conventional manufacturing or retail organizations. They operate in the healthcare-related services industry, and their service products are produced and consumed on the spot by their customers, called clients, who come to these organizations because they have a psychosocial need that has to be fulfilled. Service products are highly customized in response to each client's unique needs. Quality of service, therefore relies substantially on the knowledge and skills of the social workers in such an organization. Due to their often not-for-profit social service character, the needs of the client become paramount and profit, not a primary consideration. *Lean* operations management theory has influenced many production processes and contributed to more effective production processes across an array of industries, and as of recent has made significant inroads in the health care industry. Derived from the Japanese Toyota Production System (TPS), *Lean* operations strive to make production processes more efficient by introducing time and cost-saving measures to workplace behavioural processes that can increase an organization's profitability, improve quality and reduce waste. Closely associated with production efficiency is the use of IT-systems that have been designed to fulfill a range of *Lean* objectives, many of which are instrumental in making processes more efficient. The uptake of IT-systems in the social services industry is generally slow and sometimes met with resistance, as the role of IT in services efficiency, is often not directly associated with the nature of social services.

This study examines the adoption and acceptance of IT-systems in the South African social services sector employing the *Unified Theory of Acceptance and Use of Technology* (UTAUT), an internationally refined and widely used framework for understanding and measuring IT-systems integration in organizations. Using a cross-sectional survey design and the statistical techniques of ANOVA and Multiple Regression Analysis to, amongst others, predict the behavioural intention of a sample of 102 social workers from different contexts, to accept and use a locally developed IT-system called CORE-DMS, significant conclusions can be drawn. The study found that, overall, social workers regarded themselves as willing to accept and use IT-systems in terms of the expected performance of such systems to make work easier for them, the effort it would require to start using such system, the conditions that would facilitate the use of such system, and the extent to which such use would be intrinsic or based on social influences from management. Overall, it is concluded that social workers are ready to engage IT-technology and behaviourally respond positively towards IT-technology, expecting IT to make a significant contribution to the way they perform their duties towards clients. As an implication for management, the study found a direct positive association with *Lean* conceptual knowledge, indicating that the introduction of IT-technology should be part of a *Lean* management strategy

directed towards these organizations to prepare the context first before introducing and adopting an IT-system. Valuable strategic guidelines are recommended to management regarding how the transformation of the sector towards IT-technology can be facilitated by the simultaneous introduction of *Lean* principles.

OPSOMMING

Maatskaplike diensorganisasies het kenmerke wat verskil van konvensionele vervaardigings- of kleinhandelorganisasies. Hulle werk in die gesondheidsorgverwante dienste en hul diensprodukte word ter plaatse geproduseer en verbruik deur hul klante, genaamd kliënte, wat na hierdie organisasies kom omdat hulle 'n psigososiale behoefte het wat vervul moet word. Diensprodukte word voortdurend aangepas na aanleiding van die unieke behoeftes van elke kliënt. Diensgehalte berus dus wesenlik op die kennis en vaardighede van maatskaplike werkers in so 'n organisasie. Vanweë hul maatskaplike dienskarakter wat dikwels nie winsgewend is nie, word die behoeftes van die kliënt belangrik en is wins nie 'n primêre oorweging nie. Teorie oor bestuur van “Lean” bedrywighede het baie produksieprosesse beïnvloed en bygedra tot effektiewer produksieprosesse in 'n verskeidenheid bedrywe, en het onlangs in die gesondheidsbedryf aansienlike opgang gemaak. Afgelei van die Japanse Toyota Production System (TPS), streef “Lean”-strategie daarna om produksieprosesse doeltreffender te maak deur tyd- en kostebesparingsmaatreëls in te stel saam met nuwe gedragsprosesse in die werkplek wat die winsgewendheid van 'n organisasie kan verhoog, kwaliteit kan verbeter en afval kan verminder. Die gebruik van IT-stelsel, wat ontwerp is om 'n reeks Lean-doelwitte te bereik, hou baie verband met produksiedoeltreffendheid, waarvan baie instrumenteel is om prosesse doeltreffender te maak. Die gebruik van IT-stelsels in die maatskaplike dienste-industrie is oor die algemeen traag en word soms weerstand gebied, aangesien die rol van IT in die doeltreffendheid van dienste dikwels nie direk verband hou met die aard van maatskaplike dienste nie.

Hierdie studie ondersoek die aanvaarding en integrasie van IT-stelsels in die Suid-Afrikaanse maatskaplike dienstesektor deur middel van die Unified Theory of Acceptance and Use of Technology (UTAUT), 'n internasionaal verfynde en wyd gebruikte raamwerk vir die verstaan en meting van IT-stelselintegrasie in organisasies. Met behulp van 'n deursnee-opname-ontwerp en die statistiese tegnieke van ANOVA en meervoudige regressie-analise om onder andere die gedragsvoorneme van 'n steekproef van 102 maatskaplike werkers uit verskillende kontekste te voorspel, om 'n plaaslik ontwikkelde IT-stelsel genaamd CORE-DMS te aanvaar en te gebruik, kan beduidende gevolgtrekkings gemaak word. Die studie het bevind dat maatskaplike werkers hulle oor die algemeen bereidwillig beskou om IT-stelsels te aanvaar en te gebruik in terme van die verwagte prestasie van sulke stelsels om werk vir hulle makliker te maak, die inspanning wat nodig is om sodanige stelsel te begin gebruik, die voorwaardes wat die gebruik van sodanige stelsel sal vergemaklik, en die mate waarin sodanige gebruik intrinsiek sou wees of gebaseer sou wees op sosiale invloede van bestuur. Oor die algemeen word die gevolgtrekking gemaak dat maatskaplike werkers bereid is om IT-tegnologie te betrek en positief op IT-tegnologie te reageer, en verwag dat IT 'n belangrike bydrae sal lewer tot die manier waarop hulle hul pligte teenoor

kliënte uitvoer. As 'n implikasie vir bestuur het die studie 'n direkte positiewe assosiasie met “Lean”-konseptuele kennis gevind, wat daarop dui dat die bekendstelling van IT-tegnologie deel moet uitmaak van 'n “Lean”-bestuurstrategie wat op hierdie organisasies gerig word om eers die konteks voor te berei voordat 'n IT-stelsel ingestel en aangeneem word. Waardevolle strategiese riglyne word aanbeveel vir die bestuur oor hoe transformasie van die sektor na IT-tegnologie vergemaklik kan word deur die gelyktydige instelling van “Lean”-beginsels.

KEY CONCEPTS

Social Service Defined as intangible activities that normally take place in interactions between a customer and a service employee(s) and/or systems of the service provider, which are provided as solutions to customer problems (c.f. Grönroos (1990, p.27) in (Gupta, Sharma and Viyaya, 2016, p. 1027)). Services are intangible, heterogeneous, perishable, inseparable from the customer in that the customer plays a role in crafting the product. Services are characterized by the fact that they do not produce a change in physical properties and shape of materials during the process of manufacturing (Asnan, Nordin, and Othman, 2015). In this document social services are also termed social work services, welfare services, psychosocial services. Social services are provided by qualified professional social workers within the context of either state, health care, non-government or commercial organizations.

Lean Management (LM) is Defined as an integrated multi-dimensional approach encompassing a wide variety of management practices based on a philosophy of eliminating waste through conscious improvement. *Lean* in a service industry is thus a culture, a philosophy, and a way of thinking about improving service processes (Gupta, Sharma & Viyaya, 2016). It is postulated that the application of *Lean* in health care services can generate large economic and financial results as well as improvement in workers' behaviour.

IT-Technology (IT) Defined as the systematic processing of data to yield information. Information is used in vital organizational decision-making, amongst others in how production processes and volumes should be adjusted to optimize the profits of the organization. IT-technology is also the hardware technologies such as wireless links, Internet and e-commerce, and the development of analytical tools that improve the precision and applicability of information-based decision making in the organization (Heizer, Render & Munson, 2017). IT-System is a more specific reference to a computerized information system that has decision support capability. The two terms are used interchangeably in this study, sometimes in a more broad context, and sometimes more specific as indicated here.

Unified Theory of Technology Acceptance and Use (UTAUT) A theoretical framework or model developed by Venkatesh, Morris, Davis and Davis (2003) to measure and understand technology adoption in people. Derived from multiple theoretical

perspectives on technology adoption and acceptance, this model is used widely today for evaluating technology adoption and acceptance in different organizational contexts.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	I
ABSTRACT	II
OPSOMMING	IV
KEY CONCEPTS	VI
LIST OF FIGURES.....	XIV
CHAPTER 1 INTRODUCTION TO THE RESEARCH	1
1.1 Introduction	1
1.2 Contextualization of the proposed research	2
1.2.1 <i>Lean</i> conceptualization in Health care services	3
1.2.2 Technology adoption and <i>Lean</i> operations in Health care and social service contexts	5
1.3 Research problem statement.....	7
1.4 Contribution of the study.....	8
1.5 Aim and objectives	8
1.6 Methodology	9
1.6.1 Approach and design.....	9
1.6.2 Population and sampling	9
1.6.3 Population description.	9
1.6.4 Sample selection	9
1.6.5 Measures.....	10
1.6.6 Measurement properties of UTAUT	11

1.7	Data analysis.....	12
1.8	Conclusion.....	12
CHAPTER 2 LITERATURE REVIEW.....		14
2.1	Introduction	14
2.2	The <i>Lean</i> concept and management of <i>Lean</i>	15
2.3	IT-systems and <i>Lean</i> operations	19
2.4	Health care professions and technology acceptance	23
2.5	IT-Systems in Social Service contexts.....	26
2.6	Conclusion to section	30
2.9	Relevance of the case study in terms of the current research.....	35
2.10	Conclusion.....	36
2.11	The Unified Theory of Acceptance and Use of Technology (UTAUT)	37
2.12	Factors that influence the acceptance and use of Technology in the industry	37
2.12.1	Dimension 1 Performance Expectancy	39
2.12.2	Dimension 2: Effort Expectancy	42
2.12.3	Dimension 3: <i>Social Influence (SI)</i>	43
2.12.4	Dimension 4: <i>Facilitating Conditions (FC)</i>	46
2.12.5	Dimension 5: <i>Self-Efficacy (SE)</i>	48
2.12.6	Dimension 6: <i>Behaviour Intention (BI)</i>	49
2.13	Measurement in this study.....	51
2.14	Conclusion.....	Error! Bookmark not defined.

CHAPTER 3 METHODOLOGY	56
3.1 Introduction	56
3.2 Approach and research design	56
3.3 Population and sampling	57
3.4 Sampling strategy	58
3.5 Data collection strategy	59
3.5.1 Measures.....	59
3.5.2 The measurement tool used in this study.....	60
3.5.3 Measurement properties of the UTAUT Instrument.....	61
3.6 Data collection logistics.....	62
3.7 Data analysis strategy	63
3.8 Ethical considerations	65
3.8.1 Risk and benefit analysis	65
3.8.2 Advertising and recruitment	66
3.8.3 Voluntary participation, confidentiality	66
3.8.4 Informed consent.....	66
3.8.5 Incentives	67
3.8.6 Permissions.....	67
3.9 Conclusions.....	68
CHAPTER 4 RESULTS OF THE STUDY	69
4.1 Introduction	69
4.2 Data collection outcome	69
4.3 Realized sample.....	70

4.4	Data analysis.....	70
4.4.1	Approach to the analysis	70
4.4.2	Descriptive analysis of data	71
4.4.2.1	Gender	71
4.4.2.2	Age of respondents	71
4.4.2.3	Years' experience	72
4.4.3	Scale Reliability	73
4.4.4	Gender differences for PE, EE, SI, SE, FC and BI.....	73
4.5	Results	74
4.5.1	Interpretation	74
4.5.2	Age differences for PE, EE, SI, SE, FC, and BI	75
4.5.3	Result:	75
4.5.4	Interpretation	75
4.6	Differences between years' experience in the field of work for PE, EE, SI, SE, FC, and BI.....	76
4.6.1	Result	76
4.6.2	Knowledge of <i>Lean</i> operations	76
4.6.2.1	Having heard of <i>Lean</i> operations terminology.....	77
4.6.2.2	Having a firm plan for improving the efficiency of operations at the organization.....	77
4.6.2.3	Participation in <i>Lean</i> operations.....	78
4.6.2.4	Qualitative descriptions of <i>Lean</i>	79
4.7	Perceptions regarding <i>Lean operations</i> in the organization and its role in technology acceptance and adoption.....	80

4.7.1	Results	80
4.7.2	Interpretation	81
4.7.3	Spearman's Rho correlations between dimensions of UTAUT	83
4.7.4	Interpretation	85
4.7.5	Multiple Linear regression modelling.....	85
4.7.6	Interpretation	86
4.7.7	Multiple Linear regression modeling 2	87
4.8	Interpretation	87
4.9	Discussion of the findings	87
4.10	Conclusions	89
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS		90
5.1	Introduction	90
5.2	Limitations to the study	90
5.3	Conclusions to the study	91
5.3.1	Implications for IT-system adoption in social service organizations.....	91
5.3.2	The expected potential for acceptance of technology by the social services sector	92
5.3.3	Limitations of IT-systems to be integrated into social work professional activities.....	93
5.4	Recommendations.....	93
5.4.1	Recommendations to developers of IT-Systems for the social services sector	93
5.4.2	Recommendations to Managements of social service organizations	94

5.4.3	Recommendations to the measurement of Technology acceptance and the UTAUT model as a field of study	95
5.4.4	Final remarks.....	96
BIBLIOGRAPHY.....		98
ANNEXURES.....		104
ANNEXURE A PERMISSION LETTER: RATA.....		104
ANNEXURE B: PERMISSION LETTER: ACVV.....		105
ANNEXURE C: PERMISSION LETTER: SAVF		106
ANNEXURE D APPLICATION FOR PERMISSION TO SACSSP.....		107
ANNEXURE E: NWU ETHICS APPROVAL LETTER		110
APPENDIX E: ADVERTISEMENT ACCOMPANYING E-MAIL		111
APPENDIX F: COMPLETE QUESTIONNAIRE.....		112

LIST OF TABLES

Table 2-1 <i>Performance Expectancy</i> dimension	40
Table 2-2 Dimension 2: Effort expectancy	42
Table 2-3 <i>Social Influence</i> construct of UTAUT	45
Table 2-4 Dimension 4: <i>Facilitating Conditions (FC)</i>	47
Table 2-5 <i>Self-Efficacy (SE)</i> dimension of UTAUT.....	48
Table 2-6 Dimension 5: <i>Behaviour intention (BI)</i>	50

Table 4-1 Scale reliabilities.....	73
Table 4-2 Knowledge ratings per the description of " <i>Lean</i> ".....	83
Table 4-3 Correlations amongst UTAUT dimensions.....	84

LIST OF FIGURES

Figure 2-1 Questions about the understanding of " <i>Lean operations</i> "	22
Figure 2-2 Exposure of respondents to <i>Lean</i> concepts in the workplace	23
Figure 2-3 UTAUT basic model (Venkatesh, Morris, Davis, and Davis, 2003)	52
Figure 2-4 Primary UTAUT Predictive Model to be studied.....	53
Figure 2-5 Secondary measurement model for explaining Facilitating Conditions (FC)	54
Figure 3-1 Six-point Likert Scale as used in this research study	61
Figure 4-1 Gender distribution in the sample	71
Figure 4-2 Age distribution of the sample	72
Figure 4-3 years' experience in the field of social work.....	72
Figure 4-4 Whether the respondent has heard of " <i>Lean operations</i> ".....	77
Figure 4-5 Whether there is a firm plan for improving the efficiency of operations	78
Figure 4-6 Participation in <i>Lean</i> operations plans.....	78
Figure 4-7 Responses to whether the respondent had heard of the " <i>Lean</i> " concept.....	81

CHAPTER ONE

INTRODUCTION TO THE RESEARCH

1.1 Introduction

Technology, specifically Information Technology (IT), increasingly plays a vital role in the management of operations in an organization. IT-systems' role in facilitating, planning, and controlling *Lean* operations in manufacturing and other organizations is more acutely realized today and widely implemented. The health care sector in some instances has followed suit, and the sector increasingly comes under the spotlight regarding the need for implementation of *Lean* management practices as it is realized that healthcare costs are increasing and saving in healthcare has become a necessity. While the benefits of health care information systems have been well documented in the literature, the implementation of such systems in South African health care contexts, remains fairly limited (Wright, Mahony and Cilliers, 2017). Management philosophies such as *Lean* thinking and Six-Sigma are implemented in healthcare settings to decrease and manage waste and improve processes of health care services. According to studies such as by Waring & Bishop (2010), the concept of Lean healthcare has received significant interest in most US-based healthcare settings. Publications on *Lean* thinking implementation in South African health care context seems rather limited, despite efforts and claims by the *Lean* Institute Africa (LIA) associated with UCT Business school that *Lean* projects at several public hospitals such as Chris Hani Baragwanath Academic and Charlotte Maxeke, Grootte Schuur, Sebokeng and Kopanong hospitals, have made significant improvements in services and reduction in patient waiting times. Based on the original Toyota production processes *Lean* implementation in this industry lies in the continuous improvement of processes (Kaizen) to reduce waste of medical products, improved workflow and adding value to the practicing of healthcare and services to patients. Considering that "*Lean*" is a well-recognized management approach across industries, it is used to identify and successfully resolve operational problems to stand in the way of providing better health care services to patients and reduces inefficiency and cost in health care service delivery (Naidoo & Fields, 2019). *Lean* in healthcare is not without its problems, and is not easily implemented in the healthcare sector for various reasons, some of which are related to leadership factors, training in *Lean* thinking, and the need for champions who can drive the implementation into practice. According to these authors, many difficulties in health care management and operations can be attributed to changes in managers' demography due to South African specific affirmative action practices that changed the composition of health care management cadres to inexperienced, less-skilled workforce. In their research Naidoo & Fields (2019) found in a survey that about 62% of senior managers in Kwazulu-Natal hospitals had

knowledge of the concept *Lean*, but did not know any *Lean* tools and techniques. They also found that experience as a manager counted heavily with less experienced managers having less knowledge of *Lean*. Most alarming was that about 72% of managers sampled had no knowledge or experience of the concept *Lean*, whilst the remaining 28% had informally heard of *Lean* conceptualization through friends. Part of the complex task of implementing *Lean* in healthcare settings is the parallel process of technology adoption and adaptation to fit the culture, needs and meaning of actor networks in the new setting. The health care context is no exception when it gets to overcoming the multiple difficulties associated with technology adoption as part of operational refinement. Causing authors to ask critical questions about the beneficial or complementary effect of technology in manufacturing contexts, Ghobakhloo & Hong (2014) found that IT and *Lean* Management (LM) have a complementary relationship and the use of IT can dramatically transform and improve business processes and performance. Acting in support of existing business processes, IT-systems enhance and expand the efficiency of these production processes. It appears the process of technology use in different settings requires ongoing transformation and attention in most businesses during which technologies are adjusted and adapted to fit the new context. Embedding IT-technology in the business process is a key requirement for it to be an effective supportive tool. The following contextualization provides the background to a proposed research study that is focused upon the readiness for and acceptance of using IT-technology in a health care and social service context, which forms part of the health care service sector.

1.2 Contextualization of the proposed research

Lean management (LM) has been described as an advanced managerial approach for improving production processes in organizations that largely depends on both social and technical processes. Many organizations fail to effectively implement *Lean* processes (Bortolotti, Boscari & Danese, 2015). The *lean* implementation appears to be complex, and unless both behavioural and technology solutions are considered, likely to fail in implementation. *Lean* operations involve a change in organizational culture (OC), a critical factor in need of change if *Lean* is implemented. Evidence suggests that *Lean* interventions with a high emphasis on soft social issues, tend to be more effective than those driving hard practices such as complex technological solutions, although the cutting line between soft practices such as small group problem solving, customer involvement, employee training, supplier partnership, and continuous improvement efforts and hard technological solutions appears somewhat blurred.

Lean operations' combined soft and hard practices have been realized since early efforts at Toyota introduced both technological and behavioural changes to production processes at assembly plants. It is now widely recognized that modern IT-systems considered being 'hard

practices' play a significant role in achieving substantial improvements in production performance but would be less effective if not accompanied by series of soft practices that ensure users adopt these new technologies. (Riezebos, Klingenberg, & Hicks, 2009).

1.2.1 *Lean* conceptualization in Health care services

Based on the *Lean* conceptualization by Womack & Jones in Gupta, Sharma and Viyaya (2016) six principles are identified for the application of *Lean* in service industries that are relevant namely: customer problems need to be solved completely implying the services must operate effectively and work together; Services need not waste the customer's time; must provide exactly what the customer wants, where he wants it and when he wants it. This can be described as the business value chain in service industries that focus on improving services to the main users of the service.

With the above conceptualization setting services such as health care apart from manufacturing contexts, an exploration of costing approaches applied to service contexts highlights some important differences between these contexts:

- Services cannot be stored as inventory; therefore inventory cannot be easily evaluated
- Services to customers in health care are heterogeneous and customized per customer, and are therefore not easily standardized, making it hard to specify outputs.
- In the process of delivering a service, the customer is usually present and consumes the product on the spot. It is therefore difficult to count, measure, inspect, or test services such as healthcare.
- Labour costs make up a large proportion of service industry costs as the delivery of service depends largely on interaction with a person;
- As a result, costs in service industries are mostly charged to departments, rather than products, making it an ideal environment for the application of activity-based costing methods (Seal, Rohde, Garrison, & Noreen, 2019).

These realities play out in the implementation of *Lean* in service industries such as health care and social services. For example, it is argued that valuing performance in service sectors should rather be done through non-financial measures that complement traditional financial measures as these alone may not be entirely suitable or feasible in service organizations (Gupta, Sharma, & Viyaya, 2016, p. 1037). It follows that implementing *Lean* into healthcare contexts takes on a different character and strategies towards *Lean* focus more on the improvement of productivity, cost, quality, and timely delivery of services. "Value" in health care is defined by the need of the patient or service recipient to find a cure or relief of pain, whilst the production process is defined as patient flow through the process of treatment (Spagnol, Min & Newbold, 2013). Included in

“patient flow” are phases in treatments that are more than physical goods such as medications and treatments, or theatre operations, but a conglomerate of processes focused towards the full recovery of patients, such as quality nursing, occupational and physical therapy, and counseling of patients whilst in hospital. These are regarded as equally valuable determinants of *Lean* in healthcare because each additional service component contributes towards the total experience of the total health care service to the patient. Thus, multiple processes in the health care context contribute to optimal or *Lean* operations. It follows that waiting times for services, extended time in ICU, and bed-time post-operation all become part of the health care service experience.

Reflecting on the difficulties involved in implementing *Lean* principles in environments such as hospitals, Waring & Bishop, (2010) indicate that hospital operational management theory faces difficulties with merging sound operational practice with clinical practices in health care settings such as hospitals. Clinical practice in the consulting room context is where the medical practitioner is king, his interactions with the patient the primary coal face where core health care service is crafted, traditionally an area under the exclusive control of the health care practitioner. Historically, the clinical practice context is where service quality or precision in diagnosis and treatment is created, potentially this area resists change towards *Lean*. Waring & Bishop argue that successfully merging and integrating *Lean* practices stands a better chance of promoting *Lean* if participatory discussions are frequently held to hear the views and opinions of all health care staff regarding what can be considered *Lean* and how it should be achieved. They also conclude that technology integration is equally difficult as part of *Lean* for a variety of reasons such as claimed professional autonomy that is often seen as unrelated to operational practices and tends to override *Lean* intentions.

The question arises, to what extent can technological advances such as IT-systems contribute to, or promote *Lean* implementation in service contexts?

In conclusion, it appears that *Lean* operations in service industries have become an increasingly important field for research, with increases in implementation studies being observed as indicated by a systematic literature review by (Gupta, Sharma, & Viyaya, 2016). Their review indicates that *Lean* services are gaining in momentum, and that the concept has successfully transferred from manufacturing to the services sector, but that more research is needed to examine process differences between services and manufacturing. The importance of *Lean* operations in health care facilities is increasingly important in developing countries, as indicated by Singh, (2019) who states that *Lean* in these contexts needs to expand towards addressing issues of neglect in environmental impact and sustainability. Furthermore, the role of IT in facilitating *Lean* operations in services appears undeniably important. Given the many difficulties associated with effectively implementing *Lean* and together with it, the use of supportive IT-systems, a better understanding

is needed of how people in services contexts are ready to receive IT-systems and what contributes to their acceptance of technology in the service context. The discussion now moves towards a specific aspect of *Lean*, namely the support of IT-technology in promoting *Lean* operations.

1.2.2 Technology adoption and *Lean* operations in Health care and social service contexts

The above discussion has argued that *Lean* interventions and IT-technology are frequently inter-related. LM seems to rely strongly on technological support because these systems promote *Leaner* operations by nature of their IT-information generation capability that results in more effective decision making (Ghobakhloo & Hong, 2014). Both LM and IT-technology adoption are two critical factors in the business operations of most industries, including health care institutions. A systematic literature review on the interrelationship between *Lean* and IT has confirmed the complementary and interdependent relationship between the two concepts; has highlighted the benefits achieved from applying computers in *Lean* management; and explored HR issues in the use of IT combined with *Lean* management (Pinho & Mendes, 2017). Despite claims that IT-systems complicate the existing process by adding to the workload attached to existing processes, the literature review has shown that IT-systems enhance production and facilitate *Lean* production environments. Other literature focuses on issues such as resistance to either *Lean* principles or IT technologies in Human service contexts such as health care facilities. Literature evidence has shown that the management of Health care institutions such as hospitals frequently lacks knowledge of *Lean* practices and that this leads to weak *Lean* implementations (Naidoo & Fields, 2019). Further evidence has shown that medical practitioners are often reluctant and sometimes resistant to implement IT-technologies associated with *Lean* operations as this tends to re-configure occupational boundaries and demands new forms of clinical leadership that they are not well prepared for. Medical practitioners were concerned about losing their clinical skills in the process of focusing extensively on *Lean* practices in the institution (Waring & Bishop, 2010; Leite & Vieira, 2015). These practitioners amongst other perceived problems, became protective of their work when additional work was added in their view, that had little to do with the clinical work, but everything to do with *Lean* management. Despite concerns such as these, the overwhelming evidence about the financial and overall positive benefits of *Lean* principles implementation in service contexts is confirmed by authors such as (Leite & Vieira, 2015).

Research studies on *Lean* principles in service industries such as social welfare services or termed “behavioural health care delivery” are relatively scarce. Observations from existing sources indicate that the use of IT-systems in social service industries is fairly common in some contexts such as the USA and UK, but relatively uncommon in developing countries such as

South Africa. A field of integration between social services and health care services is termed integrated service contexts, and social workers working in these contexts are generally exposed to Health Information Systems (HIS) and clinical record systems. Sources discuss the link between the use of the HIS and *Lean* operations described as “reforms” in behavioural health care systems (Mathews, Little, Clemens, & Rutigliano, 2018). Of note in this regard is that the “HIS” is often used not only for record-keeping purposes (Electronic Health Record or EHR) but also as a mechanism for actual delivery of services in examples such as Telehealth and interdisciplinary communication. Patient safety and service quality are identified as two areas where *Lean* operations may make a difference and in this regard, HIS are hailed as highly effective mechanisms in social services within a health care context. Further discussion on these IT-systems and how they influence the delivery of social and behavioural services will be provided in Chapter 2, but suffice to say that in some contexts the use of specifically IT-systems in social and behavioural services has transformed the delivery of these services, whilst in other contexts such as South Africa, the use of IT-systems in social services are virtually non-existent. The authors stress that some of the most common problems towards adopting IT-systems in social services are the ongoing cost requirement for infrastructure and system maintenance and the fact that these organizations are not eligible for state funding to use IT-Systems (Mathews, Little, Clemens & Rutigliano, 2018, p. 260). Another perspective offered by (Krause-Jensen, 2017) found diverging opinions regarding *Lean* in Danish social workers, with some very positive about the concept, and others to be highly sceptical about *Lean* principles in their work environments, regarding it as management induced strategies that in some instances undermine professionalism and add work that the social workers did not have before. This article suggests one needs to be careful with the way in which *Lean* is implemented in the social service context.

More evidence was found regarding *Lean* principles in the social service context. From the debate it is concluded that *Lean* is receiving increasingly more attention in Health Care and social service contexts. It has been shown that *Lean* and IT-systems are interrelated. Neither of these concepts is adequately implemented in the local health care or social service context. Specifically, in the latter case, the researcher is not aware of or able to find any existing IT-systems that have been implemented in the social service sector, neither is there any evidence of specific *Lean* programmes in social service organizations. This field is therefore rich in opportunity for further research. No local literature could be found on either of these topics, apart from the few articles found in the field of health care that indicated a lack of knowledge regarding *Lean* practices at Kwazulu-Natal hospital managers. It is therefore concluded that further research is needed, specifically in the social behavioural services field, to explore both the concept of *Lean* operations and IT-system use in social service delivery contexts.

1.3 Research problem statement

Considering the above exploration of a technology acceptance example within the context of local social services, the lack of studies regarding technology acceptance in general social service contexts some trends are observable:

Implementing IT-systems in Social service organizations seems to be hampered by many different factors related to acceptance of Information technology by social service professions. It can be expected that technology acceptance in the South African context will differ significantly from acceptance in first world countries such as the US and Europe where different issues will influence the use and acceptance of IT-systems. The observed problem in the local context is therefore that there is uncertainty about the readiness of South African social workers and their organizations to consider implementing IT-technology and to accept such technology as the solution to and replacement of their existing paper-based administrative systems. Based on this, the research problem for the proposed study is as follows:

There is a significant lack of evidence and knowledge regarding the extent of acceptance of IT-system technology by social workers in South Africa. Little knowledge is available regarding the state of acceptance locally, those factors that contribute towards the relative acceptance of technology, and the state of readiness of social workers to adopt and implement IT-systems locally. This is the formulated research problem for this proposed study.

Furthermore, uncertainty exists regarding the extent of knowledge in social service contexts regarding the meaning of the term *Lean*, its role in health care services such as social work, and how knowledge of *Lean* in social services relates to the acceptance of IT-systems in social services.

Based on this problem identification, the research questions that will drive this study are as follows:

- What factors best predict whether social workers in the South African context are ready to adopt and accept IT technologies as worthwhile technological support in their professional activities?
- What is the role of demographic variables associated with social service professionals in our understanding of social workers' adoption and acceptance of specifically IT-systems in the social service organizational context?

- Does knowledge of the concept '*Lean thinking*', contribute positively to differences in the acceptance of technology by social workers in social service contexts?

The study that is proposed here thus has an interest in the readiness of South African social workers to adopt and accept IT-technology in their work environments and thereby embrace elements of *Lean* principles in their work contexts. Based on the assumption that South African social workers may display low levels of *Lean* orientation due to the factors outlined above, the main emphasis of the proposed study will be on IT-technology adoption rather than *Lean* orientation.

1.4 Contribution of the study

The research contributes towards a better understanding of the factors that most prominently contribute towards social workers' relative adoption and acceptance of IT-technology in the South African health care/social service context. Furthermore, an understanding of those factors that predict acceptance in the local context will further the development of appropriate strategies to access and promote the development and adoption of information technologies in the local context, as well as contribute towards the introduction of *Lean* in social services provision.

1.5 Aim and objectives

Based on the above exposition, the aim of the proposed study was formulated as follows:

To model the factors that contribute towards the acceptance and adoption of IT-systems by social workers in the South African social service industry.

Based on the above research aim, the following objectives were proposed:

- (a) To compile and test a predictive model of factors that potentially predicts social workers' behavioural intention towards acceptance and adoption of IT-systems through cross-sectional survey data collected from a sample of social service personnel using a UTAUT based questionnaire
- (b) To formulate suitable practical conclusions and recommendations that can be used by technology developers to consider and prepare target markets in social services for effectively adopting IT-systems in social service contexts.

1.6 Methodology

1.6.1 Approach and design

The approach of choice in this study was quantitative. A quantitative approach allows the researcher to collect data widely and access larger populations of social workers directly. This assisted in focusing the study and rendering concrete, valid, and reliable data for analysis purposes. To collect data from a large population the cross-sectional survey design was used. This is an ideal design for collecting large volumes of data using questionnaires. In this study, an electronic data collection strategy will be used, as this is currently under COVID-19 circumstance the best and most ideal data collection method. To achieve the objectives of the study, namely to identify and model predictive factors of Technology acceptance in social workers, the cross-sectional design will be supplemented by a correlational design, as this would enable the researcher to identify using statistical techniques those predictors of Technology acceptance and adoption in social service workers. The specific statistical methodology used in this study will be discussed in more detail in Chapter Three.

Based on the research questions posed above, the following dimensions were examined in this study:

1.6.2 Population and sampling

The study was not narrowly focused but aimed to get a broad representation of different subjects in the population. The study was therefore not narrowly focused on a single organization or limited sample but would attempt to access a large and varied group of social workers across different organizations to gain necessary representation and variation in opinions.

1.6.3 Population description.

The population can be considered to be all social workers registered with the SA Council for Social Service Professions (SACSSP) as a statutory body where most members of the population will be registered. At present, some 38000 social workers are registered at the SACSSP.

1.6.4 Sample selection

To ensure wide participation, an all-inclusive sampling strategy was followed. For this purpose, the SACSSP that had a record of all registered social workers and their e-mail addresses was contacted for assistance with the distribution of the survey in this study to all their members. This would simplify the collection of data utilizing an electronic survey method and ensure that the

survey reached the population. The survey would utilize the Google forms platform as this was easily available and a reliable method for electronic data collection purposes. An alternative strategy to be followed should the SACSSP option not be available, would be to target specific organizations where many social workers can be found, electronic platforms such as Facebook, Linked-In, and Research gate, and perform recruitment of participants on these platforms. The minimum sample size was therefore set to the minimum that was required for Regression analysis purposes. As confirmed by statistical consultation, a minimum sample size of 150 was considered adequate for the study.

1.6.5 Measures

Since this study required a suitable measurement tool for measuring technology Adoption and Acceptance in social workers, the *Unified Theory of Acceptance and Use of Technology* (UTAUT) is widely considered the most effective and recent method for examining technology acceptance in different populations. This model has been widely tested in many studies since its development in 2003. We proposed to develop a questionnaire using the constructs as provided by the original UTAUT model (Venkatesh, Morris, Davis, and Davis, 2003) for measuring technology adoption in different contexts. The UTAUT model was adapted slightly to fit the requirements of the local social service context. For example, since there is currently not a single IT-system being used universally by local social workers, it can be expected that prospective respondents did not have a common or unified understanding of a single IT-system, and would therefore likely attach their meaning based on their conceptualization of an IT-system, if given a survey to complete based on no specific IT-system. This study could therefore be regarded as a pre-implementation study in that it asked questions of respondents regarding how they felt about “a system”. To further focus respondents and prevent inconsistent and uncertain responses due to different conceptualizations of what an IT-system consists of, the researcher aimed to first orientate prospective respondents about the appropriate conceptualization of an IT-system. This would help them understand generically, the meaning of an IT system in their context. For this purpose, the researcher used the CORE-DMS discussed above as a model example of an applicable and relevant IT-system that the respondents could identify with, for the baseline orientation of prospective participants. This was done as follows:

- (a) The researcher prepared a 15-minute educational video presentation in which the CORE-DMS was explained and demonstrated as a typical and custom-designed IT-system for performing administrative social work services in organizations. Prospective respondents to the survey were asked to first watch the video presentation before completing the electronic survey. This enabled them to cognitively orientate themselves regarding the exact nature of a social work IT-system, before answering the questions.

- (b) They were then asked to complete the questions as if this particular example was under consideration for implementation. The researcher thus formulated all questions to include a reference to the CORE-DMS or similar IT-system.
- (c) This step was proposed to ensure that respondents had a common framework and understanding of the concept of an IT-system.

The primary measure in this study was constructed as a Google form that was used for online data collection. The questionnaire consisted of two sections. Section A was a demographic section asking different questions including Gender and Age as variables as well as experience regarding the use of IT-systems, followed by Section B that consisted of the UTAUT questionnaire as presented in the following table (See Table 2.1 - 4).

1.6.6 Measurement properties of UTAUT

Items in the original UTAUT had been validated by the developers in the original study. Since other studies have adapted the UTAUT questionnaire, and this would similarly be done in the current study, it was not possible to regard the UTAUT as a standardized scale with stable items. Properties of the original UTAUT were as follows:

- Internal consistency reliabilities for all constructs in the model were significant and above .7.
- Square roots of the shared variance between constructs and their measures were higher than the correlations across constructs, demonstrating convergent and divergent validity.
- Reverse-scored items loaded insufficiently below .60 and were removed before re-estimating the model.
- Re-estimated loadings were above .70 and considered acceptable.
- Intra-construct correlations were very high, and inter-construct correlations were very low, suggesting sufficient construct validity.
- The model as presented in Figure 1 was the resultant model with included moderating variables (Venkatesh, Morris, Davis, & Davis, 2003)

The following section discusses the constructs included in the UTAUT and how these are adapted for this study. Items from other studies were included to cover missing dimensions.

The constructs of the UTAUT questionnaire are discussed in Chapter Two. For purposes of this chapter, we refer the reader to the questionnaire added as Appendix 1 at the end of the dissertation.

1.7 Data analysis

The data analysis techniques proposed for this study followed the general guidelines for survey research as well as what was recommended by the developers and several other studies conducted utilizing the UTAUT questionnaire. Since the study aimed to determine the predictors of technology acceptance and use in South African social workers as a group, it was mandatory to use structural equation modeling or regression analysis techniques in this study. The specific analysis techniques were as follows:

- (i) Descriptive statistics and frequency distributions were used for describing the characteristics of the sample. This enabled the researcher to understand the sample and population involved in this study.
- (ii) Scale properties were established, employing Cronbach's Alpha to determine the internal consistency of the measures used in the study.
- (iii) Factor Analysis were performed depending on the realized sample size to either explore or confirm the dimensional structure of the measurement instrument that was used in this study.
- (iv) Regression analysis was used to examine relevant hypotheses regarding potential predictor variables, as indicated in the above theoretical model for ITAUT. In this analysis, the role of variables such as Age, Gender work experience, and knowledge of *Lean* were investigated.
- (v) The study also examined between-group differences for Age, Gender, and Experience using ANOVA and the Independent-samples t-test.

1.8 Summary

This first chapter has introduced the proposed study to the reader and provided background and rationale for conducting a study of this nature. The researcher, being originally qualified as a social worker and working as an academic in the psychosocial behavioural modification field, took a different perspective in this study by approaching the research the research from a management sciences perspective, rather than the usual subject-specific perspective, and specifically an operations management perspective. The study was driven by a need to better understand the working context of social service practitioners and thereby assist in the further development of IT-systems for this sector. Being a developer of IT-systems himself, the researcher had also a need to understand this specific field of work, to develop more effective strategies to refine, disseminate, and introduce IT-technology in this field and to ensure that developing such system would improve and contribute more effective and Lean operations in the

social services context. Moreover, the evidence from literature suggesting that Technology adoption and acceptance is positively related to *Lean* operations, added specific appeal, and actuality to this study. Whilst many studies have examined either *Lean* operations or Technology acceptance in various sectors, amongst these the health care sector, this study added specific value by combining the two concepts into one survey study.

The following chapter provides a review of literature on mainly three concepts, *Lean* operations, and management (LM), IT-technology (IT) adoption and acceptance, and how these two concepts were represented in the social services context. Management is about people at work, and this study specifically contributed to our understanding of how people interact with, adopt, and eventually accept technology in their work-oriented behavioural contexts. Managers, entrepreneurs, and technology developers have a profound interest in understanding how new technology can be introduced to work contexts in a people-sensitive manner for the improvement of productivity and performance of people in the workplace. This study broadly aims to contribute to this general aim.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The previous chapter dealt mainly with an orientation to the study. This involved the definition of the key concepts of the study and preliminary exploration of current literature relevant to the three concepts that were discussed. For purposes of review, the three concepts that guide this study were “*Lean operations*” and its management, referring to the philosophical and cultural element in the organization that focused upon the improvement, refinement, and streamlining of production processes in an organization towards making these more effective, efficient and of better quality. The second key concept of the study was “IT-technology adoption and acceptance”, defined as the introduction and adoption of computerized IT-systems in an organization to improve the administrative functioning of the organization as well as the improved and systematic management of information in the organization in the best interest of decision-making processes in the organization. It was shown that these two concepts were positively interrelated in the organizational context, meaning that IT-systems supported the introduction of *Lean* principles in all kinds of organizations, inclusive of both manufacturing and service-oriented organizational contexts. Technology Acceptance is a field of study frequently studied from various management-oriented perspectives across many different contexts, ranging from manufacturing, education, service industries such as IT, banking, investment, and education, to health care and occasionally psychosocial services, as was the case in this study. IT-system adoption and acceptance was also the primary concept to be measured in this study using a scale derived from the recently developed and refined Unified Theory of Acceptance and Adoption of Technology (UTAUT), a theoretical perspective aimed at measuring and understanding technology acceptance. The third concept concerns the context of this study, namely that of social services, defined as counseling and developmental behaviour modification services provided to members of the public through a recognized profession, called social work, recognized from some perspectives as a service to people that experience psychosocial situations, crisis, and problems that warrant a direct counseling service. This forms the primary focus of the study in that it provides the context against which technology adoption and acceptance will be observed.

To develop a thorough understanding of these three concepts, this chapter intends to provide a further in-depth discussion of these concepts by providing evidence and explanation on the current state of the research regarding these three topics, specifically technology acceptance and adoption in different contexts such as social services. This chapter aims to contextualize the study

further, developing a theoretical framework that will help with understanding and interpreting technology acceptance in the social services context, but finding guidelines that help with understanding the relationship between technology acceptance and adoption and *Lean* management. The literature review also provides an overview of the current state of research in this field, and to operationalize the core concepts in preparation for measuring the construct Technology Acceptance in social service contexts. The discussion starts with an exploration of *Lean* conceptualization in general, Technology acceptance conceptualization, technology in health care and social services, and lastly ends with operationalizing the Technology adoption and acceptance concept in preparation for measuring this construct in the empirical phase of the study.

2.2 The *Lean* concept and management of *Lean*

Lean management (LM) is described as an advanced managerial approach for improving production processes in organizations, and these are partly dependent on a complex array of integrated socio-technical practices. It appears that despite *Lean* management programmes and interventions, some organizations tend to fail in improving their practices, reduce costs, and gain an edge over competitors (Bortolotti, Boscari, & Danese, 2015). Several factors are postulated that contribute to *Lean* management, such as

the complexity of the LM implementation process, contingency factors limiting positive impact and difficulties regarding the implementation of JIT practices without considering other dimensions of operational management, and lack of attention in implementation HR practices. A further factor to be considered is that of organizational culture (OC), with several studies demonstrating a relationship between effective LM and OC. These authors maintain that effective LM practices contain a combination of hard and soft practices, where soft practices refer to people and relations, and hard practices to technical analytical tools. It is then postulated that operations with a high emphasis on soft practices, tend to be more effective and achieve *Lean* operations better. Using multiple group comparisons on a large international sample of mostly manufacturing plants, they confirmed that organizations achieving high *Lean*, achieve this by implementing soft practices rather than driving hard practices, but could not determine the nature of the complex relationship between soft practices and organizational culture. Soft practices include small group problem solving, customer involvement, employee training, supplier partnership, and continuous improvement efforts.

Given literary evidence confirming that *Lean* operations involve both hard and soft practices, there are indications that *Lean* had its origins before the advancement of computer technology. Accordingly, *Lean* operations, such as practices based on Kaizen principles and Kanban methods

in Toyota's assembly plants have for many years not relied on electronic technology, yet were regarded as highly effective examples of *Lean* operations that continue to influence the field of operations management today. Both Kaizen and Kanban (card) processes can be considered hard and soft practices because they have a 'technology' component (cards etc.), and soft practices focused on behaviour modification that is associated with the hard practices. Kanban can be considered a primitive form of an information system that played a simplistic, robust, and important part in the improvement and streamlining of production processes at Toyota. It is now widely recognized that modern IT-systems as 'hard practice' play a significant role in achieving excellence in production (Riezebos, Klingenberg, & Hicks, 2009).

The concept of production and *Lean* take on a different meaning in health care contexts. Womack and Jones (Gupta, Sharma, & Viyaya, 2016, p. 1033) suggested six principles for application of *Lean* in service industries that fit the nature of services well: customer problems need to be solved completely implying the services must operate effectively and work together, do not waste the customer's time; must provide exactly what the customer wants, where he wants it and when he wants it. With this conceptualization the authors stress that *Lean* is more than the application of a series of tools in a silo fashion, it proposes to focus on the complete business value chain and use of multiple strategies from different angles to achieve *Lean* principles.

With the above conceptualization setting services such as health care apart from manufacturing contexts, an exploration of costing approaches applied to service contexts highlights some important differences between these contexts:

- Services cannot be stored as inventory; therefore inventory cannot be easily evaluated
- Services to customers in health care are heterogeneous and customized per customer, and are therefore not easily standardized, making it hard to specify outputs.
- In the process of delivering a service, the customer is usually present and consumes the product on the spot. It is therefore difficult to count, measure, inspect, or test services such as healthcare.
- Labour costs make up a large proportion of service industry costs as the delivery of service depends largely on interaction with a person;
- As a result, costs in service industries are mostly charged to departments, rather than products, making it an ideal environment for the application of activity-based costing methods (Seal, Rohde, Garrison, & Noreen, 2019).

These realities play out in the implementation of *Lean* in service industries such as health care services. For example, it is argued that valuing performance in service sectors should rather be done using non-financial measures that complement traditional financial measures as these alone may not be entirely suitable or feasible in service organizations (Gupta, Sharma, & Viyaya, 2016,

p. 1037). It follows that implementing *Lean* into healthcare contexts takes on a different character and strategies towards *Lean* focus more on the improvement of productivity, cost, quality, and timely delivery of services. “Value” in health care is defined by the need of the patient or service recipient to find a cure or relief of pain, whilst the production process is defined as patient flow through the process of treatment (Spagnol, Min & Newbold, 2013). Included in “patient flow” are phases in treatments that are more than physical goods such as medications and treatments, or theatre operations, but all processes focused towards full recovery are regarded as equally valuable determinants of *Lean* in healthcare. Thus, multiple processes in the health care context contribute to optimal or *Lean* operations.

Reflecting on the difficulties involved in implementing *Lean* principles in environments such as hospitals, (Waring & Bishop, 2010) indicate that hospital operational management theory faces difficulties with merging sound operational practice with clinical practices in health care settings such as hospitals. Clinical practice in the consulting room context is where the medical practitioner is king, his interactions with the patient the primary coal face where core health care service is crafted, traditionally an area under the exclusive control of the health care practitioner. Historically, the clinical practice context is where service quality or precision in diagnosis and treatment is created, potentially this area resists change towards *Lean*. Waring & Bishop argue that successfully merging and integrating *Lean* practices stands a better chance of promoting *Lean* if participatory discussions are frequently held to hear the views and opinions of all health care staff regarding what can be considered *Lean* and how it should be achieved. They also conclude that technology integration is equally difficult as part of *Lean* for a variety of reasons such as claimed professional autonomy that is often seen as unrelated to operational practices and tends to override *Lean* intentions. Five barriers to *Lean* implementation are identified by Spagnol, Min, & Newbold (2013) as Culture and resistance to change, lack of awareness, poor training/coaching, availability of resources, time, and lack of resources. These authors indicate in a similar line that technology and human interaction is a mutual shaping process, a progressive shaping of technology by humans and humans being shaped by technologies. Described as the “actor-network approach, technology and practice are therefore co-constructed with technologies reshaping practice at the same time that practice reshapes technology” (Waring & Bishop, 2010). The way social groups or networks interact with or form around particular technologies contributes towards effective integration and adoption of technology in the workplace. The process of technology integration in health contexts is a difficult, incremental process of mutual shaping towards a gradual fit. This complex, incremental shaping process involves people that work in the organization, how they view and regard current processes; visualize how these processes can be optimized, and how technology can be incorporated and integrated into these optimized service processes. Optimized service processes can be regarded as combined hard practices (policies

and formal decisions) and soft practices (kaizen type of discussions) to facilitate *Lean*-ing operations. Incremental shaping process occurs in three stages; the first the desire to improve control and management (a hard practice); Stage 2 aims at achieving maximum productivity through JIT; and Stage 3 combines hard and soft to incrementally improve service components (a soft practice) (Riezebos, Klingenberg & Hicks, 2009, p. 237).

Pettersen (2009) proposes four distinct ways in which *Lean* can be implemented in organizations. The first is the “Toolbox *Lean*” approach, reflecting isolated small implementation attempts that tend to be isolated and potentially more destructive to the organization. The second way represents the application of a few *Lean* tools and techniques that may contribute to *Lean* processes but can still easily fail. The third way introduces goals and targets and thereby ensure more ‘hard’ approaches, such as policies and strategy changes. The fourth way of implementation sees the organization introducing *Lean* practices as a daily routine and this reflects ‘*Lean* thinking’ that is integrated into daily work practices. Consistent with the fourth method outlined here, (Spagnol, Min, & Newbold, 2013) argue that achieving *Lean* in services requires ongoing guidance by champion leaders to achieve a change in an organizational culture that takes a long time and repeated training of staff to entrench new practices. These actions eventually facilitate integration, whilst maintenance of new processes requires continuous directive efforts to reinforce the new drive towards *Lean*.

The above examples reflect the difficulties of implementing *Lean* in health care contexts and identifies the lack of uniform models and approaches for implementing *Lean* in health care organizations as identified by (Gupta, Sharma, & Viyaya, 2016). Also, authors such as (Naidoo & Fields, 2019) have found knowledge about *Lean* practices to be largely lacking amongst senior managers at a KZN hospital. In this instance, *Lean* thinking at this hospital is at the basic, entry-level of *Lean* implementation, according to (Pettersen, 2009). They conclude that the lack of knowledge resides with younger, less than 10 – years experienced managers, whilst more experienced managers seemed to have more knowledge. In contrast to low knowledge levels, senior managers were interested in improving operational practices in their context.

A search for evidence of the implementation of *Lean* thinking in social service contexts rendered no returns. Apart from a few articles aimed at introducing *Lean* thinking in public social service contexts, no evidence about *Lean* in social welfare organizations or non-government contexts could be sourced. It is assumed that this topic is not currently the focus of writing within the social service context.

The question arises, to what extent can technological advances such as IT-systems contribute to, or promote *Lean* implementation in service contexts?

2.3 IT-systems and *Lean* operations

Although IT is described as a service industry itself, in the case of service industries such as health care, financial services, public service, and education, IT plays an important supportive role in achieving *Lean* operations (Gupta, Sharma & Viyaya, 2016). The growth in modern Information technology spanned several decades. The technology explosion and its incorporation into the modern organization have been the subject of many studies (Sahadani & Salleh, 2014; Tantiponganant & Laksitamas, 2014; Olasina, 2015; Seethamraju, Diatha & Garg, 2018; Dwiputranti, Oktora, Okdinawati & Fauzan, 2019; Shiferaw & Mehari, 2019). Modern operations seem to be highly dependent upon information technology and it is no longer debatable that an organization cannot function properly without such technology (Powell, Proctor & Glass, 2014). The use of IT-systems seemed a logical enhancement of manufacturing processes, as the production of items could be controlled more effectively by planning and control activities, enabled by the use of information technology. (Ghobakhloo & Hong, 2014) conclude that the relationship between IT-systems and *Lean* operations is inter-dependent and complimentary, and not mutually exclusive, as some may think. They conclude that IT investment is one of the key drivers of *Lean* promotion, especially when these systems enable controlling and effective production management processes. Although this study focused on the auto parts industry, their study demonstrated that IT-led to more sophisticated *Lean* operations and direct, better business performance. In addition to direct returns that can be expected from well-integrated IT-systems, the indirect benefits of improved organizational processes alone seem to make the use of IT beneficial in itself. They advise that the costs implied by IT implementation are off-set by the benefits of more efficient organizational processes. (Pinho & Mendes, 2017), in their systematic review of literature on the inter-relationship between *Lean* manufacturing and *Lean* IT, confirmed the contribution of IT-systems towards better organizational performance and the furtherance of *Lean* thinking but stressed that many IT-systems are not well integrated into the organization's *Lean* thinking, are not comprehensive enough, do not sufficiently consider the supply chain, and do not explore methods for addressing staff resistance. They do confirm that HR plays a significant role in strategy implementation, including *Lean* strategies.

Based on the above, it is concluded that IT application in support of *Lean* practices in health service organizations should equally well fit, as IT already plays an important role in *Lean* production planning and control, production management and enterprise resource planning, and advanced plant maintenance. (Riezebos, Klingenberg, & Hicks, 2009, p. 239).

Researchers have taken a vivid interest in the dynamics and human factors that play a role in the extent to which information technologies are being integrated into the business environment. It has long been realized that the diffusion of technology into the organization is not a straight

forward process, but depends largely on sets of human factors and dynamics, embodied by the term 'technology acceptance'. Much research has been focused on how people adopt computerized technologies in their work context (Rizzuto, Schwarz, & Schwarz, 2014). Despite the many advantages of technology incorporated into the workplace processes, many examples of failed information systems can be cited indicating that new technology adoption is not a given, and riddles with the potential of failure.

Examining an example of Information technology in an educational service context, (Morrisson & Nzuki, 2016) recognize that despite the heightened use of technology, adoption of e-learning must be accepted by teachers and learners alike, to see the technology adopted effectively. Without involving both groups of users, it is not a given that electronic technologies will be effectively integrated into the workplace. Amongst several determinants of failure, lack of learner support proved to play a large role, amongst others, mainly the lack of training that is associated with many users of technology. This example shows that amongst the varied responses to technology, two groups of users needed to buy into the technology to make it work.

Offering further perspective on IT integration in *Lean* practices, Ferreira, Almeida, and Grilo, (2018) indicate that IT in itself needs to be *Lean*-ed to assist the organization in being more effective in its *Lean* implementation. Adaptation of operations is therefore not a one-sided organizational strategy but needs the IT-system to be adapted continuously in support of the *Lean* thinking that prevails in the organization. They suggest that an initial IT-system could be designed to collect all kinds of information, some of which may later be regarded as superfluous, less-useful information or 'waste' or, but that the system should be adapted to support more *Lean* practices. This mutual adaptation process may lead to better incorporation of IT-technology in the organizational culture.

In conclusion, it appears that *Lean* operations in service industries have become an increasingly important field for research, with increases in implementation studies being observed as indicated by a systematic review by (Gupta, Sharma, & Viyaya, 2016). Furthermore, the role of IT in facilitating *Lean* operations in services appears undeniably important. Given the many difficulties associated with effectively implementing *Lean* and together with it, the use of supportive IT-systems, a better understanding is needed of how people in services contexts are ready to receive IT-systems and what contributes to their acceptance of technology in the service context. The discussion now moves towards a specific aspect of *Lean*, namely the support of IT-technology in promoting *Lean* operations.

- (i) For purposes of measuring familiarity with *Lean* conceptualization in this study, a suitable measurement instrument had to be sourced. Since *Lean* conceptualization is not the main

focus of the study, it was decided to measure this concept utilizing methodology developed by Malmbrandt & Ahlstrom, (2013) who developed items and dimensions for an instrument to assess *Lean* service adoption in an organization. Consistent with the levels of *Lean* integration proposed by Petterson (2009) the proposed survey to be used in the current study will only assess knowledge of *Lean* at the first level, which is the Toolbox level. This decision is based on the assessment made that *Lean* is not a well-known concept in the South African social services sector and that it can only be expected that respondents will have a very basic understanding of *Lean* conceptualization. It was decided to include an open question regarding knowledge of *Lean* conceptualization and allow respondents to answer this in an open-ended format as presented below.

The *Lean* operations questions based on the literature and proposed for the purposes of this study are:

Please describe your understanding of the term “*Lean* operations” in your work context.

Answer:

Further quantitative questions regarding *Lean* implementation were decided to be as follows:

The term "Lean operations" ✕ ⋮

Description (optional)

⋮

Have you heard of the term "Lean operations"?

No, I have never heard of it

I have heard of it, but it does not apply to the way I work

Yes, I know what it means and where I work we implement it actively

What is your understanding of the term "Lean operations"?

Long answer text

Figure 2-1 Questions about the understanding of "*Lean* operations"

The above questions ask whether the respondent knows anything about the *Lean* concept and then follows-up with a question asking the respondent to describe their understanding of this concept.

Further follow-up questions were asked to probe the respondent's exposure to *Lean* management in their respective workplaces. See the following Figure:

"Lean operations" in your work context ✕ ⋮

Description (optional)

Regarding "lean operations" where you work for.... (If private practice, think of this context)

	No	Unsure	Yes	Not applicable to ...
Is there a firm plan ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you participate i...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you support pla...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important is it...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is management co...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 2-2 Exposure of respondents to *Lean* concepts in the workplace

It is concluded that the above range of questions would be sufficient for gaining an exploratory sense of understanding of social service professionals' understanding of *Lean* conceptualization in the Industry they work in.

2.4 Health care professions and technology acceptance

Several studies indicate the advantages of information technology use in medical and health care settings. A study by Ker, Wang, Hajli, Song & Ker, (2014) has found that the introduction of "no carbon required" (NCR) and digital scanning technologies in medication distribution services in a hospital, showed a 54% reduction in queuing time, 32.4% in order entry time, 76.9% in outgoing delay time and 67.7% in outgoing transit time. Vastly improving processing times, this article demonstrated the advantages and gains of using technology in a health care setting. Health professionals have frequently been studied concerning technology adoption, and several articles suggest that these professions struggle with adopting technologies as they are frequently afraid that technology may replace their professional skills and pose a threat. (Shiferaw & Mehari, 2019) in an Ethiopian study indicate that doctors and nurses are frequently the most resistant group towards information technology use, as they are concerned that the introduction of technology would contribute to a loss of professionals autonomy, increase in workload, led to an expectation of more remuneration and unwillingness to be convinced by people other than their profession. Characteristic of low-resource environmental contexts, they also complain about resource

constraints limiting access to information technology. Recognizing that these views can be described as attitudinal it would be important to ensure that any study on the adoption of technology would likely include attitude as an important construct. The study found that doctors' reluctance to use technology is related to numerous contextual constraints associated with resource scarcity and access, whilst social influences and attitude towards using technology were the strongest predictors of whether they will use it.

Technical reliability issues of the technology are cited as the main hindering factor preventing active use of technology. Another study by Sharifian, Askarian, Nematollahi, & Farhadi, (2014) utilizing a sample of 303 nurses in an Iranian hospital found that nurses' reluctance to use hospital information technology is explained by the effort required to do so, the expectancy to perform in one's job, social influences to use it and a lack of facilitating conditions. The study concluded that if the hospital management were to encourage the use of the HIS, assisted nurses in using the system, and created the needed atmosphere that facilitates access and eases the use of the system, the actual use would likely increase. A study by Lu, Cui, Tong, & Wang, (2020) focused on the pre-adoption and immediate post-adoption phase of new hospital IS by physicians, attributing reluctance to adopt technology to changes in work processes and loss of status and power. Using Attachment theory, a psychological theory based on the premise that adoption follows a path of compliance, identification, and eventual integration. Compliance is driven by the hope that the adoption will result in a benefit such as recognition by others; identification results when the individual accepts social influences in maintaining a positive image in the reference group, whilst integration takes place when the suggested behaviour is consistent with one's values. They found that early reluctance to use technology resulted in poor adoption later on. Job autonomy was indicated as a major reason for lack of adoption, whilst social influences by peers promoted to use. They furthermore found that physicians who interacted with the system before implementation were more successful in adopting it than those who did not. Disappointment with the system after having had high expectations was found to be a negative factor adding to the reluctance. An earlier study by (Zhang & Gutierrez, 2007, p. 221) involved social workers and the use of information technology in their study on the adoption of technology in this sector of healthcare. Recognizing that these services are often provided with scarce resources and in resource-constrained contexts of non-profit organizations, the authors observe that the drive and commitment towards the mission of welfare often overshadow the burden of having to use information systems, whilst IT expenses are seen as diverting the organization's precious resources away from those in need to satisfy bureaucratic requirements. Furthermore, the concern for data privacy makes the manipulation of client data highly sensitive. Pressures associated with administrative processes are viewed as the main factors causing reluctance to use IT-systems. Taylor, (2017) identifies the potential risks associated with the protection of client

data and potential security risks as prominent reasons for the slow adoption of digital technologies in Social Work. Using the concept of perceived usefulness, these authors postulate that social service workers will tend to put the interests of their clients first at the expense of the potential benefits to be gained from using an electronic administrative system. This means they will take less interest in administrative processes whilst services to their clients become paramount. Technology adoption is also low because social workers need to be convinced first that technology will benefit them and are not to the detriment of their clients. Due to resource constraints in these types of organizations, technical support, and training in the use of the system is often absent and sometimes limited to inputs from knowledgeable colleagues. A remarkable finding from this study was that *social influences* played a significant role in the actual use of the system, indicating that social workers would place their work commitments to clients before the use of a system and that they would not succumb to the pressures from management to use the system. Bullock & Colvin, (2015), whilst using TAM theory in assessing the use of IT-systems by social workers, largely observed similar reasons for social service professionals in organizations not using IT-systems as indicated above. The 'service commitment' of social workers in these studies simply overrode the need to use and adhere to organizational requirements to keep data updated in the IT-system. These authors argued that the advancement of digitization will eventually force social workers and health care professionals into using digital and IT-systems in future. Also that social service organizations in the US increasingly began requiring mandatory use of IT-systems for reporting purposes and that this would drive these professions into using IT-systems more consistently. A study on technology acceptance by social care workers in the UK (Mohammed, White, Wang & Kai, 2018) explained low technology acceptance in terms of less emphasis by the organization on the importance of IT technical and information skills. In the context of social care services rendered directly at the homes of patients with chronic health problems, the service workers worked mostly away from the office, making them less concerned about updating their administration on the office IT-system whilst paper-based administrative files in these circumstances were regarded as sufficient in any way. The study revealed that 68% of these home caregivers were using their own computers at home to perform office administrative work, as the organization did not provide computers to its workers.

A study by Sharifian *et al.*, (2014) examined Technology Acceptance in nurses at a variety of Iranian hospitals, totaling a sample of 350. The study can be regarded as a post-adoption study in that the nurses were already using the hospital Information system at the time of the study. Four hypotheses based on the original UTAUT model were examined, specifically to determine if *Performance Expectancy*, *Effort Expectancy*, *Social Influence*, and *Facilitating Conditions* predicted *Behavioural Intention*. Using Structural Equation Modelling (SEM) all four hypotheses were supported, confirming the traditional UTAUT model. The conclusion reached was that the

predictive power of the four factors was substantial and accounted for the behavioural intention to use the hospital information system. *Performance Expectancy* was by far the strongest predictor, suggesting that PE is the most significant predictor of Technology Acceptance. Although Social Influence was an effective predictor as well, its impact was less significant than the other dimensions. The assumption was made that sanctioning of the IT-System by the Hospital management largely contributed towards this effect. Due to the otherwise sufficiently developed hardware situation in Iranian hospitals, the effect of hardware requirements as part of Facilitating Conditions was found to be minimal. An aspect not considered in this example, and considered to be a limitation, concerned the nature, or composition, and type of functionality provided by the Hospital Information System. In the researcher's perspective, this can be expected in the case of a post-adoption study, and an aspect to be considered in pre-adoption studies such as the current study that can be considered pre-adoption. In the case of this study, the IT-System under consideration exists in concept only to the respondents, as most respondents have not as yet experienced this example of an IT-system.

2.5 IT-Systems in Social Service contexts

Apart from government-initiated social services by state departments such as Health, Social Development, Corrections, Police, local government and municipalities, and several other state departments making up the main work context for professions such as social workers and psychologists, the second-largest context is undoubtedly the non-profit and non-government sector. According to (Skhosana, 2020) some 60 000 social service professionals have been registered at the SA Council for Social Service Professions (SACSSP). Of this number, about 31 000 are registered as social workers and about 10000 as child and youth care workers. The NPO sector has not-for-profit objectives and many social workers that perform their duties in the context of these organizations are paid by income generated from either government subsidy, or grants received from private funders and donors. It is estimated that the average salary for social workers working in NPO's is about R169,665, whereas the CEO's of these organizations earn on average R644,799 annual incomes. Programme managers in this context earn about R351,330 per year (https://www.payscale.com/research/ZA/People_Employed_in_Non-Profit_Organizations/Salary). Many of these NPO organizations rely on donor funding, whilst increasingly some of these can be classified as Social Enterprises that drive profit objectives and, defined as the harnessing of entrepreneurial activities in the interest of supporting social, often basic needs left unaddressed by formal economic or social institutions (Littlewood and Holt, 2018). A further characteristic of the NPO or social enterprise is that these organizations seldom create profit and if they do, most of the profits are not generated for distribution to shareholders, but for re-allocation to purposes of achieving the social objectives and public causes of the

organization (Chikadzi, 2014). Stewart, (2013, p. 21) maintains that NPO's form an important part of the economy and civil society, delivering services and contributing to various interests from sports to arts to social services. He maintains further that many of these organizations consist of volunteer members who devote some of their time to these organizations, are geographically spread out, and have a diverse membership that in some instances can be considered limitations in the way these organizations operate. Emphasizing the potentially important role of electronic technology in these organizations, it is concluded that IT-technology or even electronic communication technologies may supplement and enhance the way NPO's operate and sustain their activities. Three classes of factors are identified that may contribute to the acceptance of technology in these organizations, the first being the organization itself. Unless the organization can see the value of IT-technology as an efficiency-enhancing mechanism that can lead to cost-saving, they will be reluctant to adopt these technologies. The second factor is the environmental context. Considering the efforts of other organizations to adopt IT-technologies, it becomes critical in one sense for NPO's to follow suit by realizing that competitive advantage can be gained by adopting IT-technology, the competitive environment drives technology adoption. The third factor is the result of using IT-technology which in the case of the NPO lends a certain amount of legitimacy to the organization. For example, by not adopting IT-technology, the NPO remains entrenched in manual methods for collecting and utilizing information. These methods have, in the rest of the world at least, become obsolete because of their lack of accuracy and painstaking effort that is necessary to collect information and painfully transform it into meaningful information. These authors refer to a related factor that is the organizational management's IT-knowledge, competitor scanning ability and leadership in the field that have consistently been identified as significant predictors of technology adoption in these settings. Stewart argues further research in the NPO context is necessary as most of existing studies mostly focus on young student populations that have a certain disposition relative to technology. This seems to prevent in-depth understanding of the NPO organizational context and dynamics that determine Technology adoption, it seems. Overall, this author seems to suggest that a greater understanding and sensitivity towards the rather unique and complex environmental dynamics of the NPO seems eminent to understand properly what makes these organizations adopt and accept technologies. This question lies at the centre of the current researcher's work in this field as well, as the case study that follows will demonstrate. In this instance IT-technology adoption was not a given and its rejection, though considered counter competitive and counter-productive, nevertheless driven by NPO dynamics of which lack of funding was a major factor.

Stewart found that perceived ease of use was a dominant factor. Users were not primarily interested in learning how to use technology and had little interest in the technology "feature exploration". Part of this was the perceived ease of use, and own capability or self-efficacy to use

the technology. The opposite was also true that computer anxiety proved to counter self-efficacy and cause users to feel incompetent. Further factors of importance were the issue of training availability; whether the use of technology had a playful or fun element for those who were comfortable using technologies such as computers. Perceived usefulness seemed paramount in ensuring success, although this factor alone is not enough to ensure adoption takes place. Further factors were social influences and image associated with using IT-technologies, the prestige value associated with using IT. If the technology makes doing one's work more effectively that kind of justifies the adoption of it, whether you like it or not, Stewart found. Factors such as the perceived appropriateness of using the technology, whether users thought it to be applicable, were found to play a significant role in adoption. An important factor consisted of the extent to which the technology complemented the work one is doing, whether it promotes respectful work-practices. It is assumed this aspect refers to whether the technology fits one's work. This latter aspect is close to the heart of the social service professional that has a primary objective, rendering counseling and supportive services to other people.

A further significant finding considers notions of *Lean* practices – the ability to perform multiple tasks that are enabled by the use of technology. Multi-tasking is sometimes negative, such as when people use social media whilst in a meeting, which can be disturbing to others. The issue of respect is a factor also when people use computers for their benefit, browsing the Internet for instance for their purposes. According to The Independent, a UK social worker was dismissed after having watched porn on his work computer on more than 1296 occasions (<https://www.independent.co.uk/news/uk/home-news/porn-watching-council-employee-loses-job-after-spending-half-his-time-xxx-sites-a7447051.html>). The overlapping of personal and work matters because of greater technology integration in one's lives seems to have pertinent consequences for workers, maybe especially in the social services context. (Swanepoel & Roestenburg, 2016) found for instance that social workers tended to use social media for purposes of reflecting on their work, by sharing their experiences with colleagues who gave them social support.

Taylor, (2017) alerts about the complexity of the social service context as a space that involves people things, places, and spaces where social work is practiced, and this now includes digital technology. Referring to a UK context that is much more technology-oriented, she believes that technology in this work context is so enmeshed with people elements that this close relationship is not an easy one. Recognizing the benefits for the legitimacy of the organization, there is an imminent danger that the human focus may disappear from the social service context as a result of an over-emphasis of digital technology, perhaps including IT-technology. This concern is ever more relevant within a COVID-19 context that has forced many people to work from home, even

social workers. Although much of the concern raised in this article is about digital technologies in general, and not specifically limited to IT-systems, the potential interference of technology in a human and social-focused space should be considered as possible context-specific forces that influence technology acceptance in this context.

Mohammed, White, Wang, & Kai, (2018) share some of Taylor's concerns that IT-technology may interfere with the user's work behaviours and claims that most of the system's failures in this sector occur during the period of implementation when people experience changes to their work routines and behaviours. They warn of the negative results of failures when people are more reluctant the next time an IT-system has to be adopted. Commonly encountered argumentation also provided by Bullock & Colvin, (2015) that social services cannot effectively be provided online have since been countered, yet continue to prevail. Arguments that digital technologies cannot duplicate the live therapist-client relationship have proven to be not the case. Other perceptions that drive resistance in this sector, such as the perception that investment in IT-technology removes resources (monetary) from service users (clients) who need it most and that the purpose for the technology is often not clearly communicated. These authors claim the negative perceptions cited here and lack of acceptance are a global concern. Their study findings of a survey amongst 56 care workers doing mostly home-based care indicated that IT-technologies in social care situations were there to stay, and other than in South Africa, it was realized by respondents that this is indeed the case, whether they liked it or not. Better adoption would be established if the expected effort (effort expectancy) was lower and the self-efficacy of users could be increased using training in IT-skills. Contextually, this differs from South African conditions, where the use of IT-systems in social service contexts is not expected by anybody, also not the state, resulting in less demand or pressure to adopt technology because it is expected of the organization. They admit that current work practices are persistently paper-oriented and therefore not well-suited to cross over to digital formats, a factor that is prevalent in the local context as well. They concede that social care staff needs to realize that technology will dominate the future and therefore has to be adopted (a kind of sanctioning approach), a driving force towards adopting technology (Mohammed, White, Wang, & Kai, 2018, p. 274).

Another prevailing perception is that IT-technology in social services is predominantly a management tool, and as such offers little use to frontline social workers who work directly with people and do not use the technology for bettering their work, thereby disregarding notions of time and effort saving (*Lean* operations) that underpin technology used in many instances (Bullock & Colvin, 2015).

2.6 Conclusion to section

The conclusion is reached that technology acceptance in social service organizations is complex, and characterized by complexities that directly relate to the way social workers perform their duties. It can be expected because of these complexities as outlined above, that technology acceptance may indeed take a long time to dissipate fully into this sector, and that those factors that inhibit the adoption of IT-technology in this sector should definitely and concretely be considered in attempts to introduce IT-technology in this sector. To take the central argumentation of this research further, technology acceptance in the local context should now be considered.

2.7 Local acceptance studies of IT technologies in social services

Little information could be sourced regarding the use of IT-systems by South African social workers or their organizations. No specific publications were found that specifically focused on IT development for the social services sector. The researcher, being active in the field of IT-system development within this sector, has focused his research on introducing IT-systems and improved information management practices to social service organizations since the year 2000. A Master's research dissertation on the development of an information management model for an Employee Assistance Program at a mining company (Roestenburg, 1993) examined the nature of information processes by "human service organizations" and recommended ways in which data could be collected in organizations whose primary products are the provision of "intangible" psychological and social services to clients and patients as consumers of these kinds of services. Although this work at the time had little to do with electronic health records or IT-systems directly, it attempted to design structural components for collecting electronic data that was relevant to social service organizations and indicated how service information (i.e. clinical client records) could be used for improving the operations of social service organizations as decision support systems, and how this kind of information could be used to improve the nature of clinical services to the clientele of these organizations. Roestenburg's subsequent work in this regard has involved research efforts towards developing improved clinical assessment practices of social workers, improving the development of measurement scales and tools that invariably improve the clinical precision of social services, the quality, consistency, and professionalism of social work services, and finally the development and implementation of locally relevant IT-systems. The researcher's own experience in this regard is illustrated in the following case example narrative of the introduction of a locally developed IT-system in the social services sector:

2.8 Introduction to the CORE-DMS system (Roestenburg, Oliphant & Ludick, 2012)

The researcher, in collaboration with a South African national welfare organization in the social services sector, jointly developed the CORE-DMS information system for social service organizations from 2006 – 2008. The development of the system was in response to a need expressed by this organization to introduce an IT-system that would enable them to more effectively process client and service information and use this information for more effectively managing the organization and the operations involved. The host organization at the time had several (approximately 50) branch offices across South Africa; it rendered specialist counseling services in the field of family and marital problems, and it wanted a centralized IT-system that enabled them to know what was happening at their branch offices by drawing operational statistics from each office and improving services provided by these offices. The developers of the system used project management processes that involved regular consultation with the host organization, proper assessment of their needs, joint design consultation, and testing of system components before implementation, to build the IT-system according to specifications. The development was coordinated by a joint task team to ensure the designed features met the organization's needs. Owned by the researcher's technology company, Afri.Yze Consult (Pty) Ltd, this IT-system could be described as an expert *social service case management system*. Operated from a web-based platform, the system was designed to allow social workers at the organization to perform the following functions:

- Create client files and manage records for purposes of making entries regarding client assessments and diagnosis, writing clinical case notes about clients
- Scheduling service appointments with clients and planning services jointly
- Entering client-focused activities, appointment durations, treatment information, and service outcome assessments.
- Store paper-based client reports and records relevant to each case.
- The system enabled management decision making on strength of push-button controlled statistical information that could be drawn from the CORE-DMS system for purposes of monthly performance reports, meeting statistical requirements by the Department of Social Development, and internal decision making.
- The system provided an early version of a dashboard of information to users of the system that could be used for assessing one's performance, inform one about caseloads and priorities, and being reminded of tasks to be performed.

2.8.1 Operational characteristics of the CORE-DMS

The CORE-DMS required individual social workers to enter the data obtained from clients and each was required to manage their client transactions, enter data, and write reports. The system required social workers to enter client data and reports daily, preferably straight after providing counseling services to clients. In this manner, the IT-system would be a live system that was constantly updated. Regular updating of client information meant better accuracy in the system as transactions were logged daily. The CORE-DMS required users to have an internet connection as it had to be accessed online. Users could use their PC at home, at the office, or even their cell-phone to access the system and enter data. All data was stored in the Cloud, and the head office of the organization was able to pull statistics from the system with push-button activated queries that gave them basic reports of operational activities.

2.8.2 Implementation

The CORE-DMS was gradually introduced to users utilizing a pilot testing phase during which volunteer users played with the system, received training in the use of the system, and were under no pressure to implement it in real-time use. After about one year of this form of pilot testing, several adjustments were made to the system structure after which the system was finally implemented for use by all service offices in 2012. The final implementation took place at an annual general meeting of the host organization and was regarded as the product launch, although it was not presented as such. Use of the system was not mandatory and a more psychological “soft” approach was followed by management requests to start using the system.

At the time of introducing the system, it was regarded as an innovation and a first for this particular sector, as before this system, the organization only had paper-based manual data collection systems involving filing cabinets and client files containing clinical notes and reports. Generally, the system was hailed as a first in the South African social services context and welcomed by the organization as an improvement.

2.8.3 Acceptance of the CORE-DMS technology

The initial implementation was received positively and commitments were made by system users to start using the system in their respective offices. At the time the host organization had about 60 branch organizations across South African, and some 300 users were registered to the system.

During the immediate post-implementation period, some resistance was encountered with some users, and subsequent training assisted in resolving issues. However, as time went by, the uptake of the system remained slow and limited to early users who showed interest and actively collaborated. During the five years following the implementation, the active usage of the system was limited to about 15 – 17% of employees and at about seven offices. Regardless of the low

uptake, at the end of the first five years of use, the system had collected about 57000 opened cases for clients, presenting a large data set that could render significant analysis capacity and can be considered a big data set. However, most of the data that was entered consisted of biographical information, and little was done to provide social service relevant data that was considered key to real operational analysis and decision making. Since most of the branches that adopted the system never used it beyond the entering of client demographical information, the organization was never able to draw any reliable statistics and most participating offices continued using a parallel system of both paper and electronic files. Head-office also did not force branch offices to use the IT-system, as branch offices had a certain autonomy and independence to decide whether to use or not to use the system. Because adoption of the IT-system was voluntary, many branches chose not to adopt the system, and most carried on using their old, trusted paper-based system, although the reports obtained using the old system were grossly inaccurate and required several administrative personnel to painstakingly collect Excel spreadsheets of data that were completed each year for purposes of annual reporting. Eventually, and after a new national director was appointed, the electronic IT-system was declared a failure and was considered too costly to be maintained and used any further and was de-commissioned. The organization then reverted to its former manual and paper-based methods of data collection, where it is today.

Several reasons for the lack of technology acceptance can be identified in this case study that contributed to the eventual decline and decommissioning of the system, some of which were:

- (a) Users didn't know clearly how to use the electronic IT-system. The training that was offered was attended by many employees, but training was expensive as it was done live and required employees to travel long distances to attend the training.
- (b) Most branches struggled with internet connectivity issues and outdated, obsolete hardware such as computers. Once again, budget constraints prevented technological advancement at the offices.
- (c) The system initially had technical glitches that caused it to be out of operation at times, creating the perception that the system was not reliable. The developers found that most problems perceived to be system-related were caused by users not operating the system correctly, rather than technical problems with the system. With many offices using dial-up connections at the time, the system was slow and tended to "hang" when internet connectivity was weak. Users who generally had low technological prowess blamed connectivity issues on the IT-system and this caused its popularity to dwindle. Users struggled to see the time-saving of the system. Technical backup was provided, but this did not include hardware replacement or solutions to connectivity issues. Thus, whilst an office

intended to use the IT-system, if they could not afford more bandwidth and line speed, the system could not be used, no matter how technologically advanced it was.

- (d) The cost of operating the IT-system competed with budget funding that was allocated for the primary services to clients. This was consistent with the findings of Bullock & Colvin, (2015), who made similar observations in the UK system.
- (e) Not enough training could be provided as a result of insufficient budget and geographical distances that have to be overcome.
- (f) The organization had certain expectations of the system that could not be fulfilled. For example, management did not understand the need for ongoing maintenance of the system and the costs for maintaining the system were difficult to defend. Management was unwilling to enforce the use of the IT-system at the branch offices, claiming that their affiliation rules prevented them from demanding mandatory use. Despite requests to provide a budget for training, a dedicated budget item could never be achieved. At some branch offices, individual managers had built their own Excel spreadsheets for keeping a record of operations and they insisted to keep working with these, despite the positive benefits of the IT-system. Management did not have a change management strategy and responded poorly to requests to develop such a strategy. These problems, together with an external demand by the Department of Social Development (DSD) that all evidence of services and monthly statistics must be available in a paper-based format for on-demand inspection and audit purposes caused offices to rather keep paper records and discard the electronically generated records. DSD also tended to change their information requirements, and the IT-system could not keep up with changing to the variables the DSD wanted. The developers concluded that too many forces were at play to make the system's use feasible in the long run.
- (g) A preference to go back to the previous paper-based information system that gave them tangible client files that they could put under the arm and browse whenever they wanted to. This can be described as 'set behaviour patterns' that led to resistance.
- (h) The organization did not understand the pricing model and the CEO indicated that a system was needed that could be downloaded on their PCs and that they could own. They were not comfortable with not having something tangible in their machines and felt their data was not secure in the cloud.

As a result of these perceptions, the organization terminated the contract with the supplier and the CORE-DMS was de-commissioned in 2015, after five years of use. As developers, we

evaluated the failed technology and attributed its failure, not to its technical shortfalls, but mostly behavioural and perceptual issues with the concept of technology use. During the five-year implementation period, the use of the system never reached more than 15% indicated. As a result, the system was never able to generate reliable operational statistics for the organization, and no efforts were made to increase the uptake in use. Fortunately, after five years, the system is currently successfully used by one of the branch organizations that was actively involved in the initial development effort and they intend to use it in the future.

2.9 Relevance of the case study in terms of the current research

The above case study of an existing IT-system and how it was not accepted or adopted in a social service context provides meaningful and significant background to this study as it demonstrates the low level of IT-system uptake and acceptance in a local social service context, and the conclusion that those problems experienced in the local context are vastly similar to what was observed by (Bullock & Colvin, 2015) in the UK context. The CORE-DMS can be described as a useful benchmark example of an IT-system that was designed for the South African social service sector but was not effectively accepted and adopted by the users of the system at the organization it was implemented. For many social workers in the host organization, the CORE-DMS was the only reference they had of such an IT-system and they lacked experience in managing it as a resource. No other organization (NGO sector) appears to have a comparable system at present, except for commercial social service organizations such as Careways¹ and ICAS², two service providers in the commercial counseling sector that use their in-house online platforms, but this is only available for affiliates to the organization, and this is a rather limited number. The Department of Social Development, as the primary state department responsible for social services, collects operational information from all NGO's and state departments involved in the provision of welfare, social and counseling services, but this is done in a manual, paper-based format not involving a computerized IT-system. Plans have been afoot for many years to develop an integrated electronic IT-system for use by this department, but no such system has been delivered or implemented to date. It is concluded that the State department's paper-based information system is likely to be used for several years and that this will influence many organizations to continue using the paper system, whilst budget issues at non-government non-profit organizations will prevent many organizations from adopting IT-systems for several years.

¹ "Careways" is a private, commercial Employee Assistance Programme, member of the Life Healthcare Group (Pty)Ltd.

² ICAS Southern Africa (Pty) Ltd is a private, commercial Employee Wellness programme that renders services to the South African corporate landscape

2.10 Conclusion

Considering the above case study, the following conclusions are drawn:

The concept of '*Lean* thinking' and '*Lean* production' has been thoroughly researched in different contexts, mainly in manufacturing, but as of late also in service industries such as education, hospitality, and health care. Its importance in the health services sector is well recognized, but much work needs to be done, especially locally, to integrate this concept in the health care sector in general, and specifically in social work and welfare contexts. Especially in the latter context, the concept is unknown as hardly any studies could be sourced that actively discuss *Lean* in social service contexts.

The value of IT-systems as a complementing and inter-dependent system with *Lean* objectives in organizations has been realized and is actively studied to further *Lean* strategies in organizations. Again, the acceptance of IT-systems in health care contexts is received with varied success, and indications of resistance and professional boundaries mark the use and integration of the IT-system in this context. It is concluded that relatively few studies examine technology acceptance by human service professions such as social work, psychology, and nursing, or social service contexts, probably because of the low uptake and workplace requirement for IT-systems and a possible low perceived utility value for such systems. A localized search for studies focused specifically on IT-systems in social services returned no results and those few known examples the researcher knew about anecdotally, appear to be no longer in use. Inquiries made to the South African representative forum for non-government social service organizations NACOSS³ (<http://www.nacoss.co.za/about-us.php>), indicated limited use of IT-systems, and where those were used, these were relatively simple systems relying on programmes such as Excel. No electronic systems are known to exist and none of these are used online, enabling live updating of the database. It is further concluded that most professional sectors, including social services, will be expected to increase their use of technologies soon, or risk falling into inappropriateness and inability to report on their activities.

The above case study outlined a case of non-acceptance and rejection of IT-technology, and given the extent of rejection and discontinuation of a dedicated IT-system, further explanation of the factors that contributed to this rejection needs to be made, and for this purpose, the author introduces a theoretical perspective that that can assist in this.

³ NACOSS – National Coalition for Social Services – a voluntary coalition of organizations committed to providing developmental social welfare services to the vulnerable and people in need throughout South Africa

2.11 The Unified Theory of Acceptance and Use of Technology (UTAUT)

Amongst the different approaches towards measuring technology integration and the development of these approaches over time, two stand out as being frequently used and worthy of discussion. The first is the *Unified Theory of Technology Acceptance and Use* (UTAUT) theory was developed in 2003 by authors (Venkatesh, Morris, Davis, & Davis, 2003), tested and presented as a state of the art theory for viewing technology acceptance and use in various contexts. This theory is based on several other theories developed earlier, eight of which were used at that time to derive the current model. These were the Theory of Reasoned Acceptance (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), combined TAM and TPB (C-TAM-TPB), the Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT) and Social Cognitive Theory (SCT). Since its introduction, the UTAUT became the primary theory for use in estimating acceptance of technology in users. This theory stands central as a perspective in the current study and forms the basis for the measures used in this study. More information about this theory, its concepts, and constructs, assumptions, and premise will be provided in Chapter 2. The original UTAUT was updated in 2012 and is now known as UTAUT2 (Venkatesh, Thong, & Xu, 2012). This format integrated voluntariness as a construct and is also frequently used in technology acceptance studies.

2.12 Factors that influence the acceptance and use of Technology in the industry

It has been long established that in the interest of organizational needs for information and using the information to improve business processes, technology can play a major role in this process. It has also long been confirmed in IT adoption literature that the adoption of IT-systems won't be effective unless this technology is used by people. This has led to the conclusion that technology adoption is driven by several socio-technical factors that either facilitate or limit the use of IT-technology by the users. Evidence suggests that up to 40% of changes in the IT field lead to the failure of it being adopted (Sharifian, Askarian, Nematollahi, & Farhadi, 2014). They conclude that individuals' acceptance of technology and utilization of technology together constitute the most important factors leading to effective technology implementation and adoption of technology in the workplace. It is furthermore concluded in several studies that a technology such as IT-technology is about just as effective as the extent to which it is being used (Mohammed I Ahmad, 2014). Theory on technology adoption has mainly centered around two initial strands namely, user satisfaction with technology and Technology acceptance (Mohammad I Ahmad, 2014).

Satisfaction is about the sum of one's feelings or attitudes towards a variety of factors towards the situation, and these culminated into a range of factors that determined one's behaviour towards using technology. These various psychological factors have been described in amongst other, Technology Acceptance Models and eventually into the Unified Theory of Technology Acceptance (UTAUT). (Sharifian, Askarian, Nematollahi & Farhadi, 2014) argues that technology development, use, and acceptance of It are quite different functions, and various studies have been conducted to examine these different aspects, jointly considered as technology acceptance. Some of the theories that have been used in the past to explain technology acceptance include the Theory of Reasoned Action, the Technology Acceptance Model, the Theory of Planned Behaviour, and the Model of Personal Computer Utilization (Dwivedi *et al.*, 2019, p. 719). The UTAUT offers a combination of eight different theories that have historically been used to explain the process of technology acceptance and use in various contexts. This combination has been found to offer a more effective explanation of the user's intentions to take up IT-systems and use these. For example, evidence suggests UTAUT can explain up to 69% of intention, whereas previous models only explained a maximum of 40% of intention (Sharifian, Askarian, Nematollahi and Farhadi, 2014; Dwivedi, Rana, Jeyaraj, Clement, *et al.*, 2019). A positive feature of the UTAUT is that the model proposed four moderator variables, gender, age, experience, and voluntariness to further enhance the predictive power of the model. Some limitations may be inherent to the UTAUT model, such as the role of voluntariness, as in some studies users were already expected to use the IT-system under study, and then voluntariness did not play a role or could not be measured. Critique is levelled that technology acceptance may be due to sets of personal characteristics that could influence a person's adoption of technology, factors stemming from an individual's engagement behaviour with the technology, but it was also found that these factors were only examined in about 25% of studies based on UTAUT (Dwivedi *et al.*, 2019, p. 721). The latter study shows evidence that UTAUT could be expanded by the inclusion of an attitude dimension, as this was found to additionally predict behavioural intention, yet few studies have adopted this suggestion or added it to the range of dimensions of measurement. Of value was the reflection on the role of the moderating variables that may be considered reflections of voluntariness. The above study concluded that moderating factors may be excluded from UTAUT studies where the use of technology is already in phases typically considered "post-adoption", or situations where the technology was adopted by senior management and the use thereof is mandatory.

Constructs of the UTAUT instrument that will be used in this study:

2.12.1 Dimension 1 Performance Expectancy

This construct is defined as the extent to which a person believes that using the system will help achieve gains in the work situation; thus that performance is enhanced. Performance enhancement is measured by the perceived usefulness, my extrinsic motivation, how I see the technology fit my job, and the expectation a person has of the technology in advancing their job or improving the outcomes of their job. High scores on any of these constructs predict the intention to use the technology, even if it is expected of one to use it (Mohammed I Ahmad, 2014).

Table 2-1 *Performance Expectancy* dimension

PE		
Construct	Definition	Item
Perceived Usefulness (PU)	The degree to which a person believes that using a particular system would enhance his or her job	<ol style="list-style-type: none"> 1. Using the <u>CORE-DMS</u> in my job would enable me to accomplish tasks more quickly, 2. Using the <u>CORE-DMS</u> would improve my job performance. 3. Using the <u>CORE-DMS</u> in my job would increase my productivity, 4. Using the <u>CORE-DMS</u> would enhance my effectiveness on the job. 5. Using the <u>CORE-DMS</u> would make it easier to do my job. 6. I would find the <u>CORE-DMS</u> useful in my job
Job-fit	How the capabilities of a system enhance an individual's job performance	<ol style="list-style-type: none"> 1. Use of the <u>CORE-DMS</u> will not affect the performance of my job (Reverse score) 2. Use of the <u>CORE-DMS</u> can significantly decrease the time needed for my important job responsibilities. 3. Use of the <u>CORE-DMS</u> can significantly increase the quality of output on my job. 4. Use of the <u>CORE-DMS</u> can increase the effectiveness of performing job tasks. 5. Use can increase the quantity of output for the same amount of effort.

PE

Construct	Definition	Item
		6. Considering all tasks, the general extent to which use of the <u>CORE-DMS</u> could assist on the job. (a different scale used for this item).
Relative advantage (RA)	The degree to which using innovation is perceived as being better than using its precursor	1. Using the system enables me to accomplish tasks more quickly. 2. Using the <u>CORE-DMS</u> improves the quality of the work I do. 3. Using the <u>CORE-DMS</u> makes it easier to do my job. 4. Using the <u>CORE-DMS</u> enhances my effectiveness on the job. 5. Using <u>CORE-DMS</u> increases my productivity.
Outcome Expectations	The consequences of the behaviour. Can be divided into performance expectations and personal expectations, or can be used as a single factor	If I use the <u>CORE-DMS</u> ... 1. I will increase my effectiveness on the job. 2. I will spend less time on routine job tasks. 3. I will increase the quality of the output of my job. 4. I will increase the quantity of output for the same amount of effort. 5. My co-workers will perceive me as competent. 6. I will increase my chances of obtaining a promotion. 7. I will increase my chances of getting a raise.

Hypotheses formulated according to the UTAUT model specifications

H1. PE has a positive influence on the Behavioural Intention to use the CORE-DMS or similar system.

2.12.2 Dimension 2: Effort Expectancy

This dimension measures the extent of effort it will require a person to use the IT-system. In the UTAUT this dimension is represented by three constructs, perceived ease of use, the complexity of the technology, and ease of use. According to the scale developers, this expectancy is more prevalent at the start of implementation and may be affected by whether the using technology is mandatory or voluntary. Since adoption is a process, it can be expected that effort will decrease as proficiency/skill in using the technology increases.

Table 2-2 Dimension 2: Effort expectancy

EE		
Construct	Definition	Items
Perceived Ease of Use (PEU)	The degree to which a person believes that using a system would be free of effort.	<ol style="list-style-type: none"> 1. Learning to operate the <u>CORE-DMS</u> would be easy for me. 2. I would find it easy to get the <u>CORE-DMS</u> to do what I want it to do. 3. My interaction with the <u>CORE-DMS</u> system would be clear and understandable. 4. I would find the <u>CORE-DMS</u> to be flexible to interact with. 5. It would be easy for me to become skilful at using the <u>CORE-DMS</u>. 6. I would find the <u>CORE-DMS</u> easy to use
Complexity	The degree to which a system is perceived as relatively difficult to	<ol style="list-style-type: none"> 1. Using the system <u>will take</u> too much time from my normal duties.

EE

Construct	Definition	Items
	understand and use.	<ol style="list-style-type: none">2. Working with the <u>CORE-DMS</u> <u>looks</u> so complicated, it is difficult to understand what is going on.3. Using the <u>CORE-DMS</u> involves too much time doing mechanical operations (e.g., data input).4. It <u>will take</u> too long to learn how to use the system to make it worth the effort.
Ease of Use (EU)	The degree to which using innovation is perceived as being difficult to use	<ol style="list-style-type: none">1. My interaction with the <u>CORE-DMS</u> system is clear and understandable.2. I believe that it is easy to get the system to do what I want it to do.3. Overall, I believe that the <u>CORE-DMS</u> system is easy to use.4. Learning to operate the <u>CORE-DMS</u> system is easy for me.

Hypotheses regarding dimension

H2. *Effort Expectancy (EE)* has a positive effect on the *Behavioural Intention (BI)* to use the CORE-DMS or similar IT-system.

2.12.3 Dimension 3: Social Influence (SI)

Defined as the degree to which an individual behaviour towards the technology is driven by the belief that someone else in the organization expects him/her to use it. This measures the perceived importance of using the system, whether it would be socially expected to use it. Social influences are relative in that if the use of technology is voluntary, its effect is diminished. It further diminishes by time as the technology use becomes integrated and the effect of social expectation wears off. Individual use is influenced by concepts such as compliance, internalization, and

identification and the effect is more profound when the system is promoted by those in power positions. *Social Influence* is therefore relative to whether the technology is used mandatory or voluntary. It is also shown that gender may influence social influence as women for example are more sensitive towards issues such as compliance. (Lu, Cui, Tong & Wang, 2020) in a study on the psychological theory of attachment applied to the IT-adoption of physicians in Chinese hospitals, proposed that three adoption concepts play a role in technology adoption. According to this theory, behavioural intention is driven mostly by social influence, which in turn is composed of concepts such as compliance, identification, and internalization.

Compliance refers to the tendency to accept induced behaviour, such as using an IT-system on strength of the hope to achieve a favourable reaction from another person or group. Compliance is achieved by *reward* systems that reinforce the image or provide gains such as salary or incentives, or by negative sanctioning, such as disapproval by one's superiors. Reward systems can be achieved by pre-adoption training and creating a positive image with the user of the to-be adopted the technology. It is hypothesized that compliance changes after adoption in that people start using a system, only to realize that they don't like it. Sanctioning seems to be more effective in post-adoption phases, although its effect easily becomes counterproductive.

Identification takes on a more internal motivational factor and assumes that an individual will accept induced behaviour if he can gain an acceptable image from the reference group that invariably enhances that person's standing or status in the group. It is therefore expected that positive image gains usually motivate people to use a system post-adoption. It can be hypothesized that the effect of image gain may be less for contexts such as health care where physicians and social workers regard their work with patients as more important than image amongst colleagues.

The third construct, *internalization* refers to the tendency of an individual to adopt a new behaviour if the new behaviour is seen as consistent with his value system and actually will help him solve problems in his context. In contexts where individuals work together with colleagues and they can easily see and experience the value of an IT-system in the work of others, they tend to be more positive about the gains of that system, according to the authors. Internalization thus occurs when one sees the value of information in one's own and other's work. It is concluded though that internalization is likely to occur in the post-adoption phase when users are already actively engaged in using a system and this social effect begins to play a role. Internalization may be mediated by difficulties experienced in the use of the new IT-system.

The findings of the Lu *et al.*, (2020:p. 9) study concluded that compliance as promoted by rewards and sanctioning as well as internalization played a role in pre-adoption behaviour, and imaging

appears to play a more significant role in post-adoption behaviour. The explanation offered relates to the professional patient-centered approach that dominated the intention to use the system and therefore image factors counted less in the actual adoption. Reward systems may play a larger role during the initial introductory stage as well as during mandatory use. This confirms what the author has found in the preliminary work to this study as indicated in the case study discussed in Chapter 1. It appears from this study that incentives and rewards, as well as sanctions, may be more feasible strategies for promoting uptake and adoption in the pre-adoption phase when systems are considered for implementation. This will help to get buy-in on the system during acquisition decisions. Internalization effects can be more likely expected during post-adoption processes where users start using the system and at least in a health care context, begin to realize its value as a tool. Whether image plays a significant role in either phase and what role it plays seems less clear in this study. The authors concluded that it played less of a role in pre-adoption, and more acutely in the post-adoption phase. It is doubtful if image gain plays a significant role in health care contexts.

We provide the operationalization of the *Social Influence* construct as represented in the UTAUT scale within Table 2-3.

Table 2-3 *Social Influence* construct of UTAUT

SI		
Construct	Definition	Item
Subjective norm	The person's perception that most people who are important to him think he should or should not perform the behaviour in question.	<ol style="list-style-type: none"> 1. People who influence my behaviour think that I should use the system. 2. People who are important to me think that I should use the system
Social Factors	The individual's internalization of the reference group's subjective culture and specific interpersonal agreements that the individual has made with others in specific social situations	<p><u>Indicate to what extent your use of the system would be influenced by...</u></p> <ol style="list-style-type: none"> 1. the proportion of co-workers who <u>would</u> use the system. 2. The senior management of <u>my organization</u> <u>helps use</u> the system.

SI		
Construct	Definition	Item
		3. My supervisor <u>is</u> very supportive of the use of the system for my job. 4. In general, the organization <u>supporting me in using</u> the system.
Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system	1. People in my organization who use the system have more prestige than those who do not. 2. People in my organization who use the system have a high profile. 3. Having the system is a status symbol in my organization.

Hypotheses for dimension

H3. *Social Influence (SI)* has a positive impact on the Behavioural Intention to use the CORE-DMS or similar system.

2.12.4 Dimension 4: *Facilitating Conditions (FC)*

This dimension is defined as the degree to which an individual and a technical infrastructure exist to support the use of the system. Included in this definition are behavioural control, facilitating conditions, and compatibility. To some extent, these constructs focus on the technological or environmental capacity to remove barriers towards the use of technology in the context. Behavioural control refers to the extent to which behaviour in the organization can be directed towards effectively using the technology in the context. It is also postulated that this dimension can be associated with effort expectancy as these dimensions would operate in tandem towards behavioural intention. Alone, this dimension was not found to predict intention, it thus has to be used jointly with *Effort Expectancy*. The facilitation dimension is also related to attitude towards the response behaviour, defined as one's affective response towards using a technology (Venkatesh, Morris, Davis, & Davis, 2003).

Table 2-4 Dimension 4: *Facilitating Conditions (FC)*

FC		
Construct	Definition	Items
Perceived behavioural control	Reflects perceptions of internal and external constraints on behaviour and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions.	<ol style="list-style-type: none"> 1. I have control over using the <u>CORE-DMS</u>. 2. I have the resources necessary to use the <u>CORE-DMS</u>. 3. I know what is necessary to use <u>CORE-DMS</u>. 4. Given the resources, opportunities, and knowledge it takes to use the <u>CORE-DMS</u>, it would be easy for me to use the system. 5. The <u>CORE-DMS</u> is not compatible with other systems I use.
Facilitating Conditions	Objective factors in the environment that observers agree to make an act easy to do including the provision of computer support	<ol style="list-style-type: none"> 1. <u>Enough</u> guidance was available to me in the selection of the system. 2. Specialized instruction concerning the system <u>is</u> available to me. 3. A specific person (or group) is available for assistance with system difficulties.

FC

Construct	Definition	Items
Compatibility	The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters.	<ol style="list-style-type: none">1. Using the system is compatible with all aspects of my work.2. I think that using the system fits well with the way I like to work.3. Using the system fits into my work style.

Hypotheses for dimension

H4. *Facilitating Conditions (FC)* has a positive impact on the *Behavioural Intention (BI)* to use the CORE-DMS or similar system.

2.12.5 Dimension 5: *Self-Efficacy (SE)*

Self-Efficacy refers to a person's perceived knowledge and skills to use a computer effectively for a specific task. This is mainly the knowledge and skill to use a computer or work an IT-system.

The following items used by (Lu, Cui, Tong, & Wang, 2020, p. 5) will be incorporated to measure *Self-Efficacy*:

Table 2-5 *Self-Efficacy (SE)* dimension of UTAUT

SE		
Construct	Definition	Item
Self-Efficacy		I think I can complete my work using the CORE-DMS or similar system if....

-
1. there was no one around to tell me what to do.
 2. I had never used a package like this before
 3. I only had the system manuals for reference
 4. I had a lot of time to complete the job for which the system was provided
-

Hypotheses regarding dimension:

H5 *Self-Efficacy (SE)* has a positive impact on the *Behavioural Intention* to use the CORE-DMS or similar system

2.12.6 Dimension 6: *Behaviour Intention (BI)*

With computer *Self-Efficacy* and anxiety excluded, this dimension is defined as a person's overall affective reaction to using the designated computer system in terms of four constructs; the attitude towards a behaviour, intrinsic motivation, affect toward the intended use, and affective response towards the IT-system. The following Table provides the definitions and items.

Table 2-6 Dimension 5: *Behaviour intention (BI)*

BI		
Construct	Definition	Item
Attitude Toward Behaviour	An individual's positive or negative feelings about performing the target behaviour.	<ol style="list-style-type: none"> 1. Using <u>CORE-DMS</u> is a bad/good idea. 2. Using the <u>CORE-DMS</u> is a foolish/wise idea. 3. I dislike/like the idea of using the <u>CORE-DMS</u>. 4. Using the <u>CORE-DMS</u> <u>will be</u> unpleasant/pleasant.
Intrinsic Motivation	The perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se	<ol style="list-style-type: none"> 1. I <u>think</u> using the system <u>will</u> be enjoyable. 2. The actual process of using the system <u>seems</u> pleasant. 3. <u>It will be</u> fun using the system.
Affect toward use	Feelings of joy, elation, or pleasure; or depression, disgust, displeasure, or hate associated by an individual with a particular act.	<ol style="list-style-type: none"> 1. The system <u>will make</u> work more interesting. 2. Working with the system will be fun. 3. The system <u>seems</u> okay for some jobs, but not the kind of job I want it for. (R)
Affect	An individual's liking of the behaviour	<ol style="list-style-type: none"> 1. I <u>think I will</u> like working with the system.

BI

Construct	Definition	Item
		2. I look forward to those aspects of my job that require me to use <u>this</u> system.
		3. Using the system will frustrate me. (R)
		4. <u>I think</u> once I start working on the system, I <u>will</u> find it hard to stop.
		5. I <u>will</u> get bored quickly when using the system. (Reverse score)

Behavioural Intention is identified as the response variable in the UTAUT model, whilst the dimensions PE, EE, FC, SE and SI are regarded as independent variables, assumed to be contributing towards BI. For purposes of this study the UTAUT questionnaire will be adjusted as indicated in the above table, with underlined wording; to suit the context and specific software system to be evaluated by local respondents.

2.13 Measurement in this study.

The above dimensions will be used in the measurement of technology acceptance for this study. Stemming from the above discussion on UTAUT, many UTAUT focused studies specifically address the influence of three variables on Behaviour Intention, namely Gender, Age, and Work Experience as these variables were found to be moderating variables in the UTAUT model. Different variations of these influences were observed in the literary examples of UTAUT application studies, and hence the impact of these demographic variables need to be considered within the context of the planned study. These variables will be included in the current study for measurement and analysis purposes. A specific measurement model is usually proposed for the exploration of relationships regarding the UTAUT study. Technology Acceptance in this study will

be measured utilizing the UTAUT measurement model as adapted from Venkatesh, Morris, Davis, & Davis, (2003) and displayed in the following Figure.

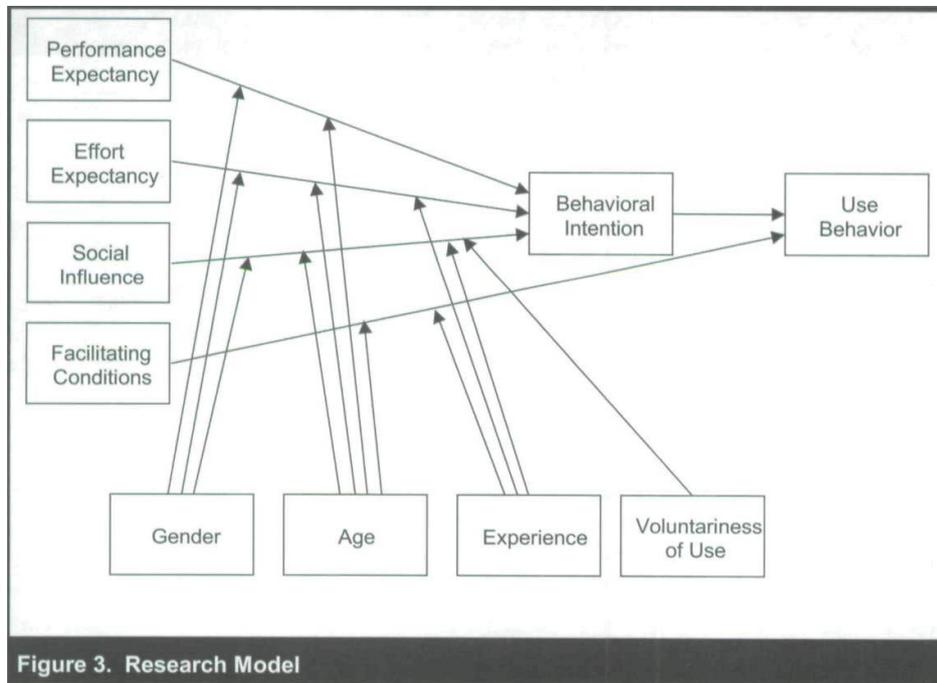


Figure 2-3 UTAUT basic model (Venkatesh, Morris, Davis, & Davis, 2003)

This model also explains the main conceptual relevance of the UTAUT theoretical base, explaining technology acceptance as a process that is determined by four dimensions that influence the intention to use a technology, whilst facilitating conditions refer to the actual preparedness of the intended users that has an influence on the actual behaviour associated with using a technology. The model has also been validated in this format and was used accordingly in multiple studies (Venkatesh, Morris, Davis & Davis, 2003; Venkatesh, Thong, and Xu, 2016). For purposes of this research, the researcher aims to use the UTAUT in its current format with the exception of the facilitating conditions part of the model as there is significant supportive evidence of it being a well-refined and evidence supported measurement tool that adequately explains technology acceptance in a variety of contexts, according to a review of studies on the UTAUT (Attuquayefio & Addo, 2014). The model in this study will measure the relationship between facilitating conditions and behavioural intention only, as the study is focused upon *intended* users, and not actual users of an IT-system. The UTAUT will therefore fit well with the intentions and aim of this study.

The adjusted model to be tested in this study is as follows:

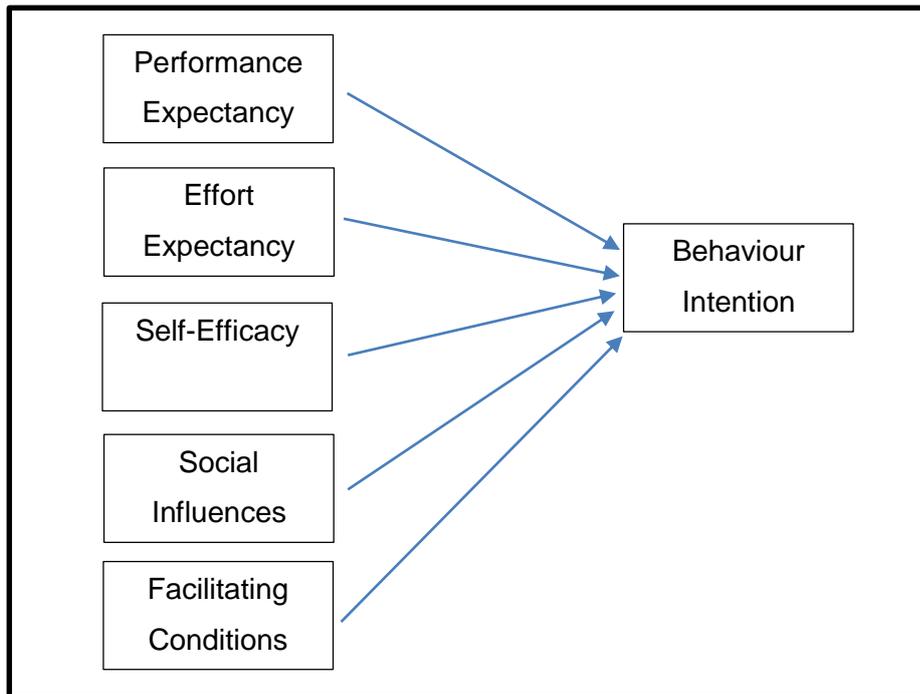


Figure 2-4 Primary UTAUT Predictive Model to be studied

The primary prediction model, therefore, examines whether any of the assumed conditions that promote the eventual behaviour towards IT-systems hold in the case of the current study. Seeing that the current study is a pre-adoption study in that the participants have not yet adopted IT-systems in their context, there is no actual behavioural response, only an intended response. The researcher furthermore wants to examine a second model, derived from the main model. This model examines whether the UTAUT dimensions of PE, EE, SE, and SI influence *Facilitating Conditions* (FC). Considering the definitional content of the FC dimension the researcher wants to establish if these determining conditions contribute towards the overall positive attitude towards IT-systems. This constitutes a sixth hypothesis, namely:

Hypothesis for *Facilitating Conditions* (FC) as the response variable

H6 PE, EE, SI and SE positively contribute towards *Facilitating Conditions* (FC)

The secondary model is presented in the following figure:

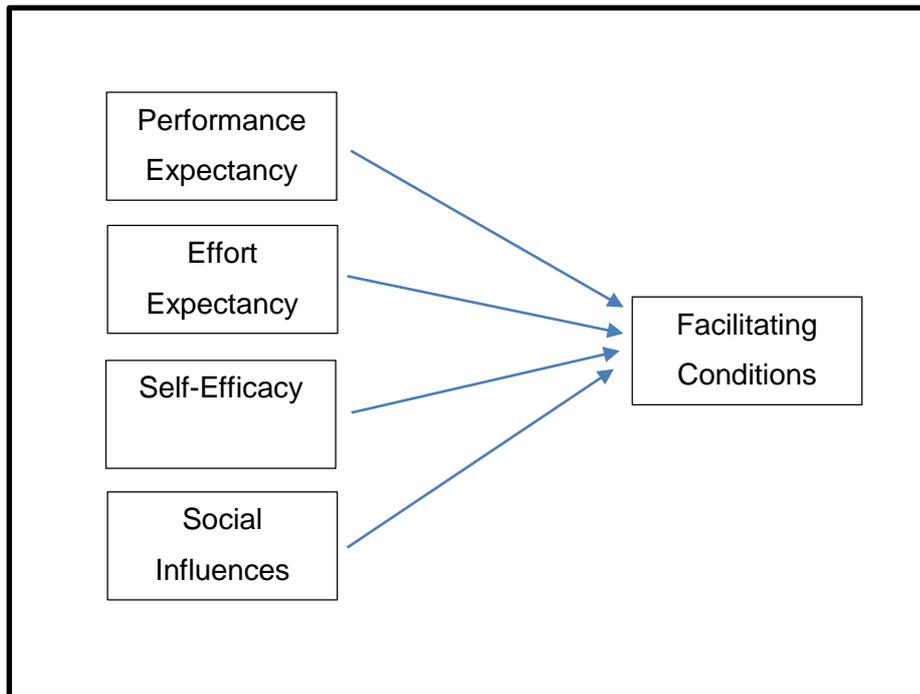


Figure 2-5 Secondary measurement model for explaining Facilitating Conditions (FC)

In terms of the current study, the above represents a secondary explanatory model that is relevant for explaining the “fit” of an IT-system into the work processes of social workers in the South African context. The UTAUT model will thereby be used in the as-designed format but will be adapted within the priorities and constraints of the current study as determined by data sufficiency and practical considerations. Since the effectiveness of regression analysis depends largely on the preferences and logical argumentation presented by the researchers within a clear, and well formulated proposed model, it is assumed that the logic presented above will be sufficient in motivating the secondary model. Although it is planned to use the complete UTAUT model for this study and also examine between-group differences regarding the moderator variables, Age, Gender, and Experience, the use of these variables as moderating variables in a prediction model may be limited by data realities.

The study was guided by the following assumptions:

- The respondents will have had little exposure to IT-technologies due to the lack of such technologies in their current work circumstances. This study will therefore be regarded as a pre-adoption study in that the respondents have not yet familiarized themselves with using a particular system, and will evaluate IT-systems from a conceptual perspective based on the video recording of a report on using IT-systems in the social service context.
- The research context is influenced by one of the most significant health events in history, namely the COVID-19 pandemic that has not only influenced the way many other industries

operate but will have a distinct influence on the way social services are practiced now and in the future. In terms of IT-system usage, this external variable may directly influence perceptions regarding the acceptance of IT-technology in the social services context.

2.14 Summary

This chapter has unpacked the three key concepts of this study, namely, *Lean* management, IT-technology acceptance, and IT-technology use in Health and social service contexts. Literary exploration has contributed to a better understanding of the multiple factors that influence the concepts of LM and IT in these contexts. The conclusion is reached firstly that technology implementation in social services lags behind that in health care contexts, which in turn lags behind other service industries and specifically manufacturing contexts where the use of technology is more of a natural “fit” than in health care. The distinguishing characteristic seems to be the fact that in health and social services contexts the professionals enacting the roles in these contexts, are likely to experience doubt regarding the role and potential interference of technology in their immediate work with people, whether these are clients or patients. These perceived interferences may be responsible for a lack of realization of the benefits and features of technology. It is even possible that the lack of realization leads to resistance in some instances and that this may contribute to low adoption and acceptance of IT-technologies in the social services sector. This factor should be considered directly in the marketing and selling of IT-systems in the health and social services sectors.

The UTAUT model’s role in explaining the dynamic factors that either contribute towards adoption and acceptance of technology in health care and social services contexts has been explored and operationalized in preparation for the empirical study that is to follow. The asking of questions, an important aspect of any empirical study has been facilitated by the formulation of suitable hypotheses and items for the UTAUT measurement instrument to be used for data collection purposes have been prepared to facilitate measurement of the construct UTAUT in a forthcoming empirical study.

The primary model that will be examined empirically, is whether PE, EE, SI, SE and FC predict BI, and at secondary level, that PE, EE, SI and SE predicts FC. If these hypotheses are supported by the data, it means that IT-system deployment amongst social service personnel in the South African context is feasible and should be worthwhile of exploitation in future endeavours.

The next chapter will discuss how the empirical study will be structured and the methodology that will be followed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter provided a literary background for this research project. It explained how this study was guided by the *Unified Theory of Acceptance and Use of Technology* (UTAUT). Also that this study was theoretically informed and that this theoretical model was used to explain two models, namely the primary model, in which the dimensions PE, EE, SI, SE and FC of UTAUT explain the Behavioural Intention of social service workers in the South African context and a secondary model, in which the dimensions PE, EE, SI and SE explain FC, or the 'fit' of IT-systems to nature of social service work in the local context. The empirical study that was intended had also examined whether knowledge of Lean operations in any manner determines the acceptance of IT-technology in social services. This chapter introduces the reader to the method that was followed in this study. The methods discussion was an expansion of the method that was briefly introduced in Chapter One. The chapter focusses firstly on the approach and design that was considered most appropriate for this study, then provides an outline of the method that was employed for determining who the respondents would be, how they would be recruited, and how data would be collected from them; how data would be analyzed, interpreted, and used for purposes of concluding.

The chapter will firstly explore the approach that was most applicable for this study. Thereafter an overview will be given of the specific design that was most relevant for achieving the aim of this study and how the sample was selected.

3.2 Approach and research design

Based on a need for gaining a broader perspective and confirming the properties of a complex measurement model, this study was approached quantitatively as this was regarded the most appropriate approach for a study of this nature. This study can be classified as a non-experimental study because the researcher wanted to obtain descriptions of a certain population at one specific point in time. There was also no manipulation of variables that can be associated with experimental studies. Specifically, the quantitative approach was followed in the form of a cross-sectional survey. This design represented a research study that used a survey to obtain descriptions from a particular group of participants, in this case, social workers who were employed at a variety of social service organizations across South Africa (Gravetter & Forzano 2016:380). These authors regard the survey design as a kind of "snapshot" design meant to

gather the demographic characteristics of the target group, as well as their perceptions or attitudes regarding a specific topic or situation that is of relevance to them. Bryman (2012:49) believes that the cross-sectional survey design is appropriate when the researcher has a specific sample of cases in mind; wants to obtain perceptions at a specific point in time; generates quantitative or quantifiable data, and seeks to identify certain patterns of association in this data, described relationships. It was therefore concluded that the cross-sectional survey design is the most appropriate design for this kind of study. The survey design was not a mere form of descriptive research but it employed a comparative group design that was aimed at comparing groups divided according to their demographic characteristics, in this case, Gender, Age, Years' experience, and knowledge of *Lean* operations thinking. Group-comparison invariably implied the use of inferential statistical methods to test the nature of specific postulated relationships between variables using hypotheses statements. Group-comparison invariably accommodated more complex analyses such as correlational analysis and as in the case of this study, identification of prediction variables through regression analysis. The cross-sectional survey design combined with a group-comparison design was, therefore, a logical choice for this research. This research also had objectives focused on investigating the existence of relationships between variables. This involved the comparison of two scores on different measures for each individual. The objective of such comparison was to examine the measurements and to identify patterns in these relationships that had a certain strength. In its most generic form, the correlations sought through investigating relationships indicated that this study had elements of an underlying correlational design (Gravetter and Forzano, 2016, p. 348). The combined design proposed for this study thus involved descriptive elements, group-comparison, and correlational elements. Since these elements all culminate in the cross-sectional design, this design was proposed as the data-collection design for this study. The correlational design is most often associated with prediction, described as the resulting equation that produces the most accurate predictions for y (the criterion variable) for each instance of X (the predictor variable). Correlational studies are essentially explanatory in nature in that the correlation between predictor and criterion variable can be explained in terms of theory and empirical significance.

3.3 Population and sampling

This research was focused on a specific population that was relevant to the topic and aim of this study. Defined as the larger group of interest (Gravetter & Forzano, 2016, p. 133), the population is very large and often difficult to include as a whole in a study. The smaller set of participants drawn from the population then becomes the sample of the study. The population for this study can be described as all social workers working in South African social service organizations and who are professionally registered to practise as a social worker with the SA Council for Social

Service Professions (SACSSP). Theoretically, and considering the ease with which modern data collection techniques enable researchers to reach whole populations through for example, electronic surveys, it would be possible to include the whole population as was specified in this study. This could, for instance, be done by sending electronic surveys to every qualifying respondent in the study, something that would be possible if the SA Council for Social Service Professions (SACSSP) would be involved in this process by sending out invitations to all registered individuals on its books. However, considering a realistic approach to sampling, it would rather be possible to identify some sub-population groups where it was likely to find respondents that were suitable for this study. The accessible population were social workers working at organizations that had been identified and selected as participating organizations. It would further include those social workers that were members of Facebook pages, or sites that were relevant to the target population. This strategy was unlikely to render a sample that could be described as representative of the population by any means, but then generalization is not necessarily the objective of this study. Much rather, explanation would be a worthwhile objective of a study such as this. With an explanatory objective, the researcher did not intend to generalize to the whole population, but rather gain an understanding of the matter being studied and how this was represented in the acquired sample. To achieve this, the study was much rather interested in gaining a variety of participants that were fairly homogenous in characteristics such as professional category and who took an interest in the target population's matters and specifically in the research topic under investigation.

3.4 Sampling strategy

To access the population as roughly outlined above, specific sampling strategies were identified that enabled the researcher to access participants that closely represented the target population. Representation, was however not the objective of this research as the scale of the project was not necessarily that large. Although the preferred strategy was an all-inclusive one where every possible sample element was included, this might not be possible, given contextual constraints such as the inability of organizations such as the SACSSP to assist the researcher in reaching the whole population. Therefore, the sample inclusion criteria were defined as follows:

- Participants were included in the study if they were qualified and registered as a social worker at the SACSSP.
- Participants who declared themselves to fit the above category were allowed to participate in the research. Since the researcher was unable to control who takes the questionnaire and who not, it was important to purposively select places or settings that were likely to render the correct participants.

To ensure a high likelihood of attracting qualified social workers for the study, the researcher purposively selecte a few organizations that could be described as social service organizations, and begin distribution of advertisements within these organizations. Secondly, the researcher selected a few prominent Facebook pages where Social Workers were likely to be the main categories of membership and targeted the members of these pages with the project advertisement.

Considering the above explanation, it was concluded that the sampling plan was all-inclusive in that all members of the population were welcome to participate, yet, not everybody who qualified, was accessible. Hence the researcher created an opportunity to target places where social workers were likely to have a presence. For purposes of this research project the emphasis was not on generalization, but on exploring and examining patterns in a construct such as Technology acceptance, from which certain conclusions of relevance to the study's objective could be drawn. The selected strategy raised questions about the ideal sample size to be obtained. Since all-inclusivity was envisaged, the sample size was theoretically equal to the population size, currently estimated to be close to 35000. The minimum sample size was estimated to be around 100, as confirmed by Dr. Erika Fourie, a Statistical Consultant at NWU as absoluut minimum for achieving valid statistical results This size would be regarded as sufficient for conducting the type of analysis envisaged here, but samples of 150 – 200 would be more adequate and therefore preferred for this research. Time and geographical constraints as well as practical considerations regarding accessibility to the population would determine the sample size in the final analysis. A minimum of 100 cases was set to enable the study to have certain practical significance. Where possible the practical effect of the study was established by measures of effect size calculations during analysis, such as Cohen's d and ETA square.

3.5 Data collection strategy

3.5.1 Measures

The *Unified Theory of Acceptance and Use of Technology* (UTAUT) was widely considered the most effective and recent method for examining technology acceptance in different populations. This model has been widely tested in many studies since its development in 2003. It was proposed to develop a questionnaire using the constructs as proposed by the original UTAUT model (Venkatesh, Morris, Davis, and Davis, 2003) for measuring technology adoption in different contexts and as discussed in the Literature study of Chapter Two. The UTAUT model was adapted slightly to fit the requirements of the local social service context. For example, since there is currently not a single IT-system being used universally by local social workers, it was expected that prospective respondents would not have a common or unified understanding of a single IT-

system, and would therefore likely attach their meaning based on their conceptualization of an IT-system if given a survey to complete based on no specific IT-system. The researcher also shortened the PE dimension of the original UTAUT questionnaire to ensure the survey did not become unreasonably long. This study was therefore regarded as a pre-implementation study in that it asked questions of respondents regarding how they felt about “a system” that they had probably not used in reality, but evaluated in concept. To focus respondents and prevent inconsistent and uncertain responses due to different conceptualizations of what an IT-system consists of, the researcher aimed to first orientate prospective respondents about their conceptualization of an IT-system. For this purpose, the researcher used the CORE-DMS discussed above as a model example of an applicable and relevant IT-system that the respondents would identify with, for the baseline orientation of prospective participants. This was done as follows:

- (a) The researcher prepared a 15-minute educational video presentation in which the CORE-DMS was explained and demonstrated as a typical and custom-designed IT-system for performing administrative social work services in organizations. Prospective respondents to the survey were asked to first watch the video presentation before completing the electronic survey. This enabled them to cognitively orientate themselves regarding the exact nature of a social work IT-system, before answering the questions.
- (b) They were then asked to complete the questions as if this particular example was under consideration for implementation. The researcher thus formulated all questions to include a reference to the CORE-DMS or similar IT-system as an example
- (c) This step was proposed to ensure that respondents had a common framework and understanding of the concept of IT-system.

The primary measure in this study was constructed as a Google form that was used for online data collection. The questionnaire consisted of three sections. Section A was a demographic section asking different questions including Gender and Age as variables as well as experience regarding the use of IT-systems, followed by Section B that consisted of questions about Lean operations thinking, as an additional objective of the research was to establish if knowledge of Lean had any relationship with acceptance of technology, Section C consisted of the UTAUT questionnaire as presented in the previous chapter and Appendix F.

3.5.2 The measurement tool used in this study

The UTAUT model was used as the basis for data collection in this study. The different dimensions of the model were discussed in the previous chapter and information was provided concerning

the item formulations that were used in this study. To keep the measurement instrument within a reasonable length and to consider the pre-adoptive nature and focus of this study some items in the Performance Expectation dimension were omitted from the current study. A Likert scaling format was chosen for the research questionnaire that was used in this study that utilized a six-point agreement scale as indicated in Figure 3-1. The first category of “unsure” was added due to the pre-adoption focus of the study that asked respondents questions about how they perceive a situation that had not occurred as yet.

I think I can complete my work using the CORE-DMS or similar system if....



Figure 3-1 Six-point Likert Scale as used in this research study

The questionnaire was composed of the UTAUT dimensions of measurement as discussed earlier, a section for demographic variables was added at the top of the questionnaire, and this included the questions about *Lean* operations as these were formulated in Chapter 2.

3.5.3 Measurement properties of the UTAUT Instrument

The developers validated items in the original UTAUT as part of their seminal work (Venkatesh, Morris, Davis, & Davis, 2003). The UTAUT measure had been used extensively in subsequent studies. Although most authors had attempted to use the original items in their studies, the trail of evidence regarding the exact formulations of the original scale were not that clear. Even the original study did not contain a clear indication of exact scale item formulations. Several authors had adapted items to suit the nature of their studies, and this was the same in this study where item formulations were adjusted slightly to fit the characteristics of the local context. The psychometric properties of the original UTAUT were as follows:

- Internal consistency reliabilities for all constructs in the model were significant and above .7.
- Square roots of the shared variance between constructs and their measures were higher than the correlations across constructs, demonstrating convergent and divergent validity.
- Reverse-scored items loaded insufficiently below .60 and were removed before re-estimating the model.

- Re-estimated loadings were above .70 and considered acceptable.
- Intra-construct correlations were very high, and inter-construct correlations were very low, suggesting sufficient construct validity.
- The model as presented in Figure 2-1 is the resultant model and included the moderating variables Gender, Age, and Years' experience (Venkatesh, Morris, Davis, & Davis, 2003). These moderating variables were significant in conjunction with the original UTAUT model. There was evidence that the moderating variables were not always included in the analysis of predictor variables such as was attempted in this study, and in several studies, these were not included in the regression analysis. Some significant findings regarding Gender were observed by the developers: For example, men tended to be more inclined towards the perceived usefulness of the technology, whilst women scored higher on perceived ease of use. Further evidence was presented that men tended to be more task-oriented and were therefore likely to score higher on performance-expectancy. Related to Gender was Age, and this was sometimes jointly used to understand gender differences in attitudes. Evidence was presented by the developers stating that these variables, as well as Experience, played a significant role in perceptions regarding technology.

3.6 Data collection logistics

The cross-sectional survey was distributed electronically and as this strategy simplified the data collection process, the logistical arrangements were as follows:

The survey would be opened on the Google page and Links to the survey were distributed to different potential participants to the research. The data would be collected electronically via the web-interface where it was stored. On the day the survey was closed, the data was withdrawn from the Google site in Excel format from where the data was checked and cleaned where necessary. All this was done in preparation for analysis. The data was then uploaded into the IBM SPSS 26.0 version software package and the data file was then prepared for analysis purposes. The data was stored on the researcher's password-protected computer for the duration of the project where he was the only person that had access to the data. After the project, the data was removed from the PC and transferred to the REC for storage purposes. The data was captured for purposes of this research only, and there was no prospect of doing further research on the data.

3.7 Data analysis strategy

The data analysis techniques proposed for this study followed the general guidelines for survey research as proposed by (Pallant, 2011). According to this author, the analysis of quantitative data follows a descriptive analysis that enables the researcher to explore the data and describe the sample. This initial phase enabled the researcher to identify errors in the data and begin to understand the dataset and variables in the ensuing analysis. The analysis procedure, therefore, followed well-known principles. The sequence of analysis and specific analysis techniques used are identified as follows:

- (i) Descriptive statistics and frequency distributions were used for describing the characteristics of the sample. This enabled the researcher to understand the sample and population involved in this study.
- (ii) Scale properties were established employing Cronbach's Alpha for determining the internal consistency of the measures used in the study. This was used to interpret the different theory derived scale dimensions as determined for this study.
- (iii) Factor Analysis was performed depending on the realized sample size to either explore or confirm the dimensional structure of the measurement instrument that was used in this study if the use of such technique was warranted by sample size considerations. Factor analysis is generally considered when the researcher has a large number of items and wants to explore the underlying structure of such a set of variables. Such an analysis was not the primary purpose of this study and could only be considered if the ensuing sample was large enough. If the realized sample size did not enable factor analysis, the researcher would employ and use the scale dimensions of the UTAUT model according to the prior theoretical evidence of its validated constructs. Pallant, (2011, p. 183) maintains that factor analysis is preferred when datasets of 300+ have been obtained.
- (iv) Regression analysis was used to examine relevant hypotheses regarding potential predictor variables as indicated in the above theoretical model for ITAUT. Multiple Regression Analysis (MRA) is described as a more sophisticated form of correlation analysis and is used specifically for identifying and exploring the predictive ability of a set of independent variables on one continuous dependent measure (Pallant, 2011, p. 104). The main difference between linear and multiple regression analysis is therefore the number of independent variables that are used in the latter procedure. The technique is highly applicable in management sciences where it is most often used in forecasting studies. Therefore, for research of this nature that had explanatory objectives rather than

forecasting, regression analysis was highly suitable because it addressed the problem of establishing the predictive relationship between variables that meaningfully contribute towards the formulation of management guidelines and decision making (Render, Stair, Hanna & Hale, 2015). The study did not employ the more complex and recently developed technique of Structural Equation Modelling, as this generally required larger sample sizes that would not be feasible within the limits of this study. MRA requires at least one dependent and continuous variable and more than one independent variable that are themselves continuous and measure based. The purpose of this phase of analysis was to determine which of the variables were the better predictors of the response condition as indicated in the study. In terms of this study, the response or dependent variable was the dimension of Behavioural Intention (BI) as this was mandated by the UTAUT model for technology acceptance. The multiple regression method enabled the researcher to determine the relative contribution of a set of predictor variables of Behavioural Intention relative to technology adoption. The theoretical basis for the regression analysis in this study was based on the logical relationships as postulated by the UTAUT model. The logical structure of the UTAUT model enabled the researcher to follow the standard multiple regression approach where all variables were entered into the model simultaneously and the resulting comprehensive model was evaluated. With a single outcome variable in the form of Behaviour Intention (BI) as derived from theory, the sample size of 100 was assumed to be sufficient for purposes of using this technique (Pallant, 2011, p. 150). The analysis will also consider the effects of multi-collinearity to ensure items were not correlated too strongly. Indications have been found in some articles such as Venugopala, Jinkab, & Priyac, (2016) that a second response variable *Facilitating Conditions (FC)* could be used to understand the relationship between variables that predict the conditions under which the intentionality of behaviour towards technology could be optimized. In terms of this study, such prediction would be useful as it might show how conditions can be optimized for the optimal acceptance of the technology. The two models considered for analysis was the primary model and secondary model as proposed in Chapter 2 of this dissertation. As a technical guideline, the researcher would in evaluating the regression statistics consider the strength of correlations between independent and dependent variables, assuring that these were not too low ($< .3$) or too high ($> .7$). Tolerance and VIF statistics would be interpreted as a way of investigating possible multi-collinearity, using standards as set out by (Pallant, 2011, p. 158). Also, standardized PP-Plots were interpreted to determine the normality of the result. Although the UTAUT model incorporated analysis of moderation as achieved by the variables Gender, Age, and Years' experience, this was not investigated in this part of the analysis. The reason for this was that if sample numbers permitted, such analysis could be feasible. But in smaller samples moderation analysis may not be feasible.

- (v) The study would also examine between-group differences for Age, Gender, and Experience utilizing ANOVA and the Independent-samples t-test. The particular sequence followed in this research was to first conduct the analysis using parametric techniques and then to use non-parametric equivalent techniques to confirm findings obtained by the parametric techniques. For purposes of this study, the One-way between groups ANOVA was used mainly for comparisons between variables that had three or more categories and the Independent samples t-test was used for variables that had two categories (Pallant, 2011, p. 204). This technique was also used for determining group differences based on knowledge of Lean operations.
- (vi) Qualitative analysis was performed on the single open-ended question in the questionnaire asking respondents to provide their description of Lean operations. Due to the relatively short description that was anticipated, the qualitative analysis was not extensive enough to warrant the use of dedicated methodology. The analysis only considered an analytic discussion of the descriptions provided by respondents.

3.8 Ethical considerations

The study was conducted according to the ethical guidelines of the North-West University, whilst ethical approval was obtained from the Economic and Management Sciences Research Ethics Committee (EMS-REC). This research adhered to the principles of voluntary participation, anonymity, and confidentiality.

3.8.1 Risk and benefit analysis

According to general Ethical research practice guidelines, it was recommended that the participants in a research study should be protected from any harm. To protect participants one should conduct a risk-benefit analysis. The study was focused on professional people who would be asked to participate in the survey voluntarily. They were expected to respond to a questionnaire that reflected their perceptions of an existing IT-system (CORE-DMS) to which they had been exposed before the research, by watching a video demonstrating the features of the IT-technology. Their perceptions regarding this technology were then measured using the UTAUT questionnaire. This participation was not expected to hold any risk for them, because none of the questions were expected to draw any personal information from respondents that could harm them in any way. The prospective participants did not stand to benefit anything directly by participating in the study. The survey did not require them to do anything that was above what could be expected from anybody to do during their regular daily tasks. As a result, the study was classified as containing minimal risk to participants. The management sciences community stands

to benefit indirectly from the results in that a better understanding will be gained regarding the acceptance of technology by health and social service professionals in specifically the field of social work. Although this professional category was regarded in some contexts as belonging to the health professions, this is not the case in all contexts and their professional registration is also separate. This survey was not expected to cause any health effects or change the status of health for social service professions.

3.8.2 Advertising and recruitment

Respondents to the survey were recruited using visual advertisements that were sent out to prospective participants using social media such as Facebook, Linked-In, and Research gate. Advertisements were also sent by e-mail to different organizations where target respondents worked. Since participation was voluntary no respondent was under any pressure to participate. Interested persons were able to click on a link that took them to the Google-based questionnaire that explained the survey and what was required of respondents. The questionnaire contained a video demonstration of the CORE-DMS as an example of an IT-system that was purposely designed for use in this sector and should act as a reference to the respondent. Should respondents wish to participate in the survey, they could then click on a button that allowed them access to the survey front page. Here they could read information about what was expected of them, and they could complete the rest of the questionnaire. This served as informed consent and clicking the button would take them to the actual survey. The survey should take them about 20 – 30 minutes to complete. A copy of the advertisement for this project is attached to this document as Appendix E.

3.8.3 Voluntary participation, confidentiality

Participation in the survey was completely voluntary and the participant could exit the video and survey at any time should they wished to do so. Their participation was also confidential in that their names were not be asked, and they were therefore not recognizable by their questionnaire. The Google electronic survey tool used was set not to collect e-mail addresses; thus the researcher was not able to identify any participant.

Participants completed the survey in the privacy of their homes or wherever they chose to complete it. The level of confidentiality was therefore at their discretion.

3.8.4 Informed consent

As indicated above, informed consent was given when the respondent to the survey clicked a button in an e-mail that took them to the informed consent form and allowed them to click their

willingness to participate. They would not be able to take the survey unless they clicked the “agree to participate” button.

3.8.5 Incentives

Participants in the research did not receive any form of payment and it was expected that they would not incur any costs during participation.

3.8.6 Permissions

The research was conducted using an online survey. For this purpose, the following sites, forums, or organizations were targeted:

The South African Council for Social Service Professions (SACSSP). This was the official regulatory body where all practicing social workers were registered. The organization was approached and the researcher awaited a permission letter indicating their willingness to post the survey link to their members. It was estimated that the Council had +- 38000 registered members at the time and this could lead to a sample size that was fairly reasonable for purposes of this research. Included in this population would be prospective participants who did not use e-mail, or whose e-mail addresses were no longer valid. Electronic surveys were under COVID-19 conditions the only valid and convenient method for collecting data from respondents, hence this option was used in terms of the sampling plan the whole population was targeted. Should the SACSSP not contribute to this study, alternative media such as Facebook and related media would be used.

Three organizations have been approached where large numbers of social workers are employed. These organizations have agreed to distribute the survey and advertisements to their employees via e-mail for consideration to participate. Letters of goodwill are attached to this report for information purposes. These organizations are:

- SAVE
- RATA
- ACVV
- Vrystaat Versorging/ Free State Care

Also, the researcher has secured membership of the following Facebook pages where many social workers are affiliated:

- ASASWEI

- Forensic social work
- Social workers for better salaries
- NACSSW

Also, the researcher will launch the survey from his Linked-In profile and Research Gate profile where many followers are social workers.

3.9 Summary

This chapter has outlined the methodological elements of the study and how the researcher planned to access the target population for the study. The cross-sectional survey design for data collection has been selected as the most likely method and strategy for collecting data and demarcating the sample. The survey design underpins other, more complex designs such as group-comparative designs and correlational designs. The combined design will be selected for this study as it appears to contain elements of all the foregoing designs mentioned and enables the researcher to reasonably access the target population. The chapter indicated how the data will be collected using an electronic survey, using a questionnaire composed of elements of the UTAUT model as represented by the different scales as presented by the original UTAUT study. The data collection strategy has been outlined as consisting of an advertisement that will be sent to different organizations and social media platforms where social workers will be found and an invitation and link to the Google online questionnaire that will enable the respondent to complete the survey. This is deemed adequate for a study of this nature that wants to compare variables and measures to each other to establish predictive relationships. The ethics section of the chapter outlined how participation will be voluntary, confidential, and anonymous. Although respondents to the survey will not gain anything by participating, the indirect benefits of the study for the knowledge base of Management sciences, specifically operations management, and the profession of social work has been highlighted as key considerations of ethical implications of the study.

Considering the above arrangements, the study was considered to be ready for implementation and execution at an empirical level. The next chapter will report on the way the data was collected in reality, and the analysis of data will be performed in the next chapter. The study proposal utilizing the above methods was approved by the EMS-REC on 18 September 2020 with ethics number NWU-00844-20-A4.

CHAPTER FOUR

RESULTS OF THE STUDY

4.1 Introduction

Thus far, the study has outlined the methodology to be followed in collecting, analyzing, and reporting on the data that will be collected in the survey. Once ethics approval was obtained for the study, efforts were made to obtain the necessary goodwill permission from the different organizations as planned. The data collection took place during COVID lockdown level 3 circumstances, during which no live data collection could take place, limiting the researcher to resort to electronic methods for data collection. The survey instrument was distributed to the population of potential respondents electronically and this was the standard mode of data collection followed in this study. This chapter introduces the data analysis as planned in the previous chapter, and presents the main results of the study.

4.2 Data collection outcome

The data was collected from 05 - 31 October 2020. The study was introduced under the approved Emilton REC ethics number (NWU-00844-20-A4) and this enabled the researcher to proceed with the study. The Google form questionnaire and Link to the questionnaire was sent to the three organizations that had agreed to distribute the questionnaires. Goodwill permission was obtained from three welfare organizations that indicated a willingness to distribute questionnaires for this project to their employees, SAVF, ACVV, and RATA. An advertisement was added to the e-mail for prospective respondents to familiarize themselves with the study aims. Jointly, these three organizations employ about 400 social workers in different provinces of South Africa. The SACSSP, a professional body for the registration of social workers, opted not to participate and the researcher, therefore, did not have access to a potential population of 35000 + registered social workers. No response was obtained from the forum for social workers in Private Practice, SAASWIPP, who was contacted to assist with distribution to their members as well, totalling more than 2500 potential participants. In addition to the three organizations, a fourth organization, Free State Care was contacted and they opted to distribute the questionnaire to their employees as well. Also, the researcher advertised the project on different Facebook pages of which he is a member, on Linked-In and Research gate. Repeat advertisements and reminder letters were sent at regular intervals during data collection to motivate respondents towards participation. This assisted in raising awareness about the survey and increased the participation rate.

4.3 Realized sample

The data was collected over a period of one and a half months and the realized sample consisted of 105 respondents. The data was downloaded from the Google site to the researcher's computer in Excel format and imported to IBM SPSS 26 in preparation for analysis. Since the data was captured anonymously, no further anonymization was required. Since no manual transfer procedures were used, there was no need to clean the data enabling immediate statistical analysis. The analysis was conducted in consultation with Dr. Erika Fourie from the Statistical Consultation Services of the NWU.

4.4 Data analysis

4.4.1 Approach to the analysis

Analysis proceeded as follows: A descriptive analysis was conducted on all Section A demographic variables, to gain an overview profile of the realized sample.

Factor analysis – an Exploratory Factor Analysis was attempted on the items and dimensions in the UTAUT scale that was used in the study. This procedure was abandoned upon advising as the current Likert format contained an “unsure” category (see Chapter Three for explanation) that was selected by a significantly large proportion of respondents. Due to the expected influence of this response category, the factor analysis would be influenced negatively by this additional category. Seeing that a relatively small number of respondents completed the survey in terms of data requirements for factor analysis purposes, it was considered not feasible to attempt factor analysis and this procedure was abandoned. Subsequently, it was decided to perform further analysis based on the theoretical, prior developed, and validated dimensions of the UTAUT questionnaire. To keep the analysis realistic and reduce the possibility of very small effect sizes, the analysis was limited to the six dimensions as proposed by the UTAUT model. No attempts were made to analyse the sub-sections as discussed in Chapter 2, as such level of detail was not feasible, given the realized sample size of 102 respondents. To accommodate the possibility of not normally distributed data, non-parametric techniques were used alternatively in some instances, to confirm findings obtained with parametric techniques.

Reliability analysis – reliability of broader scale dimensions was investigated using Cronbach's Alpha.

Group comparisons – between-subject effects or inter-group comparisons on selected variables as indicated in the planning for this study were conducted using the parametric techniques of ANOVA for variables with more than two categories such as Years' experience and Age, and the

Independent samples t-test for variables with two categories, such as Gender. In these cases, non-parametric alternatives were used to confirm parametric findings.

Regression analysis – Identification of predictor variables was achieved using the Multiple Linear Regression analysis technique (MRA), with an examination of linear collinearity diagnostics.

4.4.2 Descriptive analysis of data

The following descriptive statistics were obtained for the three key demographic variables in the study:

4.4.2.1 Gender

The majority of respondents (83.7%) were female and 16.3% were male. Subsequent analysis involving the gender variable was thus inclined towards reflecting female opinions.

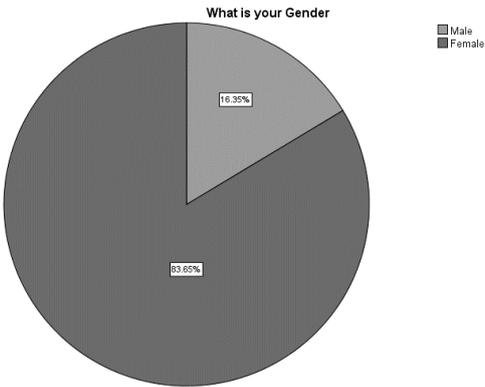


Figure 4-1 Gender distribution in the sample

4.4.2.2 Age of respondents

The minority of respondents were in the 61+ years age group (6.73%). Younger age groups were fairly equally distributed. It was concluded that the sample age range was predominantly from 18 – 60.

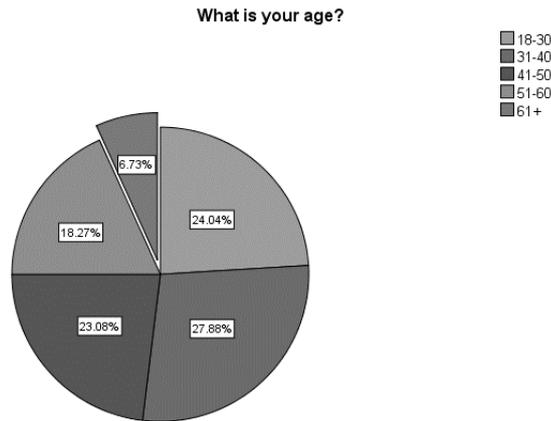


Figure 4-2 Age distribution of the sample

4.4.2.3 Years' experience

The majority of respondents (46.6%) are in the 0 – 10 years' work experience bracket, indicating that most respondents were less experienced and younger employees. The second-largest proportion of respondents (30%) had experience of 11 – 20 years and the remaining 23.3% of respondents had experience of more than 21 years.

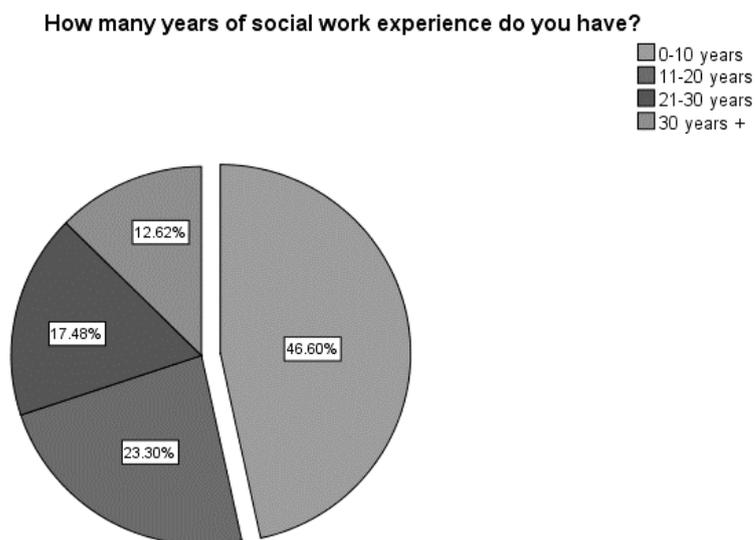


Figure 4-3 years' experience in the field of social work

4.4.3 Scale Reliability

The reliability of the measurement scale used in the study was examined using Cronbach's Alpha. The results of this analysis are provided in Table 4-1.

Table 4-1 Scale reliabilities

<i>Scale reliabilities for the different scale dimensions used in the study</i>		
Dimension	Item cluster	Reliability
Performance Expectation (PE)	7 Items and all items were retained	.857
Effort Expectancy (EE)	13 items and all items were retained	.917
Social Influence (SI)	9 items and all items were retained	.877
Facilitating Conditions (FC)	11 Items and all items were retained.	.926
Social Efficacy (SE)	4 Items retained Removed item: I had never used a package like this before	.683
Behavioural Intention (BI)	15 items and all items were retained	.917

Based on the above Table, it was concluded that all the scale dimensions used in this study had sufficient reliability to be used as-is for further analysis. The dimensions as indicated were the main dimensions that formed the basis for all further analysis. As indicated, these dimensions were not de-constructed into smaller sub-dimensions to ensure further analysis maintained sufficient power to render useful results.

4.4.4 Gender differences for PE, EE, SI, SE, FC and BI

In the following analysis, the effect of Gender on the different dimensions of Technology acceptance and adoption are considered. The hypothesis to be investigated in this instance was:

H₀ Gender does not influence any of the dimensions of UTAUT, namely PE, EE, SI, FC, SE, or BI individually and independently

H₁ Gender has a significant and positive influence on Technology adoption and acceptance, as represented by the dimensions of PE, EE, SI, FC, SE, and BI.

The analysis was conducted utilizing the Independent Samples t-test, a group comparative test for binomial categories.

4.5 Results

The Independent samples t-test results indicated a significant difference on the *Behavioural Intentions* dimension only, Males (M = 4.1292, SD = 0.445), Females (M = 3.8212, SD = 0.564), $t(2.484)$; $p = 0.019$). This result indicates that males on average had a higher *Behavioural Intention* to implement and accept Technology in the workplace, compared to women. Effect sizes concerning all the results indicated moderate practical significance for *Performance Expectancy* Males (M = 4.134, SD = 0.727), Females (M = 3.881, SD = 0.680); $d = 0.35$ and *Behavioural Intention* as reported above, $d = 0.55$. A small, almost negligible effect of $d = 0.21$ was reported for *Effort Expectancy*, Males (M = 3.632, SD = 0.695) and Females (M = 3.478, SD = 0.737), indicating that males were more optimistic regarding the effort involved in using the system, and the expected performance of the system. Although insignificant and negligible small effect of $d = 0.12$, it is reported that Females (M = 3.581, SD = .593) performed higher on *Social Influence* than Males (M = 3.491, SD = .742). This indicates that females were more likely to respond to social influences such as management pressures to use IT-systems than males would be. Differences between Gender groups regarding *Facilitating Conditions* (FC) and *Self-Efficacy* (SE) were insignificant and of no practical value. This meant that males and females felt the same about the integration of IT-systems in their work contexts.

4.5.1 Interpretation

The above results indicate that Males and Females viewed the performance and effort towards accepting and using IT technologies in the workplace rather differently in that males saw it as less of an effort to use it and have correspondingly higher expectancies from the benefits of using the IT-system. Females, on the other hand, relied more on the social influences towards using an IT-system. For them, there was a slight tendency to use the system rather because one's superiors required it, whilst giving one support in doing so, made it mandatory to use it and because others seemed to use it and think it a good idea to use it. This latter finding plays a relatively small practical role in the overall acceptance and adoption theory being investigated here but should be considered during system implementation along with the finding that women had lower behavioural intentions to use the system, compared to men. Specific efforts should be made to ensure that management support was obtained and that mandatory implementation was a

condition for adopting the system, to increase the social influence that were required to ensure buy-in and adoption of technology amongst both gender groups.

4.5.2 Age differences for PE, EE, SI, SE, FC, and BI

In the following analysis, the effect of Age on the different dimensions of Technology acceptance and adoption are considered. The hypothesis to be investigated in this instance was:

H₀ Age does not influence any of the dimensions of UTAUT, namely PE, EE, SI, SE, FC, or BI individually and independently

H₁ Age has a significant and positive influence on Technology adoption and acceptance, as represented by the dimensions of PE, EE, SI, SE, FC, and BI.

The analysis was conducted utilizing the One-way ANOVA for multiple groups, Welch test for equality of Means, Games-Howell post-hoc test and Eta partially squared effect size calculation.

4.5.3 Result:

None of the ANOVA results was found to be significant, as confirmed by the Welch Robust test for equality of Means. However, in spite of the lack of significance that effectively confirmed the nil-hypothesis in this instance, practical significance or value of the finding enabled assuming that the alternative hypothesis may in fact be relevant in practice. Specifically, practical feasible differences were reported between Age group 41 - 50 (M = 3,362, SD = 0,853;) and age groups 18 – 30 (M = 3,543, SD = ,756; $\eta^2\rho = .29$) and 31 – 40 (M = 3,606, SD = ,437; $\eta^2\rho = .21$) with respect to *Effort Expectancy*. Age group 41 - 50 (M = 3,301, SD = ,654;) differed from age groups 18 – 30 (M = 3,643, SD = ,542; $\eta^2\rho = .52$) and 31 – 40 (M = 3,578, SD = ,642; $\eta^2\rho = .42$) with respect to *Social Influence*. In this instance the 51+ age group (M = 3,723, SD = 0,576;) also differed from the 41 - 50 group (M = 3,301, SD = 0,654; $\eta^2\rho = 0.65$) as well as the 31 – 40 group (M = 3,578, SD = ,642; $\eta^2\rho = 0.24$).

4.5.4 Interpretation

The implications of this result should be considered. The results indicated a consistent decrease in *Effort Expectancy* scores as age increases. This meant that younger respondents were progressively more familiar with electronic devices and were less likely to see the effort to begin using an IT-system as a problem. The same trend for Age was observed for *Social Influence*. In the latter instance, the pattern was distinct; the 51+ age group was most optimistic, even more so compared to the youngest group and suggests that this was the group that typically was in senior management positions and therefore more inclined to seek operational strategies that were more

effective for the organization. This group was also more willing to provide support to workers in lower categories and thereby influence them to take up IT-systems in the workplace. One should regard this result against the background of inter-generational roles in the workplace. According to previous research by the author in a paper on Millennials in the workplace (Roestenburg, W, 2020), Millennials were more adept at using the Internet and software applications for solving their problems than older generations. According to this paper, technology was ingrained in millennials, whilst the internet was as important to them as the air that they breathed. It was a logical consequence of intergenerational relationships at work that millennials could be effectively managed if the internet played a larger role in their management. This result confirmed these notions.

4.6 Differences between years' experience in the field of work for PE, EE, SI, SE, FC, and BI

In the following analysis, the effect of Years' experience on the different dimensions of Technology acceptance and adoption were considered. The hypothesis to be investigated in this instance was:

H₀ Years' experience does not influence any of the dimensions of UTAUT, namely PE, EE, SI, SE, FC, or BI individually and independently

H₁ Years' experience has a significant and positive influence on Technology adoption and acceptance, as represented by the dimensions of PE, EE, SI, SE, FC, and BI.

The analysis was conducted utilizing the One-way ANOVA for multiple groups, Welch test for equality of Means, Games-Howell post-hoc test and Eta partially squared effect size calculation.

4.6.1 Result

ANOVA results were significant for *Performance Expectancy* [$F(2, 94) = 3.599; p = .031$], and *Behavioural Intention* [$F(2, 99) = 3.168; p = .046$]. Specifically, Post-hoc tests indicated a significant difference between experience level 11 – 20 years ($M = 3.654, SD = .612, \eta^2_p = .60$) and 21+ years' ($M = 4.021, SD = .427$) experience.

4.6.2 Knowledge of *Lean* operations

An important part of this study concerned the respondents' knowledge about *Lean* operations in the organization they worked in. Based on the theoretical assumptions held in this study, knowledge, and experience of *Lean* operations in the workplace was often associated with the

use of IT-systems. The five questions about *Lean* operations knowledge were answered as follows:

4.6.2.1 Having heard of *Lean* operations terminology

About 71.15% of respondents had no former knowledge of the concept of *Lean* operations, confirming the assumption that professionals in human services often lack concern for and emphasis on operational matters in the organizational contexts they work. This was consistent with what Bullock and Colvin, (2015) observed in US contexts and as discussed in this dissertation’s literature study.

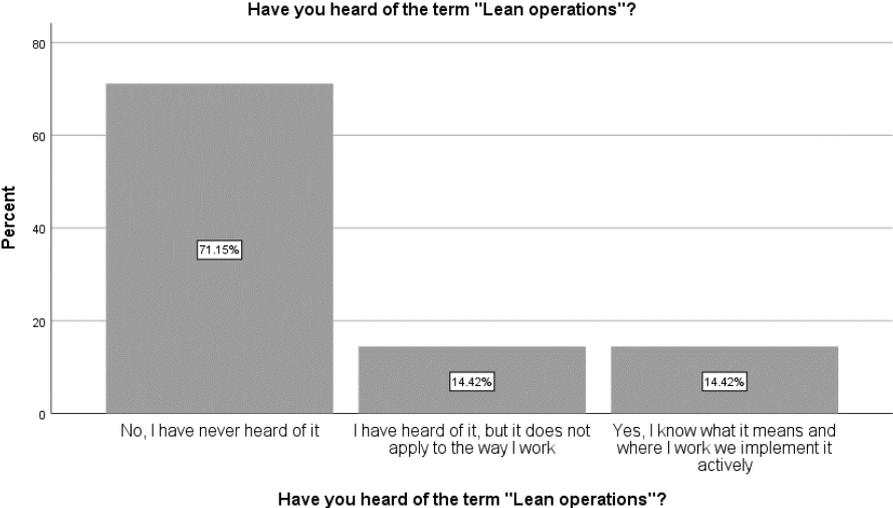


Figure 4-4 Whether the respondent has heard of "*Lean* operations"

A smaller proportion (14.42%) of respondents had heard of *Lean* but either did not apply it and an equally sized proportion (14.42%) actively applied *Lean* operational principles in the workplace.

4.6.2.2 Having a firm plan for improving the efficiency of operations at the organization

About 49.5% of respondents indicated that their organizations had firm plans in place to improve the efficiency of operations at their organizations. This indicated that more respondents knew about *Lean* operational principles but were not aware of what they were doing at work to promote efficiency as another form of *Lean* operations. The relatively large proportion that was unsure or did not have firm plans in place, indicated that there was uncertainty in this sector about operations issues and *Lean* operations. It was possible that *Lean* operations may be priorities in some social service contexts, yet were not termed as such. The almost 5% not applicable

category was notable, indicating that some social workers were not concerned about Lean, as this probably did not apply to their smaller private practice contexts.

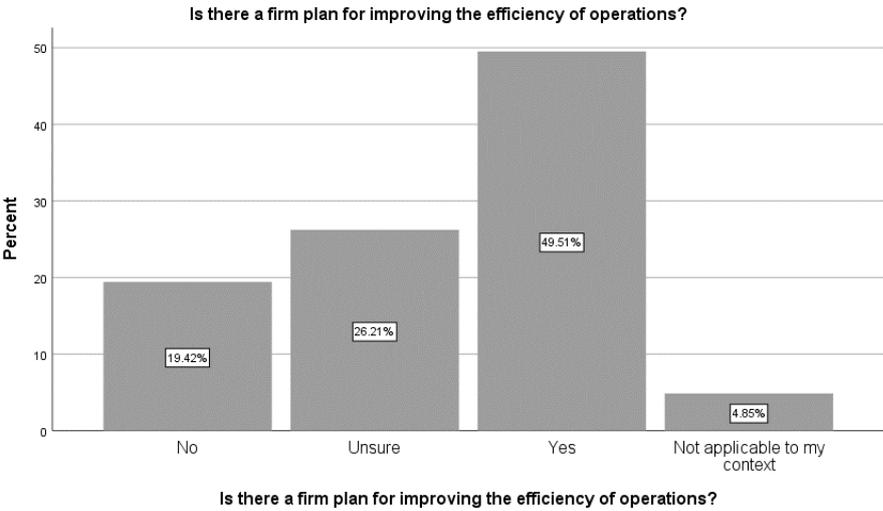


Figure 4-5 Whether there is a firm plan for improving the efficiency of operations

4.6.2.3 Participation in Lean operations

About half of respondents (52.94%) were involved in plans and efforts to improve organizational functioning, though the remaining 48% were not involved in such activities, once again emphasizing the relative nature of focus on operations improvement activities.

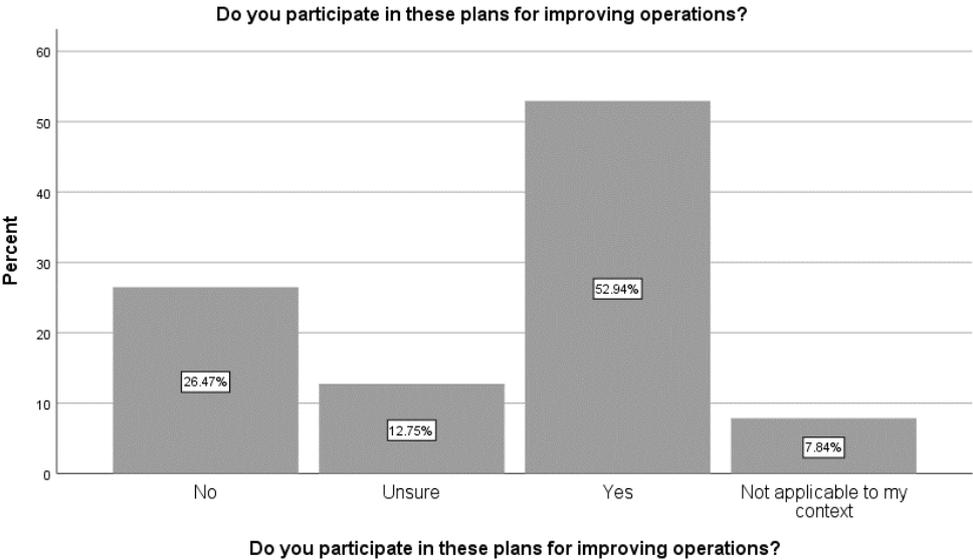


Figure 4-6 Participation in Lean operations plans

Also, about 90.29% of respondents indicated that they actively supported plans to improve the efficiency of operations at their organization, demonstrating a willingness to participate in these efforts. Similarly, the majority of respondents (96%) regarded efforts to make work easier as very important, whilst about 69% thought that their supervisors and management staff supported ideas to improve operations at work. These observations confirmed that respondents in this survey were ready to make changes to the way they performed their duties at work and work more efficiently. The attitude towards *Lean* principles could include the adoption of new technologies in facilitating more efficient work processes.

4.6.2.4 Qualitative descriptions of Lean

Responses that reflected knowledge of Lean operations were as follows:

“As much as I do understand the concept as providing adequate service to the clientele with less resources, efficiently but at the same time obtaining greatest results, it is still not being implemented in the office I’m based in. Lean operations to my understanding and how I got introduced to the concept, focuses on avoiding or eliminating waste but on the other hand reaching greater customer satisfaction”.

“Focusing more on providing greater customer satisfaction while making use of fewer resources”.

“Work more effective with less resources”

“Lean operation is a way of work that runs entities and or organizations by maximizing results whilst using minimal resources as possible. It has a value add approach and reduces the wastage of resources.”

Most knowledgeable responses effectively made the link between operational processes and quality of service products as well as reduction in waste. A few responses explained that resources could be saved or more optimally applied in Lean operations, whilst others emphasized improved customer satisfaction derived from Lean operations. These findings were consistent with what Malmbrandt & Ahlstrom (2013) had found to be the themes in their literature review. They identified three key topics of knowledge:

- (i) The presence of enablers, defined as management commitment, training for employees and time and resource allocation towards lean operations.
- (ii) Lean practices – described as efforts to ensure work processes were in line with lean principles, such as value stream mapping, workplace design flows, work standardization and proactive planning, and:
- (iii) Lean performance – indicators that reflected the results of Lean operations that had developed over time. Performance in terms of costs and customer satisfaction were most often cited as indicators of performance.

Although the comments by respondents in the current survey did not go into the detail of the Malmbrandt & Ahlstrom, (2013) factors the impression was gained that those who had knowledge about the Lean concept, were able to relate the key objectives of Lean thinking.

4.7 Perceptions regarding *Lean operations* in the organization and its role in technology acceptance and adoption.

This study hypothesized that users in the social services sector were less focused upon the conceptualization regarding *Lean operations* since they were in a service sector that primarily was interested in delivering personal care and counseling services to their clients. As identified in the literature study, social service workers tended to regard their clients as paramount above all else, and that this implied less interest and focus upon *Lean* conceptualization. Professionals in this sector would often resist organizational procedures and tactics to introduce *Lean* principles. In this study, awareness of *Lean* conceptualization was measured utilizing a single knowledge question to which the respondent could answer in one of three ways: 1) not having heard of the concept, 2) Having heard of it, but not thinking it is relevant; and 3) Having heard of it, and actively implementing it. This study wanted to establish if one's knowledge of *Lean* conceptualization determined in any way one's reaction towards technology adoption, specifically the dimensions PE, EE, SI, SE, and BI. The hypothesis examined was:

H₆ Understanding of *Lean operation* conceptualization determines Social Work Respondents' *Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Self-Efficacy* and *Behavioural Intention* to use IT-systems.

The parametric one-way between-subject ANOVA was conducted to compare the effect of *knowledge about Lean operations* on the *Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, Self-Efficacy* and *Behavioural Intention* of respondents, and Cohen's D effect size indicator was used to examine the empirical value of differences between the three response groups. Games-Howell post-hoc tests were used in significant cases to examine the exact nature of differences.

4.7.1 Results

Frequencies regarding the response to the question, have you heard of the term "*Lean operations*" are provided in the following Figure:

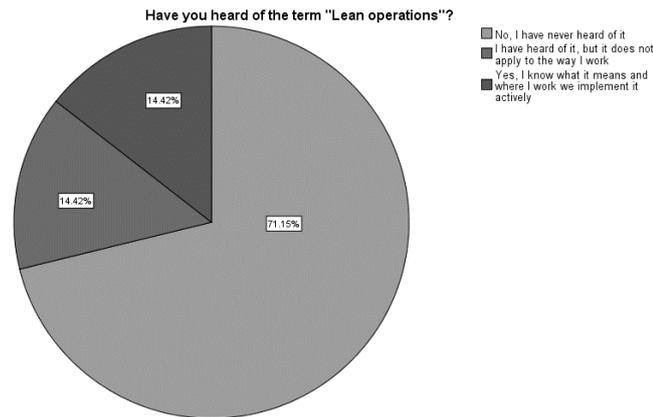


Figure 4-7 Responses to whether the respondent had heard of the "Lean" concept

This figure indicated that the majority of respondents had never heard of the term *Lean* operations. Only 14% indicated that their organization actively implemented the concept and another 14% had heard from it although their organization did not implement it. Analysis of variance (One-way ANOVA) indicated a significant effect of being aware and actively implementing *Lean* concepts in the workplace on Effort Expectancy at the $p < 0.05$ level [$F(2, 100) = 5.156, p = .007, \eta^2 = 0.59$] and *Facilitating Conditions* at $p < .05$ level [$F(2, 98) = 3.144, P = .047, \eta^2 = .06$]. The result was confirmed by the Welch Robust test of Equality of Means [$F(2, 30.158) = 4.555, p = .019$] and [$F(2, 32.009) = 9.217, p = .001$]. Post-hoc comparisons using the Games-Howell test confirmed a significant difference ($p = .015$) between the "Yes, I know what it means" ($M = 3.932; SD = .765$) group and the "No, I have not heard of it" ($M = 3.397; SD = .765$) group with a mean difference of .535. for *Effort Expectancy* and ($M = 5.344; SD = .533$) for the "Yes" group and ($M = 4.461; SD = 1.29$) for the "No" group on *Facilitating conditions*. This meant that the *Effort Expectancy* and *Facilitating Conditions* for respondents that knew the meaning of *Lean* operations and had implemented it in their workplace contexts, was higher than for those who did not have any knowledge about the concept.

Between-group differences regarding *Behaviour Intention* were insignificant [$F(2,100) = 1.281, p = .282, \eta^2 = .37$]. The eta-square value indicates that although p was insignificant, the hypothesis was confirmed in practice by the result that those who had heard about *Lean* operations were behaviourally more intent to accept technology in the workplace.

4.7.2 Interpretation

The above results indicated that respondents who had heard about *Lean* conceptualization and had experienced it being implemented in their workplace were better prepared to accept IT-technology in the workplace. Moreover, though not significant, there was an indication that the

Behaviour towards Technology acceptance by these individuals was positive. This result not only confirmed the relationship between *Lean* operations and technology used in the organization towards *Leaning* operations but also showed the advantages of adopting IT-technology if people had been exposed to *Lean* concepts at work. The group that understood the meaning of the term *Lean* operations was better prepared concerning the effort that was saved by adopting an IT-system, and the facilitating conditions that were present when adopting IT-systems in the workplace. This finding suggested that it may be advantageous to orientate and train individuals in the basics of *Lean* operations before adopting an IT-system such as the CORE-DMS.

To what extent were respondents convinced that *Lean* principles were being implemented in their organizations? In 49% of cases, the organization had a firm plan in place for improving the efficiency of operations, versus 19% of organizations where this was not the case and 26% where respondents were unsure. The pattern was similar regarding the respondent's participation in these *Lean* operations plans. Overwhelmingly, most (99%) were very optimistic about the idea of operational improvements in their organizations, and in 69% of cases, respondents were very positive about management's commitment towards improving operations.

The knowledge of respondents about *Lean* operations conceptualization was tested utilizing an open-ended question asking them to describe their understanding of the term "*Lean* operations". The researcher then developed a grading scale based on the thinking of Malmbrandt & Ahlstrom, (2013) as indicated in the methodology chapter of this dissertation, to assess the responses provided. Based on the ratings obtained, the following results were obtained:

Table 4-2 Knowledge ratings per the description of "Lean"

Knowledge rating based on criteria

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cannot explain "Lean"	36	34.3	34.3	34.3
	Housekeeping definition	19	18.1	18.1	52.4
	Internal efficiency description of "Lean"	38	36.2	36.2	88.6
	"Process" and "flow" description	10	9.5	9.5	98.1
	Ideal flow and practical implementation description	2	1.9	1.9	100.0
	Total	105	100.0	100.0	

Based on this Table, it appears that about 36% of respondents provided answers consistent with the broad "internal efficiency" description, whilst 34% of respondents were not able to explain the term. Only two respondents were able to provide a description that matched the Ideal flow and practical implementation definition, indicated by the authors as the most advanced conceptualization. It is encouraging to note that the internal efficiency description percentage was relatively high as this provides more ideal circumstances for *Lean* operational implementation in Welfare organizations that can be described as social entrepreneurial organizations.

4.7.3 Spearman's Rho correlations between dimensions of UTAUT

This study aimed to investigate whether the Different dimensions of UTAUT correlated to one another and how strong this correlation was. For this purpose, Spearman's Rho correlations were used assuming that the data was not normally distributed.

Based on the results of this analysis, the results are provided in the following Table:

Table 4-3 Correlations amongst UTAUT dimensions

			Correlations					
			Performance Expectancy Scale	Effort Expectancy Scale	Self- Efficacy Scale	Facilitating Conditions Scale	Social Influence Scale	Behavioural Intention Scale
Spearman's rho	Performance Expectancy Scale	Correlation	1.000	.268	.262	.137	.202	.494
		Coefficient						
		Sig. (2- tailed)	.	.006	.008	.173	.042	.000
		N		102	101	101	102	103
	Effort Expectancy Scale	Correlation		1.000	.455	.250	.286	.518
		Coefficient						
		Sig. (2- tailed)			.000	.012	.004	.000
		N			100	101	102	103
	Self-Efficacy Scale	Correlation			1.000	.332	.378	.404
		Coefficient						
		Sig. (2- tailed)				.	.001	.000
		N				100	101	101
	Facilitating Conditions Scale	Correlation				1.000	.379	.093
		Coefficient						
		Sig. (2- tailed)					.	.000
		N					100	101
	Social Influence Scale	Correlation					1.000	.136
		Coefficient						
Sig. (2- tailed)							.	
	N						103	
Behavioural Intention Scale	Correlation						1.000	
	Coefficient							
	Sig. (2- tailed)						.	

Significant to note was that *Facilitating conditions* were not significantly related to *Behavioural Intention (BI)* and *Performance Expectancy (PE)*, And *Performance Expectancy (PE)* was also

not related to *Social Influence* (SI). *Social Influence* was not related to *Behavioural Intention* (BI), whilst all the other dimensions were significantly and moderately or strongly related.

4.7.4 Interpretation

This result indicated that as the respondent's expectancy of IT-systems to make work lighter and more efficient, so did the savings on the administrative effort that was required in this line of work; thus *Effort Expectancy* increased as the expectancy that the system would perform to one's expectancy. Jointly, these two factors contributed positively to one's intended behaviour to master the use of the IT-system.

Although *Social Influence* was not related to *Behavioural Intention* directly, it was expected that social influence from one's supervisor or manager would increase the likelihood of actively using the system at work. This was an important finding, as it indicated that few respondents would use the system out of their own accord, but if their supervisors adopted it, they would easily be influenced into using it as they could see the effort savings potential of such system, and this would drive their behaviour towards using the system. The lack of a significant and positive relationship between *Facilitating Conditions* and *Behavioural Intention* as well as *Performance Expectancy* indicated that these conditions, referring to hardware requirements and training inputs to get acquainted with an IT-system were independent of one's expectancy of the system to perform, or the likely behavioural response towards such system. This lack of significance indicated that social workers had a stronger need for the system to perform and were willing to direct their behaviour towards using an IT-system, regardless of whether the hardware and associated facilities were in place. Furthermore, considering the previous finding that women in this industry were more likely to respond on strength of social influence, it could be expected that the response towards the use of IT-systems should be positive. The initiation of the system had to come from the organization's side. In further analysis, it was important to determine what will drive the actual behaviour of using the IT-system.

4.7.5 Multiple Linear regression modelling

Aim of the study: To investigate whether *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Facilitating Conditions* (FC), *Self-Efficacy* (SE), and *Social Influence* (SI) predict *Behavioural Intent* (BI).

The Null-hypothesis for this study was:

There will be no significant prediction of *Behavioural Intention (BI)* by *Performance Expectancy (PE)*, *Effort Expectancy (EE)*, *Facilitating Conditions (FC)*, *Self-Efficacy (SE)*, and *Social Influence (SI)*.

Alternative hypothesis:

Behavioural Intention (BI) should be predicted by *Performance Expectancy (PE)*, *Effort Expectancy (EE)*, *Facilitating Conditions (FC)*, *Self-Efficacy (SE)*, and *Social Influence (SI)* respectively.

Multiple linear regression was calculated to predict *Behavioural Intent (BI)* based on *Performance Expectancy (PE)*, *Effort Expectancy (EE)*, *Facilitating Conditions (FC)*, *Self-Efficacy (SE)*, and *Social Influence (SI)*. A significant regression equation was found ($F(5,94) = 19.377, p < 0.000$) with R^2 of 0.508. Participant's predicted *Behavioural Intention (BI)* is equal to $1.527 + .292 (PE) + .234 (EE) + .145 (SE)$ where PE, EE and SE were represented by scores on each scale. *Behavioural Intention (BI)* increased by 0.292 units for each 1 unit of PE, by .234 for each unit of EE, and 0.145 units for 1 unit of SE. *Performance Expectancy (PE)*, *Effort Expectancy (EE)* and *Self-Efficacy (SE)* were therefore significant predictors of *Behavioural Intention (BI)*, but *Facilitating Conditions (FC)* and *Social Influence (SI)* were found to be insignificant predictors of *Behavioural Intention (BI)* and therefore did not play a role in the respondent's intention to take action.

Three of the five hypotheses stated regarding the influence of UTAUT constructs on *Behavioural Intention* were found to be supported. It was only hypotheses 4 and 5 that were not supported.

4.7.6 Interpretation

This result indicated that the intended use of IT-systems in social work contexts was primarily driven by the expected performance of the system towards improving operations in the workplace, as well as the expected effort gains because of the technological possibilities inherent of an IT-system. To a lesser extent, behavioural intent was motivated by *Self-Efficacy*, or the tendency to have knowledge and experience that would facilitate acceptance of the technology. Facilitating conditions such as hardware provision and training did not seem to play a role in the actual behavioural response towards the IT-system and Social Influences also did not play any role in influencing the behaviour of respondents.

The current study results were largely consistent with findings by Venugopala, Jinkab, & Priyac, (2016) who conducted a similar study amongst hospital doctors in an Indian context. *Performance Expectancy* and *Effort Expectancy* weights were found to be largely similar to those found in the

stated study, confirming the relative importance of these factors in the acceptance behaviour of health care practitioners.

4.7.7 Multiple Linear regression modeling 2

Aim of the study: To investigate whether *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Self-Efficacy* (SE), and *Social Influence* (SI) predicted *Facilitating Conditions* (FC).

The Null-hypothesis for this study was:

There was no significant prediction of *Facilitating Conditions* (FC) by *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Self-Efficacy* (SE), and *Social Influence* (SI)

Alternative hypothesis:

Facilitating Conditions (FC) will be predicted by *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Self-Efficacy* (SE), and *Social Influence* (SI) respectively.

Multiple linear regression was calculated to predict *Facilitating Conditions* (FC) based on *Performance Expectancy* (PE), *Effort Expectancy* (EE), *Self Efficacy* (SE), and *Social Influence* (SI). A significant regression equation was found ($F(4,95) = 8.464, p < 0.000$) with R^2 of 0.518. Participant's predicted *Facilitating Conditions* (FC) was equal to $1.869 + .325(SI)$, where SI was represented by scores on the SI scale. *Facilitating Conditions* (FC) increased by 0.325 units for each 1 unit of SI. *Social Influence* (SI) were therefore significant predictors of *Facilitating Conditions* (FC), but *Performance Expectancy* (PE), *Effort Expectancy* (EE), and *Social Efficacy* (SE) were found to be insignificant predictors of *Facilitating Conditions* (FC) and therefore did not play a role in whether conditions were optimal towards accepting technology.

One of the four hypotheses stated regarding the influence of UTAUT constructs on *Facilitating Conditions* were found to be supported.

4.8 Interpretation

4.9 Discussion of the findings

The above results significantly contributed towards the understanding of how social workers viewed IT-systems such as the CORE-DMS system and answered the question of whether they and the sector in which they work were ready to accept IT-technology and adopt it in their work contexts. Some of the insights gained from the results were:

- Respondents that had an understanding of the term *Lean operations* were significantly more willing to display adaptive behaviour in response to IT-system introduction. Although only about a third of respondents indicated knowing *Lean operations*, the rest appeared to be involved in organizational improvement efforts from time to time and were more familiar with these efforts. It should therefore be considered to introduce IT-systems in the welfare sector along with interventions designed to improve the *Lean operations* in these organizations as the link between these two constructs appears logical. This study had shown that the expectancy regarding the effort that would be saved administratively, joined with a positive attitude in terms of the technical conditions that were needed to introduce and adopt IT-technology were overwhelmingly positive contributing factors towards creating the correct mindset for adopting IT-technology in the social services sector. The result that Facilitating Conditions were NOT related to Behavioural Intention was equally positive as it showed that the intended adoptive behaviour was in no way dependent on whether the hardware conditions facilitated adoption or not. Furthermore, the decision to either adopt or not adopt IT-technology was largely independent of social influences that might have played a role.
- Although respondents generally were highly optimistic about the use of IT-systems in their work contexts, this optimism was caused by the facilitated efficiency characteristics associated with using IT-systems as well as the gains achieved from the effort to use it, which played the biggest role in influencing the intention to use such systems. As reflected by *Performance Expectancy*, *Effort Expectancy*, and *Social Efficacy*, Behavioural Intention depended most on these three aspects.
- Although Facilitating Conditions in the workplace positively contributed towards the expected effort to use IT-systems, these did not influence the behavioural intention to use the system. This meant that either social workers were used to not having the latest computer hardware and facilities, or they regarded this as less important in their work context that was rather driven by factors such as service to clients.
- Social Influence did not significantly contribute towards the intention to adopt and accept technology in the workplace.
- Considering gender differences regarding the use of technologies and the social influences that might influence the extent to which women in the sample might adopt and accept technologies such as IT-systems, one needed to consider the need for social influence as a factor to promote the adoption of technology by women. Consistent with observations indicated in Chapter 1 regarding the rejection of the CORE-DMS system in a previous similar context, it was now realized that the rejection and failure of that system to be effectively implemented in the host organization, may have been because the use

of the system was not enforced by the senior management of the organization and use by branch offices was made voluntary. In terms of the findings of this study, this could be the single most important factor and something that needed to be considered in future deployments of this system.

- The conditions that facilitated the adoption and acceptance of technology were driven by social influences, meaning that if social influences were used to stimulate employees either through Reward systems or Sanctioning, it was more likely that the context was ready to accept technology.

4.10 Summary

The empirical findings from this study indicated several significant trends regarding the respondent's preferences and readiness to accept IT-technology in their operational contexts.

Firstly, the study showed that although social workers were not pertinently familiar with concepts such as *Lean* operations, they were familiar with and involved in efforts by their organizations to improve operations and processes of work to make these more efficient. They were overwhelmingly positive about operational changes and could actively participate in these should the opportunity arise. This willingness showed readiness and flexibility towards change in the organization and could be a constructive positive attitude towards the introduction of *Lean* operations techniques and strategies alongside the introduction and implementation of an IT-system in the work context.

It was concluded that any efforts at introducing IT technologies in the social service sector should be accompanied by orientation towards *Lean* operations first as a mechanism towards softening and preparing the sector towards more favourable adoption of IT-technology.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the conclusions and recommendations to the study and establishes whether the research questions have been answered. In essence, the study wanted to establish whether the UTAUT model dimensions of *Performance Expectancy* (PE), *Effort Expectancy* (EE), *social Efficacy* (SE), *Facilitating Conditions* (FC) and *Social Influence* (SI) predicted *Behavioural Intention* (BI) in a sample of South African social workers working in social service organizations. The extent to which this question could be answered would enable the researcher to better understand this particular sector and effectively plan technology adoption in the future. The understanding of trends and variances in the combination of factors that influences behaviour towards technology adoption will benefit developers and managers whose aim may be to introduce technology in this sector of health care services.

The discussion in this chapter will firstly focus upon the limitations of the study, and followed by the conclusions that are relevant for management sciences, and then reflect on recommendations to be made regarding future research in this field and the field of technology acceptance.

5.2 Limitations to the study

This study has been limited by the following aspects:

- Sampling was rather small and with 102 cases and lowered responses, the advertising was discontinued and the survey stopped. The relatively small sample size limited the execution of some of the analytical techniques that were planned. For example, after consultation with a statistician, it was decided not to conduct an Exploratory or Confirmatory Factor analysis as this would be influenced by the sample size. It was then decided to conduct further analysis using the UTAUT scale dimensions as theoretically validated in prior studies.
- As a result of the smaller realized sample, it was decided not to analyze moderation in the study, as was planned and done in most other studies. This change in the analysis plan was not uncommon and was observed in several other studies where a similar analysis was not done (e.g. Venugopala, Jinkab, and Priyac, 2016). To compensate for this, the demographic variables Gender, Age, and Years' experience were used as independent variables in executing group comparison analysis utilizing Independent samples t-test and ANOVA. This rendered workable results that significantly contributed to the results.

- The study did not use the full complement of items from the *Performance Expectancy* (PE) dimension of UTAUT, and the analysis was conducted using two sub-dimensions of PE that were regarded most appropriate for a situation in which respondents had little experiential knowledge of an IT-system and had to base their responses on a conceptual presentation of the IT-system. The apparent effect of this adaptation of the measurement tool was rather limited as the scale still operated reliably and rendered significant results.
- The items developed in the measurement tool that reflected *Lean* operations proved to have limited value in terms of the study, as these could not effectively be combined to provide scale-like analysis opportunities. Although it would have been preferred to scale the *Lean* items, it was still possible to conduct the analysis effectively with each item in situ.
- The study was limited by the SA Council for Social Service Professions' decline to support the study and assist with collecting data from its constituents. This severely limited the power that could have been obtained from the study, had it been possible to distribute the questionnaire to the larger population of social workers in South Africa. This limitation undermined the value of the study somewhat in that results could not be generalized to the larger population as the sample was not representative of the population. The effect of this limitation was minimized somewhat by employing an alternative sampling strategy that involved several social welfare organizations and electronic platforms where social workers are frequently members.

5.3 Conclusions to the study

5.3.1 Implications for IT-system adoption in social service organizations

The study showed clearly that social workers in the social services sector were positive about IT-technology and were likely to adopt it if it was introduced to them. In contrast, it became equally clear that the majority of social workers had not heard about *Lean* conceptualization and how work processes in social services could be made more efficient, and the role of IT-technology in facilitating *Lean* operations in social service organizations.

This study had clearly shown that the dimensions of the UTAUT model equally well applied to the Behavioural intent of social work respondents. Specifically, the intention to direct behaviour towards acceptance of IT-technology was driven by *Performance Expectancy*, *Effort Expectancy*, and *Social Influence*, but not *Facilitating Conditions*. The way this predictive model was interpreted is important. *Facilitating conditions* such as the ease of use, support availability, hardware availability, compatibility did not directly influence the intention to direct behaviour towards adopting IT-technology. This meant social workers were ready to adopt technology and had high expectations that the proposed IT-system (The CORE-DMS) would not be too difficult to implement, regardless of the difficulties this might bring. It should be borne in mind that this

study was conducted pre-adoption and the result may be different if the study was conducted post-adoption. A small proportion of respondents (+- 10) were already exposed to the IT-system and had been using it at the time of the study. This may have had a small effect.

Based on the findings, it was concluded that the social service sector was ready to receive IT-technology and the market was ready to accept technology.

5.3.2 The expected potential for acceptance of technology by the social services sector

It is asserted, based on the above conclusions, that the social services Market was ready to accept IT-technology such as the CORE-DMS and this meant that marketing strategies could now be actively developed to reach out to the market and achieve some form of market penetration. It was expected, based on prior experience, that marketing would have to be done bottom-up, by convincing direct users firstly and then use this force to convince management, who by default was concerned about financial implications that their users were ready to accept technology.

It would be advantageous to combine the marketing of IT-technology such as CORE-DMS with training and orientation towards the *Lean* conceptualization. This study had clearly shown that such training would facilitate a more constructive and positive orientation towards Technology acceptance, and was likely to improve those facilitating conditions and effort gain perceptions that were needed to sell the IT-technology concept to the user.

This study showed that marketing needed to be adjusted and focused on specific gender groups. Males had to be reached in terms of the “Power” of the system to provide accurate statistics and features that would improve the service planning aspect of the organization, whilst women could be targeted regarding the social benefits that could be achieved with an IT-system. One of these social benefits should be improved communication and interaction between different users regarding the work they do. If, for example, the system’s capability to be an instrument for gaining social support from colleagues, was enhanced and elevated as a definite selling point, this may lead to more positive attitudes and acceptance in women users.

It was significant to note that neither Age nor Years’ experience in the social service field had a pertinent influence on acceptance dimensions. Although it appeared that younger users might, due to intergenerational factors, be more inclined towards using IT-technology, this effect was not overarching and general. Older and more experienced respondents seemed to have a broader vision regarding the importance of IT-systems in this sector, and since they might frequently be found in management positions, were likely to influence the adoption of IT-technology.

5.3.3 Limitations of IT-systems to be integrated into social work professional activities

The ever-present financial shortages associated with technology adoption in social service organizations, especially at NGO/NPO organizations might be a severely limiting factor towards the active adoption of IT-technology in social services. Unless forms of crowdfunding and social responsibility funding options were exploited, this might be a severe negative impact on the concept of introducing IT-technology to this market.

A further macro-factor to be considered was the lack of support to be expected from State departments, which had thus far lacked attempts to introduce IT technologies into the social services sector. The state's persistence in adhering to old, paper-based manual information systems might hinder and discourage the adoption of IT-technology in those organizations that viewed it favorably. Associated with outdated paper-based systems was the frequent changing of service codes by the state that required organizations to switch the way services were coded. These changes were set to disrupt modern IT-systems unless their developers were agile in adapting systems to these frequent structure changes.

IT-technology adoption might be limited if a concerted effort was not made to change to IT-technology and this change could be implemented across the sector. The scale of change to IT-technology needed to be large enough to disrupt the market and cause a dramatic change towards technology use. Only then would it be possible to use this disruptive stance to influence wider scale adoption.

Limitations in hardware acquisition and suitability might be a limiting factor as well. Connectivity and its associated costs might discourage some organizations from adopting IT-technology and since connectivity was directly linked to the technology itself, might cause faith and confidence in the IT-system to fail if connectivity was weak.

5.4 Recommendations

5.4.1 Recommendations to developers of IT-Systems for the social services sector

This study showed that the market for IT-systems in social services was ready to accept Technology based on the pre-adoption perceptions of a sample of social workers targeted for this study. This readiness to accept technology did not mean that it would be easy to penetrate the market and easily develop and sell IT-systems in this market sector. Some general considerations were important:

- A thorough understanding must be gained from the needs in the market to develop the appropriate system that reflects the needs and practices of the target market segment.

- It might be necessary to secure solid investment or financing to fund IT-system development as most NGO/NPO organizations in this sector will not be able to foot the bill of development.
- Any technology development efforts should consider the frequently changing State information needs and demands on the sector, as this will negatively impact the development and disrupt the stability of an IT-system.
- Any product introduction should be planned carefully because social workers working in the social services sector frequently display characteristics similar to their counterparts in the health care sector regarding the tendency to override organizational priorities and demands by the service demands and needs of their clients. This might influence the accuracy and precision of data collection in this sector.
- The introduction of IT-systems in this sector must be accompanied by an extensive training and support programme, as this will ensure more success in the launching of the system.
- Any technology introduction in this sector should be accompanied by an extensive *Lean* operations strategy for each organization to prepare the playing field for the adoption of the technology. This study has shown that knowledge of *Lean* or involvement in *Lean* strategies significantly improved the acceptance levels of respondents.
- Lastly, any system that was introduced should be implemented using a rewards and sanctioning approach, meaning that the system's use must be compulsory to the users as this will ensure greater adherence to protocols and ensure a reasonable standard of data can be obtained.

5.4.2 Recommendations to Managements of social service organizations

Since this study concluded that the social services sector was ready to adopt and implement IT-technology, it should be realized by management that technology adoption and implementation in this sector is not unlike that in other sectors. However, there are a few aspects that warrant specific attention of senior managers in social service organizations.

- There is no single IT-system that will fulfill all the needs of the organization or industry it has been designed for. Technology adoption and implementation appear to be a continuous process that occurs over time. It is therefore not possible to buy completely off-the-shelf products that accurately fit the needs of the organization. IT-technologies are iterative tools in organizations and are continuously developed and refined. Therefore, the decision to acquire an IT-system should not be taken lightly, yet should not be postponed indefinitely until the perfect system is found.

- Technology adoption and implementation are strongly associated with changes and improvements in the organization's operational processes. It is therefore recommended to management to introduce an IT-system along with a *Lean* operations strategy since IT-systems inherently exploit information technology that leads to more efficient operations in the organization. This study has shown an important interrelationship between knowledge of *Lean* and IT-acceptance, and this should be exploited as a strength in the effort to introduce IT-technology. Respondents have shown consistently that their expectations regarding the effort to adopt IT-technology were significantly more positive when they knew about *Lean*. Similarly, they were significantly more optimistic regarding those conditions that facilitated the adoption of IT-systems.
- IT-technology adoption should be part of a longer-term plan for *Lean* operations. Once the change-over has been made it will be very difficult to return to previous types of manual activities and undoing the effect of IT-implementation may present more negative than positive outcomes.

5.4.3 Recommendations to the measurement of Technology acceptance and the UTAUT model as a field of study

The study has contributed to the continued testing and refinement of the UTAUT model by demonstrating the effectiveness of the model for evaluating technology acceptance in a South African context. Although the results confirmed what many other studies have found regarding the prediction value of *Performance Expectancy*, *Effort Expectancy*, *Social Influence*, and *Facilitating Conditions* on *Behavioural Intention*, the study made a significant contribution by exploring the link between *Lean* operations and technology acceptance. It was recommended that further research be conducted on this relationship as it appears from this study that combining *Lean* thinking with technology adoption may result in more effective adoption and acceptance of technology in social service organizations.

As such, *Lean* conceptualization was not often encountered in social service organizations, and to the knowledge of the researcher, this was the first time a study was conducted in the social services sector that extensively focused upon these two constructs, technology acceptance, and *Lean* operations. It is recommended that follow-up studies, involving larger samples and more concrete emphasis on *Lean* principles should be conducted. A larger study that involves a broader sampling scope would enable more concretized results regarding the overall readiness and acceptance of technology in the South African social services sector.

Regarding the UTAUT model, it is recommended that more consideration is given in future research regarding the linkage with operations management principles and *Lean*

conceptualization. New dimensions could be developed that extended the UTAUT model's capability to understand underlying processes in organizations as contributors or facilitators of technology adoption.

5.4.4 Conclusion

This research was a response to a need and challenge that the researcher experienced to introduce IT-technology to the social services sector in South Africa. His experience in introducing this sector to IT-technology has been partially successful, but the road thus far has been difficult and included a failed system at one organization. These experiences sparked an interest in investigating the acceptance and use of IT-technology in the social services sector, indirectly leading to this study. Although the study turned out relatively small in size, it achieved what was expected of it, namely to answer questions that were formulated at the start of the study, namely:

- What factors best predicted whether social workers in the South African context were ready to adopt and accept IT technologies?
- What was the role of demographic variables associated with social service professionals in our understanding of social workers' adoption and acceptance of specifically IT-systems in the social service organizational context?
- Did knowledge of the concept '*Lean thinking*', contribute positively to differences in the acceptance of technology by social workers in social service contexts?

The answer to the first question provided new insights into the potential that South African social workers will adopt IT-technologies shortly. It was found that they are indeed positive and ready to adopt and accept technology, but that the process of introduction of IT needed to be accompanied by a specific technology-oriented *Lean* strategy, as this would enhance the potential of adoption. The second question rendered rather non-specific answers. Although it was possible to infer roles ascribed to the demographics of the population, this could only be derived indirectly by studying group differences as none of these variables significantly contributed to prediction models. The answer to the third question was a definite "yes". The introduction of IT-technology was less likely to be successful if it was not introduced as part of *Lean* operational strategies. With this, some answers had been provided.

It was thought that the advent of COVID-19 might rather unexpectedly contribute towards the earlier introduction of IT-technology in this sector, as "working from home" could become a reality soon in this sector, however, most social service organizations remained operational throughout Lockdown as social services continued to be provided live...

BIBLIOGRAPHY

Ahmad, Mohammed I (2014) 'Unified Theory of Acceptance and Use of Technology (UTAUT), A decade of Validation and Development', *Encyclopedia of Education and Information Technologies*, pp. 1750–1750. doi: 10.1007/978-3-030-10576-1_300692.

Ahmad, Mohammad I (2014) 'Unified Theory of Acceptance and Use of Technology (UTAUT): A Decade of Validation and Development', *In: Fourth International Conference on ICT in our lives 2014*, (1), pp. 1–13. doi: 10.1590/0034-7612140185.

Asnan, R., Nordin, N. and Othman, S. N. (2015) 'Managing Change on Lean Implementation in Service Sector', *Procedia - Social and Behavioral Sciences*, 211, pp. 313–319. doi: 10.1016/j.sbspro.2015.11.040.

Attuquayefio, S. and Addo, H. (2014) 'Review of Studies With Utaut As Conceptual Framework', *European Scientific Journal*, 10(8), pp. 249–258.

Bortolotti, T., Boscari, S. and Danese, P. (2015) 'Successful lean implementation: Organizational culture and soft lean practices', *International Journal of Production Economics*, 160, pp. 182–201. doi: 10.1016/j.ijpe.2014.10.013.

Bryman, A. (2012) *Social Research Methods*. 4th edn. Oxford: Oxford : Oxford University Press.

Bullock, A. N. and Colvin, A. D. (2015) 'Communication Technology Integration into Social Work Practice Overview of Communication Technology Integration into Social Work Practice Description of the Technology Acceptance Model (TAM)', *Advances in Social Work*, 16(1), pp. 1–14.

Chikadzi, V. (2014) 'A case for definition: Key features guiding the conception of social enterprise in South Africa', *Mediterranean Journal of Social Sciences*, 5(14), pp. 593–600. doi: 10.5901/mjss.2014.v5n14p593.

Dwiputranti, M. I., Oktora, A., Okdinawati, L. and Fauzan, M. N. (2019) 'Acceptance and use of information technology: Understanding information systems for Indonesia's humanitarian relief operations', *Gadjah Mada International Journal of Business*, 21(3), pp. 242–262. doi: 10.22146/gamaijb.39199.

- Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., *et al.* (2019) 'Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model', *Information Systems Frontiers*, 21(3), pp. 719–734. doi: 10.1007/s10796-017-9774-y.
- Ferreira, C. L., Almeida, M. H. and Grilo, A. (2018) 'Lean IT adoption: Success cases in Portuguese banks', in *Proceedings of the International Conference on Industrial Engineering and Operations Management*. Bandung, Indonesia: IEOM Society International, pp. 2146–2158.
- Ghobakhloo, M. and Hong, T. S. (2014) 'IT investments and business performance improvement: the mediating role of lean manufacturing implementation', *International Journal of production Research*, 52(18), pp. 5367–5384.
- Gravetter, F. J. and Forzano, L.-A. B. (2016) *Research Methods for the Behavioral Sciences*. 5th edn. Stamford: Cengage Learning.
- Gupta, S., Sharma, M. and Viyaya, S. M. (2016) 'Lean services: a systematic review', *International Journal of Productivity and Performance Management*, 65(8), pp. 1025–1056. doi: 10.1108/IJPPM-02-2015-0032.
- Heizer, J., Render, B. and Munson, C. (2017) *Operations Management, Sustainability and Supply Management*. 12th edn. Harlow: Pearson Education Limited.
- Ker, J.-I., Wang, Y., Hajli, M. N., Song, J., *et al.* (2014) 'Deploying lean in healthcare: Evaluating information technology effectiveness in U.S. hospital pharmacies', *International Journal of Information Management*, 34(4), pp. 556–560. doi: 10.1016/j.ijinfomgt.2014.03.003.
- Krause-Jensen, J. (2017) 'Trimming the social body: An analysis of Lean management among family counsellors in a Danish municipality', *Journal of Organizational Ethnography*, 6(2), pp. 68–86. doi: 10.1108/JOE-01-2017-0005.
- Leite, H. dos R. and Vieira, G. E. (2015) 'Lean philosophy and its applications in the service industry: A review of the current knowledge', *Producao*, 25(3), pp. 529–541. doi: 10.1590/0103-6513.079012.
- Littlewood, D. and Holt, D. (2018) 'Social Entrepreneurship in South Africa: Exploring the Influence of Environment', *Business and Society*, 57(3), pp. 525–561. doi: 10.1177/0007650315613293.

- Lu, Z., Cui, T., Tong, Y. and Wang, W. (2020) 'Examining the effects of social influence in pre-adoption phase and initial post-adoption phase in the healthcare context', *Information and Management*, 57(3), p. 103195. doi: 10.1016/j.im.2019.103195.
- Malmbrandt, M. and Ahlstrom, P. (2013) 'An instrument for assessing lean service adoption', *International Journal of Operations & Production Management*, 33(9), pp. 1131–1165. doi: 10.1108/IJOPM-05-2011-0175.
- Mathews, E. B., Little, V., Clemens, B. and Rutigliano, J. (2018) 'Health information technology', in Stanhope, V. and Straussner, S. L. A. (eds) *Chronic Illness Care: Principles and Practice*. New York: Oxford University Press, Inc, pp. 401–417. doi: 10.1007/978-3-319-71812-5_34.
- Mohammed, A., White, G. R. T., Wang, X. and Kai, H. (2018) 'IT adoption in social care: A study of the factors that mediate technology adoption', *Strategic Change*, 27(3), pp. 267–279. doi: 10.1002/jsc.2200.
- Morrisson, M. K. and Nzuki, D. M. (2016) 'User Acceptance and Usage of E-learning Technologies: A Theoretical Review', *International Journal of Science and Research*, 5(12), pp. 525–529. doi: 10.21275/ART20163483.
- Naidoo, L. and Fields, Z. (2019) 'Knowledge and Experience of Lean Thinking Amongst Senior Health Care Managers in Selected South African Public Hospitals', *SPOUDAI Journal of Economics and Business*, 69(4), pp. 21–37.
- Olasina, G. (2015) 'Factors Influencing the Use of M-Banking By Academics: Case Study Sms-Based M-Banking', *The African Journal of Information Systems*, 7(4), p. 4.
- Pallant, J. (2011) *SPSS Survival Manual, A step by step guide to data analysis using SPSS*. 4th edn. Crows Nest, NSW: Allen & Unwin.
- Pettersen, J. (2009) 'Defining lean production : some conceptual and practical issues', *The TQM Journal*, 21(2), pp. 127–142. doi: 10.1108/17542730910938137.
- Pinho, C. and Mendes, L. (2017) 'IT in lean-based manufacturing industries : systematic literature review and research issues', *International Journal of Production Research*, 55(24), pp. 7524–7540. doi: 10.1080/00207543.2017.1384585 IT.
- Powell, B. J., Proctor, E. K. and Glass, J. E. (2014) 'A Systematic Review of Strategies for

Implementing Empirically Supported Mental Health Interventions.’, *Research on social work practice*, 24(2), pp. 192–212. doi: 10.1177/1049731513505778.

Render, B., Stair, R. M., Hanna, M. E. and Hale, T. S. (2015) *Quantitative Analysis for Management*. 12th edn. Harlow: Pearson Education Limited.

Riezebos, J., Klingenberg, W. and Hicks, C. (2009) ‘Lean Production and information technology: Connection or contradiction?’, *Computers in Industry*, 60(4), pp. 237–247. doi: 10.1016/j.compind.2009.01.004.

Rizzuto, T. E., Schwarz, A. and Schwarz, C. (2014) ‘Toward a deeper understanding of IT adoption: A multilevel analysis’, *Information and Management*, 51(4), pp. 479–487. doi: 10.1016/j.im.2014.02.005.

Roostenburg, W. J. H. (1993) *The development of an information model for the management of an employee assistance programme*. Rand Afrikaans University.

Roostenburg, W., Oliphant, E. and Ludick, J. (2012) ‘CORE Data Management System’. Carletonville: Afri.Yze Consult (Pty) Ltd.

Sahadani, N. and Salleh, S. (2014) ‘Investigating Students’ Acceptance of Tablet Pc in Learning Science: an Application of the Modified Technology Acceptance Model’, *EDULEARN14 Proceedings*, pp. 3203–3215.

Seal, W., Rohde, C., Garrison, R. H. and Noreen, E. W. (2019) *Management Accounting*. 6th edn. New York: Mc Graw Hill.

Seethamraju, R., Diatha, K. S. and Garg, S. (2018) ‘Intention to Use a Mobile-Based Information Technology Solution for Tuberculosis Treatment Monitoring – Applying a UTAUT Model’, *Information Systems Frontiers*, 20(1), pp. 163–181. doi: 10.1007/s10796-017-9801-z.

Sharifian, R., Askarian, F., Nematollahi, M. and Farhadi, P. (2014) ‘Factors influencing nurses’ acceptance of hospital information systems in Iran: application of the Unified Theory of Acceptance and Use of Technology’, *Health Information Management Journal*, 43(3), pp. 23–28. doi: 10.12826/18333575.2014.0001.Sharifian.

Shiferaw, K. B. and Mehari, E. A. (2019) ‘Modeling predictors of acceptance and use of electronic medical record system in a resource limited setting: Using modified UTAUT model’, *Informatics*

in Medicine Unlocked, 17(April), p. 100182. doi: 10.1016/j.imu.2019.100182.

Singh, P. (2019) 'Lean in healthcare organization: an opportunity for environmental sustainability', *Benchmarking*, 26(1), pp. 205–220. doi: 10.1108/BIJ-04-2018-0104.

Skhosana, R. M. (2020) 'The dilemma faced by npos in retaining social workers: A call to revisit the retention strategy', *Social Work (South Africa)*, 56(2), pp. 108–124. doi: 10.15270/56-2-815.

Spagnol, G. S., Min, L. L. and Newbold, D. (2013) 'Lean principles in healthcare: An overview of challenges and improvements', *IFAC Proceedings Volumes (IFAC-PapersOnline)*, 6(PART 1), pp. 229–234. doi: 10.3182/20130911-3-BR-3021.00035.

Stewart, L. (2013) *Technology Acceptance in Organizations*. Kansas State University.

Swanepoel, J. M. and Roestenburg, W. J. (2016) *The relationship between perceived social support, online social network usage and reflective practice in forensic social work*, *Unpublished Master's dissertation*. North West University, School for Psychosocial health.

Tantipongnant, P. and Laksitamas, P. (2014) 'An analysis of the technology acceptance model in understanding students' behavioral intention to use university's social media', *Proceedings - 2014 IIAI 3rd International Conference on Advanced Applied Informatics, IIAI-AAI 2014*, 12, pp. 8–12. doi: 10.1109/IIAI-AAI.2014.14.

Taylor, A. (2017) 'Social work and digitalisation : bridging the knowledge gaps', *Social Work Education*, 36(8), pp. 869–879. doi: <https://doi.org/10.1080/02615479.2017.1361924> Social.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. (2003) 'User acceptance of information technology: Toward a unified view', *MIS Quarterly: Management Information Systems*, 27(3), pp. 425–478. doi: 10.2307/30036540.

Venkatesh, V., Thong, J. Y. L. and Xu, X. (2012) 'Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology', *MIS Quarterly: Management Information Systems*, 36(1), pp. 157–178. doi: 10.2307/41410412.

Venkatesh, V., Thong, J. Y. L. and Xu, X. (2016) 'Unified theory of acceptance and use of technology: A synthesis and the road ahead', *Journal of the Association for Information Systems*, 17(5), pp. 328–376. doi: 10.17705/1jais.00428.

Venugopala, P., Jinkab, S. and Priyac, S. A. (2016) 'User Acceptance of Electronic Health

Records: Cross Validation of Utaut Model.', *Global Management Review*, 10(3), pp. 42–54.

Available at:

<http://ezproxy.library.capella.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=119317189&site=bsi-live&scope=site>.

Waring, J. J. and Bishop, S. (2010) 'Lean healthcare: Rhetoric, ritual and resistance', *Social Science and Medicine*, 71(7), pp. 1332–1340. doi: 10.1016/j.socscimed.2010.06.028.

Wright, G., Mahony, D. O. and Cilliers, L. (2017) 'Electronic health information systems for public health care in South Africa : a review of current operational systems', *Journal of Health Informatics in Africa*, 4(January), pp. 51–57. doi: 10.12856/JHIA-2017-v4-i1-164.

Zhang, W. and Gutierrez, O. (2007) 'Information technology acceptance in the social services sector context: An exploration', *Social Work*, 52(3), pp. 221–231. doi: 10.1093/sw/52.3.221.

ANNEXURES

ANNEXURE A PERMISSION LETTER: RATA



NPO Registrasie: 001-518NPO

NPC Registrasie: 2001/002289/08

www.rata.org.za



Posbus 2368
PRETORIA
0001
Tel 012 543 0234 / 0446
E-pos: mariaan@rata.org

11 September 2020

Prof WJH Roestenburg
NWU

Dear Prof Roestenburg

Readiness and Acceptance of IT-Systems in social services

Rata Social Services NPC hereby provides permission to Prof WJH Roestenburg to conduct the above research study amongst social workers of our organization, within the parameters of research ethics. We will assist this research effort by distributing the questionnaire to our social workers.

The organization will appreciate feedback on the findings of the study.

Kind regards,

Mariaan Steenkamp
EXECUTIVE DIRECTOR

'Reach out, Touch'

ANNEXURE B: PERMISSION LETTER: ACVV

ACVV Hoofkantoor / Head Office

ACVV-Sentrum/Centre, Caledonstraat 61/ 61 Caledon Street

Posbus / P O Box 3834, Kaapstad /Cape Town, 8000

Tel: (021) 4617437, 461 1109

Faks/Fax : (021) 4610074

Epos/email: headoffice@acvv.org.za

www.acvv.org.za

002 834 NPO
930004921 PBO



TO WHOM IT MAY CONCERN

Permission has been granted to **PROF. W H ROESTENBURG of North West University** to conduct a research study towards an MBA dissertation with social workers of the ACVV. The topic of the proposed research is *"Technology Readiness of social workers in the South African social service context and whether they will accept IT systems in the work context."*

All social workers employed by the ACVV are allowed to participate in the research study. The methodology would be an online questionnaire regarding the social worker's perceptions about technology use in practice. It will include watching a YouTube video of 15 minutes and then complete a survey for another 35 minutes. Participation by individual ACVV social workers in the study is voluntary.

According to ACVV Policy it is required of the student/researcher to supply the ACVV Head Office with a copy of the research findings on completion of the study.

For any enquiries about the study the researcher can be contacted at 083 675 8054 or Dr. Johannes Jordaan at 071 366 2262 of NWU for any further questions or problems experienced. The undersigned is the contact person for the ACVV.

NICOLETTE VAN DER WALT
ACVV National Manager: Child Protection

nicolette@acvv.org.za
071 880 1408

*ACVV lewer maatskaplike dienste aan kwetbare kinders, gesinne, vroue en ouer persone/
ACVV renders social services to vulnerable children, families, women and older persons*

• SAAM IN DIENS VAN DIE GEMEENSKAP • TOGETHER IN SERVICE OF THE COMMUNITY •
• SIKUNYE KWIINKONZO ZOLUNTU • RE MMOGO MO DITIRELONG TSA LOAGO •

ANNEXURE C: PERMISSION LETTER: SAVF



SAVF HOOFKANTOOR HEAD OFFICE

Hospitaalstraat 41, ARCADIA 0083
41 Hospital Street, ARCADIA 0083

Posbus/PO Box 25342, GEZINA, 0031
Tel: 012 325 3920
Fax: 012 324 4109
Epos/Email: bverster@savf.co.za
www.savf.co.za

001-446 NPO

Date: 9 September 2020

Our ref: RES – W Roestenburg 2020
E-mail: bverster@savf.co.za

Prof W Roestenburg
E-mail: Wim.Roestenburg@nwu.ac.za

Prof Roestenburg

PERMISSION TO CONDUCT: "TECHNOLOGY READINESS OF SOCIAL WORKERS IN THE SOUTH AFRICAN SOCIAL SERVICE CONTEXT AND WHETHER YOU WILL ACCEPT IT SYSTEMS IN YOUR WORK CONTEXT" SURVEY WITHIN SAVF

With reference to your email dated 8 September 2020 regarding the abovementioned matter.

The proposed: "Technology Readiness of social workers in the South African social service context and whether you will accept IT systems in your work context," study with the request that SAVF social workers complete a questionnaire on the topic, was discussed by the SAVF Department of social services.

SAVF Department social services approved the participation of SAVF staff in the research study according to prescribed ethical guidelines and principles.

We are looking forward to being part of the project and request that you provide us with a copy of report on your findings upon completion.

Kind regards

DIRECTOR SOCIAL SERVICES

ANNEXURE D APPLICATION FOR PERMISSION TO SACSSP

20 July 2020

To: The Registrar

Ms. Langi Malamba

SA Council for Social Service Professions

37 Annie Botha Avenue

Anlynn

Pretoria

Dear Ms. Malamba

Application for permission to research within the SACSSP: Prof WJH Roestenburg - The Readiness and Acceptance of Technology in social workers

The world is a continuously changing place, more so since the COVID-19 pandemic took the world by storm. If anything, the current circumstances have made all of us acutely aware of our dependency on technology, specifically internet technology, to keep on conducting our business as usual. The social work profession is by no means an exception, and in various contexts, social workers are forced to adapt to working under conditions of isolation or to continue providing social work services to others who may live in isolation or who are out there in the community and vulnerable as a result of the fact that they cannot isolate. Social work appears to be the same and yet so different.

As part of a Master's dissertation, I want to ask permission of the SACSSP to research the acceptance of information system technology by social workers. As you may be aware, a few years ago, I have developed an IT-system for case management specifically for use by social workers. This system, the CORE-DMS was implemented at a SA welfare organization for a period of five years, where it underwent testing and evaluation. Based on this evaluation, refinements were made to the system and although the organization was positive about it, they chose not to use it further as a result of the costs associated with that. Literature indicates that all spheres of society will become more dependent on IT-systems soon and that the adoption of such systems becomes an increasing priority. Literature also recognizes the reality that people do not easily adapt IT-technology in the workplace, and that health professionals per se are reluctant to use

such technologies in their practice. Social Worker appears to be not much different. This study aims to evaluate the potential acceptance of IT-technology in social work contexts. Specifically, I am interested in determining what factors contribute to the acceptance of technology in social workers. The study aims not only at identifying factors, but also assess their role in predicting future technology use. The information from this study will help to answer the question of how ready are social workers to adopt IT-technology in the workplace? What factors contribute towards, or distract from the smooth adoption of technology in social work contexts? Answers to these questions will help in the future implementation of IT-systems in social work practice.

The benefits of IT-technology outweigh the risks, and modern social work will be enhanced if the technology is adopted. However, though this may be the case, its effective adoption depends largely on the readiness of social workers as users to engage the technology and integrate it into practice. To carry out this study I need to conduct a cross-sectional survey, involving as many social workers as is possible, to obtain a cross-sectional image of those factors that prevent and enhance technology acceptance in the social work context.

I would expect the following from Council:

1. A favourable consideration of this project and letter of permission by SACSSP, granting permission for this project to reach social workers, and in which support for the implementation of this project is pledged.
2. An indication will also be required regarding how many social workers have registered e-mail addresses on the Council's electronic database.
3. A commitment towards e-mailing a project advertisement, the electronic questionnaire link, and a 15-minute video presentation on a local IT-system for social workers, the CORE-DMS, to all registered social workers on the SACSSP database. The researcher will provide these items and a set of instructions to the Council after approval has been granted.
4. Since this project will be implemented under COVID-19 conditions and instructions, the survey will only be distributed electronically and no alternative data collection methods involving direct human interaction will be available.

In return and at the end of the project, the researcher will provide the SACSSP with a brief research report that can be used to inform participants of the results of the research, and inform any future planning or strategy development, should Council wish to do so.

It is my intention also to publish at least one journal article based on the research.

Your consideration of this request will be highly appreciated

Kind regards

Prof WJH Roestenburg

ANNEXURE E: NWU ETHICS APPROVAL LETTER



NORTH WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>

Economic and Management Sciences Research
Ethics Committee (EMS-REC)

21 September 2020

Dr J Jordaan
Per e-mail
Dear Dr Jordaan,

EMS-REC FEEDBACK: 18092020
Student: Roestenburg, WJH (13285262)(NWU-00844-20-A4)
Applicant: Dr J Jordaan - MBA

Your ethics application on, *Readiness and acceptance of IT-System in Social Sciences*, which served on the EMS-REC meeting of 18 September 2020, refers.

Outcome:

Approved as a minimal risk study. A number **NWU-00844-20-A4** is given for one year of ethics clearance.

Due to the Covid-19 lock down ethics clearance for applications that involve data collection or any form of contact with participants are subject to the restrictions imposed by the South African government.

Kind regards,

Prof Mark Rathbone
Chairperson: Economic and Management Sciences Research Ethics Committee (EMS-REC)

APPENDIX E: ADVERTISEMENT ACCOMPANYING E-MAIL

Invitation to participate in the Readiness and Acceptance of Technology in Social Services survey

- **Digital technology** significantly influences our daily lives. This influence is expected to increase dramatically over the next few years...!
- You are invited to participate in a survey about your readiness to accept and use technology in social work practice.
- Participation will make a direct contribution towards how technology can be incorporated into future social work practices
- For more information and to participate in this important survey, click on the Link below

https://docs.google.com/forms/d/e/1FAIpQLSfVJwTqauMUlvLUUyM2-ij7Ccw5iq3jUj_VSriE2OUZLmbA/viewform?usp=sf_link

Further enquiries can be directed towards:

Dr Johannes Jordaan +27713662262 (NWU Business School)

Prof WJH Roestenburg +27836758054

APPENDIX F: COMPLETE QUESTIONNAIRE

12/7/2020

Technology Readiness and Acceptance Survey

Technology Readiness and Acceptance Survey

Information Technology influences most our lives quite dramatically. You are invited to participate in a research study towards my MBA dissertation. This research is about the influence of information technology on your life and your acceptance of information technology in your work context. Please contact the researchers if you have any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand this research and how you might be involved. Your participation is entirely voluntary and you are free to decline further participation any time. If you say no, this will not affect you negatively in any way whatsoever.

This study has been approved by the Economic and Management Sciences Research Ethics Committee of the Faculty of Management and Economic Sciences of the North-West University (NWU-00844-20-A4) and will be conducted according to the ethical guidelines and principles of Ethics in Health Research: Principles, Processes and Structures (DoH, 2015) and other international ethical guidelines applicable to this study. It might be necessary for the research ethics committee members or other relevant people to inspect the research records.

What is this research study all about?

The survey is about the Technology Readiness of social workers in the South African social service context and whether you will accept IT systems in your work context.

This survey will ask you questions about information technology in general, and specifically use an example, the CORE-DMS, an example of an IT system that has been designed for use by social workers and is implemented in some organizations. This system enables social workers to conduct all their administration online and no longer rely on paper-based filing systems. Online functions include: 1) Appointment scheduling; 2) process note capturing, 3) client problem classification, 4) opening and closing of files, 5) case-referral to other workers, 6) online supervision, 7) worker performance management, 8) monthly statistics compiler, 9) document uploading, 10) group and community work management. The CORE-DMS is designed to convert your complete practice into an electronic workstation.

More information about the research study can be read below:

Why have you been invited to participate?

You have been invited to be part of this research because you are a social worker registered with the SACSSP and may have an opinion regarding the use of Information Technologies in practice.

What will be expected of you?

You will be expected to complete an online questionnaire regarding your perceptions about technology use by social workers in practice. You will watch a You Tube video of 6 minutes and then complete a survey for another 35 minutes. Total: 50 minutes

Will you gain anything from taking part in this research?

<https://docs.google.com/forms/d/1TMGhDTQv-6DYisVVcuEig2JmCekGjObVCwt7QE05XBE/edit>

1/15

Will you gain anything from taking part in this research?

- You will not benefit anything by participating in this survey. Participation will indirectly influence the profession and you will contribute in this manner by providing valuable insights into the use of IT systems in the practice of social work

Are there risks involved in you taking part in this research and what will be done to prevent them?

- There are no direct risks involved by participating.

How will we protect your confidentiality and who will see your findings?

This survey is set not to collect e-mail addresses. This ensures complete anonymity of your data. All other information collected is not of a personal nature, and in this way the researcher is unable to identify you in any way. Data will be stored at the NWU Business School for a period of 5 years.

What will happen with the findings or samples?

- The findings of this study will only be used for this study. The data will be kept safe and stored according to the Record Management guideline of the University of the North West.

How will you know about the results of this research?

- The results of this study will be published in an academic Journal and a short report will be made available to the SACSSP who may choose to make the results available to you.

Will you be paid to take part in this study and are there any costs for you?

There will be no costs involved for you, if you do take part in this study.

Is there anything else that you should know or do?

- You can contact the researcher at 0836758054 should you require more information or Dr Johannes Jordaan at 0713662262 if you have any further questions or have any problems.

If you are willing to participate in this survey you are welcome to proceed to the survey by clicking on the following Button

*** Required**

1. Email address *

2. I have read the above information and am willing to participate *

Check all that apply.

- Yes
 No

Identifying details

3. What is your Gender

Check all that apply.

- Male
- Female
- Other

4. What is your age?

Check all that apply.

- 18 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61+

5. How many years of social work experience do you have?

Check all that apply.

- 0 - 10 years
- 11 - 20 years
- 21 - 30 years
- 30+ years

6. Are you currently employed as a social worker?

Mark only one oval.

- Yes
- No

7. Indicate the sector you are currently working in

Mark only one oval.

- NGO/NPO
- Private Practice
- DSD or other State department
- Commercial Industry
- Other organization not mentioned

8. Name the organization you are working at, or your practice name?

Video
section

The video explains the benefits of the CORE-DMS as an example of an IT-System that is currently used by social workers

Please watch the 6 minute video and then press "next"



<http://youtube.com/watch?v=ce6ElbZ36E0>

The term "Lean operations"

9. Have you heard of the term "Lean operations"?

Mark only one oval.

- No, I have never heard of it
- I have heard of it, but it does not apply to the way I work
- Yes, I know what it means and where I work we implement it actively

10. What is your understanding of the term "Lean operations"?

"Lean operations" in your work context

11. Regarding "lean operations" where you work for.... (If private practice, think of this context)

Check all that apply.

	No	Unsure	Yes	Not applicable to where I work
Is there a firm plan for improving the efficiency of operations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you participate in these plans for improving operations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you support plans to improve efficiency of operations in the organization?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How important is it for you to try and make your work easier?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is management committed towards improving the organization?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Technology
Acceptance and Use

Answer the following questions regarding your views on the use of IT-Systems in social work contexts

12. If you were to use an IT system such as CORE-DMS...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
It will increase my effectiveness on the job.	<input type="radio"/>					
I will spend less time on routine job tasks.	<input type="radio"/>					
I will increase the quality of output of my job.	<input type="radio"/>					
I will increase the quantity of output for the same amount of effort.	<input type="radio"/>					
My co-workers will perceive me as competent.	<input type="radio"/>					
I will increase my chances of obtaining a promotion.	<input type="radio"/>					
I will increase my chances of getting a raise.	<input type="radio"/>					

13. Learning to use an IT system such as CORE-DMS...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Learning to operate the CORE-DMS would be easy for me.	<input type="radio"/>					
I would find it easy to get the CORE-DMS to do what I want it to do.	<input type="radio"/>					
My interaction with the CORE-DMS system would be clear and understandable	<input type="radio"/>					
I would find the CORE-DMS to be flexible to interact with.	<input type="radio"/>					
It would be easy for me to become skillful at using the CORE-DMS.	<input type="radio"/>					
I would find the CORE-DMS easy to use	<input type="radio"/>					
Using the system will take too much time from my normal duties.	<input type="radio"/>					
Using the CORE-DMS involves too much time doing mechanical operations (e.g., data input).	<input type="radio"/>					

12/7/2020

Technology Readiness and Acceptance Survey

It will take too long to learn how to use the system to make it worth the effort.

— — — — — —

My interaction with the CORE-DMS system is clear and understandable.

I believe that it is easy to get the system to do what I want it to do.

Learning to operate the CORE-DMS system is easy for me.

Overall, I believe that the CORE-DMS system is easy to use.

14. My use of an IT system such as CORE-DMS would be influenced by...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
whether people who influence my behavior think that I should use the system.	<input type="radio"/>					
whether people who are important to me think that I should use the system	<input type="radio"/>					
the proportion of co-workers who would use the system.	<input type="radio"/>					
the senior management of my organization being helpful in using the system.	<input type="radio"/>					
my supervisor is supportive of the use of the system for my job.	<input type="radio"/>					
in general, the organization supports me in using the system.	<input type="radio"/>					
people in my organization who use the system have more prestige than those who do not.	<input type="radio"/>					
people in my organization who use the system have a high profile.	<input type="radio"/>					

12/7/2020

Technology Readiness and Acceptance Survey

the system is
considered a status
symbol in my
organization.

15. My use of an IT system such as CORE-DMS would depend on whether...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
I have control over using the CORE-DMS.	<input type="radio"/>					
I have the resources necessary to use the CORE-DMS.	<input type="radio"/>					
I have the knowledge necessary to use the CORE-DMS.	<input type="radio"/>					
I have the resources, opportunities and knowledge it takes to use the CORE-DMS, it would be easy for me to use the system.	<input type="radio"/>					
the CORE-DMS is compatible with other systems I use.	<input type="radio"/>					
enough guidance was available to me in the selection of the system.	<input type="radio"/>					
specialized instruction concerning the system is available to me	<input type="radio"/>					
A specific person (or group) is available for assistance with system difficulties.	<input type="radio"/>					
Using the system is	<input type="radio"/>					

compatible with all aspects of my work.

I think that using the system fits well with the way I like to work.

using the system fits into my work style.

16. I think I can complete my work using the CORE-DMS or similar system if...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
there was no one around to tell me what to do.	<input type="radio"/>					
I had never used a package like this before	<input type="radio"/>					
I have the knowledge necessary to use the CORE-DMS.	<input type="radio"/>					
I only had the system manuals for reference	<input type="radio"/>					
I had a lot of time to complete the job for which the system was provided	<input type="radio"/>					

17. Regarding your feelings about using an IT system such as CORE-DMS...

Mark only one oval per row.

	Not Sure	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
Using the CORE-DMS is a good idea.	<input type="radio"/>					
Using the CORE-DMS is a wise idea.	<input type="radio"/>					
I like the idea of using the CORE-DMS	<input type="radio"/>					
Using the CORE-DMS will be pleasant.	<input type="radio"/>					
I think using the system will be enjoyable.	<input type="radio"/>					
The actual process of using the system seems pleasant.	<input type="radio"/>					
It will be fun using the system.	<input type="radio"/>					
The system will make work more interesting.	<input type="radio"/>					
Working with the system will be fun.	<input type="radio"/>					
The system seems okay for some jobs, but not the kind of job I want if for.	<input type="radio"/>					
I think I will like working with the system.	<input type="radio"/>					
I look forward to those aspects of my	<input type="radio"/>					

job that require me
to use this system.

Using the system will
frustrate me.

I think once I start
working on the
system, I will find it
hard to stop

I will get bored
quickly when using
the system.

This content is neither created nor endorsed by Google.

Google Forms