School of Media, Creative Arts and Social Inquiry

Considerations for Reducing Risk of Community Engagement and Associated Knowledge Management Sociotechnical Initiatives

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Human Research Ethics

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number HRE2016-0389.

Signature Redacted

Arthur M. Wilson

11 June 2021

Acknowledgement of Country

I acknowledge that Curtin University works across hundreds of traditional lands and custodial groups in Australia, and with First Nations people around the globe. I wish to pay my deepest respects to their ancestors and members of their communities, past, present, and to their emerging leaders.

My passion and commitment to work with all Australians and peoples from across the world, including First Nations peoples, are at the core of the work and research I do and is reflective of my commitment to reconciliation in Australia.

Abstract

The rapid development of digital technologies over the past three decades has resulted in a significant investment in technologies and associated infrastructure. This development has transformed how public, private, and not-for-profit organisations engage with stakeholders. One area of transformation involves opportunities to enhance the means and frequency with which community organisations are able to engage with residents and to collect and manage knowledge from these interactions. Despite this, there is a high rate of failure of such sociotechnical initiatives.

My attention and interest were drawn to determining how community organisations in Western Australia (WA) engage with residents and capture knowledge from these interactions through digital technologies. To understand the extent to which community organisations are undertaking such activities, this study sought to increase understanding of the contextual factors that may help mitigate risk associated with the use of sociotechnical solutions for engaging and capturing knowledge from interactions with residents.

Academic and professional literature identifies multiple actors and networks involved in transforming processes and services through the use of digital technologies. Consistent themes from the literature include the pervasive nature of digital technologies and the high failure rate of sociotechnical initiatives. Some research indicates the high failure rate may be attributed to current influential models or frameworks' not adequately capturing the iterative nature of transformation, not sufficiently considering the culture of stakeholders, and not appropriately understanding power dynamics between actors and networks.

This longitudinal study explores how a sample of five community organisations based in metropolitan and regional WA make use of digital technologies to engage with residents. The first wave of interviews for this study commenced in 2006. The second and final wave of interviews commenced in 2016 and concluded in 2018.[1]

To better understand the relationships and dynamics between multiple and diverse actors and networks, Actor-Network Theory (ANT) is employed. ANT is both a theory and a method for describing and explaining the interaction between the social and the technical.

[1] The reason for the time between the first and second waves of interviews is that I put my PhD in hiatus. The hiatus also provided the opportunity to conduct a longitudinal study to examine whether time had made any difference to how organisations approached community engagement and knowledge management.

ANT allows the examination of hierarchy and power and processes within and between actors and networks to be investigated. The transformation model proposed in the thesis synthesises existing sociotechnical models and frameworks and considers complex social and technical challenges. The model embeds activities to influence and change culture, incorporates the role of power, and reduces risk to transformation through use of digital technologies that might arise from sociotechnical initiatives. The proposed model focuses on the interaction and influence between the themes of leadership and management; culture; process; and technology to mitigate risk that may hinder successful transformation.

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Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AI	Artificial Intelligence
ANT	Actor-Network Theory
AR	Augmented Reality
CMS	Content Management System
e-Government	Electronic Government
FA	Focal Actor
IS	Information Systems
LGA	Local Government Area
PMBoK	Project Management Body of Knowledge
PRINCE2	Projects in Controlled Environments
RO	Research Objective
SAM	Strategic Alignment Model
VR	Virtual Reality
WA	Western Australia

Glossary

Actors/actants	Actors/actants encompass human and non-humans entities that has a position in discourse or ascribed agency. A differentiator is that actors are able to put actants into action (Callon and Blackwell, 2007; Latour, 1996).
Community	Community is based on a geographical locality, specifically, the WA Local Government Areas (LGA) boundaries are used to define borders of the community. This perspective aligns with a conventional interpretation in which community is a physical place within a bounded geographic location (Duncan-Howell, 2007; Fernback and Thompson, 1995; Kaufman, 1959; Kenny, 2006; Mersey, 2009; Rothaermel and Sugiyama, 2001).
Community engagement	There are multiple types of community engagement including informing, consulting, involving, collaboration and empowerment (Head, 2007; International Association of Public Participation, 2018). This study focuses on the involvement type of community engagement which encompasses direct engagement of residents throughout a process to ensure the desired state is consistently considered and understood.
Community knowledge	Knowledge that is locally and collectively created and used to assist in the decision making process to influence community activities.
Delegate	Delegates are actors that represent particular perspectives that have been imparted to them (Holmström and Robey, 2005; Walsham, 1997).
Digital transformation	Customer focused initiatives based on the implementation of digital technologies that focus on enhancing business processes and fostering cross organisational change (Larsson and Teigland, 2019).
Focal actor	Focal actors develop strategies and also identify the actors to implement them (Papenbroock and Österberg, 2017).
Knowledge	Knowledge can be defined from several different perspectives (Hislop, Bosua, and Helms, 2018). For this study knowledge is information in context with an awareness of how to adopt and apply it (Corfield and Paton, 2016).

Knowledge management	Knowledge management is an umbrella term concerning the deliberate; systematic management of activities leverages knowledge for an organisation's benefit, such as by creating, organising, sharing, and using knowledge (Corfield and Paton, 2016; Hislop et al., 2018; Lepik and Krigul, 2014; Skyrme, 2007).
Project management	Project management involves planning, organising, monitoring and controlling a project. It also encompasses motivating people to safely achieve the project goals the within specific and time, cost, and quality criteria (Radujković and Sjekavica, 2017)
Residents	Residents are people whose primary place of residence is within a previously defined area (Wert and Palacios, 2016).
Sociotechnical	Sociotechnical concerns how the social and technical aspect of initiatives, organisations and communities interrelate. Sociotechnical systems comprise of multiple evolving components, activities and interactions, and are characterised by feedback networks, the ability to self-organisation, and hierarchies (Savaget, Geissdoerfer, Kharrazi, and Evans, 2019)

Copyright Statement

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Every reasonable effort has been made to acknowledge the owners of copyright material. I would be pleased to hear from any copyright owner who has been omitted or incorrectly acknowledged.

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To my wonderful wife Melissa – Thank you for your support, patience, love and living this life the best we can.

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Chapter 1

Introduction

The catalyst for this research is based on the past experience of the researcher. This includes military experience as a quality control inspector and avionics engineer. While in the military I was also introduced to supply chain management. This provided me with the knowledge to undertake roles that included Health Logistics Manager; Manager, Electronic Business; Senior Manager, Project Management Office; Assistant Director, Information Services, as well as a Policy Officer for the WA Government's Office of Premier and Cabinet, and Public Sector Management Office. The breadth of my experiences started as technical but evolved to roles that focused on the development and execution of business strategy, and leading operational teams tasked with meeting targets set by the leaders of organisations.

A common thread in my background is assisting or facilitating change. I am interested in what makes digital technology enabled initiatives recognised as a perceived success. I have gained knowledge from projects that are considered a success, as well as those perceived as failures. Of particular interest to me was the emergence of the Internet and increased use of digital technologies to enhance supply chains and to connect organisations and people. This caused a paradigm shift in how people and organisations engaged. As the initiatives that used the Internet and digital technologies became more prevalent, I recognised that many projects seemed to run over budget and over time, and that stakeholders were not satisfied with the quality or the product or of the service.

Furthermore, the rapid development and pervasive adoption of digital technologies over the past three decades resulted in the development of strategic plans and significant investments in technologies and associated infrastructure that have contributed to fundamental changes in how governments and private and not-for-profit organisations operate. People's personal, social, educational and working lives have been and continue to be transformed by these changes. One area of transformation is an expansion of the means and frequency with which community organisations are able to engage with residents, and collect, manage, and use knowledge from such interactions.

At the start of this study in 2007, few community organisations within WA had strategies to transform how they interact and engage with residents through digital technologies. Today, many of the same community organisations have digital strategies in

which digital technologies are considered essential for engaging and consulting with residents. The process of consultation with residents through digital technologies continued to evolve and stakeholders gained knowledge and experience with digital transformation. Currently, the transformation process remains challenging and complex. From a global perspective the failure rate for digital transformation initiatives, including knowledge management initiatives, is over 70 per cent (Allen et al., 2017; Ramesh, 2019; Tooranloo, Ayatollah, and Alboghobish, 2018). Addressing this problem is important for community engagement initiatives and remains unresolved (Ramesh, 2019). Reducing the failure rate of digital transformation, specifically addressing community engagement, is that problem and the focus of this research.

Each organisation that participated in the study recognises the continued challenges of transforming the ways of engaging with residents through the use of digital technology. To demonstrate this, the Office of the Auditor General in WA states that local governments hold information, including confidential information, about their residents and their community. This information is essential to their operations. Such information should be reliable and used in a manner that maintains the security of people, data and systems. It is also recognised that, as these information systems grow and are exposed to an increased number of technical and non-technical networks, the number and types of risk to the organisation can increase. The Auditor General found that from a sample of ten local government organisations in WA, "all 10 local government entities need to improve their general computer controls" (Government of Western Australia, 2020, p. 12). The report states that local government entities should use standards and frameworks as a reference to implement good controls for their operations, have appropriate policies and procedures, and ensure that the IT plans and objectives align and support their overall business strategies and objectives (Government of Western Australia, 2020).

The above example illustrates current challenges and opportunities facing organisations that seek to engage community residents and then gain knowledge from such engagements. Underlying the effort to engage community residents is capturing knowledge from these engagements and then using this knowledge as part of the complex interactions of the information systems. To guide organisations through these complexities requires commitment from leaders and managers, planning and undertaking activities to influence changes from the existing culture to a desired culture, the revision of existing processes and the creation of a new process to support community engagement and

associated knowledge management. There is also the need to ensure the technology is appropriate and is maintained.

This remainder of this chapter sets out the context for the study and presents the rationale, the research question and the objectives. The chapter also includes a description of the overall research approach, scope, and contribution. The research contributes to the overall body of knowledge of knowledge management. The contribution includes developing an ANT influenced model to help guide sociotechnical initiatives such as community engagement and knowledge management. This model aims to identify and mitigate risks that contribute to these sociotechnical initiatives high rate of failure. It concludes with an outline of the structure for the remaining chapters of this thesis.

1.1 Context

The essence of this thesis is to study the ways in which five community organisations based in five different WA local government areas use digital technologies as a primary means of engagement with residents and to support and extend the residents' knowledge of their local communities. The five community organisations are aligned to three separate categories: social enterprise, community enterprise, and local government. The study also provides insight into the broader question about how organisations adopt and use digital technologies to manage internal and external relationships and enhance existing processes and services or create new ones. In conducting this study, the complexities associated with a state the size of WA must be recognised.

WA is the largest of all Australian states and territories. It has a mainland area comprising 2,526,786 square kilometres, or 33 per cent of Australia (Geoscience Australia, 2017). The vast size of WA means there are significant differences in community governance, infrastructure, quality of service delivery, and cultures that exist between various areas of the state, especially between the metropolitan and regional areas.

The boundaries used in this study are based on local government areas (LGAs). With the exception of the Australian Capital Territory (ACT), Australian states and territories have legally designated geographical boundaries defined as LGAs. Within the boundaries of the LGAs, elected bodies are responsible for governing. These areas may include cities and towns (Australian Bureau of Statistics, 2016). Perth, the capital city of WA is the largest city in WA and the seat of the state government. The state government defines the boundaries, powers, and responsibilities of local governments through the WA Local Government Act (Australian Government Digital Transformation Agency, 2014).

Australia is a federation with three tiers of government, national, state/territory and local. Each LGA has a governing structure that directly and indirectly makes decisions of social and economic significance to community residents. These decisions may influence the range, type, cost and quality of fundamental services provided to residents. The services delivered by national and state governments include, but may not be limited to, health, education, community safety, and utilities and infrastructure; they all affect what is available within any one LGA to its residents. The utilities and the infrastructure supporting residents also include roads and water, gas, electricity and increasingly, telecommunications, including the Internet.

However, other WA organisations in addition to local government authorities have an interest in engaging with those residing and working in their community to understand and potentially influence their social and economic actions. How both local government councils and other organisations are transforming the ways they engage through the use of digital technology is explored as part of this study. To gain an understanding of how organisations engage with members of their community, five locations from the metropolitan and regional areas of WA participated in this study.

1.1.1 Influence of digital technologies on society

In Australia, like other countries in the developed world, digital technologies have transformed the social, economic, and political sectors. From a social perspective, digital technologies have enabled people to socialise, communicate, learn, and upgrade skills in new ways (Francisco, 2013). Economic transformation includes changes in trade practices and how capital is accessed and used, increased competition, and worker productivity (Hanna, 2016; McFarlan, 2005). Digital technologies also transform how politicians engage and governments deliver information and services (Hanna, 2016; Virjan, 2013; Wilson and Goldschmidt, 2005).

The use of digital technologies has also had a significant affect on people's lives. Individuals have increasingly incorporated the use of the Internet into their daily lives to such an extent that it is considered as essential as utilities like gas, water and electricity and necessary for supporting a contemporary society (Chang, Li, Yao, Zhang, and Yu, 2016a, 2016b; Misa, 2003). The introduction and uptake of digital technologies, including the Internet, has spawned benefits through new channels of communication, including social media, and virtual and online communities that can be used for collecting, collating and sharing knowledge (Dubow, Devaux, and Manville, 2017; Preece, 2000). The

emergence of digital technologies has not been without risks; these include a range of security vulnerabilities that can influence how people and organisations protect and manage security and protect privacy (Glisson and Choo, 2017).

The influence of digital technologies impacts on people both young and old in Australia. Young people are growing up in a world in which digital technologies influence their daily life (Hsin, Li, and Chin-Chung, 2014). The availability and use of digital technologies is fostering debate amongst researchers about the social, emotional, physical and cognitive affect that technology is having on children (Hsin et al., 2014). At the other end of the age spectrum, according to Ihm and Hsieh (2015) older members of the community are adopting digital technologies at a faster rate than any other age demographics. For some older people the use of digital technology has been highly beneficial, giving them access to many forms of communication and services which can reduce isolation and overcome barriers associated with the physical limitations of age. However, the older population is not homogenous, and some older Australians are likely to experience physical, psychological, and economic challenges in accessing the technologies. The negative affects of digital technology use by older people may include the potential for reduced access to face-to-face services offered by government agencies, a reduction in their participation in community activities, and inadequate access to or limited competency in the use of digital technologies (Gorecki and Kelly, 2012).

The following are examples of how the Internet and associated digital technologies are influencing the lives of community residents:

- **Education**: Educational institutions are adopting a range of technologies and applications to aid the learning process, including use of the Internet to deliver lectures and manage teaching related activities (Eynon, 2008).
- **Healthcare**: Some hospitals are adopting call centres to answer patient enquiries about medical conditions (Minister for Health and Ageing, 2008). Doctors also use the Internet to consult with specialists (Medindia.com, 2008). In some jurisdictions, patients are able to make appointments through the Internet (UCSF Medical Centre, 2008).
- **Community safety**: Agencies use technology to inform the community of emergencies (Roe, 2005), to identify and track offenders considered dangerous (O'Neill, 2007), and to promote community safety (Prime Minister's Strategy Unit, 2007).

1.1.2 Community engagement and digital technology

The use of digital technology to transform community engagement is often characterised in scholarly literature as an opportunity to foster social discourse (Cavaye, 2004). Community engagement is considered important and influential in transforming services delivered to residents. Active and inclusive strategies of community engagement can empower people by giving them an opportunity to express their needs and influence the service organisations they access and use (Harsh and Ichalkaranje, 2015; Sá, Rocha, and Cota, 2016). Articles from Australian Federal and State governments, as well as from political science and community research centres, identify several community engagement initiatives that include:

- community cabinets in which politicians and members of the community use digital technologies, including video conferencing, the Internet, and social media, to have formal and informal discussions (McCann, 2012)
- creation of the Queensland's Government Community Engagement Division.

Multiple government service delivery initiatives incorporate digital technologies to engage with residents, including the Australian Federal Government's Centerlink, South Australia's Service SA initiative, and Western Australia's Digital WA (Government of Western Australia, 2016; Kernaghan, 2009; Reddel and Woolcock, 2004). Digital technologies including email, websites and social media, is fostering innovation in engagement with stakeholders and how services are delivered to customers (Kernaghan, 2009). Through such interactions a significant amount of information can be generated. This knowledge can be harnessed, analysed and then used for making more informed decisions to benefit stakeholders (Kitchin, 2014). Collectively, the benefits of community engagement and knowledge management may include better relationships between stakeholders, a more collaborative resolution of existing problems, community development, and setting and meeting stakeholder expectations (Kernaghan, 2009; Reddel and Woolcock, 2004).

Although benefits from the use of digital technologies can be substantial for participants, the transformation of community engagement requires more than technology. It requires organisations with a responsibility for community engagement to transform the way they engage with internal and external stakeholders (Ogonek and Becker, 2018) and to develop sociotechnical competencies (Alvesson and Sveningsson, 2015; Stam, Lord, Knippenberg, and Wisse, 2014) to effectively leverage the digital technologies. Digital

competence is based on the fundamental skills of enabling and using digital devices such as computers and mobile devices to retrieve, assess, store, generate, present, and share information, and to interact and collaborate via networks such as the Internet (Ilomäki, Kantosalo, and Lakkala, 2011). Digital technologies, and competencies developed to use the technologies, influence culture and the digital transformation process (Wildemeersch and Jütte, 2017). In addition, the digital competence of leadership and management increases understanding of social, economic, and political shifts that occur as a result of the adoption of digital technologies within organisations. Furthermore, as artificial intelligence, automation, robotics, and other digital technologies evolve and become more mainstream, there are opportunities for the competencies to transform governance, thus allowing opportunities for more efficient delivery of services (Jones, 2017).

Efficient delivery of services includes creating engagement plans and strategies to maintain and grow relationships and networks, and to overcome the difficulties and barriers that arise in transforming the culture of traditional relationships and hierarchies to one that is more open, transparent, inclusive and collaborative. There are also challenges associated with sustained information sharing and knowledge transfer.

1.1.3 Community engagement and knowledge

One of the by-products of community engagement is knowledge. Knowledge can be considered "information in context, with an understanding of how to use it" (Corfield and Paton, 2016, p. 2). In this study, an important reason for organisations to engage with community residents through digital technology is to capture and use the knowledge gained from such interactions. Through digital technologies, residents have a range of communication channels available to engage with community organisations. The foresight, capacity, and capability of organisations to make use of the engagement opportunities with community residents, and to capture and effectively use knowledge gained from these interactions, are likely to involve a number of staff with differing skills. To improve the chances for successful management of the knowledge gained from the interaction between the community organisation and residents, financial and human resources are required. Furthermore, the organisation's leadership, managers, and other staff will need time to consider options, and to plan, coordinate and execute activities. However, once these component parts are aligned and understood by key actors in the organisation, they will be positioned better to understand the wants and needs of residents (Koh, Ryan, and Prybutok, 2005), and will be able to make informed decisions based on the knowledge gained from the community engagement process.

Knowledge management can assist organisations in their efforts to capture information about the wants and needs of community residents. However, there are a number of challenges organisations face when implementing knowledge management solutions. These challenges include gaining the support and approval of leaders, developing plans and having resources allocated to advance knowledge management (Ramirez, Coakes, Søndergaard, Kerr, and Clegg, 2007). A significant challenge to the successful adoption of knowledge management is related to culture. Some organisational cultures are resistant to knowledge sharing, which can reduce the extent of data capture, storage, protection and use of knowledge (Corfield and Paton, 2016).

Traditionally, knowledge gained from engagement was viewed as a unidirectional flow, from the organisations to the users of the knowledge, including community members (Elsabbagh et al., 2014). From the perspective of community enterprises, the benefits from bi-directional interaction with members of the community, and leveraging knowledge gained from the engagement are recognised. However, there is little consensus about the process of linking engagement and activities associated with knowledge and knowledge management (Elsabbagh et al., 2014).

Although not originally intended, this study was conducted over two waves. The reason for this is explained in Chapter 4, where the research method is presented. During the first wave, the participants were identified, recruited and interviewed. Data was collected and analysed and categorised, themes created and presented. This process was replicated during the second wave of this longitudinal study. After the second wave of interviews, the findings were compared to the first wave, discussed and research question and objectives evaluated.

When the first interviews were conducted for this study, many of the knowledge management challenges that organisations faced remain today. Oliver and Kandadi (2006) considered creating a culture suitable for knowledge management essential for the success of such implementations. Factors that influenced a culture for successful knowledge management included: leadership, infrastructure, reward systems, process management, recruitment, organisational structure. Each of these factors require management to develop a culture and sustained operation of knowledge management (Oliver and Kandadi, 2006). The changes between the first and second waves of interviews were significant in many respects. The business environment changed significantly, organisational structures became flatter, the need for flexibility became more prominent, and systems were generating a wealth of information essential for business operations (Stojanović-Aleksić,

Nielsen, and Bošković, 2019). A constant impediment between the two periods of this study to achieving successful knowledge management outcomes remained the challenge of creating a culture to foster, support and sustain knowledge management.

In WA, the state government is showing increasing interest in active community engagement and in the use of knowledge from such engagements to support decision making as part of the Digital WA Strategy (2016-2020) (Government of Western Australia, 2016). Organisations, including government agencies that use digital technology to engage and interact with people, are able to capture significant amounts of information. This information can become useful knowledge to assist the organisation to make informed decisions (Herschel and Yermish, 2009) and improve products and delivery of services (Chung, Chen, and Nunamaker, 2005). Scholars from multiple disciplines have suggested that knowledge management has the potential to transform work activities as well as the nature of an organisation, resulting in benefits to public administration organisations and communities (Dixon, 2010; Hislop et al., 2018). Evidence of the potential benefits of engagement and knowledge management and interest in the area appears to be growing; however, achieving the desired results remains a challenge (Dixon, 2010). According to Hislop et al. (2018) one reason for attaining the desired results is that strategy for knowledge management has not had appropriate attention and, as a result, strategy models are considered unsophisticated.

According to Tooranloo et al. (2018), the rate of knowledge management failure is 80 per cent and exceeds the rate of other sociotechnical initiatives. it is commonly agreed that the major challenges to improving knowledge management and its use in improving outcomes are as follows:

- the need to address cultural issues within the organisation to see and realise the benefits
- the overemphasis on technology, and not its strategic use
- knowledge management conducted separately from business goals
- organisations not adequately developing an understanding or properly considering the adoption of knowledge management technologies and practices can disrupt current process
- a focus on quantity over quality.

This study aims to investigate these challenges.

1.2 Research rationale, question, objectives and design

This research focuses on community organisations in WA, responsible for operating efficiently and using available knowledge to make decisions in the best interest of community residents and businesses. It investigates how these organisations transform manual and labour-intensive community engagement and knowledge management processes into more efficient operations through digital technology. From online engagement through digital technologies, organisations can capture, analyse and leverage community knowledge to make decisions for the purpose of ultimately improving the social and economic prospects of its residents and businesses.

1.2.1 Rationale for the study

There is a continuing trend of community organisations seeking to use digital technologies to consult, collect and manage knowledge from interactions with residents and businesses on matters that may be of social and economic significance (Kolopack, Parsons, and Lavery, 2015; Reddel and Woolcock, 2004; Thompson and Riedy, 2014; Wray-Lake, DeHaan, Shubert, and Ryan, 2017). Organisations undertaking actions face complex challenges that often result in many such initiatives failing to meet stakeholder expectations (Khazieva, Tomé, and Caganova, 2018; Ramesh, 2019). There is a high rate of failure associated with transformation of organisations through the use of digital technologies (Pflügler, Malzer, Jäschke, Wiesche, and Krcmar, 2018; Ramesh, 2019). A reason for this is that many of the existing models and frameworks may not be suitable for managing the complex processes for transforming community engagement and associated knowledge management processes (Khazieva et al., 2018).

Models and frameworks may assist community organisations to successfully adopt solutions to enhance and transform their existing methods of engagement and collaboration with residents. In addition to engagement, knowledge gained from the interaction can be used to make informed decisions regarding the residents of a community. In this study a sample of these models and frameworks is evaluated.

The knowledge gained by the organisations from engaging with residents may assist them in their decision-making process. These decisions may include significant social and economic matters:

Influence on society

Gaining knowledge from community engagement (Wray-Lake et al., 2017) can assist community decision makers to identify how to best meet residents' changing social needs or desires. However, increased use of technology to engage, collect, store and manage knowledge for the purpose of improving the lives of residents may also increase risks to the privacy of people living in the community (Anderson and Ostrom, 2015).

Influence on the economy

Evangelista, Guerrieri, and Meliciani (2014) and Odermatt and Stutzer (2017) recognise that both having access to technology, and being excluded from access, influence the economic security of individuals.

1.2.2 Research question

Digital technologies can assist community organisations to transform and enhance how they engage with residents and businesses. Through the use of digital technologies, there is the opportunity for residents to be engaged and participate in decisions that may influence them as individuals, as family members, and the broader community in general; community organisations can gather greater knowledge about matters that may be of interest to residents and businesses, including their desires for the future. These actions can have a positive influence on a community's social and economic situation. To understand how community organisations plan and undertake this transformation, the research question is:

> What are the strengths and weaknesses of various sociotechnical models or frameworks used in a sample of WA community organisations to transform how they engage residents and then manage knowledge collected through the use of digital technologies?

The purpose of the question is to gain insights into the likely practical opportunities and guidance needed for community organisations to better engage with residents using digital technologies. Through this engagement with residents, knowledge can be obtained that can allow better decisions to be made for the benefit of the community. To achieve this, insights from multiple disciplines is needed. Documents such as business strategies, information technology strategies, and operational plans can also provide insight that may aid in implementing community engagement and knowledge management solutions.

Activities to align business related operations and the technology to support transformation can reduce risk, and eventually improve the likelihood of successful outcomes.

1.2.3 Supporting research objectives

The research objectives reflect the uncertainty that can occur within organisations when adding new processes, or when replacing or enhancing existing processes of community engagement. This uncertainty is confirmed, through evidence from academic literature, interviews and observations conducted with practitioners. The result of this uncertainty can manifest in the high rate of failure associated with transformation initiatives with digital technology as an essential element for change (Cresswell and Sheikh, 2013). The uncertainty can be compounded by the complex nature of issues related to community engagement initiatives (Ford and Kemokai, 2014). This includes a lack of understanding of the culture change that may be required both by people in the organisation facilitating the transformation and by residents in the community (Cavaye, 2004). From the perspective of practitioners who participated in this study, the absence of thorough plans and how risk associated with the transformation process would be managed contributed to uncertainty about the direction of community engagement and associated knowledge management activities. By reducing the uncertainty, the success rate of digital transformation strategies may increase.

The research objectives are to establish how community organisations tasked with responsibility for community engagement can reduce uncertainty, better manage risk, and improve opportunities for enhancing processes associated with community engagement activities. Accordingly, the supporting research objectives (RO) are:

> **RO-1**: Identify and categorise factors that may contribute to reducing risk for successful transformation of community engagement and associated knowledge management initiatives.
>
> **RO-2**: Based on the findings of this research, enhance an existing or create a new model or framework that may assist organisations to successfully transform how they engage with community residents and manage associated knowledge through the use of digital technologies.

These research objectives support the research question by outlining actions undertaken to transform how community residents are engaged through the use of digital technologies.

To achieve the objectives, five organisations based in different local government areas (LGAs) were studied to identify common processes, models or frameworks for community engagement and associated knowledge management activities. In addition, the common issues that affect the engagement activities are explored and potential solutions presented.

1.2.4 Research design

Chapter 2 contributes to the research's trajectory by reviewing the literature concerning community engagement and associated knowledge management activities. Chapter 2 also contributes to the research design and data collection methods by highlighting important areas of investigation related to theoretical sociotechnical models and frameworks and their application.

Chapter 4 details the methodological foundations and research design for this study. This research adopts an interpretive and inductive approach, with a focus on potential opportunities to transform and gain value from sustained engagement between community organisations and the residents they support (Prince and Felder, 2006). The research involved a series of interviews with employees in several community organisations, to gain understanding of the issues, opportunities, and solutions, both particular to the local context of the organisation, and more generally (Skulmoski, Hartman, and Krahn, 2007). The research design created the foundation to analyse empirical data from strategies and approaches of multiple active community engagement and knowledge management initiatives. This analysis identified the facilitators and barriers that exist and alter these processes.

The interviews were conducted with representatives from five WA organisations responsible for coordinating information and services for their local communities. From the interviews and observations, cases that focused on each participating organisation were developed. The cases identify stakeholders and describe interactions and situations to gain a better understanding of current methods of interacting with residents. The chapter introduces actor-network theory (ANT) which is the lens used to explore and analyse relationships between stakeholders described in the cases. ANT allows consideration of social, technical, conceptual, and textual aspects in the development and operation of engagements and associated activities that are this study (Law, 1992).

The organisations selected for this study include WA State Government, commercial and not-for-profit organisations that interact with their local residents

(people that work, visit, or reside in the community). Although there are similarities in how each organisation engages with the community, there are also differences. These differences include how each organisation undertakes and manages the community engagement and associated processes. The similarities and differences are not exclusive to organisations participating in this study; it can be reasonably assumed that there are commonalities with other organisations, and communities located in both the metropolitan and regional areas across WA.

There is increasing interest to engage residents by using digital technologies. This includes the rise of virtual town meetings and online community consultations (Dubow et al., 2017; Vlachokyriakos et al., 2014). However, how organisations use digital technologies to engage and then manage, capture and leverage knowledge from such engagements has received little attention in scholarly research to date (Johnson et al., 2017; Riege and Lindsay, 2006).

Since the advent of the Internet, there have been many studies about how technology and its application can influence people living within geographical communities (Beckers and van den Besselaar, 2014; Kingsley, Coulton, and Pettit, 2014). This includes studies about how the Internet can foster a stronger sense of community (McMillan and Chavis, 1986; Preece, 2003), how supply chains are transforming the ways in which people and organisations interact with one another (Bharadwaj, El Sawy, Pavlou, and Venkatraman, 2013), and the potential opportunities to change how politicians engage and interact with their constituents (Cavaye, 2004; Hindman, Tsioutsiouliklis, and Johnson, 2003; Wilson and Goldschmidt, 2005). However, research in this field has not led to models or frameworks that resulted in the consistent success of the important efforts to engage community residents and then capture and use knowledge from such interactions.

Successful models and frameworks can motivate transformational efforts (Paulk, 2008). Research indicated that many organisations develop plans defining current activities and outlining future directions. To support these plans, organisations have focused on managing technical infrastructure rather than driving innovation (Matt, Hess, and Benlian, 2015). There is no evidence that a common overarching sociotechnical method, model or framework, based on empirical and theoretical foundations, is being adopted by organisations to transform community engagement activities through use of digital technology.

What differentiates this study from other research is the consideration of ANT to investigate how existing sociotechnical models and frameworks guide the transformation of community engagement and knowledge management processes with residents by means of digital technologies. Specifically, this research investigates if such models and frameworks consider organisational and community culture change activities and identify the risks associated with engaging residents and managing knowledge from this process. The term risk refers to the potential for the realisation of undesirable repercussions or the deviation from a standard. The risk identified can be managed and mitigated. This study presents a model based on data to guide adopting digital technology to transform community engagement and related knowledge management activities.

1.3 Scope

Although focused on five WA organisations, the study may benefit other organisations involved in sociotechnical transformation. The theoretical focus is drawn from models and frameworks used to implement sociotechnical solutions that have transformed strategic and operational activities in a broad range of organisations and industry segments, including healthcare, information technology, finance, the automotive industry, and the public sector, both within Australia and internationally.

The research is not intended to cover all aspects of community engagement or knowledge management, or to weigh the advantages of one perceived benefit for the community over another. It is a qualitative study not focused on causation. The emphasis of this research is on improving current practices for sustained community engagement and associated knowledge management.

1.4 Research contribution

This study aims to make a significant contribution to information systems and specifically knowledge management bodies of knowledge by increasing understanding of how organisations can reduce risk of failing and increase the likelihood of success when adopting digital technologies to change or transform community engagement and associated knowledge management processes. This contributes to supporting an organisation’s efforts to engage with community residents and the benefits from such interactions.

Digital technology use is widespread and continues to transform social, economic, and political activities. Given its continuing and expansive impacts, this study takes an

inter-disciplinary approach as foundational to understanding how digital technologies can be better used for community engagement. In this way, the study has the potential to make a significant contribution to multiple disciplines, including sociology, business, economic, and technical disciplines (Gupta and Kim, 2004; Simon, Janneck, and Gumm, 2006). The study will achieve this through the modification of an existing model or framework, or development of a new model or framework.

In the process of modifying or creating a new model or framework, this study aims to increase understanding of how to improve the practice of implementing complex, continuously evolving, and multidisciplinary transformative community engagement initiatives delivered through digital technologies. It is anticipated that the model or framework will also provide guidance to identifying and mitigating potential risk that may hinder the success of community engagement and associated knowledge management initiatives.

The approach to refining an existing model or framework or developing a new model framework as an outcome of this study will be an iterative process. In addition to the review of commonly used existing models and frameworks, this review will also consider evidence from the organisational cases to determine the final form the model or framework will take. The model or framework, whether existing or new, will aim to be suitable for professional specialisations addressed in multiple academic disciplines. This is because sociotechnical initiatives involve specialists from differing disciplines interacting to coordinate and prioritise homogenous trends to transform processes (Matt et al., 2015). This interaction between multiple specialists, and/or people from various disciplines such as business, humanities, computer science and public policy, can help reduce risks that may not initially be considered when embarking on activities to change or transform organisational processes and how they interact with community residents (Simon et al., 2006; Tatnall and Gilding, 1999).

The study also provides a greater understanding of the association between community engagement and knowledge management. This association has the potential to create a significant amount of information and knowledge that can be used for the purpose of making decisions (Kitchin, 2014) for and on behalf of community residents. This study focuses on the process of generating and capturing knowledge about the community. This knowledge may be able to be used to more effectively manage and better reflect the three basic functions of Information Systems (IS): remembering the past, handling the present and preparing for the future (Benson and Standing, 2007).

1.5 Thesis overview and structure

This section provides an overview of the thesis chapter structure, and how the chapters relate to one another.

Literature review (Chapter 2)

The Literature Review describes existing research and publications relevant to the research question and objectives. In addition, the chapter includes a review of websites, annual reports and other government reports and publications, research reports, news reports, news commentary, magazine articles, websites and social media. This information identifies, analyses and critiques fundamental theories, methodologies, models and frameworks related to digital technologies in the context of this study.

From the literature, gaps in research are identified, and trends determined and explored. The chapter draws on research from a range of disciplinary perspectives including sociology, business, economic, and technical disciplines (Gupta and Kim, 2004; Simon et al., 2006). This was essential, as the wide ranging affects of digital technologies on organisations, communities and individuals require it to be examined from various disciplinary perspectives to develop an in-depth understanding of these transformations to date and in the future.

Conceptual framework (Chapter 3)

This framework consists of a collection of concepts that provides a picture and the interpretive approach taken in this study. It discusses intentions and their interpretations, which contribute to the research design. The conceptual framework also provides context to the research, including the identification and purpose of key relationships.

Methodology (Chapter 4)

This chapter describes the theoretical foundations, the research design and approach adopted in order to investigate how organisations responsible for engaging community residents undertake these activities. It includes the choice of methods used to collect and analyse data, how the data was interpreted, and how the theories and methodologies are relevant to the research question. This chapter will also explore the links to key theories that have informed the proposed model or framework outlined in this research.

Findings: First wave of interviews and observations (Chapter 5)

This chapter presents the findings of the cases and the implications of the findings for consideration within the proposed model. The chapter includes the analysis, synthesis, and presentation of the research findings for the first wave of the study.

Findings: Second wave of interviews and observations (Chapter 6)

This chapter presents the findings of the second wave of interviews and observations. These findings are compared to those of the first wave that was conducted ten years earlier. Where possible the same questions were included, and people and organisations from the first wave of interviews were sought to participate in the second wave. In this chapter, changes that occurred within the organisations since the initial interviews are highlighted.

Discussion (Chapter 7)

This chapter provides a consolidated view of the findings from the first and second waves and these are further analysed for association. The chapter includes the analysis, synthesis, and presentation of the research findings from both waves. In this chapter, the common issues found between the cases are identified, and the key differences presented.

Within this chapter, the literature (Chapter 2), methodologies (Chapter 3) and findings (Chapter 4–Chapter 6) are synthesised. Theoretical and actual practice of community engagement and knowledge management activities are compared and presented. The result is a discussion about a proposed sociotechnical model that may assist organisations to enhance their method of adopting digital technologies to transform community engagement and knowledge management practices.

Conclusion, extensions and future research (Chapter 8)

The final chapter presents a conclusion to the research with key contributions summarised. The research question and stated objectives are answered. Included also is a discussion of the potential implications of the study and areas for future research.

Chapter 2

Literature Review

2.1 Introduction

This research aims to identify influential sociotechnical models and frameworks to identify and mitigate risk, therefore improving opportunities to increase the success of community engagement and associated knowledge management initiatives in WA. To achieve this, the current chapter brings together literature from a range of disciplines to document how community engagement and associated knowledge management practices are influenced by digital technologies.

As part of the literature review, the high failure rate of sociotechnical initiatives that were intended to transform operations through the use of digital technology will also be summarised. Knowledge gained from the literature will help inform the conceptual framework and guide the data mapping and collection process.

The objectives of the literature review set out here:

- Describe the benefits, strengths and weaknesses of community engagement through the use of digital technologies.
- Describe the benefits, strengths and weaknesses of knowledge management through the use of digital technologies.
- Identify and categorise data associated with transforming engagement activities between community organisations and residents.
- Identify existing influential models and frameworks used to guide transformation efforts of organisations that seek to engage with community residents through the use of digital technologies.
- Identify strengths and weaknesses of influential models and frameworks that may be used to assist organisations to reduce risk of failure when they deploy digital technologies to engage with community residents.

These objectives helped determine the literature that was identified and reviewed for this study. Next a thematic approach was then applied to categories of matters relevant to this study. To develop the themes, literature was identified and reviewed. From the review, initial categories were considered that appeared to work across the literature. The literature was then further reviewed, leading to refinements and a reduction of categories. This

resulted in major themes: strategic and operational. These two themes align to and support efforts to plan, budget, foster decision making (Berbegal-Mirabent, Gil-Doménech, and Alegre, 2016, p. 89) for engagement activities between organisations and residents within their community. The rationale for these categories is addressed in the following section.

2.1.1 Structure of the literature review

The literature review begins with an overview of global and Australian trends in digital transformation and knowledge management. These trends provide the foundation for the rest of the literature review. The literature then presents the two central topics of this study: community engagement, followed by knowledge management, particularly its association with community engagement. Next the literature review focuses on culture. It is believed that influencing culture is important to both community engagement and knowledge management initiatives. The challenges, risk and complexities of community engagement are explored.

Models and frameworks are then discussed, including those that are considered influential. Actor-Network Theory (ANT) is introduced as a theoretical lens for this study.

The literature review will also describe, compare, contrast, and interpret data sources related to this research. As part of this process, the review will identify gaps that exist in the literature. Finally, how this research aligns with the existing literature is explained and the relevance of this study described.

The remaining sections contribute to creating a context for this study by discussion of the maturity cycle of social-technical initiatives and a discussion about public and private sectors' approach to community engagement activities. A brief discussion about community engagement alignment with knowledge management follows. At the conclusion of this chapter, the scope of the thesis is established.

2.2 Trends

2.2.1 Digital transformation

In this section the term digital transformation is first deconstructed and then defined. The term "digital" suggests a view that changes in society, business and industry are influenced by contemporary information technology solutions. These solutions allow data to be processed in real time, allowing the collection of information and allowing stakeholders the opportunity to gain enhanced knowledge about processes, products and services. The word "transformation" describes a process in which activities are

performed to change something from its current state into an enhanced desired state (Gray and Rumpe, 2017).

The trend towards digital transformation can be defined as customer focused change initiatives intended to enhance business processes, improve services and the delivery of the services and increased user satisfaction. How information is converted to knowledge and used is essential to the success of such initiatives. These initiatives can foster deep and significant organisational change in addition to the integration of digital technologies (Larsson and Teigland, 2019). Since the 1990s, digital technologies helped foster a significant shift in the way people interacted and maintained their relationships with family and friends, organisations, and members of their community (Horn et al., 2013). From the mid-1990s, the use of digital technologies presented further opportunities for government to interact with citizens (Herriman, 2011; Minkler and Wallerstein, 2005). The emergence of these types of interactions through digital technologies contributed to organisations redeveloping the delivery of their services, including how they interacted with community residents (Evangelista et al., 2014; Kingsley et al., 2014).

From a global perspective, the influence of digital technologies on people, organisations and communities is significant (Beckers and van den Besselaar, 2014). The ability of digital technologies to influence and transform social, economic, and political environments can be compared to other significant technological advances, such as the telegraph, radio, telephone, and television. Like these technologies, digital technologies, including social media, are having a significant influence on personal and professional relationships (Brynjolfsson and Hitt, 2000; Rauniar, Rawski, Yang, and Johnson, 2014). Digital technologies are also transforming local and global commerce, the management and accountability of financial services (Amiri and Reif, 2013; Brynjolfsson and Hitt, 2000; Evangelista et al., 2014; Ferreira, McKnight, Perry, and Fish, 2014), and how organisations, large, small and virtual, engage with customers, extend their markets, and expand their revenue base beyond their traditional boundaries (Wahi and Medury, 2014). The advent of digital technologies has transformed how political engagement occurs: for example, change.org and other crowd funding organisations have been instrumental in engaging citizens in matters that concern them (Balestrini, Bird, Marshall, Zaro, and Rogers, 2014; Spierings and Jacobs, 2014).

Within Australia, the influence of digital technologies has contributed to local government reforms that include initiatives to better control expenditure, and to provide stronger accountability, transparency, improved reporting, and community consultation

(Aulich, 2002; Hossan, 2015). Although access to digital technology is becoming more prevalent across WA metropolitan and regional centres, how technology is used to engage with residents and manage their knowledge differs between communities (Nabatchi and Amsler, 2014). Through the knowledge gained from these engagements, residents will have the opportunity to provide insights that may influence the decisions of community stakeholders. This supports the view that connected and empowered communities can have a positive influence on residents (Dubow et al., 2017; South, 2015). It also recognises that the participation of residents in decisions that have an impact on them can enhance public trust in community leaders (Irvin and Stansbury, 2004) and improve perceptions of legitimacy, justice and governance effectiveness (Fung, 2015).

These reforms provide a legitimate impetus to consider improvements in the process of engaging with residents. Engagement with residents is central to democratic processes in which residents have the right to exercise their voice, their desires, their right to vote, and to engage in discourse about decisions that may affect them (Aulich, 2009; Tacchi, 2012). Through the availability and use of digital technologies, increased engagement can help community leaders identify issues residents may have concerns about, provide opportunities to learn what residents seek to improve, and help them gain insight into methods for sustaining engagement with residents (Kolopack et al., 2015).

An increased focus on community engagement aligns with the directions of knowledge economies, in which knowledge intensive activities drive improvements in processes and customer interactions (Powell and Snellman, 2004). For this study, the community engagement focus includes an examination of methods that organisations use to engage with residents and capture knowledge in a way that can influence decisions the organisation may make. This cannot satisfy the complex and varied needs of residents unless various perspectives from multiple disciplines are adequately considered (Simon et al., 2006).

Discussions regarding opportunities to effect transformation through the use of digital technologies are wide ranging in the academic literature. The literature covers the impact that digital technologies have in diverse areas, which include: communities (both virtual and geographical) (Granata and Scozzese, 2017; Herriman, 2011; Kitchin, 2014; Rheingold, 1993), business (Brynjolfsson and Hitt, 2000; Hanna, 2016; Wahi and Medury, 2014); the economy (Evangelista et al., 2014; Virjan, 2013); and politics (Bennett, Segerberg, and Knüpfer, 2018; Wilson and Goldschmidt, 2005).

2.2.2 Global and Australian digital transformation trends: From late 2000 to 2010

In the early-to mid-2000s, digital technologies including websites, teleconferencing, and infrastructure for broadband and mobile communications were an increasing area of focus for organisations' human and financial resources. The drivers for these investments included competition, the ability to reduce the cost to deliver products and services through digital channels. The ease with which information was able to be found online when compared to searching for information through paper documents or when calling service centres for assistance (Andal-Ancion, Cartwright, and Yip, 2003; Scott, 2007) can also be considered a driver. The number of online transactions and the availability of online information grew. The cost of transactions is much less than the cost of searching through manual documents in archives of paper documents (Andal-Ancion et al., 2003). During the first wave of this study, the ability to customise information and news to cater for the specific needs of individual customers also emerged (Andal-Ancion et al., 2003). These changes can be considered significant when compared to the previous decade.

The 2000s also saw the influence of digital technologies on the way people engage and interact, as well as how they create, find and use content (Lanzolla and Anderson, 2008). Other new opportunities included transforming the way residents were engaged throughout the cycle of governance, such as policy creation, planning, service delivery and the evaluation of the performance of programs (Dutil, Howard, Langford, and Roy, 2008). It was also recognised during this period that more research was required about the effect of engaging with residents through the use of digital technologies (Dutil et al., 2008).

Within and across Australia, there was growing interest and investment of time and effort into e-government, including increased use of digital technologies to deliver services to communities and provide more opportunities for community engagement (Government of Western Australia, 2008). During this period other key initiatives included efforts to increase accountability across government, services becoming resident focused, increased financial constraints on public sector organisation and the desire to outsource services (Shackleton, Fisher, and Dawson, 2006). Of the three tiers of government, i.e. federal, state and local governments, local governments were considered to have fewer resources and be more resistant to changes facilitated by digital technologies (Shackleton et al., 2006).

At the time of the first wave of study, activities to engage residents through digital technologies were not often considered ongoing initiatives in many local governments, but as finite projects (Shackleton et al., 2006). Being considered a finite project can have a negative influence on resource allocations, sustainability and the performance of transformational initiatives that use digital technologies.

2.2.3 Knowledge management from 2000 to 2010

According to Ionescu, Burstein, and Zyngier (2006), knowledge management awareness was high in Australia in the early 2000s. In particular, there was increased awareness of the value that can be gained through knowledge management, the issues that knowledge management presents, the resource requirements, and an understanding of the tools and concepts for managing knowledge. Many organisations created plans to acquire and exploit knowledge. Furthermore, the number of knowledge workers increased across many industry sectors (Hislop et al., 2018). Organisations committed to knowledge management will need to ensure that such initiatives are adequately funded to support knowledge management initiatives or they will fail (Ifijeh, 2011).

However, multiple challenges remain as there are significant obstacles faced by organisations when implementing knowledge management strategies. These obstacles include the need for effective solutions to establish a culture to support sharing organisational knowledge, to develop trust and genuine commitment and to obtain higher levels of management support for delivering knowledge management strategies. Issues regarding identifying and using the right technology to capture and share knowledge also remain (Ionescu et al., 2006; Martin, 2005). The results are that during the first wave, although there was awareness of knowledge management value and benefits, few Australian government agencies adopted knowledge management. From a strategic perspective, leaders may be unclear about how knowledge management can realistically assist them to meet organisational objectives (Martin, 2005). This is supported by Hislop et al. (2018) who recognise that a key task is creating a supportive culture that, through development and communication of a long-term vision, embraces knowledge management. The experience in Australia is similar to the challenges faced in other countries when trying to progress knowledge management initiatives (Burstein and Sohal, 2010).

2.2.4 Global and Australian digital transformation trends: Decade from 2010 to 2020

There have been significant changes in technologies and how they were adopted to transform business processes since the late 1990s and 2000s. During the following decade (2010s) the adoption and use of digital technologies were not equal within or across industries, but transformation had commenced. The implications of digital transformation include the economic performance of organisations. Some of the main drivers for digital transformation include the continued increase in customer expectations, the expeditious manner in which information is exchanged, and the speed at which products are delivered. This process continues to grow in importance. A primary reason for transformation is the opportunity to reduce costs and to obtain greater efficiencies. The number of academic works related to digital transformation increased significantly from the year 2000 to 2018 with the largest growth period between 2015 and 2018 (Pihir, Tomičić-Pupek, and Furjan, 2018).

During the period from 2010 to 2020, the emergence of digital transformation continued to be researched in a number of scientific fields including information science, computer science, business, management, accounting, engineering, social services, and finance (Pihir et al., 2018). Within organisations and in the broader community, there is increasing awareness of the evolution of digital technologies, such as social media, and other applications as a method of disseminating information and services to residents (Gorecki and Kelly, 2012; Herriman, 2011).

Within Australian local government, however, there is evidence of integrating digital technologies into day-to-day operations because of marketing, privacy and access to appropriate resources (Fan, 2018). For organisations to better advance towards more effective use of digital technologies to engage with residents within the community, Fan (2018) recognised the need for a more effective model. Local governments may be aware of the benefits of providing information and services online through digital technologies; however, there is a general lack of experience and knowledge to implement sociotechnical solutions (Fan, 2018). Sociotechnical solutions are composed of a variety of evolving components, actions and interconnections that may include feedback loops, self-organisation and hierarchies (Savaget et al., 2019).

2.2.5 Knowledge management from 2010 to 2020

As with many countries, Australia was also influenced by knowledge management trends. These trends include the strengthening links between digital technologies and customer engagement. Digital technologies have been identified as a major enabler of knowledge sharing. As technologies including social media have evolved, they have had an impact on how organisations consider knowledge management. Between 2010 and 2020, the potential role of digital technology in knowledge management has become even more significant due to continued innovation and advancement of technologies (Asrar-ul-Haq and Anwar, 2016). Trends suggest that blogs, wikis, instant messaging and other social media technologies foster communication sharing and changes to both formal and informal knowledge sharing behaviours (Asrar-ul-Haq and Anwar, 2016). Emerging technologies such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) will further influence knowledge management adoption in organisations (Kane, 2017). However, knowledge management has yet to emerge from the early stages of adoption in many organisations and is not yet achieving the promised benefits (O'Riordan, 2020). Reasons for failing to achieve the benefits from the early stages of knowledge management adoption include the failure to gain or sustain the support of leaders, inadequate plans, insufficient resources (Ramirez, Coakes, Søndergaard, Kerr, & Clegg, 2007) with too much focus on technology (Corfield and Paton, 2016; Tooranloo et al., 2018) and not enough on changing culture to allow sustained sharing and creation of knowledge (Hashemi, 2016).

The role of leadership is also recognised as an enabler for fostering knowledge management within organisations. Additionally, the role of this leadership is seen as developing trust as well as motivating staff to pursue and participate in knowledge management initiatives (Asrar-ul-Haq and Anwar, 2016). Like community engagement, successful knowledge management initiatives involve developing the culture and the expertise, and changing the way focal actors and individuals interact. Focal actors develop strategies and also identify the actors to implement them (Papenbroock and Österberg, 2017). This change is often resisted, and not initially embraced (Ali, 2014; Gurteen, 1999; Hislop et al., 2018). The literature describes reasons for this resistance, including organisations' leaders and managers providing little clarity about how to achieve a change in culture and neglecting to encourage and support knowledge sharing across multi-disciplinary teams (Corfield and Paton, 2016).

2.2.6 A common trend: The high rate of failure of sociotechnical transformation initiatives

Previous studies have shown that many organisations find that successful implementation and the sustained operation of complex sociotechnical initiatives are elusive (Baxter and Sommerville, 2011; Bloch, Blumberg, and Laartz, 2012). An international sample of over 5,400 large information technology projects (defined as projects exceeding US$15 million in cost) had more than US$66 billion in cost overruns (Bloch et al., 2012). According to some estimates, the failure rate for technology implementations exceeds 60 per cent (De Waal, van Outvorst, and Ravesteyn, 2016; Pflügler et al., 2018), and rework to correct poor software development due to inadequate functional and business requirements exceeds more than US$45 billion annually (Pimchangthong and Boonjing, 2017). According to Pflügler et al. (2018), the rate of failure for digital technology initiatives has not significantly decreased in the past decade. These failures have social and economic impacts and can negatively influence the organisation and people working within it (Baxter and Sommerville, 2011; Bughin, Catlin, Hirt, and Willmott, 2018; Pflügler et al., 2018).

The high failure rates may be due to myriad reasons. These reasons include issues such as more attention allocated to technical consideration of sociotechnical initiatives, and less focus on non-technical and social impacts (Spector and Wang, 2002; Tatnall and Gilding, 1999). Therefore, situations can arise in which state-of-the-art technology can be developed and implemented, but the initiative may not be considered a success because the social aspect of the initiative was not adequately considered, leading to customer dissatisfaction (Baxter and Sommerville, 2011).

For example, adopting a digital technology such as a call centre to support resident engagement and linking the technology with content and/or knowledge management activities may be insufficient to ensure successful transformation from old processes to new (Serenko, Bontis, and Hull, 2016). Success in knowledge management requires appropriate technologies, internal support, structures, and strategies (Geisler and Wickramasinghe, 2015). Therefore, technologies can be an important part of an engagement and knowledge management model or framework; but alone, technology without an articulated business direction, availability of the appropriate skills, and supporting processes, is not sufficient to reduce the risk of a transformation initiative failing (Jamil and Lodhi, 2015).

A high rate of failure may also be attributed in part to an underestimation of the momentum of change and the scale of disruption that digital transformation will cause (Bughin et al., 2018). Leadership may also contribute to the high failure rate as a result of a lack of insight, competence, or experience to transform their organisations, processes, and services through the use of digital technologies (De Waal et al., 2016). To illustrate this point, within WA, the potential benefits from adopting digital technologies to enhance service delivery are considered significant (Government of Western Australia, 2016). However, the WA Government has identified that shortcomings need to be addressed. These include a more strategic focus, more effective leadership, the need for culture change and a recognition that better interaction between multiple disciplines is necessary if digital technology is to have a sustained positive influence on service delivery (Government of Western Australia, 2017).

2.3 Community and community engagement

In this section, first the term "community" is defined and discussed. This is followed by a summary of the influence that technologies have on communities then the types and participation rates of community engagement. From this, the rationale of community engagement through digital technologies is presented. The section concludes with a discussion of the strengths and weaknesses of community engagement.

2.3.1 Community and the residents living there

Understanding how the concept of community is framed, defined, and applied is important to this study. Communities can have conceptual or geographical boundaries that vary depending on the purpose and perspective of those who define the word (Kingsley et al., 2014). Conceptual definitions of community are based on a commonality amongst individuals, for example, ethnic background or a recreational interest. In this study, community is based on a geographical locality, specifically, the WA LGA boundaries are used to define borders of the community. This approach allows a consistency for comparing the cases in the chapters in which the findings are presented.

This perspective aligns with a conventional interpretation in which community is a physical place within a bounded geographic location (Duncan-Howell, 2007; Fernback and Thompson, 1995; Kaufman, 1959; Kenny, 2006; Mersey, 2009; Rothaermel and Sugiyama, 2001). Geographical communities comprise social units that include residences and places of employment, and encompass other activities (Kaufman, 1959). These activities incorporate coordinated and integrated activities, organisations, businesses,

systems, and governance, to support communities and solve their problems (Kaufman, 1959). What may be implied in the literature, but not explicit, is that the interaction between social, economic and political activities can foster the creation of content that can affect the operation of communities (Kingsley et al., 2014).

The social, economic and political activities can foster the creation of content to inform stakeholders, including community residents. Social content is used to communicate and share perspectives (Pahl-Wostl and Hare, 2004). Economic information can be generated and used to provide analysis and a summary of industry skills and knowledge linked to the community (Virjan, 2013). Political content may include communications of political actors, for example, the mayor and city councillors, promoting the policies, plans and strategies related to activities of political parties (Dolan, Peasgood, and White, 2008; McNair, 2017; Nabatchi and Amsler, 2014; Neuendorf, 2016).

Community residents are defined as people whose primary place of residence is within a previously defined area (Wert and Palacios, 2016). Residents are considered a stakeholder group as they can be affected by changes that influence the community's purpose (Niu, Dong, Niu, and Deng, 2017). In this study, the residents of the community are separated into service age groups. Service age groups divide residents into groups that reflect typical life stages. Key audiences for community engagement comprise residents within age ranges that may typically manage household responsibilities. These audiences include the following service age groups:

- tertiary education and independence (18 to 24)
- young workforce (25 to 34)
- parents and homebuilders (35 to 49)
- older workers and pre-retirees (50 to 59)
- empty nesters and retirees (60 to 69)
- seniors (70 to 84) (Australian Bureau of Statistics, 2020).

Service age groups give an indication of the level of demand at different stages in people's lives and, through a longitudinal study, may provide insight into how that demand is changing.

In this study, industry is defined as the industry sectors in which the residents are employed and work (Informed Decisions, 2020b). Although there is often a focus on global connections created through digital technologies, according to Wise (2017) there

also remains the need to maintain a focus on local communities. Within the community, the interactions between residents and a number of stakeholders collaborate to build, maintain, and grow the local economy (Wise, 2017). Local industry is influenced by the skill base, employment opportunities and the social economic status of residents within the community (Informed Decisions, 2020b).

2.3.2 Influence of digital technologies on communities

Studies of the use of digital technologies, and their increasing influence on cities, communities, organisations, and people are well documented. The research also recognises that digital technologies are becoming an essential component of community infrastructure considered vital for supporting contemporary society, alongside utilities such as electricity, gas, and water (Misa, 2003).

Also emerging from the literature is a recognition that within communities integrated networks are being formed which comprise technological infrastructure, information, and the ability to harness knowledge. This could influence social and economic activity (Anthopoulos and Tsoukalas, 2006; Borja, 2007; Chourabi et al., 2012; Dirks and Keeling, 2009; Kingsley et al., 2014; Lindskog, 2004; Nam and Pardo, 2011). Studies indicate that communities with adequate infrastructure may be better placed to attract new opportunities for residents and businesses, compared to those with a less mature integration of digital technologies (Evangelista et al., 2014; Rothaermel and Sugiyama, 2001). Conversely, residents may consider a community without suitable digital technologies and associated infrastructure as less affluent, leading them to migrate to other communities where more adequate services are available (Slater, 2013).

2.3.3 Community engagement and digital technology

Benefits from community engagement activities outlined in this study are not possible without the use of technology (Gurteen, 1999). According to Vlachokyriakos et al. (2014), the use of digital technologies can assist communities with social change. Articles from Australian federal and state governments, as well as from political science and community research centres, identify the importance of digital technologies such as video conferencing and social media to community engagement activities and initiatives (Government of Western Australia, 2016; Kernaghan, 2009; McCann, 2012; Reddel and Woolcock, 2004). This is supported by multiple studies conducted to investigate the changes technology may have on community engagement (Corbett and Le Dantec, 2018; Dubow et al., 2017; Herriman, 2011). This effects opportunities to use technology to

leverage knowledge to foster social (Balestrini, Bird, Marshall, Zaro, & Rogers, 2014; Cavaye, 2004), economic or political discourse, and actions to influence decision making for the benefit of residents (Kingsley et al., 2014).

Community engagement is also considered important and influential in transforming services delivered to residents. Active and inclusive strategies of community engagement can empower people by giving them an opportunity to express their needs and influence the service organisations they access and use (Harsh & Ichalkaranje, 2015; Sá et al., 2016).

The use of digital technology to transform the engagement process in a manner that allows residents to help shape policy, plans and service delivery was described as an enhancement to the community consultation process by some authors (see Dubow et al. (2017) and Nabatchi and Amsler (2014)). However, understanding the affect of technology on the community engagement process requires additional research (Corbett and Le Dantec, 2018; Nabatchi and Amsler, 2014). This includes research concerning how to raise awareness amongst community members about the availability of new or transformed services; how to assist residents to develop the skills to access and use the new or transformed services; investigating the influence of the transformation of relationships, including the power dynamics within the community; how to align new actors and networks to new goals; and further research to better understand the impact on plans, practices, processes, and skills (Corbett and Le Dantec, 2018; Nabatchi and Amsler, 2014).

Digital technologies, particularly the Internet, are considered a driver of service delivery initiatives. Through digital technologies, multiple channels including email, websites and social media can be used by community organisations to engage and interact with residents about issues that may interest them (Bonsón, Torres, Royo, and Flores, 2012; Kernaghan, 2009). Interaction between community organisations and residents can generate a significant amount of information. With appropriate direction, leadership and management, skills and processes, this knowledge can be harnessed, analysed and then used for making more informed decisions that may benefit community residents (Kitchin, 2014). Collectively, community engagement and knowledge management activities provide benefits that include:

- organisations building better relationships between people, business and government
- creating effective partnerships and developing new solutions to existing problems
- contributing to social and economic development in the community
- developing services in consultation with members of the community to better meet their needs

- ultimately, improving community satisfaction with the services being provided (Kernaghan, 2009; Reddel & Woolcock, 2004).

2.3.4 Community engagement types and participation rates

There are at least five types of community engagement noted by Head (2007). The types of engagement range from informing, to consulting, involving, collaborating, with the final type being empowering (Head, 2007; International Association of Public Participation, 2018). The focus of community engagement presented in this study is on the involvement type. The involvement type relates to direct engagement of residents throughout a process to ensure the desired state is consistently considered and understood. For this study, the tools for engaging with residents to involve them in decision making are digital technologies. Determining participation rates of community engagement through digital technologies is not yet clear and is influenced by many factors such as age, skills and location (Andersen et al., 2020; Moy, Manosevitch, Stamm, and Dunsmore, 2005).

However anecdotal evidence suggests that there is room for improvement. According to Herriman (2011) and Nabatchi and Amsler (2014), the reality is that only a small proportion of the community is engaged, and they are not usually representative of the broader community. The availability and use of digital technology may reverse the low participation rate of residents in community engagement activities (Aulich, 2009; Irvin and Stansbury, 2004). However, Fung (2006) recognised that some leaders, managers, and residents may become frustrated with the low number of people interacting with their organisation online about issues presented to the community for consideration. Yet, if the number of people participating in direct voting increases, Irvin and Stansbury (2004) state that some leaders and managers may feel a real or perceived loss of control as a result of residents wielding a more direct input into public policy decisions.

Authors recognise the low participation rate of residents in community engagement activities (Aulich, 2009; Irvin and Stansbury, 2004). According to Corbett and Le Dantec (2018) and Herriman (2011), residents not participating in community engagement activities include young adults, older residents, the unemployed, people who have had bad experiences with representatives of the organisation, immigrants, and people who have barriers to literacy, or are linguistically diverse.

To increase residents' participation in engagement initiatives, organisations may undertake activities that include identifying and considering a range of methods to consult groups. This consultation is a way to build trust with marginalised groups (Herriman,

2011). The consultation process may be combined with computer literacy, and other activities to raise awareness to influence community perceptions. Regarding computer literacy, Cresswell and Sheikh (2013) state that activities undertaken to ensure residents have an adequate education in the use of digital technologies may reduce risks associated with sociotechnical initiatives, such as community engagement. The computer literacy initiative and other awareness raising activities can foster conversations in which people share their experiences. This process, also known as word of mouth, can foster a major change on the behaviour of stakeholders (Berger, 2014; Cramm, Van Dijk, and Nieboer, 2013; Patton and Gregory, 2014).

2.3.5 Community engagement rationale

Community engagement initiatives are promoted as empowering, increasing transparency and allowing residents the opportunity for a more direct representation on matters related to them (Minkler and Wallerstein, 2005). The availability and use of digital technologies have increased interest to transform community engagement processes (Gilardi, 2016; Matsusaka, 2005).

According to Morton (2013, p. 173) "engaged communities" are an intangible influence on the decisions of stakeholders. Engaging with residents can build a stronger sense of community by steadily working to improve what South (2015, p. 7) describes as the "…shared stake in place, service, culture and activity" associated with community.

De Weger, Van Vooren, Luijkx, Baan, and Drewes (2018) identified a wide range of definitions and interpretations of community engagement. Community engagement activities can take many forms and encompass the following common factors: engaging people from the community in the decision making process and the planning, design and delivery of services (De Weger et al., 2018; Glandon, Paina, Alonge, Peters, and Bennett, 2017).

Community engagement is a sociotechnical practice. It involves humans interacting with each other and through material objects such as digital technologies. Enabling community engagement involves creation of plans, policies, procedures and other artefacts. Engagement with residents, as presented in this study, also involves acquiring and creating new knowledge. The new knowledge can present opportunities for innovation (Geisler and Wickramasinghe, 2015; Middleton and Whitmore, 2017; Roblek, Meško, Bach, Pejić, and Bertoncelj, 2014).

2.3.6 Strengths of community engagement

A number of researchers have recognised and articulated the benefits and opportunities of community engagement. According to Milton et al. (2011) and Irvin and Stansbury (2004), the benefits include better exchange of information between local residents and the organisation providing the service, the opportunities to influence and enlighten government, and enhanced legitimacy of decisions. Prior to making decisions about matters concerning community residents on issues of public policy, it is preferred that organisations undertake broad community consultation (Herriman, 2011). This consultation should include engaging with people who will be affected by the issue under consideration as part of the direct democracy process. Attree et al. (2011) and Irvin and Stansbury (2004) believe community engagement can improve social relationships, empower residents, and also develop the skills of community activism. To support these benefits, Dufty (2017) states that community engagement should include clear methodology, sufficient content, allocated responsibilities, timeframes, and details describing how the results of the engagement will be evaluated.

The interest of scholars, business leaders, managers, and other stakeholders involved in community engagement activities has fluctuated over time (Nabatchi and Amsler, 2014). In this study, community engagement is led primarily by public, private, or not for profit organisations that seek to undertake responsibility for engaging with residents. This study encompasses the increasing use of digital technologies to interact with community residents. Through this interaction, organisations can participate in collaborative decision making (Corbett and Le Dantec, 2018). As a result of the feasibility of using digital technologies, there is a resurgence of interest in improving community engagement that focuses on improving decision making, service delivery, and gathering intelligence, (Corbett and Le Dantec, 2018; Moore, McDonald, McHugh-Dillon, and West, 2016). Through the use of technology, processes can be transformed to allow a more direct method for engaging residents (Matsusaka, 2005). Since 2010, digital technologies such as websites, email, and social media are increasingly being used by politicians and their advocates to engage directly with constituents, to persuade them to vote for particular candidates, or support various initiatives and issues (Dubow et al., 2017). Digital processes for citizen input into public policy, plans, strategies, and how services are delivered to residents are transforming communication and can contribute to creating a new sense of community (Nabatchi and Amsler, 2014; Wray-Lake et al., 2017).

2.3.7 Weakness of community engagement

In contrast to the strengths of community engagement, there are also weaknesses. According to Herriman (2011) and Nabatchi and Amsler (2014), the reality is that only a small proportion of the community is engaged, and they are not usually representative of the broader community. The view that only a small proportion of community residents are engaged is supported by Aulich (2009), who states that in WA, where local government voting is not compulsory, and voting can be conducted by post, the average turnout was 36 per cent in 2005. This is compared to a 22 per cent voter turnout for local councils using polling booths instead of postal voting in 2003. Fung (2006) considers community engagement activities to be a political process at the core of community. Fung (2006) recognised that some leaders, managers, and residents may become frustrated with the low number of people participating in public and online forums about issues being presented to the community for consideration. On the other hand, if the number of people participating in direct voting increases, Irvin and Stansbury (2004) state that some leaders and managers may feel a real or perceived loss of control as a result of residents wielding a more direct input into public policy decisions.

Furthermore, engaging people through the use of digital technology may not be a solution that is suitable for all members of the community. Tapscott (1994), supported by Nabatchi and Amsler (2014), notes that as the adoption of digital technologies within communities grows, inequalities are emerging. These inequalities, often referred to as a digital divide, and digital inequities, relates to some people having the skills and resources to access and use digital technologies, while other residents may not (Dobson and D'Mello, 2012; Robinson et al., 2015; Van Dijk, 2012; Venkatesan, Eversole, and Robinson, 2004). Knox and Pinch (2014) believe that people with less access to digital technologies may feel as if they are disadvantaged and have a sense of social separation and inequality.

The impact on the staff of community organisations who participate in activities associated with community engagement through the use of digital technologies may also require additional research. Demerouti, Derks, Lieke, and Bakker (2014) believe that, as a result of adopting digital technologies, staff may work extended hours and feel overworked, which can have a negative influence on their work–family balance and job satisfaction. Compounding this is the expectation that workers are increasingly available and accessible to undertake more tasks outside traditional work hours. To help address the community engagement challenges, the following section presents key concepts that describe the context and relationships between communities, community residents, knowledge and technology.

2.4 Knowledge and knowledge management

In this section, first the term “knowledge” then “knowledge management” is defined and discussed. The links between community engagement and knowledge management are explored. This exploration includes processes related to community knowledge, and the knowledge management processes in general, followed by a summary of the influence that technologies have on communities then the types and participation rates of community engagement. From this, the rationale of community engagement through digital technologies is presented. The section concludes with the strengths and weaknesses of community engagement discussed.

2.4.1 Knowledge

Different disciplines conceptualise knowledge in ways suitable for their needs, using many definitions and classifications of knowledge (Greenhalgh and Wieringa, 2011). For this study, knowledge is defined as information in context with an awareness of how to adopt and apply it (Corfield and Paton, 2016).

Knowledge is derived from information that can be seen, obtained, stored, and retrieved and processed by individuals as knowledge (McDermott, 1999; Tanhua-Piiroinen & Sommers-Piiroinen, 2013). Information that is collected can be aggregated with other forms of information to create knowledge that can then be used to better understand problems, individuals, improve practices, design, and the delivery of services (Hall, 2001). Common knowledge classifications include explicit (or structured) knowledge, implicit (or unstructured) knowledge, and tacit knowledge (Newman, Conrad, & Carter, 2010; Tanhua-Piiroinen & Sommers-Piiroinen, 2013). The utility of knowledge is derived from better decision making and based on the extent to which the knowledge is trustworthy and useful for the intended audience, is necessary according to Alavi and Leidner (2001) and Ekstedt et al. (2004). Unlike physical resources, when knowledge is shared by the original owner, it can be sustained and not diminished (Mokyr, 2005). In the context of this study, sustainability refers to a continuous systematic process of managing knowledge obtained through the engagement of community residents in such a way that it remains valid, can be accessed and used. Knowledge can be used by organisations, local, state and national governments, for planning, decision making, compliance, and associated activities which may be used to benefit local communities (Ritter, 2006).

2.4.2 Knowledge management

Knowledge management became recognised as a management discipline during the 1990s and gained popularity after organisations adopting it advocated its benefits to their business (Corfield & Paton, 2016; Jamil & Lodhi, 2015) and to the community (Riege & Lindsay, 2006). Knowledge management is goal-oriented; systematic management of activities leverages knowledge for an organisation's benefit, such as by creating, organising, sharing, and using knowledge (Corfield & Paton, 2016; Lepik & Krigul, 2014; Skyrme, 2007). It can also be considered a strategy to get the appropriate knowledge to relevant actors and networks to enhance an organisation's operations (Girard and Girard, 2015).

Knowledge management can add value to the community engagement process by capturing, coding, storing, and disseminating information gained from residents to create new knowledge. The sustained use of knowledge can be used to assist in the community organisation's decision-making process (Greaves and Romice, 2015; Koh et al., 2005). With sustained use, in the context of this study, referring to a continuous systematic process of managing knowledge obtained through the engagement of community residents in a way that it remains valid, can be accessed and used.

Although the benefits of knowledge management are recognised in the literature, Hislop et al. (2018) states finding accurate data on the use of knowledge management in the business community since the mid-1990's has proved to be difficult. However, according to Mc Evoy, Ragab, and Arisha (2019) use of knowledge management, particularly in public sector organisations, remains at an early stage of adoption.

2.4.3 Community engagement and knowledge management

According to Angelidou (2015), during the 1960s, 1970s and 1980s, academic scholars started to speculate about ways to use information technology to generate, collect, and disseminate knowledge, and how it could affect communities. During the 1990s, academic publications described visions in which technology would be the primary enabler of democracy and influence how cities and communities were managed (Angelidou, 2015; Aurigi, 2006). This study investigates activities to link people within organisations to community residents through the use of technology. The study recognises that the data and information gained from such engagement can generate knowledge. Managing this knowledge may contribute to improving services and support for community residents. According to Davis, Challenger, Jayewardene, and Clegg (2014),

the amount of data available to support community knowledge is significant. However, the ability to create and use community knowledge requires more work (Mc Evoy et al., 2019; Rose, 2014). This view is supported by Angelidou (2015) who concluded that although the linking of processes to engage with residents and manage community knowledge provide the opportunity to further democracy and the management of communities, efforts remain at an embryonic stage.

Communities represent highly complex sociotechnical environments (Jarulaitis, 2015; Lönnqvist, 2014; Mumford, 2006; South, 2015) consisting of interconnected networks encompassing multiple and often varied service areas, such as healthcare, community safety, social services, and education. The creation of knowledge in one section of this network may influence other parts of the network. Managing knowledge for this complex network can be difficult, and how this is done may have an affect on community productivity (Lönnqvist, 2014). A flow-on effect from activities associated with engaging the community through digital technologies is the ability for the continuous creation and management of knowledge about community residents. This knowledge can help the community and other stakeholders better understand problems that have been identified, opportunities to improve practices, and the design and delivery of services (Corfield and Paton, 2016; Hall, 2001).

Organisations guiding community engagement and associated knowledge management activities should ensure that their solutions for engaging with residents and capturing knowledge from such activities are sustainable (Serenko et al., 2016). Traditionally, knowledge gained from engagement was viewed as a unidirectional flow, from the organisations to residents (Elsabbagh et al., 2014). A series of recent studies indicates that from the perspective of community organisations, benefits from bi-directional interaction with residents enhances the ability to obtain and leverage knowledge gained from the engagement. Bi-directional engagement can also build trust and may have a positive influence on achieving the desires of residents (Elsabbagh et al., 2014). However, while bi-directional interaction with residents between experts, elected officials, leaders, managers, community activists, and residents is preferred, it may add to the complexity of knowledge management practices (Elsabbagh et al., 2014). It is noted that to capture and use knowledge to make decisions and transform the existing processes to more efficient processes enabled by digital technologies, community organisations will need to gain the acceptance of residents (Elsabbagh et al., 2014).

2.4.4 Community engagement and the knowledge management process

There are multiple ways for organisations to create knowledge management processes, engage with and create community knowledge through digital technologies (O'Mara-Eves et al., 2013) and use knowledge gained through this process to assist in the decision-making process of organisations. The knowledge creation process is an iterative process consisting of at least three generally linear phases (Roblek et al., 2014). Roblek et al. (2014) describe three phases that organisations transition through when adopting knowledge management. The three phases derive from efforts to make the multiple frameworks of knowledge management more coherent and practical, and to some extent simplified:

- **Phase 1: Internal integration**

  The first phase is the progressive integration of knowledge management practices within the organisation. During this phase, the internal participants are identified, and the processes for capturing and managing knowledge are considered (Fung, 2006; Roblek et al., 2014). This phase includes activities for the organisation to understand knowledge and knowledge management, and the skills that are required to support and sustain it. During this phase there may be resistance to the knowledge management initiative. To reduce this risk, activities to influence the culture of the organisation may be required (Corfield and Paton, 2016; Gurteen, 1999).

- **Phase 2: End-to-end processes**

  The second phase is adoption and operation of an end-to-end knowledge process known as the knowledge management lifecycle. The knowledge management lifecycle manages the process from knowledge creation, including the capability to retrieve, arrange, describe and structure knowledge to the progressive distribution and use of knowledge within the organisation and to the community (Fung, 2006; Roblek et al., 2014). During this phase, the organisation has developed.

- **Phase 3: Informed and influenced by knowledge**

  During this phase, the organisation is able to make decisions based on knowledge, have the capability of sharing the knowledge with the community, and take actions and monitor progress based on the knowledge (Fung, 2006; Roblek et al., 2014).

An example of how the three phases interact with one another is the knowledge management practices that can be linked to the adoption and use of self-service forms. Providing residents with the ability to use self-service forms allows speed and the convenience of getting the information they desire, while reducing the cost of the service delivery process (Zhu, Nakata, Sivakumar, and Grewal, 2013). These self-service forms can also be used to support community engagement and knowledge management efforts (Osei-Frimpong, Wilson, and Lemke, 2018). To address reduce risk and potential challenges, during the first phase internal stakeholders are identified and opportunities for knowledge management are explored, skills developed and activities to reduce resistance undertaken. During the second phase, end-to-end knowledge processes are created. This includes how knowledge gained from the forms aligns with the knowledge cycle. During the third phase the knowledge gained from this practice contributes to the organisation's decision-making process. Although the three phased process is a simplification of the knowledge management concept, this is a complex process due to complexities associated with aligning the interdependencies, mitigating the risks associated with unforeseen events, and responsibility for managing the knowledge which might involve many internal and external networks and actors (Australian Public Service Commission, 2012).

2.4.5 Knowledge management, content management systems (CMS) and archives

An archive can assist the development and maintenance of community knowledge by capturing the array of information that is shared digitally (Caswell, Cifor, and Ramirez, 2016). Collectively, this content can be considered part of the collective social history of the community (Comer and Copeland, 2015). An archive can be used for good record keeping and capture knowledge to support the focal actor's business operations (Martin, 2005). Content management systems (CMS) refer to a technological repository of content that assists focal actors to capture and share knowledge during engagements with residents or other community stakeholders (Huffman and Cachola, 2016; Laumer, Maier, and Weitzel, 2017).

Through this study, community engagement and knowledge management are linked. One reason for this link is the ability of an organisation to acquire and use technology to capture, store, accumulate and maintain community knowledge from engagements with residents in a digital repository, (Caswell et al., 2016). The archive would consist of knowledge that can be searched by those with expertise or interest in community activities, or by project teams that have been directed to progress initiatives (Hahn and

Subramani, 2000). The knowledge can consist of information for frequently asked questions (FAQs), lessons learned, as well as preserving the history of the community (Comer and Copeland, 2015).

The literature has identified that some challenges in making archival content public may be a result of privacy concerns (Taylor et al., 2015), as well as challenges related to how to organise the information, especially with the amount of data generated through social media, the potential to develop or revise policy regarding access to social media's archival information, and the cost of maintaining and supporting such a public archive (Zimmer, 2015).

2.4.6 Knowledge management processes

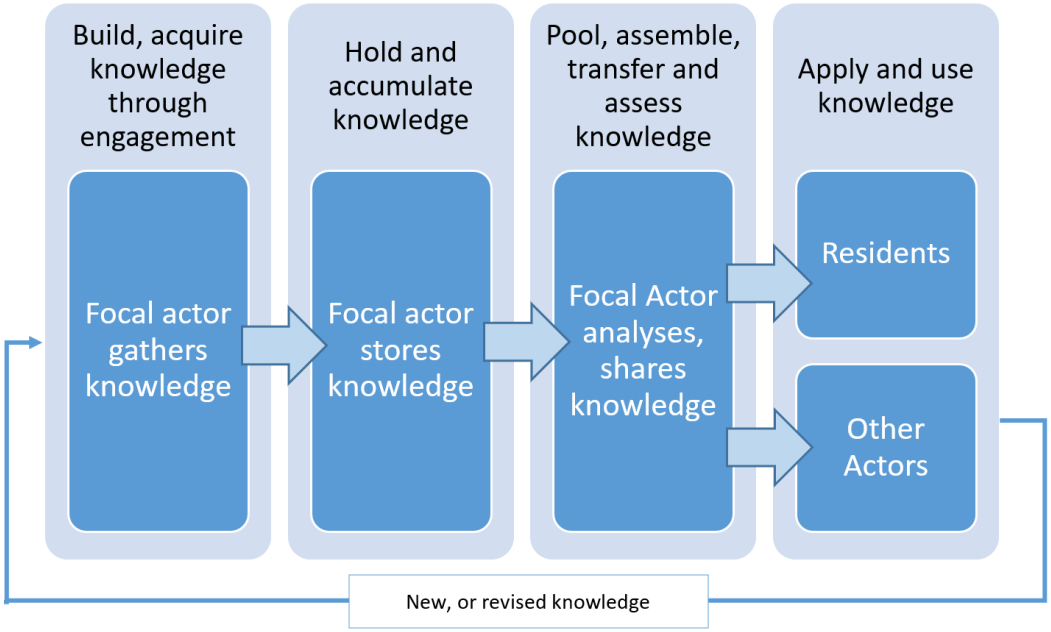
A key sociotechnical process is knowledge management. According to O'Mara-Eves et al. (2013), academic literature consists of multiple examples of different knowledge management cycles. However, the differing cycles include the following fundamental processes: knowledge is obtained, stored and organised, shared, applied, and then renewed or refreshed for the benefit of the focal actor and/or community. The knowledge cycle consists of four process areas that Alavi and Leidner (2001) and Evans, Dalkir, and Bidian (2015) categorise as processes to:

- build or acquire knowledge
- hold and accumulate knowledge
- pool, assemble, transfer and assess knowledge
- apply or utilise knowledge.

Academic literature provides multiple examples and varieties of knowledge management cycles. However, the differing cycles often include the following common processes: knowledge is obtained, stored and organised, shared, applied, and then renewed or refreshed. Figure 2.1 is an illustration of these knowledge processes.

Figure 2.1

An example of a community knowledge management cycle



Based on Evans et al., 2015 pp. 92-94

Process to build and acquire knowledge

In the context of this study, the acquisition of knowledge includes the process of obtaining data or information from the engagement process to create knowledge. This may be undertaken in multiple ways. A catalyst may evolve from knowledge previously gained though a consultation process, or residents' seeking increased input into developing the community budget, or changes to policy that may affect them. The focal actor then engages community residents, requesting their input or support as part of the decision-making process. In practice, the focal actor acquires knowledge from the engagement process in multiple ways. Residents can respond to the focal actor request to engage via voice, paper, or through digital technology. The acquisition of data and information from residents may not be the only source of information and data used as part of the knowledge creation process. It can be combined with other sources of information to assist in the decision-making process.

Process to accumulate and hold knowledge

After the process of building and acquiring knowledge comes the process of accumulating and holding knowledge. New and old knowledge is stored. Within this stage of the knowledge management cycle, knowledge is received and consolidated. This stage

may also be referred to as storage of community memory (Alavi and Leidner, 2001). A process of social filtering is undertaken, which may assist the process of recommending quality content sources from trusted content providers (Arazy, Kumar, and Shapira, 2006) (Arazy et al., 2006). Initially, this activity may incorporate manual and automated processes. However, over time, increased automation may be used to link stakeholders to knowledge relevant to their needs in ways that are more efficient and effective than the initial manual processes. Automation may include automatic elicitation of user feedback (possibly transparent to the user), measuring similarities with other users through algorithms and enhanced ways of predicting the knowledge needs of geographical community stakeholders (Arazy et al., 2006). The knowledge accumulation and holding stage also consists of working with content providers and confirming the validity of community generated content and converging knowledge from multiple sources.

The knowledge has thus been consolidated, analysed, and plans finalised to convert the knowledge into action for the purposes of influencing plans, support or services of community residents.

Process to pool, assemble, transfer and assess knowledge

During this stage of the knowledge management cycle, the focal actors engage with their networks to transfer and validate knowledge, and to refresh and replace knowledge based on value to the focal actor or the community, and with motivation for sharing knowledge (Alavi and Leidner, 2001). During this stage, knowledge is shared through multiple formal channels such as meetings, training sessions and conferences, or through informal channels including face-to-face or virtual ‘catch-ups’, seminars, or social events (Alavi and Leidner, 2001). A difficulty of this stage is to ensure the relevance and accuracy of knowledge, including how the knowledge is interpreted as it is shared between actors and networks (Hashemi, 2016).

Process of applying and using knowledge

The final process in the knowledge management cycle is the process of applying and using the knowledge to gain benefits (Evans et al., 2015). During this process, residents are informed of actions resulting from community engagement activities, and as a result plans, support or services for residents being influenced. Residents and other actors and networks can then provide feedback to the first stage, the building or acquisition of knowledge. As a result of the feedback, older knowledge will be enhanced, or new knowledge created that may eventually influence community residents. At the conclusion

of this stage, the knowledge management cycle is complete and then repeats, commencing with another round of community engagement. Throughout this process, community knowledge is gained, captured and utilised for the purpose of facilitating transformation. For example, communities, like companies, need to innovate and transform to remain attractive for residents. How past and current community knowledge is managed and utilised can facilitate actions related to social, economic and technical developments and needs (Gertler and Wolfe, 2004).

2.4.7 Benefits of knowledge management

Scholars from multiple disciplines have suggested that knowledge management has the potential to transform public administrations and benefit communities (Dixon, 2010; Hislop et al., 2018). According to Benson and Standing (2007), the support knowledge management provides includes enabling focal actors to remember the past, handle the present, and prepare for the future. Successful knowledge management initiatives involve developing the culture and the expertise, and changing the way focal actors and individuals interact.

The changes required to successfully adopt knowledge management is often resisted, and not initially embraced (Ali, 2014; Gurteen, 1999). The literature describes reasons for resistance, including an organisation's leaders and managers providing little clarity about how to achieve a change in culture and neglecting to encourage and support knowledge sharing across multi-disciplinary teams (Corfield and Paton, 2016).

The reasons for community engagement initiatives can vary, but it provides opportunities for residents to influence decisions on matters of potentially significant importance to their lives (Greaves and Romice, 2015). However, there is little consensus in the literature about a preferred process of linking community engagement and activities associated with knowledge and knowledge management (Elsabbagh et al., 2014). The link between community engagement and knowledge management is relatively recent yet important. A reason may include that data obtained from community engagement can evolve into knowledge which can be analysed and used for multiple purposes. These purposes include preserving knowledge about a community's past, and help identify current positive or negative trends about the community (Davis et al., 2014).

Organisations, including government agencies that use digital technology to engage and interact with residents, are able to capture significant amounts of information. This information can become useful knowledge to assist the organisation to make informed

decisions (Herschel and Yermish, 2009) and improve products and delivery of services (Chung et al., 2005). Knowledge management can assist organisations in their efforts to capture information about the wants and needs of community residents. Multiple authors acknowledge the potential advantages gained from initiatives based on knowledge management (Awad and Ghaziri, 2004; Benson and Standing, 2007; Nonaka, 1991). In WA, the state government is showing increasing interest in active community engagement and the use of knowledge from such engagements to support decision making as part of the Digital WA Strategy 2016-2020 (Government of Western Australia, 2016).

2.4.8 Knowledge management challenges

Although knowledge management has a number of recognised benefits, it is difficult to implement, with a number of factors contributing to its high rate of failure (Alexander and Silvis, 2014; Ali, 2014; Dixon, 2010; Frost, 2014; Hislop et al., 2018). Frost (2014) suggests that with a high failure rate knowledge management acceptance has been limited. These challenges include gaining the support and approval of leaders, developing adequate plans, and having resources allocated to advance knowledge management (Ramirez, Coakes, Søndergaard, Kerr, & Clegg, 2007). The overemphasis on technology, the resistance to sharing knowledge, and failing to align knowledge management and business goals are also considered as barriers to knowledge management success (Corfield and Paton, 2016). However, according to Hashemi (2016) and Hislop et al. (2018) culture is a significant obstacle to the successful and sustained sharing and creation of knowledge networks. Even when knowledge is gained, it can be a challenge to maintain resident participation in the knowledge management process. This is attributed to several factors, including complacency, inadequate representation, and dissatisfaction with the consultative process (Irvin and Stansbury, 2004).

The desire to capture and translate knowledge from community engagement is recognised in the literature (Elsabbagh et al., 2014; Riege and Lindsay, 2006). However, the rhetoric and practice of communities transitioning from a one-way to a two-way engagement model do not appear to align (Weerts and Sandmann, 2008). For example whilst there is potential for knowledge management related initiatives to improve insights gained about community residents, there is a lack of evidence of activities that link community engagement and knowledge management (Lönnqvist, 2014). Development of this link may contribute to knowledge gained from community engagement being used to gain better insights into the desires of residents (Koh, Ryan, & Prybutok, 2005), and then contribute to informed decisions to support them.

Another challenge is managing community stakeholder expectations. For example, if as a result of the community engagement process, residents and leaders of the community organisation endorsed agreed actions, residents have an expectation that visible, tangible progress to achieve the actions will be undertaken. The residents, have in essence, entrusted the community organisation to successfully deliver on the agreed actions (Henderson and Venkatraman, 1993; Herriman, 2011).

However, the ability to meet stakeholder expectations may be at risk if there is insufficient operational capacity, for instance, a lack of adequate human and financial resources available for the community organisation to undertake the endorsed actions (Brambilla, 2018). To reduce this risk, the leaders of the community organisation will need to have adequately considered and factored the potential change of organisational capacity and resources availability into decisions to meet, if not exceed, the expectations of stakeholders (Kotter, 2000; Moore, 1995, 2003; Moore and Khagram, 2004). For example, if leaders within the community organisation endorse and promote to stakeholders a vision to transform the process of engaging with residents to obtain input for community initiatives, an expectation is created that this stated vision will be progressed and achieved. The vision and its links to the focal actor's plans and strategies to support community engagement and knowledge management initiatives will assist in enrolling support and reduce some risk associated with the initiatives (Berson, Halevy, Shamir, and Erez, 2015; Schein, 2009; Stam et al., 2014). However, if the leaders of the community organisation do not develop these links or fail to allocate human (staff) or non-human (systems) resources, achieving the vision will be difficult, if not impossible. It is also important to note that initiatives that intend to transform may take time, and there is a risk that the interest and influence of leadership may decrease over time (Fung, 2015).

2.5 The challenge of culture

To enable significant changes to an existing process to engage residents and manage knowledge from interactions, the culture of the organisation fostering the change needs to be considered and understood. This consideration can be considered complex as it may need to consider organisational culture change from the perspective of new methods and systems to engage with residents (Hossan, 2015), as well as new methods and systems for managing community knowledge (Mc Evoy et al., 2019). In addition to considering the organisation's internal culture, the culture of community that is the focus of the proposed change needs to be understood. Understanding of the culture of these two stakeholders is essential for planning and actioning the transition from a current state of engagement, to a desired one.

Culture is defined and considered by academics in a variety of ways (Alvesson and Sveningsson, 2015; Hofstede, 2011; Odor, 2018). These various definitions have common characteristics including a relationship to history, shared traditions, and customs. Culture is difficult to change, difficult to measure and classify; and can be embedded into artefacts (Alvesson and Sveningsson, 2015; Hofstede, 2011). According to Hofstede, Neuijen, Ohayv, and Sanders (1990) the characteristics of culture are holistic, and influence individuals as well as groups of people. In this study, culture is defined as the attitudes, beliefs, practices, values, shared identities, rituals, customs that distinguishes the group and members of the group from others (Allan, Grimes, and Kerr, 2013; Hofstede, 2011).

This study considers culture from two perspectives: organisational culture, which has a stronger emphasis on practices within organisations, and the culture of community residents, which has a stronger focus on values (Alvesson and Sveningsson, 2015; Hofstede et al., 1990; Jetten, Postmes, and McAuliffe, 2002). The differences between organisational and community culture are related to values and practices. A person's core values are acquired from their community and embedded within them during their youth (Alvesson and Sveningsson, 2015; Hofstede et al., 1990; Jetten et al., 2002). According to Alvesson and Sveningsson (2015) the culture of the organisation can influence the values of a person, however, the likelihood of their core values changing in a significant manner are considered low. Conversely, a person can learn new practices, rituals, and customs that help them and others identify them with their workplaces. This is supported by the view that "culture is habitual behaviour but this characteristic does not mean it cannot alter or evolve over time" (Corfield and Paton, 2016, p. 3).

Initiatives in which the adoption of digital technologies is prominent may trigger the need for culture change within organisations (Alvesson and Sveningsson, 2015). Within organisations are business units that may include the executive team, corporate services, information technology, business operations, and sales and marketing. These business units work with one another to deliver products and/or services to customers. Each of these business units may have differing roles, perspectives, and cultures (Alvesson and Sveningsson, 2015).

Some authors suggest that to effect change in culture, an environment of trust to support interaction between organisations, business units, and people is required (Baxter and Sommerville, 2011; Geisler and Wickramasinghe, 2015; Herriman, 2011). This change in culture may require the organisation's leadership to undertake actions that result

in the creation of a new common language, practices, and processes for sharing and interpreting knowledge across the disciplines (Fisher et al., 2015).

The culture within organisations, and the community they support, can affect on how people feel, how they are treated, how problems are solved, and the extent to which change is embraced (Schein, 2009). Culture can be linked to the success and sustainability of transformation initiatives (Alvesson and Sveningsson, 2015). In this study, the academic literature is consistent in the recognition that culture is a common challenge, and a reason for the failure of community engagement (Herriman, 2011), knowledge management (Ali, 2014; Hashemi, 2016), and digital transformation initiatives (Hossan, 2015; Walsh, McGregor-Lowndes, and Newton, 2006).

2.5.1 The role of leaders and managers in fostering culture change

A considerable amount of literature has been written about organisational culture and its influence on transformation (Fink, Dauber, and Yolles, 2010). This includes influential works of Hofstede (2011) in which the dimensions of organisational culture are explored. The process of undertaking culture change should not be underestimated. Chandler (1990), expressed the view that culture is directly influenced by strategy. The culture of stakeholders can help or hinder how strategies, plans, policies, competencies and projects are developed and implemented (Matt et al., 2015; Odor, 2018). An iterative approach by leadership and activities to communicate with stakeholders have an important role in changing culture for reducing risks associated with new community engagement processes. How an organisation's community engagement activities transform from their current state to a desired state may need several iterations. These iterations include a phased approach to changing the culture within the organisation and influencing the attitudes and actions of residents (Alvesson and Sveningsson, 2015).

The process includes the consideration of leaders' effectiveness in communicating with their organisation's workforce and with the community, the frequency and tone of the messages, and the management of understanding and expectations of stakeholders (LaVenture, Brand, Ross, and Baker, 2014). Some authors suggest that to effect change in culture, an environment of trust to support interaction between organisations, business units, and people is required (Geisler and Wickramasinghe, 2015; Herriman, 2011; Hislop et al., 2018; Sharif, Troshani, and Davidson, 2016). This change in culture may require the organisation's leadership to undertake actions that result in the creation of a new common language, practices, and processes for sharing and interpreting knowledge across

the disciplines (Fisher et al., 2015). Previous studies have emphasised that, due to its significance, culture should be included as part of the strategic planning process and that it contributes to the potential acceptance and perceived success of initiatives (Alvesson and Sveningsson, 2015; Lawrence, 2015).

Leaders who are visible, accessible, supportive, communicate frequently in an appropriate tone, are vital to managing understanding and expectations of internal and external partners, and they create an opportunity to change culture and foster transformation (Alvesson and Sveningsson, 2015; LaVenture et al., 2014). How leaders and managers communicate can also encourage acceptance of sociotechnical systems such as community engagement and associated knowledge management activities.

The ability of leaders and other stakeholders to first understand the culture within the community organisation, and the community is important in gaining the support of residents to accept transformation of community engagement activities (Corbett and Le Dantec, 2018; Gangadharan, 2017). Alvesson and Sveningsson (2015) and Cresswell and Sheikh (2013) consider that understanding the attitudes within the community, and how to influence them, can mitigate risks by reducing resistance towards community engagement initiatives. With this understanding, a methodical manner of consultation and communication with stakeholders can be undertaken.

Communication strategies can assist the leadership of the organisation to raise awareness in a formal manner of the disruptive influence that community engagement initiatives can have on existing operations (De Waal et al., 2016). If for example, there is no communication strategy, or if the communication strategy is unstructured, informal, with no clear roles, responsibilities or routines for communication, the efforts to convince stakeholders of the benefits of transformation may struggle. On the other hand, clear regular communication with stakeholders in a manner that is accessible and transparent, with clear actions and lines of accountability, can assist the transformation effort (Alvesson and Sveningsson, 2015). The communication strategy can include community awareness activities to keep stakeholders abreast of the potential changes resulting from the transformation and be used to gain feedback from those that may be affected. Knowledge gained from this process may assist the organisation’s efforts to gain and sustain support for the community engagement initiative.

The ability of community organisations to engage residents through digital technology does not ensure it is effectively used, or that the new process for community

engagement will be supported (Herriman, 2011). Culture is a significant challenge for organisations seeking to implement a successful and sustained community engagement initiative (Herriman, 2011; Hossan, 2015).

2.5.2 Culture and alliances

A challenge for community engagement initiatives is the creation of a culture that establishes and maintains stakeholder support (Baxter and Sommerville, 2011). Leaders and managers have a key role in creating "partnerships, i.e., collaborative alliances among business, government and civil society…" (Sanzo, Álvarez, Rey, and García, 2015, p. np). Partnerships and alliances can foster culture change through bilateral capability building, knowledge transfer, provision of services and innovation (Grover, 2016; Sanzo et al., 2015; Zhang, Shu, Jiang, and Malter, 2010). This includes partnerships to engage the community and help manage the community knowledge cycle. Partnerships can involve two or more organisations (Head and Alford, 2015) that may involve combinations of public and private sector organisations, and commercial and not-for-profit organisations (Sanzo et al., 2015).

An important aspect of the community engagement and knowledge management process is the forming and maintaining of alliances with other stakeholders. Alliances are an arrangement in which partners cooperate and learn from one another as they acquire and create knowledge to achieve strategic goals (Zhang et al., 2010). Through the process of sharing knowledge with partners, there is the potential to benefit from their experiences. These experiences may include matters related to improvement processes, resource management, culture change, the management of knowledge, or other topics of interest. The interaction within the alliance provides opportunities to further influence culture and enhance engagement related solutions for the focal actor and community (Gurteen, 1999; Jiang, Bao, Xie, and Gao, 2016). These knowledge sharing alliances can contribute to activities that influence how residents think, process and interpret knowledge (Bhagat, Kedia, Harveston, and Triandis, 2002). Creating strategic and operational alliances, and using technology to interact and share knowledge can also contribute to increasing the participation of residents (Corbett and Le Dantec, 2018).

According to Zhang et al. (2010), the failure to develop alliances limits opportunities to exploit the benefits of community engagement and knowledge management activities, hindering learning and innovation. To form alliances, and to capture and leverage

knowledge in a meaningful manner, requires a culture within the stakeholders, including the community that is based on trust, sharing and developing knowledge (Jiang et al., 2016; Roblek et al., 2014).

2.5.3 The influence of training on culture

Influencing the culture of stakeholders may involve training. To influence culture, the development and delivery of training and awareness programs suitable for differing audiences may need to be considered (Jarulaitis, 2015; Lawrence, 2015). From an internal stakeholder perspective, increased executive awareness and competency in the digital environment would assist in strategic planning and execution of activities for community engagement and knowledge management (Bughin et al., 2018). Furthermore, developing and maintaining internal knowledge about digital technologies can be considered essential for cultural change. If the focal actor has limited knowledge, it may hamper development of a training strategy to assist with community engagement and knowledge management initiatives (LaVenture et al., 2014; Schein, 2009).

2.5.4 Culture of set expectations and the failure to meet them

There have been many academic studies about initiatives with technology considered essential for success where the result has been a failure to meet stakeholder expectations (Frost, 2014). Recent studies have concluded that not adequately addressing culture related matters is a common factor in the high failure rate of sociotechnical initiatives (Ali, 2014; Frost, 2014; Hornstein, 2015; Hossan, 2015). Failing to address culture related matters can hinder the success of community engagement initiatives. As a foundation for change, some authors suggest initiatives to transform culture is predicated on a supportive culture within organisations providing the products and services and the ability to influence culture external to the organisations to foster acceptance of the community engagement initiative. These efforts include influencing people residing within the community to adopt and sustain engagement (Alvesson and Sveningsson, 2015; Herriman, 2011).

2.5.5 Culture and existing models and frameworks

Widely used project management methods and standards such as the Project Management Body of Knowledge (PMBoK) and Projects in Controlled Environments (PRINCE2) are based on time, cost and quality criteria. A project was often considered successful by project management practitioners if it met these criteria. It is now recognised

in the literature that this perspective lacks consideration matters such as the culture within the organisation and the intended users of the product or service, criteria for stakeholder satisfaction and the social and political aspects of change (Hughes, Rana, and Simintiras, 2017). Sociotechnical models and frameworks do not appear to sufficiently address activities that influence the attitudes, beliefs, practices, values, rituals, and customs of people within the organisations, as well as the culture of residents (Allan et al., 2013).

The sociotechnical models and frameworks considered for this study look beyond these traditional project management criteria to incorporate matters related to change management and culture change activities which can contribute to the success of complex sociotechnical initiatives. Therefore, traditional project management methods and standards, although they may have evolved, are still based on what Hughes et al. (2017, p. 145) refers to as the iron triangle of "time, cost and quality".

Regarding existing sociotechnical models and frameworks, common considerations for deploying digital technologies are identified. These factors include the need for leadership support, the allocation of adequate resources, review and revision of processes, and having the right technology to do the job (Davis et al., 2014). The models and frameworks also consider the alignment of an organisation's business plan and information technology plans (Coltman, Tallon, Sharma, and Queiroz, 2015; DeLone and McLean, 2003; Henderson and Venkatraman, 1993). Culture in these existing models and frameworks may be implied at best but do not appear to be sufficiently prominent.

2.6 Challenges, risks and complexities

Successful adoption and sustained use of sociotechnical systems are difficult to achieve, as there are several challenges, including managing and gaining benefit from the rapid creation and increasing amount of data, information, and knowledge emerging from the use of digital technologies that can be analysed and leveraged from many different perspectives. How the data, information, and knowledge are used needs to be considered and addressed (Bharadwaj et al., 2013). Planning will help identify potential sociotechnical challenges, so that they can be explored and mitigated.

A challenge in managing sociotechnical systems is the need to develop and communicate the purpose, status, and issues associated with activities to transform processes, services and products (Bygstad, Nielsen, and Munkvold, 2010; Jarulaitis, 2015). Other challenges to sociotechnical systems include processes and technologies.

Regarding processes, there is an ongoing need to develop new processes, or reengineer existing ones, to deliver transformed services to the community (Jarulaitis, 2015; Van Der Aalst, 2013). Technologies that are distinct and separate may need to be coupled, which can result in incompatibilities. Coupling technical infrastructure and associated applications "in such a way as to create a functional whole" (Spector and Wang, 2002, p. 3) can generate synergies in ways that may not have been planned for or intended (Gulledge, 2006; Jarulaitis, 2015; Spector and Wang, 2002). However, with appropriate planning, including consideration of the challenges, coupling of technologies can create value and provide opportunities to enhance community efficiencies (Batty et al., 2012; Gulledge, 2006; Gurstein, 2014).

2.6.1 Risk and risk management

Advances in digital technologies have created opportunities to improve the quality of engagement provided by organisations. However, adopting new, or reengineering existing systems, and processes depend on the ability to demonstrate to stakeholders that the benefits outweigh the risk. If the expected benefits outweigh the real or perceived risk, the likelihood that stakeholders will accept and use the new solution increases. Governance activities can help identify, manage and reduce risk associated with new solutions (Faruq and Tatnall, 2016). According to Reed and Angolia (2020), processes to manage risk are believed to improve the chances of success for IS solutions.

In this section, academic literature relating to risk and risk management will be discussed. First, definitions of risk will be presented. This is followed by presenting literature related to risk and information systems, and risk and complexity. This section concludes with the presentation of potential risk related issues associated with community engagement activities outlined in this thesis.

Risk can be described as the probability of an undesirable, negative consequence or event. The consequences of the activity have an associated uncertainty such as a move away from a reference point and other related uncertainties (Aven, 2015; International Organization for Standardization, 2018). According to Aven (2015), risk management has two main tasks. One is to use risk assessments to investigate and mitigate the risk of specific activities. The second task of risk management involves activities to understand, assess, characterise, communicate and manage risk (Aven, 2015).

Risk management consists of iterative cycles that incorporate the systematic application of policies, as well as procedures and associated practices. Risk management also involves communicating, determining the context and assessing risk, as well as

treating, monitoring, reviewing, recording and reporting risk (International Organization for Standardization, 2018). It involves balancing multiple concerns that include, but may not be limited to, the financial impact of the risk, including an organisation's investment in digital technologies (Debreceny, 2013), public safety, and the reputation of the organisation. To manage risk, people consider alternative actions, evaluate the strengths and the weaknesses and then make a decision that best aligns values and priorities of the organisation (Aven, 2015).

Research shows that multiple risk management processes exist. These activities are often highly compatible and generally comprise the following steps:

- **Risk planning activities**

  Establish context, determine the goals and risk criteria.

- **Risk assessment activities**

  Make judgments of the potential likelihood of the events and potential consequences. During this step, situations and events are identified that may affect the activity to be undertaken. The risk assessment steps may also include analysis of potential consequences.

- **Risk handling activities**

  Evaluate the risk and consider the significance of the risk. Actions to treat the risk are performed during this step.

- **Risk monitoring activities**

  Track and evaluate the performance of risk mitigation activities (Aven, 2015; Conrow, 2004).

Several studies suggest that, while progressing through the risk management steps, those involved with managing risk may need to consider and interact with stakeholders internal and external to the organisation (Cabral, 2017; de Bakker, Boonstra, and Wortmann, 2010; International Organization for Standardization, 2018). A recent standard concluded that the internal and external consultation will help ensure cultural factors are taken into account (International Organization for Standardization, 2018). Although there are many studies related to risk management, the research regarding the affect of culture and information systems remains limited in the process of risk planning, assessment, risk handling and monitoring.

2.6.2 Risk and perceptions of successful initiatives

Previous studies have shown that for initiatives to succeed, potential risks should be considered that can affect the stakeholder's perception of success. Most early studies have shown that the success of initiatives is based on meeting three criteria: projects delivered on time, meeting cost and quality requirements. The categories of project success as defined by the Standish Group's Chaos Report is based on measures of time, cost and quality (Reed and Angolia, 2020). The Chaos Report classifies project outcomes as successful, challenged or failed. These classifications are defined as:

- **Successful**

  Meets scope criteria within a range acceptable to the stakeholders.

- **Challenged**

  The initiative is delivered but falls outside an acceptable range of time or budget or quality.

- **Failed**

  Project is not able to deliver a solution considered complete (Gaikema, Donkersloot, Johnson, and Mulder, 2019).

A benefit of the approach taken in the Chaos Report is that the definition of success has some flexibility and takes into account a range of acceptable outcomes based on the views of customers (Reed and Angolia, 2020). However, previous studies have almost exclusively focused on time, cost and quality as success factors for projects, including those involving sociotechnical solutions (de Bakker et al., 2010).

However, other considerations of risk include the alignment of human and financial resources and complexities related to culture (Reed and Angolia, 2020). With the advent of projects to transform the services organisations deliver using digital technologies, key questions remain regarding managing risk to enhance opportunities for success. For example, time, cost and quality may not sufficiently include potential risks associated with multidisciplinary teams working across the organisation, the alignment of business and technology activities and organisational change factors, including the influence of culture on the success of initiatives (Bloch et al., 2012; Henderson and Venkatraman, 1993; Hornstein, 2015). It is also important to recognise that as resources, plans, and actions mature, they may have a positive or negative influence on risk (Debreceny, 2013).

2.6.3 Complexity as a risk

Transforming community engagement and associated knowledge management activities through digital transformation can include a number of risks. One such risk is the complexity that can be linked to digital transformation initiatives. This complexity may also be a contributing factor to the high rate of failure, for example Larsson and Teigland (2019) emphasised that sociotechnical initiatives, such as digital transformation, are complex and are rarely a simple task.

Larsson and Teigland (2019) suggests that due to their scope, digital transformation initiatives in reality are not a matter of simply implementing one initiative, but instead a series of interacting initiatives requiring the organisation to better understand and navigate through change. In this way digital transformation essentially makes organisations change to become even more customer driven (Larsson and Teigland, 2019). Benbya and McKelvey (2006) recognise that if complexity is not adequately managed, the desired outcomes may not be achieved. The academic literature rarely mentions complexity as a challenge to the successful implementation of community engagement solutions, or cites it as a significant reason for the failure of sociotechnical systems (Benbya and McKelvey, 2006).

The challenges of complexity have been the focus of a number of authors (Benbya and McKelvey, 2006; Büscher and Sumpf, 2015; Grundgeiger, Sanderson, and Dismukes, 2015; Head and Alford, 2015; Kaul, Storey, and Woo, 2017) and studied from various perspectives. However, research into reducing complexity in information systems appears to be relatively new, and with limited articulation within the literature (Benbya and McKelvey, 2006; Kaul et al., 2017). Table 2.1 refers to academic literature that identifies the challenges and complexities for managing information systems, and sociotechnical initiatives such as community engagement and associated knowledge management activities.

Concerning community, according to Wray-Lake et al. (2017), residents who are engaged have the opportunity to contribute to decisions that influence them. However, community engagement is a complex endeavour, involving more than allowing residents to contribute to the decision-making process (Halinen and Mainela, 2013; Head and Alford, 2015; Mollerup, 2006).

There are many reasons for this complexity. From the perspective of an organisation that is involved in the engagement process, the degree of complexity can be influenced by the ability of its staff members to accept change, the absence of specific strategies and plans to address potential risk related to community engagement and associated knowledge management initiatives (Ali, 2014; Frost, 2014). Other internal influences include recurring themes of complexity, inadequate leadership support, political matters, organisation processes, inadequate infrastructure, and a culture not willing to accept the changes required for knowledge management (Ali, 2014; Hislop et al., 2018).

Factors external to the organisation also influence complexity associated with community engagement initiatives. These include potential pressure from economic threats (Alvesson and Sveningsson, 2015) and the influence of technology on activities that can change methods of communicating and marketing to external stakeholders (Schein, 2009). These factors need to be recognised, and various stakeholders' perspectives aligned or there is significant risk that the community engagement initiative will fail to meet intended expectations (Frost, 2014).

Adding to this complexity are the challenges associated with defining the reasons for changing the community engagement process to a broad audience, understanding the interdependencies, considering unforeseen effects, and recognising that the responsibility for the solution might involve many stakeholders (Australian Public Service Commission, 2012). The engagement process can lead to a significant shift in power and authority. There is the potential that, as a result of the engagement process through digital technologies, power will be transferred from government officials and public servants who provide indirect representation to the residents who become the direct representatives (Greaves and Romice, 2015). Early recognition and a commitment to address the challenges of complexity will reduce risks associated with community engagement and associated knowledge management initiatives (Benbya and McKelvey, 2006).

Table 2.1

Complexities associated with sociotechnical initiatives

Complexity	Key themes	Literature
Organisational change and transformation	Leadership and culture	Alvesson and Sveningsson (2015)
Aligning and coordinating the reengineering of processes with democratic principles, legislation, public sector regulations, policies, security, privacy	Leadership and processes	Gangadharan (2017); Hossan (2015); (Sarker, Sarker, and Sidorova, 2006)
Managing the broad range of internal and external relationships, including associated power dynamics can be complex	Leadership, and process	Benbya and McKelvey (2006); Corbett and Le Dantec (2018); Fisher et al. (2015); Herriman (2011); Hossan (2015))
Development and alignment of organisational strategy, digital strategy, community engagement strategy, and IT strategy is considered complex	Leadership	Chan and Reich (2007); Matt et al. (2015)
Establish a sustainable multidisciplinary environment for the community engagement initiative	Leadership, culture, and process	Herriman (2011); Lawrence (2015); South and Phillips (2014)
Digital transformation is continuous and can affect internal (e.g., business units within the organisation) and external operating environment (e.g., residents)	Leadership, culture, process, and technology	Matt et al. (2015)
The complexity of some issues may be difficult for all to understand	Leadership and culture	Ford and Kemokai (2014)
Effective knowledge management systems are difficult to successfully implement and maintain due to their complex nature	Leadership, culture, process, and technology	Alexander and Silvis (2014); (Hislop et al., 2018)
Technology based initiatives are considered complex and have a high rate of failure	Leadership, culture, process, and technology	Cresswell and Sheikh (2013)
Integration of multiple technical channels of communication, for example social media, call centres, mobile devices, etc	Culture, process, and technology	Herriman (2011)

Note: The above table includes complexities that can be associated with sociotechnical initiatives. They include complexities that can affect broad digital transformation initiatives such as projects for community engagement and knowledge management.

2.7 Models and frameworks

This section defines and discusses models and framework and their importance in sociotechnical initiatives. Models and frameworks can help guide the actions of actors to attain the desired goals of digital transformation. There have been numerous studies on the importance of the need for actors to manage their sociotechnical implementations. This is evidenced by the broad range of models and frameworks in academic literature that cross multiple disciplines.

A model is a presentation in a schematic form common often in the simplified manner of a current or desired state or condition (Nilsen, 2015). A framework is often considered a structure or system for the realisation of a defined result or goal and may also specify relationships between actors. The purpose of a framework is to help understand and/or explain influences on outcomes of an implementation. A framework may also include the capability to identify gaps, risks, reduce inherent complexity, foster collaboration and predict outcomes or interpret outcomes with hindsight (Nilsen, 2015; Stanley, 2012).

Models and frameworks aid researchers to replicate results (Wahi and Medury, 2014). There are multiple types of models and frameworks that have been identified in the academic literature that aim to assist organisations to successfully transform through the use of digital technologies. There are broad ranges of models and frameworks that cross disciplines. These models and frameworks help to study relationships, for example, the representation of business process for the delivery of services (Weinert, 1996). From an IS perspective, there are existing influential models and frameworks identified in academic literature for aligning IT risk, IT planning decisions, and the use of technology (De Waal et al., 2016), and the alignment of business and IT strategies (Henderson and Venkatraman, 1993) and specifically for knowledge management (Laihonen and Mäntylä, 2018). What is common across both the models and frameworks is that their aim is to assist actors to successfully transform from an existing state to a desired state (Nilsen, 2015).

During the adoption, implementation and eventual integration of community engagement activities, one must be cognisant of and sensitive to potential changes that may occur and affect stakeholders, including those within the organisation and the community. Neglecting to do so may increase the risks to the success of the community engagement initiative. One way of mitigating differences and challenges that emerge between different disciplines is by using models and frameworks that help the organisation view activities from different perspectives (Gray and Rumpe, 2017).

Models such as Arnstein's ladder of participation (Brackertz and Meredyth, 2009; Gaber, 2019) are useful for ensuring whether all sections of the community have an opportunity to be heard. Firmstone and Coleman (2015) recognise that digital technology has changed the way local governments can interact with community residents, and the need to ensure inclusiveness, strategy and expertise. Like Arnstein's ladder of participation, the Centre for Ethnicity and Health Community Engagement Model (Fountain, Patel, and Buffin, 2007) is recognised as contributing to community engagement, including ensuring that all members of the community are engaged for health and social services activities. However, the model is not sociotechnical and it is unclear how the model has evolved or has been adopted by others. Across Australia, community engagement is being seen as essential for the strategic planning of local governments activities (Grant, Dollery, and Kortt, 2011). However, these plans do not include activities to address the role of digital technology in community engagement, including the importance of knowledge management.

The need to adequately and thoroughly manage sociotechnical implementations, such as community engagement and associated knowledge management initiatives can be considered vital for such implementations to be considered successful (Herriman, 2011; Prananto, McKay, and Marshall, 2001). When implementing sociotechnical solutions a holistic yet practical approach to address a range of issues needs to be considered and worked through as the organisation considers and undertakes activities to change from its current state to a newly desired state (Pawlowski and Bick, 2015). Use of appropriate models and frameworks should assist the actors identify and address the issues.

2.7.1 Influential models and frameworks

In this section, a sample of influential models and frameworks are discussed. First, each model or framework is introduced, then their strengths and weaknesses are presented. Finally, how the model or framework may align to this study is summarised.

To reduce the number of models and frameworks identified in the literature, a process of reduction was undertaken that considered the following factors:

- the success factors for sociotechnical initiatives
- consideration and alignment of organisation's business and information technology strategies
- an understanding of the value the organisation is seeking to produce.

Although there are many models and frameworks that may be able to meet the abovementioned criteria, these three criteria were selected because of their longevity, their influence in academic literature and their relevance to this study's research question and objectives.

The success of sociotechnical initiatives can be linked to the alignment of an organisation's business and information technology strategies (DeLone and McLean, 2016; Renaud, Walsh, and Kalika, 2016; Zouaoui, Triki, and Ferchichi, 2016). To determine success parameters and align business units may involve consultation and planning across multiple disciplines, or areas within an organisation, and may involve the allocation of adequate human and financial resources and sustained leadership support (Coltman et al., 2015; DeLone and McLean, 2003; Gerow, Thatcher, and Grover, 2015; Henderson and Venkatraman, 1993).

2.7.2 The critical application of existing models and frameworks

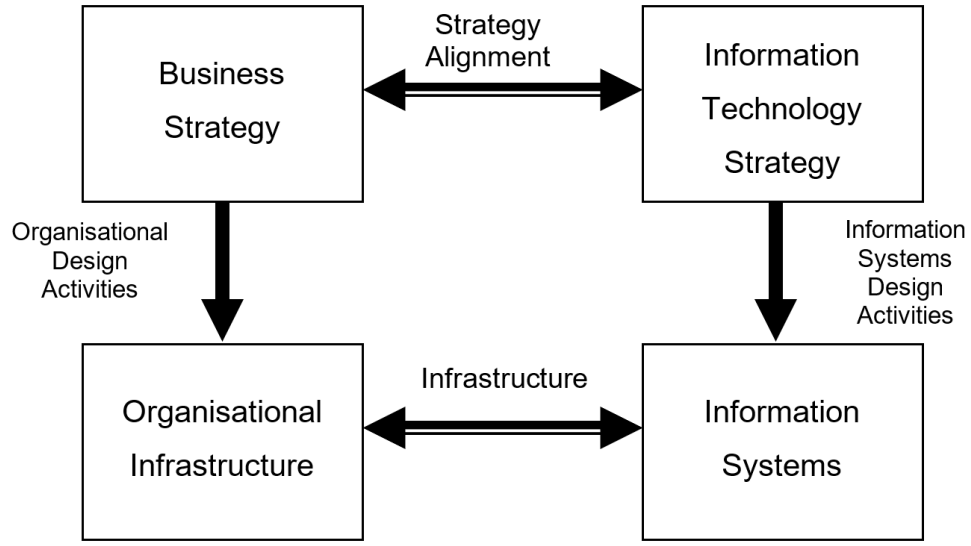
From the literature, four existing influential models or frameworks were identified, compared, and contrasted with one another. The review also sought to identify common sociotechnical factors and their potential to guide transformation from a present state to a desired state. The information from the actors and networks that focused on the categories of leadership and management, culture, process and technology (delegates) in this study will help determine how these influential models and frameworks assist in theory and practice while also contributing to answering the research question and objectives. First Henderson and Venkatraman (1993, 1999) Strategic Alignment Model (SAM) will be discussed. This will be followed by Moore (1995) Strategic Triangle; then Davis et al. (2014) Sociotechnical System will be explored. Finally, Actor Network Theory (ANT) will be presented. As the lens of this study, the relevance, terminology, strengths and weaknesses of ANT will be discussed. Furthermore, the rationale for using ANT as the lens for this study is examined.

2.7.3 Reflections of the Henderson and Venkaraman (1993) Strategic Alignment Model (SAM)

The catalyst of SAM was the recognition that, although the focal actors were increasing their investment in technology, there were opportunities to further leverage gains in productivity. A focus of SAM is to improve an organisation's efforts and prospects of gaining value from their investment in technology. This is achieved through aligning business and technology plans and strategies (Henderson and Venkatraman, 1993). Sun and Chen (2008) recognise that knowledge management initiatives can also benefit from SAM.

Figure 2.2

Alignment and interaction of SAM domains



(Henderson and Venkatraman, 1993)

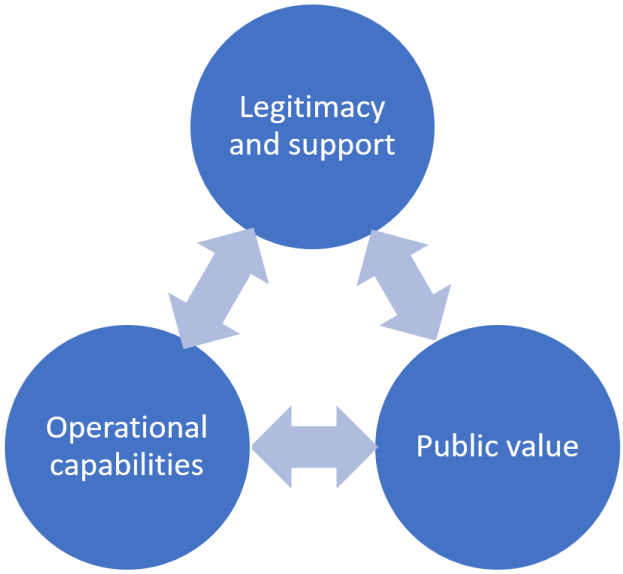
Activities to transform culture identified in SAM could include a broad range of skills, such as improving the technical literacy of stakeholders, activities to increase awareness of stakeholder engagement and initiatives associated with managing expectations. These activities are included in the delegate that represent culture, as described in Section 2.5 of this study; Lawrence (2015, p. 52) describes these as the creation of identity through "recursive communication." As discussed, there is no consensus on the definition of culture; however, Hofstede et al. (1990) identify characteristics of culture that are relevant to this study. The characteristics include culture being considered as being holistic, historically determined, and influencing individuals as well as larger groups, while acknowledging that the behaviour of individuals and groups is difficult to change.

2.7.4 Reflections on Moore's (1995) Strategic Triangle

The strategic triangle is considered an important contribution to the literature (Bryson, Crosby, and Bloomberg, 2014); it describes actions that can be undertaken by organisations to create value for their community. The strategic triangle consists of three elements: resources and operational capability; value and performance; and, at the peak of the triangle, the authorising environment and legitimacy and support.

Figure 2.3

Strategic Triangle



(Moore, 1995)

The following is a brief description of the elements of the Strategic Triangle:

- **Legitimacy and Support:** This element of the triangle is considered the authorising environment. This element provides the approval, legitimacy and ensuring adequate support is approved and allocated for the activity, or initiative (Moore, 1995, 2003).
- **Value and Performance:** (Moore, 2003)This focuses on value created as a result of activities of the organisational resources allocated, operational capability and perceived legitimacy and support component (Stanley, 2012).
- **Resources and operational capacity:** Without resources and the capacity to do the work, no value can be created. This includes activities related to finance, staff, skills, and technology (Benington and Moore, 2011).

An example of how the strategic triangle has been successfully applied in Australia for community engagement is the participatory budgeting process put into place by two local governments, Canada Bay in New South Wales in 2012, and Geraldton, WA in 2013. Participatory budgeting involves focal actors engaging with residents about how their local government allocates its budget. When successful, resident participation levels are sufficient to warrant and sustain local government's commitment to changes to the process to authorise decisions regarding reallocation of resources, and residents can see value as their participation influences service delivery (Thompson and Riedy, 2014).

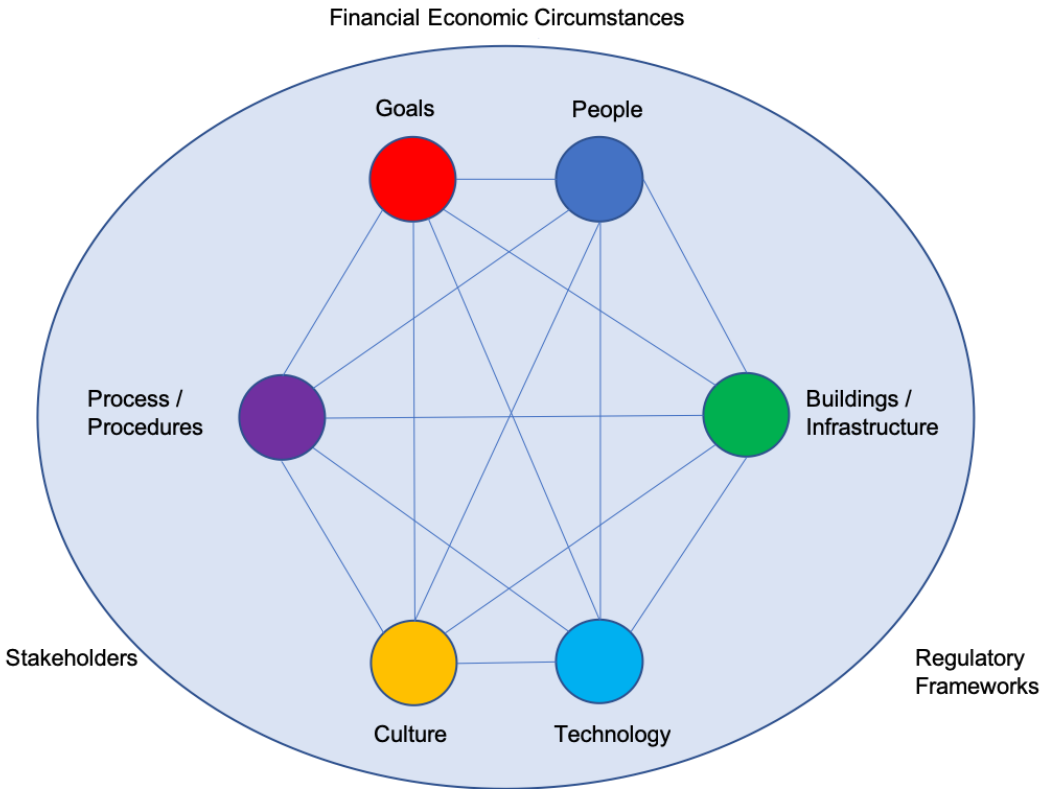
Although a common use for the strategic triangle is to guide the decision-making public managers who are fostering change, a weakness is that the framework lacks clarity in its explanation of public value and how it describes its "actions and programmes *[sic]*," (Williams and Shearer, 2011, pp. 1, 11). Through the lens of the strategic triangle, there is also a lack of clarity about activities relating to transformation of focal actors and the community they support. Furthermore, there is a view that the strategic triangle may modulate the influence and importance of elected representatives, as well as the associated politics of those elected to office, while increasing focus on the importance of the public sector managers (Bryson et al., 2014). The application of the strategic triangle for community engagement and its affect on representative and direct community democratic processes is not clear, and support is not universal (Bryson et al., 2014). The strategic triangle also appears to lack clarity about the dynamics and transitions of power associated with the engagement process, including changes resulting from the transition of resident views being expressed by a nominated representative, to one in which they represent themselves and express their views directly and not through a representative.

2.7.5 Reflections on the Davis (2014) Sociotechnical Framework

The third approach, the Davis sociotechnical framework focuses on issues that guide the successful integration of technology and social systems (Davis et al., 2014), including knowledge management solutions (Davies, Coole, and Smith, 2017). It includes the interdependency and interaction among different humans, social groups, technology, and organisations, that should be considered when advocating or progressing organisational and community change activities (Dalpiaz, Giorgini, and Mylopoulos, 2013; Davis et al., 2014). The framework described by Davis et al. (2014, p. 6) identifies the following as interdependent activities: goals, people, buildings–infrastructure, technology, culture, and processes–procedures, and is based on sociotechnical theory.

Figure 2.4

Sociotechnical Framework



Davis 2014, p. 6, illustrating the interrelated interactions of an organisational system

However, according to Cecez-Kecmanovic, Galliers, Henfridsson, Newell, and Vidgen (2014), the challenge of a sociotechnical framework is determining the alignment and optimisation of technical and social elements in the design of a solution. This challenge can be compounded by the level of support, behaviours, and capacity of actors to undertake transformative initiatives. The environment in which the change is to take place or transform is also an important consideration in how the sociotechnical framework is applied. Failure to adequately address these challenges can lead to the failure of transformation initiatives (Dalpiaz et al., 2013).

2.7.6 Reflections on the Actor Network Theory (1986) Sociotechnical Framework

The theoretical framework proposed for this study is Actor Network Theory (ANT). ANT was developed in Science and Technology Studies by Bruno Latour, Michel Callon, and John Law during the 1980s to describe and explain the interaction between the social and the technical (Ponti, 2010). ANT also considers the dynamics of hierarchy and power

in organisations and public life in an impartial manner (Callon, 1986; Law, 1992; Venturini, Munk, and Jacomy, 2016). ANT also provides the ability to examine processes within and between actors and networks. Through the lens of ANT, an understanding of processes within and between actors and networks can be gained and used to determine findings and draw conclusions (Cresswell, Worth, and Sheikh, 2010).

However, a point of considerable controversy is the notion that actors can be either human or non-human, real or fictional. To help resolve this controversy, the term actant is often used in place of actor to describe human or non-human artefacts (Alexander and Silvis, 2014; Walsham, 1997).

Relevance of ANT

ANT is recognised as both a theory and a method. From a theoretical perspective, ANT is focused on identifying and understanding how relational associations within complex sociotechnical circumstances lead to particular processes and outcomes (Bosco, 2014; Seuwou, Banissi, Ubakanma, Sharif, and Healey, 2017). To adequately address the research question and objectives, a theory is needed which recognises that social and technical views are intertwined, and the distinction between social and technological issues is difficult to determine (Cordella and Bonina, 2012). The research was deemed to benefit from a theory in which analytical differences are minimal, and the social and technical dimensions are complementary and inseparable.

From a method perspective, ANT provides the ability to trace human and non-human interactions within networks, to gain an understanding of what is happening and why it is happening (O'Connell, Ciccotosto, and De Lange, 2014; Troshani and Wickramasinghe, 2014). Furthermore, ANT provides an opportunity to describe causes, effects and understanding of the relationship, including subtleties of power dynamics, between multiple and diverse actors and networks when provoked to foster change (Ponti, 2010).

ANT terminology

ANT provides a vocabulary for recognising actors and their relationships. Theoretical nomenclature associated with ANT includes the terms focal actor, alliances, delegates and actors. For the remainder of this thesis the term actors will be used to describe both actors and actants. In this thesis the terms actors and actants are interchangeable. In this study, focal actors are responsible for broad strategies. They are also responsible for identifying actors to advance their strategies (Papenbroock and Österberg, 2017). Alliances consist of

delegates and actors that are enrolled to advance either the strategic or operational activities in support of the focal actor's strategy (Alexander and Silvis, 2014). Alliances are not static and adapt according to the actors that are enrolled and the alliances that have been formed (Papenbroock and Österberg, 2017). Delegates are actors that speak for particular points of view that have been imparted to them (Holmström and Robey, 2005; Walsham, 1997).

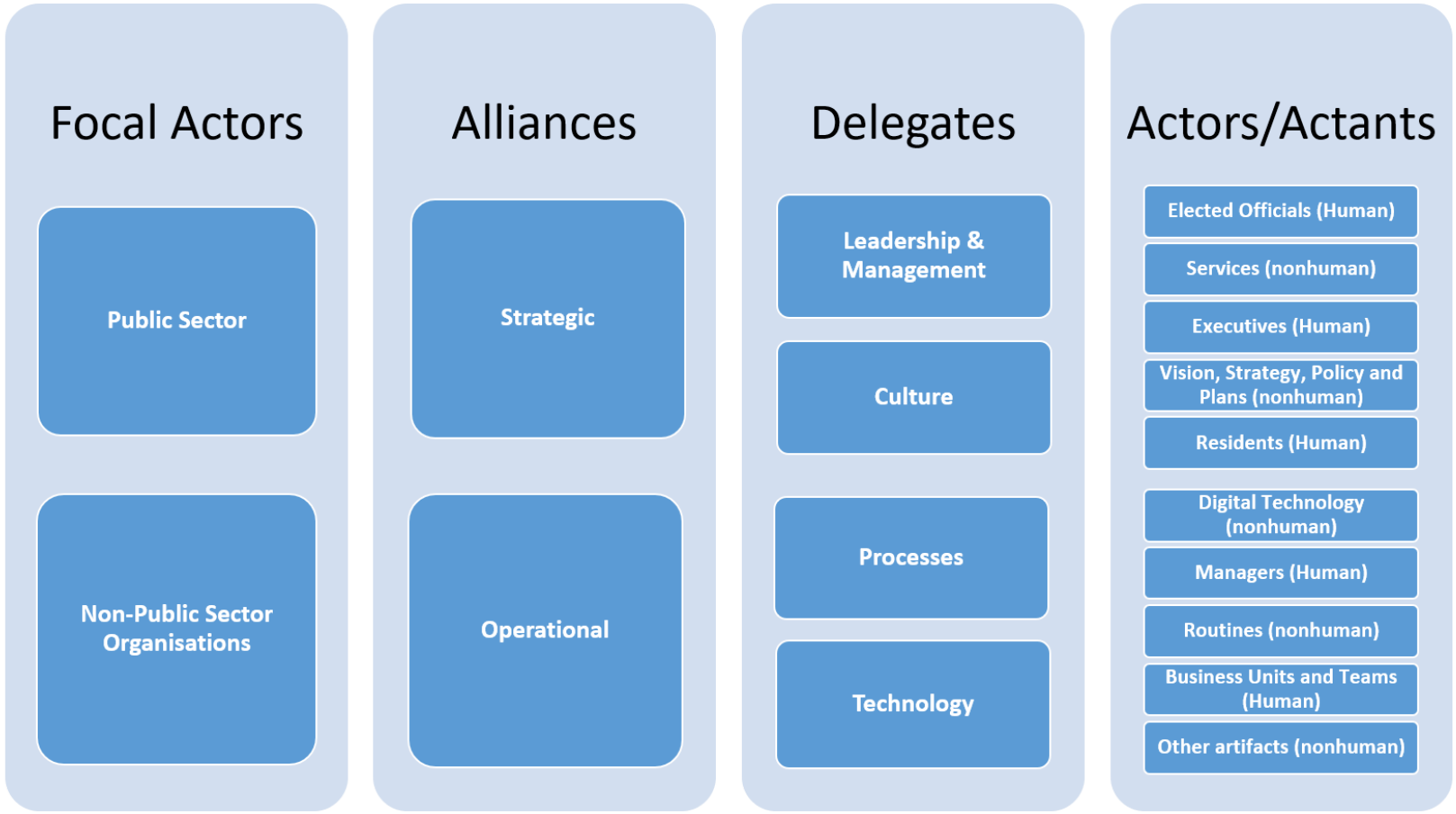
In this study, actors operate as a result of activity generated by others. Delegates are actors[1] who:

- represent and advocate for leadership and management
- undertake activities associated with culture
- support effective and efficient processes
- perform activities associated with maintaining a technical environment for sustained and secure operations (Latour, 1996).

[1] Actors have the ability to enrol other actors to form networks. Therefore, actors can evolve into networks and these networks can be recognised as delegates.

Figure 2.5

Alignment of theoretical nomenclature



In addition to terminology that identifies actors and their networks, ANT includes terminology related to activities they undertake. The focal actor alliances actors and delegates interact within ANT at four moments. These four moments are iterative processes that involve (1) defining the problem (referred to as problemisation in ANT); (2) undertaking activities to attract the interest of stakeholders, imposes a view and has the power to stabilise other actors, networks, or delegates (referred to as interessement in ANT) (Callon and Blackwell, 2007; Heeks and Stanforth, 2007) with sufficient interest, (3) actors demonstrate support through an enrolment process (referred to as enrolment in ANT); and once sufficient support is gained and sustained the network proceeds to (4) transform from the undesired state to the desired state (referred to as mobilisation in ANT) (Callon, 1986; Faruq and Tatnall, 2016; Ponti, 2010; Priyatma, Polina, and Hernawan, 2015).

Strength of ANT

ANT is recognised for strengths that include the ability to describe how things occur and the ability to understand and explore the relationships and interactions between the human and non-human objects, how actors form networks, the composition of the networks, how the networks develop and are maintained. ANT also features a framework and vocabulary for recognising actors and their relationships (Law, 2009).

ANT has the ability to track how multiple actors and networks interact with one another to first transform and then sustain the transformed systems. This process involves iterative cycles that include the design and execution of desired changes (Boyatzis, 2006). Each iteration builds on knowledge from previous iterations. With each iteration cycle, the opportunity to test changes can be incorporated, evaluated, and further refined (Norman and Verganti, 2014).

ANT also enables researchers to gain insight into how networks compete with one another, and how networks can be made more durable and stable (Serenko et al., 2016; Tatnall and Gilding, 1999). According to Alexander and Silvis (2014), ANT could help researchers identify and understand the power dynamics of sociotechnical networks involved in transformation processes.

ANT is considered by Glover and Arora (2017) to be a useful conceptual tool to understand the interaction between actors (referred to as actants), including people, society and technology in the performance of practice. ANT also provides a research framework that enables the examination of events that are activated to change from one stage to another (Burga and Rezania, 2017).

Weakness of ANT

According to Williams-Jones and Graham (2003, p. 279) the purpose of ANT is not to explain social context, but to explore and explain sociotechnical environments that consist of human and non-human objects. This is also considered a weakness for its failure to explain the larger social and political context and for ignoring race, class and gender (Walsham, 1997; Williams-Jones and Graham, 2003). Instead, ANT focuses on how relationships form and their association with human and non-human objects, actors, and networks. Cresswell et al. (2010) consider a potential weakness is the significant number of actors that may be involved in ANT research. This may lead to the question of what networks and sub-networks to include, and ensuring appropriate boundaries are set for data collection.

Rationale for ANT

ANT is considered suitable lens to explore strategic and operational networks associated with community engagement. ANT explores relationships between the social, technical, conceptual and textual (e.g., written participant observations and documents such as plans, strategies and vision statement) fields in the development and/or operation of products and services (Law, 1992). ANT has the ability to investigate sociotechnical environments, and the transformations that occur in them over time (Troshani and Wickramasinghe, 2014). This aligns with the research as both a theory and a method[1].

ANT appears to provide an appropriate lens for at least two reasons. First by perceiving community engagement activities as a network of actors, ANT provides a framework and vocabulary for recognising actors and their relationships. Second, the actors and their interactions are part of ANT's sociotechnical research tradition. During the transition through the four moments of translation towards the desired state (i.e., problemisation, interessesment, enrolment and mobilisation), the stability of the network can be monitored. With the monitoring, actions can be taken to stabilise or unstabilise all, or parts of the network to achieve a desired result (Priyatma et al., 2015). Through ANT there is recognition that the actors, their relationships and actions can affect stakeholder acceptance of community engagement and knowledge management activities. ANT also allows consideration of the incremental steps towards transformation from an existing state to the desired state. These considerations were key in the decision to use ANT as the

[1] Refer to Chapter 4 (Methodology), Section 4.3.3 for further information concerning ANT as a method.

study's underpinning theoretical framework (Burga and Rezania, 2017). Furthermore, Glover and Arora (2017) consider ANT to be a useful conceptual tool for understanding the interaction between actors (also referred to as actants), including people, society and technology in the performance of practice.

ANT considerations of power and relationships

Power dynamics is critical to understanding how digital technologies are deployed by organisations, including how they are used to engage and interact with residents (Doolin and Lowe, 2002; Pollack, Costello, and Sankaran, 2013). ANT takes into consideration that power relationships between networks are dynamic, meaning that the power within and between networks changes according to their stage of maturity (i.e., adoption, implementation or integration) or other events (Tatnall and Gilding, 1999). Using the transformation of community engagement as an example, at different stages of the initiative, the power of one network may be more influential than that of other networks (Cressman, 2009).

Critical to understanding how to transform the community engagement process through the use of digital technologies is an appreciation of the role that power plays. Power and the vision of leadership complement one another as both influence policies, practices, how people act, how they access and interact with resources and how they use technologies to achieve strategic goals (Berson et al., 2015; Burga and Rezania, 2017; Schein, 2009). Power can move across organisations and social settings to change existing procedures (Glover and Arora, 2017).

Therefore, during the adoption stage of the initiative, the strategic alliance network, consisting of leaders and managers, may be more powerful than the operational network that is responsible for processes. The leaders and managers have this power because they have authority to approve and allocate human and financial resources required to support the community engagement initiative. During the implementation stage, the network responsible for processes may rise to power, as the focus of the initiative shifts to being more focused on and dependent on their operational expertise to deliver on the plans created by the leaders and managers. Meanwhile the power of the leaders and managers recedes during this period. The scenario of shifting power continues until the desired state is reached during the integration stage of the initiative.

According to Glover and Arora (2017) power manifests in the creation and drive to achieve a vision. This vision can be for an organisation or a community. Power drives the

vision from a concept into reality, the allocation of human and financial resources and how these resources are used. Power influences how skills are developed and deployed and manifests in generating and enforcing of rules and practices. Power also drives how technologies are adopted, but also the ability of individuals to act independently and make decisions freely is influenced through relationships with human and non-human actors. These relationships assist people to initiate, organise and coordinate activities, and can also change the way activities are undertaken and how they are performed by actors or networks.

Through the use of ANT, people within an organisation can trace the moment when the desire to enhance the community engagement process happens, to when leaders and managers within the organisation coalesce around the concept, to the creation of a vision statement, communication plans, an even purchase orders to procure technologies. Each of these actions has the power to influence activities within the organisation.

Through ANT power can be achieved, can influence and be transferred to both human and non-human actors. How power influences activities can be uncertain and unpredictable. The influence can be influenced by allies if they support an initiative, or by dissidents if there is a failure to gain sufficient support of allies. The level of support, or the strength of the dissidents, may lead to changes in how power is applied, or even the form of this power that is wielded. For example, power may manifest itself in the form of discussions. These discussions can shape views of actors. Power may also be in the form of policies, procedures, process, or even how technology is configured (Glover and Arora, 2017).

ANT alignment with research

The selection of ANT aligned with the needs of this research to a greater extent than other examined models and frameworks. ANT has been used in studies that included elements of strategic organisational change and technologies (Pollack et al., 2013; Walsham, 2006) – factors that are integral to this study. Initiatives such as community engagement fit well with ANT as associations between human and non-human actors are able to be traced through the initiative's stages of maturity (Burga and Rezania, 2017).

ANT also allows the researcher the ability to investigate the interaction of individual and aggregated heterogeneous technical and social objects (Rose and Sanford, 2007). ANT is fundamental to the research question and objectives, recognising ways in which the technical influences the social (Heeks and Stanforth, 2007).

Aligning ANT and concepts

The concepts, themes and categories have interwoven relationships and rely on one another to achieve the perceived success of a sociotechnical community engagement initiative. In creating a conceptual framework, opportunities for new concepts and theories may arise. A conceptual framework may influence and where necessary may help constrain data collection, provide support for data reduction and help verify conclusions. Table 2.2 lists the concepts, sources of data and the discipline alignment.

Table 2.2

Concepts, source of data and the alignment to a discipline

Guiding concept	Concepts	Sources of data for concepts	Associated discipline	References
Strategic	Governance	Business management	Business / Information systems	(De Haes and Van Grembergen, 2009; Henderson and Venkatraman, 1993, 1999)
Strategic	Culture	Organisational studies	Social science	(Hofstede, 2011)
Strategic	Collaboration	Organisational studies	Social science / Information systems	(Simon et al., 2006)
Operational	Knowledge management	Knowledge management	Business	
Operational	Models and frameworks	Business management	Business	(Coltman et al., 2015)
Operational	Process creation and management	Business management	Business	(Dijkman, Lammers, and de Jong, 2015)
Operational	Technology	Computer communications (e.g., Internet, social media)	Computer science	(Coltman et al., 2015)
Operational	Application of technology	Business management	Information Systems	(Boschetti, Fulton, Bradbury, and Symons, 2012)

2.8 Addressing culture and complexities in transformation models and frameworks

Although the Henderson and Venkatraman (1993, 1999), strategic alignment model (SAM), Moore's strategic triangle (Moore, 2003; Moore and Khagram, 2004), and the sociotechnical framework (Davis et al., 2014) have generated considerable interest since their initial publication, they do not appear to sufficiently address culture and the competencies needed for operating in a digital environment. The need to address culture has been identified as a reason many sociotechnical initiatives fail (Alexander and Silvis, 2014; Frost, 2014). A review of influential strategic alignment models and frameworks, including the Henderson and Venkatraman (1993) strategic alignment model (SAM), Moore (2003) strategic triangle, and Coltman et al. (2015) Sociotechnical System found that they do not explicitly address culture change within organisations or in communities as a measure of reducing risks to community engagement initiatives. Enhancing existing frameworks or creating new models that include activities to influence culture may help to reduce risks that lead to failure of sociotechnical initiatives (Herriman, 2011; Hossan, 2015).

The second challenge concerns managing complexities associated with community engagement and associated knowledge management solutions. Büscher and Sumpf (2015) recognise that complexity associated with sociotechnical systems contributes to uncertainty, and often to the reluctance of residents to trust in the organisation sponsoring the solution and the systems.

Therefore, it is important to know who the potential stakeholders are, their interest, and how these interests can be influenced. The stakeholders and the artefacts that influence them can be human or non-human. The stakeholders can be viewed as relationships in the form of an interconnected network. Consideration about the alignment of the diverse range of stakeholders and their interest is important to reduce risks associated with new solutions (Priyatma et al., 2015).

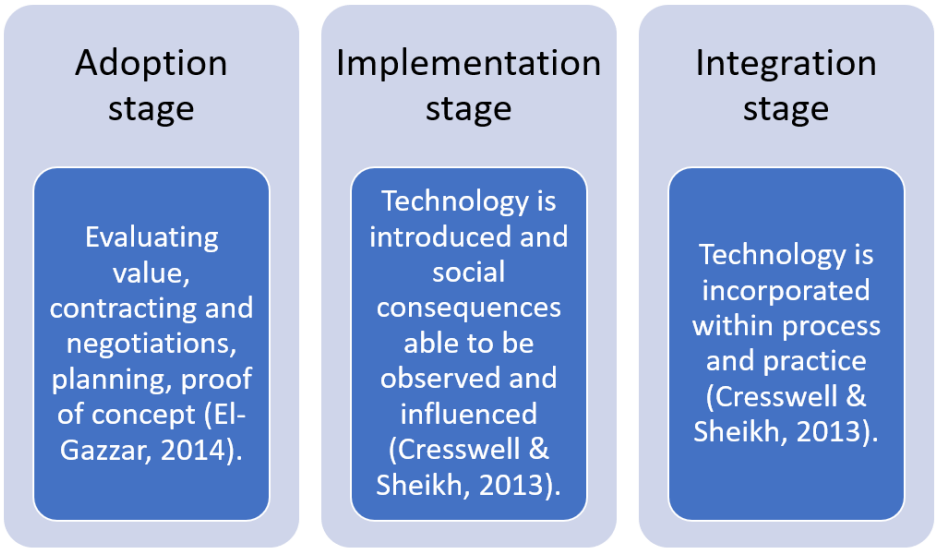
2.9 Maturity cycle of sociotechnical initiatives

The maturity of an initiative can be expressed as iterative stages of knowledge and experience gained through activities and time. Each iteration of the maturity cycle builds upon lessons gained from the previous cycle. As part of the maturity process there are key points where leaders and managers become satisfied that the focal actor achieved the defined aim of the maturity stage, or that there is no more time to continue. It is at this point the cycle terminates (Norman and Verganti, 2014). The stages of maturity used in

this study are the adoption stage, implementation stage, and integration stage. Before transitioning from one stage to the next, processes associated with the stage are no longer conducted in an ad-hoc manner and are repeatable (Dijkman et al., 2015). Furthermore, as the organisation transitions through the stages of maturity, the resources and networks can change depending upon potential risks and challenges associated with the stages of maturity (El-Gazzar, 2014).

Figure 2.6

Stages of initiative maturity



For example, the resources and networks applied during an adoption stage gain knowledge and experience. The knowledge and experience gained may influence the selection of different resources and networks to be used during the implementation stage. At the conclusion of the adoption stage, resources and networks may differ from those employed during the adoption stage, with those more relevant for the implementation stage being put in place. This process is then repeated at the end of the implementation stage, where knowledge and experience gained during the implementation stage is used to obtain the appropriate resources and networks for the integration stage.

This interaction between the resources and networks is important, through the adoption and implementation, because they convert engagement with residents into visible and tangible action. Whereas the quality of and risks to the success of the initiative can be better determined during the adoption, implementation and integration stages. Furthermore, areas of strength and weakness can be identified, and adjustments made to

reduce or mitigate risks. The maturity stages provide the ability for the initiatives to evolve and adjust as risks are identified and mitigated. This capability does not appear to be reflected in some influential models and frameworks such as Henderson and Venkatraman (1993, 1999) strategic alignment model (SAM), Moore (1995) strategic triangle, and Davis et al. (2014) Sociotechnical Models.

The ability of organisations to use digital technologies to generate value and to manage risk depends on the maturity and reliability of business process and relational mechanisms. Furthermore, to ensure a holistic approach to risk, these alignment efforts should also consider other relevant organisational plans and strategies that may be altered by community engagement initiatives (Matt et al., 2015). However, even with a broad range of academic literature related to governance, risk and risk management, transformation initiatives using digital technologies continue to have a high rate of failure (Gaikema et al., 2019; Hornstein, 2015).

2.10 Public and private sector community service providers

There are generally two types of organisations that produce goods and services: either an economic market-focused organisation, or a governmental authority. The economic market-focused organisation is also referred to as a private sector organisation, while a government authority is a public sector organisation (Bullock, Stritch, and Rainey, 2013). The private sector organisations sell products or services and create wealth for stakeholders and to fund the operation of their business (Nutt, 2006). The public sector is funded through State and Commonwealth grants and supplemented from revenue generation activities such as taxes and fines (Nutt, 2006; Shackleton et al., 2006). Largely, the public sector delivers collective services, while the private sector focuses on the individual and exercises activities to influence potential purchasers (Thompson and Riedy, 2014). Both private and public sectors may be able to integrate geographical communities and digital technology to foster community knowledge.

A majority of organisations identified as potential hubs for community knowledge in metropolitan Perth are public sector organisations, specifically local government organisations. In regional and remote areas of WA, private sector and not-for-profit organisations often performed the role of being a community hub that provided a range of services for community residents. These services included access to computing facilities and Internet access (Jones and Buckley, 2017).

However, each type of organisation has unique characteristics that may influence how resources are managed, the ways geographical community and digital technology are integrated (different philosophies, business modes, performance indicators, drivers, etc.) (Bullock et al., 2013) and how knowledge is managed. Differences between the public and private sector characteristics are presented in Table 2.3.

Table 2.3

Differences between public and private sector characteristics

Private sector	Public sector
Leaders have more authority over strategic goals (Bullock et al., 2013).	Leaders' strategic goals are politically influenced (Bullock et al., 2013).
Less formal structure (Bullock et al., 2013).	More formal and centralised structures (Bullock et al., 2013; Kearney, Hisrich, and Roche, 2009).
Citizens voluntarily purchase and firms provide for a profit (Barton, 1999).	Provides public goods or social goods such as law and order, public schools, public health, community facilities (Barton, 1999).
"Economic-oriented employees" (Bullock et al., 2013, p. 9).	Public service or pro-social characteristics (Bullock et al., 2013).
Significant, but calculated, personal and financial risk (Kearney et al., 2009).	Organisational instead of personal risk often taken.
Potential to be constrained by profit and challenges in access to funding (Kearney et al., 2009).	Easier to fund risky projects; instead of holding a profit motive, driven by political and social objectives (Kearney et al., 2009).

Studies have identified differences and similarities in public and private sector values (Van der Wal, De Graaf, and Lasthuizen, 2008), along with the perceptions of public and private sector efficiency (Andrews and Van de Walle, 2013). In some cases, such as when large private sector organisations consolidate business units across divisions (e.g. corporate services functions as a shared service for the whole organisation), the public sector has attempted to replicate the method or models adopted by the private sector to deliver services (Walsh et al., 2006). However, the community has differing expectations of the public and private sectors. The accountability of the public sector is vested in the interests of citizens, acting through representatives, politicians, and government delegates such as public servants (Bovens, Goodin, and Schillemans, 2014; Larsson and Teigland, 2019). Conversely, the accountability of the private sector is mostly met by satisfying consumer demand (Barton, 1999). Therefore, it is important to investigate both types of

organisations for potential differences in approach to integrating a geographical community and digital technology.

2.11 Information systems and community engagement

This section puts the community engagement initiative in the context of the information systems. Information systems are defined as:

> The study of information systems and their development is a multidisciplinary subject. It addresses the range of strategic, managerial and operational activities involved in the gathering, processing, storing, distributing and using of information and its associated technologies, in society and organisations (Avison and Elliot, 2006, p. 5).

To reduce ambiguity and confusion, when compared with computing, management or social sciences, the unique nature of the information systems discipline is that it "examines more than just the technological system, or just the social system, or even the two side by side; in addition it investigates the phenomena that emerge when the two interact" (Avison and Elliot, 2006, p. 5). The discipline of information systems encompasses sociotechnological initiatives such as community engagement (Lyytinen and King, 2004).

Collectively, community engagement and knowledge management initiatives form sociotechnical systems. The literature supports the view that communities consist of networks of sociotechnical relationships between residents, organisations, and technologies (Batty et al., 2012; Bygstad et al., 2010). Sociotechnical systems include the integration of "strategy, structure, technology, people and management processes" (Coltman et al., 2015, p. 92), as well as legal, ethical, and social perspectives (Fisher et al., 2015). These sociotechnical activities influence one another and help present a broad view of the initiative. This provides an opportunity for leaders and managers to be better able to identify and address potential risks to complex initiatives, including initiatives such as community engagement and associated knowledge management activities. Thus, the sociotechnical approach to community engagement and knowledge management initiatives can produce environments that are robust and foster increased engagement with residents, and that can contribute to solutions that would be quite different from what was previously experienced (Bygstad et al., 2010; Cecez-Kecmanovic et al., 2014; Gurstein, 2014; Kline, 1985).

Aligning an organisation's sociotechnical artefacts, such as its strategies, resources, processes, technology, and associated activities, can reduce instances of unstructured and unstable processes described by Cecez-Kecmanovic (2001) and improve the likelihood of more effective community engagement and knowledge management practices and their outcomes (Baxter and Sommerville, 2011; Coltman et al., 2015; Henderson and Venkatraman, 1993). This is consistent with a view that successful delivery of a solution combining community engagement, knowledge management and digital technology, to influence provision of information and services for residents, requires integration and alignment of organisational and technological artefacts (Batty et al., 2012; Bygstad et al., 2010; Chourabi et al., 2012).

The alignment of sociotechnical artefacts is a complex process (Chan and Reich, 2007). Thorough planning can assist organisations to manage their complexity and gain knowledge of how to: transform services; monitor, understand, and analyse activities; then leverage sociotechnical environment benefits (Bharadwaj et al., 2013; Coltman et al., 2015; Henderson and Venkatraman, 1993). These benefits may lead to organisational efficiencies and opportunities to improve the quality of life within the community (Batty et al., 2012).

A potential area of consensus about community engagement and associated knowledge management is its multidisciplinary nature (Hislop et al., 2018). Therefore, to understand the effect and influence that community engagement and associated knowledge management activities can have in a community, the importance of its multidisciplinary nature should be recognised. Implementing community engagement with knowledge management can be considered a sociotechnical undertaking. Initiatives for community engagement and knowledge management can involve multiple people, teams, and organisations applying a diverse range of competencies. These competencies may include disciplines such as sociology, anthropology, health studies and promotion, economics, and information systems (Cecez-Kecmanovic, 2002; de Chavez, Backett-Milburn, Parry, and Platt, 2005; Dwivedi et al., 2015).

Community engagement and knowledge management are considered by information systems researchers as a sociotechnical activity (Neugebauer, MacDonald, and Tayler, 2010). Adopting a multidisciplinary approach for community engagement and management activities can help identify and mitigate risk when implementing sociotechnical initiatives. For example, Simon et al. (2006) point out that where one discipline may view an issue as a technical matter, the same issue may be perceived by

other disciplines as a social, economic, or political matter. Academic literature supports the view that an awareness of actual and perceived risks and their potential consequences cannot be adequately achieved from the perspective of a single discipline (Geisler and Wickramasinghe, 2015; Simon et al., 2006). Conversely, a multidisciplinary approach sheds light on potential risks so that they may be considered.

2.12 Summary

The review of academic literature presents the current state of knowledge regarding sociotechnical systems, community engagement, and knowledge management. This chapter builds on and adds context to Chapter 1, the introduction of this study. The knowledge gained from this literature review establishes a foundation for the conceptual design of the study and includes strategic and operational themes that help guide this study.

In addition to identification of themes, the review of academic literature identifies the potential outcomes that influence this study. Specifically, the review:

- articulates the potential benefits from the implementation of community engagement and associated knowledge management activities
- confirms the viability of the selected research focus, research question and objectives by presenting the findings from the literature that acknowledge that there is opportunity to improve community engagement and associated knowledge management practices
- contributes to the direction of the research by considering theoretical sociotechnical models and frameworks and their application
- contributes to the research design and data collection methods by highlighting important areas of investigation related to community engagement and associated knowledge management activities.

At the core of this study is the recognition that guided digital technologies can be a fundamental catalyst for enhancing community engagement processes. It is apparent from the research that there is potential for organisations to enhance how community residents are engaged, how knowledge from such engagement is captured and managed through the effective implementation and use of digital technologies. Community engagement and associated knowledge management activities are achieved through the effective implementation and use of digital technologies. The following chapter (Chapter 3) presents the conceptual framework for this study, informed by the literature reviewed in this chapter.

Chapter 3

Conceptual Framework

3.1 Introduction

Successful adoption of a community engagement initiative is a complex endeavour involving multiple bodies of knowledge from different disciplines. Data sources indicate that a majority of sociotechnical initiatives fail to meet stakeholder expectations. This high rate of failure affects time, costs and the quality of the services delivered online. To better understand the issues concerning community engagement through the use of digital technologies, a sociotechnical approach is required. Qualitative methods serve as a sufficient tool for investigating this complex issue (Jabareen, 2009). This study looks at a sample of public and private sector organisations in WA with initiatives to use digital technologies to engage with resident within their associated communities. Initially, I looked at how organisations implement solutions to engage with a broader range of stakeholders within the community.

With the high rate of failure of such initiatives, I was curious to investigate how models or frameworks were used and how they contributed to guiding the changes necessary for the organisation to engage successfully online with residents within their community.

When the study commenced, there was an increasing awareness that organisations, large and small, public and private sector, would need to interact with other businesses, government and their customers through digital technologies. Being involved in many organisations that had undertaken projects to enhance interaction with customers through digital technology, I recognised that there are multiple audiences that need to be satisfied for the initiative to be perceived as successful. My experience also helped me recognise this was not a just technical issue. However, technical issues often became the primary focus. I believed that a successful change needed a multidisciplinary approach with less focus on the technology and increased focus on accountable leadership and management, activities to influence culture and improved processes. My concern is that there is a recognition in the literature that the focus on technology may be a reason the high rate of sociotechnical failure persists. This study considers other factors that contribute to the high failure rate.

This conceptual framework is a collection of concepts which, when considered collectively, present a picture and interpretive approach to social reality. This chapter consists of intentions and interpretations of those intentions. The intentions described in this study should not be interpreted as findings. The findings are introduced in Chapter 5–Chapter 6 and are described in Chapter 7. The data presented in this chapter is meant for interpretation, to provide an understanding of the situation and to describe and explain key relationships.

The increased use of digital technologies in organisations highlights the need for a more sophisticated manner of viewing the increasingly complex relationships between networks of human and non-human actors (Cresswell et al., 2010). Although internationally recognised, the models and frameworks used in the organisations I worked in did not seem to take into consideration the challenges posed by initiatives that used digital technologies as a foundation. I was also aware of initiatives large and small based on digital technologies that were considered as failures. The reasons the initiatives were unsuccessful was not usually due to the technology but often the failure to identify and mitigate risk. The risks include but are not limited to the appropriate allocation of resources, user awareness and training and the creation of useful processes. This gained my interest and was discussed in my Master's thesis[1].

3.2 Conceptual framework and research question alignment

From my interest in learning about how to increase satisfaction of stakeholders involved with projects that had digital technologies as an essential part of the initiative, the research questions and objectives were developed. As stated in the research question, my aim was to find out the model or framework adopted in a sample of WA organisations to guide their efforts to successfully make changes necessary to operate in the online environment. I was interested to learn how the model or framework worked, the key components, and how the components interacted to achieve an outcome. I was also interested in opportunities to improve the model or framework to help organisations navigate through their online journey.

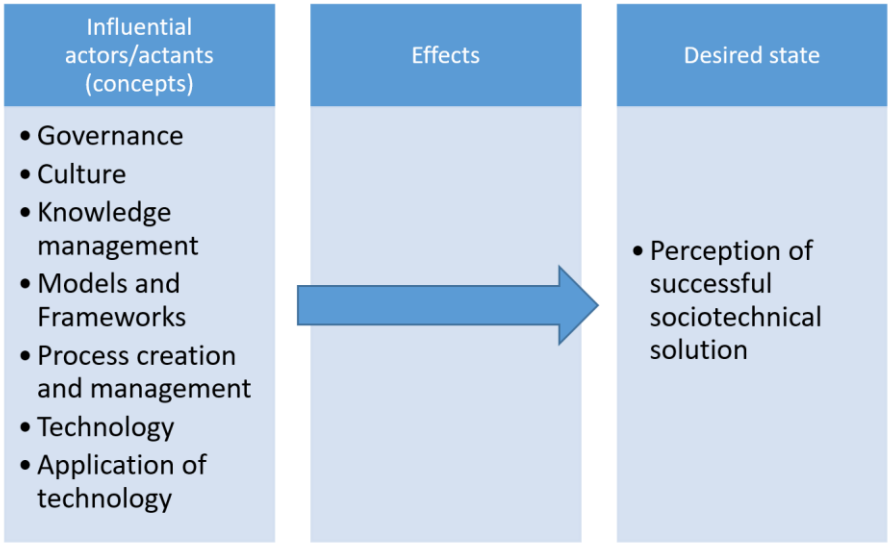
[1] Wilson, A.M. (2003). Replicating Communities in Online Communities (Unpublished Master's thesis) University of Western Australia, Crawley.

3.3 Cause and effect: Effect of influential concepts

The underlying concepts of a model or framework can affect the success of a sociotechnical initiative to engage residents through digital technologies. The desired state and the multiple concepts that influence it for engaging residents through digital technologies are provided in Figure 3.1. The concepts were developed from various sources, including academic literature, websites, and government plans and reports. Through the lens of ANT, the concepts can be considered actors. These actors influence the desired state and the stakeholder's perception of a successful initiative.

Figure 3.1

Influential actors of the conceptual framework that effect the desired state



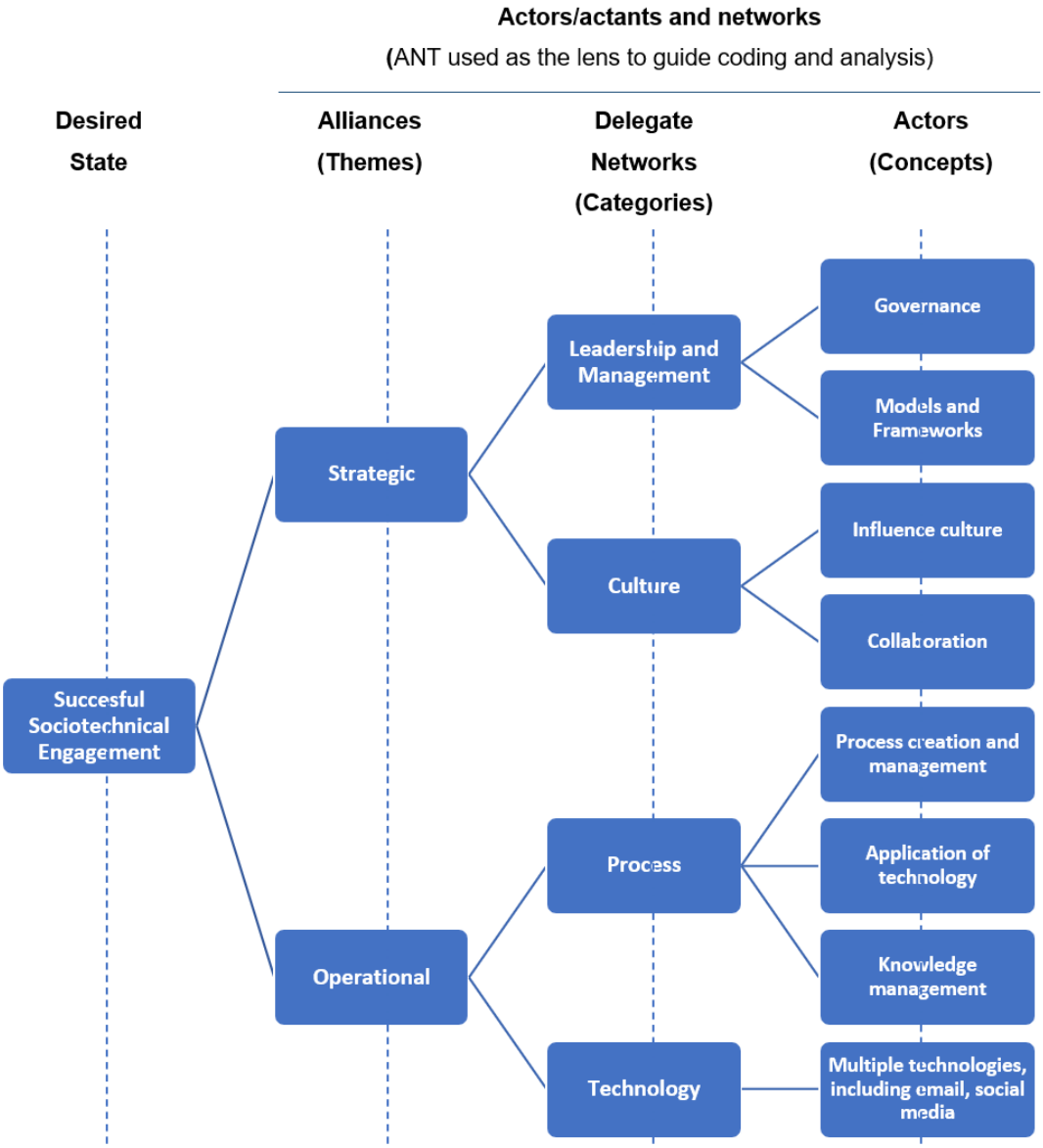
3.4 Integrating and synthesising the concepts

During this phase, concepts are integrated and grouped according to similarities to form the conceptual framework. This process involved reducing the concepts to create categories. These categories were further reduced by using a thematic approach to create themes (refer to Figure 3.2). These themes are then linked to the desired state. The desired state is linked to the research question. The concepts, categories and themes have interwoven relationships and rely on one another to achieve the perceived success of a sociotechnical engagement initiative. Within this phase, opportunities for new concepts and theories may rise. The conceptual framework influences and where necessary helps constrain data collection, provides support for data reduction and helps verify conclusions.

In Figure 3.2, concepts are linked, integrated and synthesised.

Figure 3.2

The integrated conceptual framework, linking and synthesizing concepts for the study



3.5 ANT as the analytical lens

ANT is adequate for conceptual framework creation due to its primary characteristics and has been used as a lens to guide research (O'Connell et al., 2014). It consists of a number of distinct features that can assist in conceptual development. ANT enables researchers to explore interconnections between networks, disciplines and technology to deliver solutions for stakeholders. This framework has also been used as a lens to examine the organic nature of change. This includes the influence of both human and non-human roles of actors during change.

ANT was originally developed by Bruno Latour, Michael Callon and John Law between 1978 and 1982 to better understand the social construct of science (Alexander and Silvis, 2014). It is used to study the roles of human and non-human networks, their ideas and technology for the purpose of creating knowledge that is new (O'Connell et al., 2014). ANT has been influential across multiple disciplines. Organisational studies have used ANT to examine knowledge management and accounting, and used it as a lens to explain changes in organisations during the implementation of information technology (Nehemia-Maletzky, Iyamu, and Shaanika, 2018; O'Connell et al., 2014).

Although ANT can be used as a theory, it is also used as an analytical method and for theory development. ANT is also considered a research method to assist in the discovery of theory. This includes the creation of process-oriented descriptions and explanations of situations that are iterative. ANT allows the researcher to identify and map the differences between actors and networks' shifts in power within and during iterations (Cresswell et al., 2010).

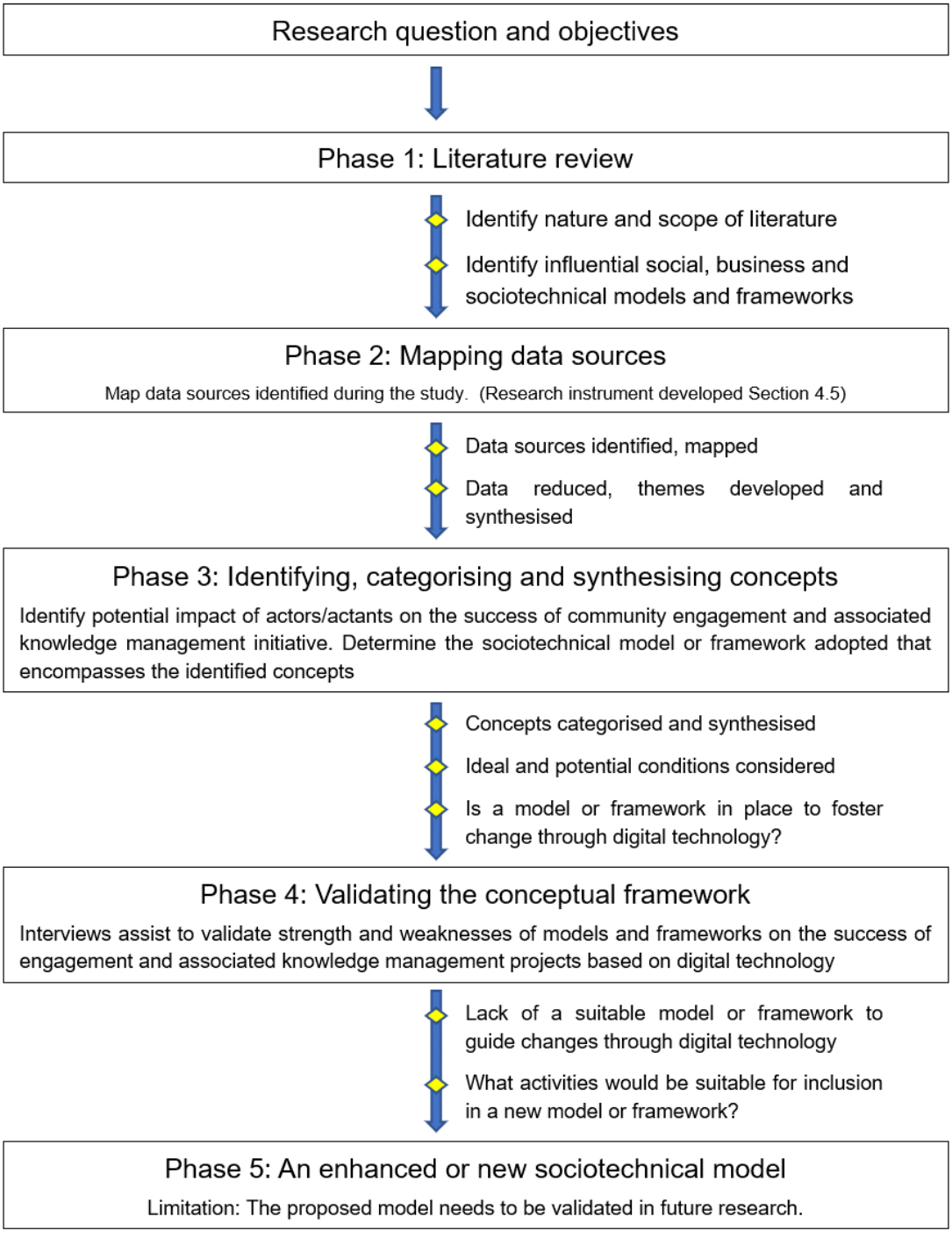
A benefit of ANT is its ability to consider and analyse iterations, or changes to an initiative or project as it progresses from a starting phase to the development and a completion stage. In some instances, this sequence of iterations repeats.

3.6 Conceptual framework development

The conceptual framework informing this study is composed of five phases, with the first being the literature review. The second phase consists of the mapping the data sources. The third phase is focused on identifying, categorising and synthesising concepts. The fourth phase is the validation of the conceptual framework. In the fifth and final phase, amendments to existing, or a new sociotechnical model are proposed. These phases are illustrated and then presented and briefly described in this section.

Figure 3.3

An illustration of the conceptual framework for this study



3.6.1 Phase 1: Literature review

The first task was to investigate the nature and scope of multidisciplinary literature involving community engagement activities in adopting digital technologies and associated knowledge management practices. This process included identification of primary and secondary data sources including academic articles, published and unpublished literature, websites and social media. Interviews were conducted with practitioners and specialists from disciplines that were involved in advancing digital technologies and associated knowledge management initiatives.

3.6.2 Phase 2: Mapping the data sources

The second phase includes mapping data sources identified during the first phase of the conceptual framework to the literature. During the process of mapping data sources, the involvement of multiple disciplines that are represented in the data are recognised. This recognition contributes to the richness and depth of the inquiry and provides opportunities to view the phenomena from different perspectives. Through ANT, a sociotechnical focus helped guide data analysis and assisted in gaining an understanding of why things happened in the way they do (Nehemia-Maletzky et al., 2018).

3.6.3 Phase 3: Identifying, naming and categorising concepts

During the phase of mapping data sources, data was considered and selected to allow the creation of concepts. These concepts are categorised as actors when considered through the lens of ANT. These actors present an interpretive representation of social reality. Further, these actors may compete and sometimes contradict one another. The actors emerged from the data obtained during the study and linked to references.

To assist in the identification of the actors, a typology matrix was created that takes into consideration whether an actant will have a high or low impact on the initiative. The matrix also considers if the actor is more ambiguous (e.g., the actor may add value; however, the amount of value is not yet determined) or less ambiguous (e.g., the actor is a future consideration and not required immediately).

Figure 3.4

Typology of activities that influence the implementation of sociotechnical solutions

Typology of influential actors/actants to implement sociotechnical solutions

		Sociotechnical initiative: Community Engagement	
		Indirect impact on the initiative	Direct impact on the initiative
		Low Impact (Non-Essential)	High Impact (Essential)
Ambiguity	Low		• Governance • Culture • Technology
	High	• Knowledge management (Actor considered for future adoption and not required immediately)	• Application of model or • Collaboration • Process creation and management • Application of technology

High impact actors include those that are essential to the success of the sociotechnical initiative. Without these actors (and their associated activities) being progressed, the risk of the sociotechnical initiative failing increases. Supporting essential actors are activities and processes that assist them. For example, governance is considered an essential actor. For governance to succeed, processes are needed to support the governance actors or the initiative can be considered a failure.

To further illustrate this example, developing the COVID-19 vaccine is considered essential for combatting the virus. However poor distribution of the COVID-19 vaccine across nations can create the perception that efforts to fight the virus are failing. In this example developing the vaccine can be considered a strategic imperative. While the distribution of the vaccine can be considered an operational matter. There is a time when both the strategic and operational activities have to be coordinated if the initiative is to be considered a success. However, initially the focus is on the strategic, in this instance the vaccine.

Low impact actors include those that are not yet required for the success of the sociotechnical initiative. One of the concerns identified in the literature is related to the complexity of sociotechnical initiatives (Kaul et al., 2017; Troshani and Wickramasinghe, 2014). By identifying actors and associated activities that may add value to the initiative but is not yet considered essential, contributes to the complexity of the initiative. With the increased complexity, the associated risks increase. This risk includes the diversion of time and resources from the aspects considered essential for success of the initiative.

The uncertainty or ambiguity associated with their capacity, capability and scope of responsibility of high impact actors should be low to reduce risk to initiative success (Walker, Davis, and Stevenson, 2017). Where risk is identified, resources may be allocated to reduce the ambiguity of high impact actors. To reduce ambiguity, iterative activities such as stakeholder consultation, redesign and retesting of the solution may also be undertaken. These iterative activities may continue until stakeholders perceive the situation is an improvement over the previous state.

The context of this typology is important. The context of the typology matrix represents a point of time. At this time the primary focus is engagement with residents through digital technologies. The secondary focus is harnessing and using the knowledge gained through the engagement with residents through digital technologies. However important, knowledge management is not considered the primary focus of the initiative. Therefore, less time and effort are allocated to reduce ambiguity related to knowledge management. For this purpose and in this context, knowledge management is considered low impact and highly ambiguous. However, once the primary focus of community engagement is completed to the satisfaction of stakeholders, knowledge management may then be considered essential, and work can be done to reduce its ambiguity.

Governance of sociotechnical initiatives

Governance encompasses the responsibility of the organisation's leaders and managers to ensure the sociotechnical activities are able to support their policies, plans and strategies. Within governance, these artefacts are created and monitored to support the organisation's efforts to attain an agreed vision. An important element of governance may include the strategic alignment of business and technology (De Haes and Van Grembergen, 2009; Henderson and Venkatraman, 1993, 1999).

Culture

Culture is a broad multifaceted actor that influences the perception of success of an initiative internal and external to the organisation. Culture influences routines, staff responsibilities, whether the systems are open or closed to social engagement. Culture also influences if organisational controls of systems are tight or loose, and how knowledge is obtained from engagement with residents and shared with stakeholders. Culture influences communication, the depth of engagement and the ability to create and sustain a change or series of changes (Hofstede 2011).

In reviewing sociotechnical models and frameworks, activities to influence culture is not often recognised as an integral activity. Within some organisations culture may be considered part of a project, but it is not often seen as the thread that weaves together internal and external stakeholders, or binds the organisation with the community (Wildemeersch and Jütte, 2017). Influencing culture to accept change requires more than communications and training plans. Although these artefacts are important to help guide and influence culture, the proposed actors are more integrated within the initiatives. This integration is important for initiatives to be considered successful. However, this robust perspective of culture is not often considered within plans for sociotechnical initiatives (Hornstein, 2015; Wildemeersch and Jütte, 2017).

Collaboration to deliver and support sociotechnical initiatives

For this study, society, business, and sociotechnical activities are interconnected. Therefore, a model or framework would need to support a multidisciplinary environment (Henderson and Venkatraman, 1993; Lawrence, 2015). Business literature states the importance of leadership and management support for strategic projects. Academic literature also refers to the importance of technology projects to be aligned with and driven by an organisation's business plans (Matt et al., 2015). It is recognised in the data that organisational change or changes in culture were often a significant challenge to the success of sociotechnical initiatives, but often not included within the plans for the initiative, an exception being the training of staff and communicating with stakeholders regarding the desired change. More collaboration may be required as this level of collaboration may not be sufficient for the significant change stemming from the use of technology to engage with residents (Lawrence, 2015; Simon et al., 2006). I believe the changes in technology, even small ones, can have significant ripple effects across the organisation from the trainees to the executives.

Knowledge Management

Community engagement can be a rich source of knowledge that may allow the organisation to make better decisions for the benefit of residents. However, to achieve these benefits requires collaboration between multiple stakeholders each with separate and distinctive knowledge bases. Knowledge management is recognised as being complex (Ali, 2014; Syed, Murray, Hislop, and Mouzughi, 2018), especially when considering the relationship between people, knowledge management and digital technologies. The ability to create a repository for knowledge and codify knowledge across multiple and varied technical systems that may include email, videoconferencing and various forms of social media can be a challenge (Syed et al., 2018).

Models and frameworks

Organisations seeking to implement an initiative to engage stakeholders external to the organisation through digital technologies may adopt a model or framework to help guide the initiative. Many of the models and frameworks, including project management methods and standards such as PMBoK and PRINCE2 consist of a number of interlinked and dependent activities. These activities include building support for the initiative, planning, obtaining and allocation of human and financial resources, and undertaking the initiative. Activities associated with undertaking the initiative may include: implementing the initiative, testing and obtaining feedback about the initiative from residents, refining the initiative based on the feedback, signing-off the initiative as complete, conducting a post-implementation review (Coltman et al., 2015).

However, even with an understanding of the importance of models and frameworks, as discussed, the failure rate of sociotechnical initiatives remains high. Although the models and frameworks may consider other disciplines, a more integrated approach may need to be embedded within them. The role of power and the transfer of power between disciplines may not be sufficiently captured in the existing frameworks and models. This may affect the visibility of the initiative across the organisation. For example, the knowledge required for the implementation of an initiative to be considered successful may include and require the support of multiple areas within an organisation. Furthermore, the models and frameworks should consider potential changes external to the organisation, including residents, and the effect on its supply chain, as well as the internal change to the activities of corporate services, operations, risk management and strategic planning.

A common standard applied by practitioners to determine the success of an initiative is if the initiative met three criteria: whether the initiative was completed on time, at the specified cost, with the agreed quality (Bloch et al., 2012). As digital technology driven sociotechnical projects came to prominence, it became more difficult to estimate how long it would take to complete an initiative (Dalcher, 2017). This may be attributed to factors including the effect technology has on stakeholders. For example, before a system is considered complete, potential customers are often invited to test the proposed solution. Prior to contemporary sociotechnical solutions, people would need to be physically present to test the solution and provide their feedback. A venue would be needed to conduct the test, staff from the organisation may need to attend to provide support. Currently, more tests can be conducted, with a broader audience in a more efficient manner, and particularly with systems now operating online, insights from more people can be captured and knowledge gained. This paradigm shift is an iterative cycle of the process. With this knowledge there is potentially more time to increase the quality of the initiative.

Process creation and management

Enhancing community engagement activities through the use of digital technologies may require existing processes to be changed or new processes to be created. These processes can influence the plans and strategies related to how an organisation manages and interacts with the community. The purpose of the engagement processes should be clear for the organisation and the residents. This may contribute to the perceived performance of processes and the organisation (Dijkman et al., 2015). The audience for the engagement should be clear. For example, is the engagement initially focused on the younger residents, or the older residents? This decision can influence the selection of the digital technology to be used, the processes needed, and activities needed to be undertaken to ensure the desired solution is accepted. Each process may need to be aligned to business plans and strategies, key characteristics of the process planned and documented, the process developed, tested, applied and reviewed (Rangone, Batocchio, and Ghezzi, 2015). As part of this initiative, old processes may need to be retired, scheduling for the transfer from the old process to the new process undertaken, staff trained and residents informed about using the new method of engaging.

Technology

Digital technology is increasingly at the core of initiatives to foster the exchange of information within an organisation and to engage and share information with stakeholders external to the organisation (Dubow et al., 2017). Information technology provides organisations with the opportunity to explore ways to meaningfully engage with stakeholders. Through this engagement, knowledge can be gained that may allow identification of potential trends for optimisation of services delivered by the organisation. To gain tangible benefits from such engagement, the initiative should be aligned to the organisation's vision and business strategy for community engagement (Coltman et al., 2015; Henderson and Venkatraman, 1993; Matt et al., 2015).

Application of technology

Multiple types of digital technology can be considered and applied by an organisation to engage with community residents. How the technology is deployed and used can change how an organisation engages with residents. Furthermore, in the planning for the application of technology, capabilities such as the ability to monitor activities, collect and share information, provide services and transact business need to be considered. How the technology is applied can save time, solve problems and contribute to the development of relationships within and external to the organisation (Boschetti et al., 2012).

3.6.4 Phase 4: Validating the conceptual framework

The process of validating the conceptual framework is outlined during this phase. The purpose of validation is to ensure the proposed conceptual framework is able to be understood by scholars and practitioners. The framework is meant to present a reasonable theory for stakeholders from different disciplines to gain an understanding of the actions required to create and successfully advance sociotechnical solutions for engaging residents through digital technologies.

During this phase, interviews with study participants validate the changes that occur in the use of sociotechnical models or frameworks. In reviewing data collected during the study, it is anticipated that there would be varying use of sociotechnical models and frameworks.

Ideal versus potential real conditions

Based on the acquired knowledge and experiences as well as an understanding from multiple data sources, the conceptual framework and ideal conditions are contrasted against emerging details of the perceived real conditions. This proved effective by providing insight into the gap between real and perceived conditions. For example, it is expected that use of a sociotechnical model or framework to guide community engagement and associated with knowledge management would be used by a majority of participants. However, within the real conditions, use of the sociotechnical models and frameworks may not be as prevalent as anticipated. However, new concepts and theories may assist in increasing the rate of the perceived success of sociotechnical initiatives that are based on digital technologies. In Chapter 5–Chapter 6, the findings of this study are presented and the gaps in practice (referring to the difference between current processes determined from the interviews, and an ideal situation described in professional knowledge) will be presented.

3.6.5 Phase 5: An enhanced or a new sociotechnical model or framework

As described in the research question, if this study finds that organisations participating in the study are yet to adopt a suitable model or framework, there is the opportunity to consider the reasons. This includes identifying potential strengths and weaknesses of their approaches to adopting digital technology and associated knowledge management activities. Understanding these strengths and weaknesses may assist in enhancing an existing model or framework or provide input for the creation of a new model or framework.

3.7 Descriptive themes

There are multiple realities and perceptions that can be considered as part of the data analysis. This section provides the researcher's interpretation of context and provides the reader with a basis for logical and congruent analysis and presentation of results. Recognising that there may be variations in views and the perception between the research and the reader, themes and descriptions are listed in the following Table 3.1. These themes and descriptions are intended to contribute to the accuracy and trustworthiness of the research process. This is achieved by providing insight into how and why decisions were made (Graneheim, Lindgren, and Lundman, 2017).

Table 3.1

Descriptive themes and how they are interpreted

Descriptive Theme	Description
Complexity	Requires the coordination of multiple actors, disciplines, processes and systems to deliver the desired information or service.
Digital technology and associated knowledge management	Digital technology can generate information that can be used to create knowledge for decision managing, and/or improving the manner in which services are provided. In this study, the term 'associated knowledge management activities' encompasses initial actions to determine knowledge management requirements or the process of data capture. This data may eventually be used for the purpose of knowledge management and used for the purpose of organisational decision making.
Iterative processes	Iterative processes are the repetitive cycles of an initiative or project. The repetitive cycle provides an opportunity for stakeholders to monitor and increase their understating of a situation or phenomenon. With this understanding, a decision can be made concerning the initiative or project. As an initiative or project goes through the cycle of repetition, new actors may be engaged, and existing actors removed from the project or initiative.
Initiative or project	An activity to change service from a current state of operation to the desired state. The desired state is usually an improvement over the current state. In this study, the term initiative and project are interchangeable.
Operational	The operational theme includes activities, networks and actors that undertake actions to achieve the vision, plans and strategies determined by the strategic networks and actors.
Strategic	The strategic theme includes activities to develop and facilitate actions to achieve a vision. Networks and actors working within the strategic theme provide governance for initiatives and projects. They also authorise the allocation of human and financial resources.

3.8 Summary

This conceptual framework aims to provide context and to describe and explain the models and frameworks to engage community residents through the use of digital technologies. The actors that form the conceptual framework draw upon multiple bodies of knowledge from multiple disciplines and provide an interpretive approach to social reality. Each actor plays an integral role and through the conceptual framework they are linked together to provide a comprehensive understanding of the research being undertaken. The conceptual framework has a six-phase qualitative process of analysis. The data is composed of various data sources that addressed the sociotechnical matters in question. The following chapter (Chapter 4) presents the research methods and design for this study, informed by the conceptual framework and the literature review (Chapter 2).

Chapter 4

Methodology

4.1 Introduction

This study considers actions to reducing the risk of community engagement and associated knowledge management and sociotechnical initiatives. This is done by investigating the potential opportunities and limitations of models and frameworks for transforming how WA community organisations engage and manage the knowledge of residents through digital technologies. I considered the possibility that the models or the frameworks used to help guide the transformation of how community organisations engage and interact with residents through digital technologies are insufficient. If this is the case, then insufficiency may lead to the high failure rate of initial efforts to transform community engagement and the associated knowledge management process.

This chapter describes the philosophical stance (refer to Section 4.2), research design (Section 4.3), data sources (Section 4.4), data collection, reduction and research instruments (Section 4.5), and data analysis (Section 4.6), the role of the researcher (Section 4.7), ethics, reliability and validity (Section 4.8), followed by the conclusion (Section 4.9).

4.2 Philosophical stance

This study's philosophical stance is aligned to knowledge management within the discipline of Information Systems (IS) which is based on the disciplines of social sciences and humanities, and is considered suitable for sociotechnical research (De Villiers, 2005; Schultze and Leidner, 2002). This IS-based approach also aligns with the views of Carlile (2004), who argues for developing practical yet innovative activities to address real world problems, coupled with general principles of design to guide future decisions.

4.2.1 Interpretivism

The theoretical epistemological position for this study is interpretivism. The interpretivist paradigm assumes that reality is produced through social constructions, which include language, consciousness, and shared meanings (Myers, 2013). In contrast, positivism assumes there are indisputable truths, and that generalisation and causation can lead us to the 'truth'. This research studies systems that involve human and non-human

actors and networks that interact within and across organisations, and between organisations engage with other people to achieve common outcomes.

Interpretivism has been adopted for this study because of the subjective and formative nature of the study. A brief example of the interpretivist nature of this study is the interaction of human and non-human networks. These networks are influenced by, for example, rhetoric and discourse and change over time to achieve the desired outcomes (Weber, 1997). Throughout these interactions the awareness, understanding, and perspectives of people are influenced and changed, and this can lead to the evolution of process and practice.

The interpretivist paradigm allows for context and contours that are inductive. Interpretivism allows for individuals' accounts to inform explanations of why and how particular ways of community engagement and its alignment to knowledge management have evolved. This approach enables participants to discuss specific aspects of their situation and provides the researcher with opportunities for new explanations to emerge. This is important, given it is an exploratory study in an emerging area where there are substantive gaps in knowledge. It also permits a better understanding of underlying approaches, strategies, and perceptions of success related to organisations' engagement with residents, and endeavours to capture and manage community knowledge.

4.3 Research design

The study design consists of "concepts, assumptions, expectations, beliefs, and theories that support and inform" this research (Maxwell, 2012, p. 39). The design clarifies concepts, the purpose and relationships being investigated, with the aim of providing the context for interpreting research findings based on appropriate theory.

This study is an exploratory, qualitative design, in keeping with the emerging nature of knowledge development in this area. A key aspect in considering the integration of community and digital technology is whether the integration can result in sustained change and development across a variety of social, economic, and political networks within a community. To gain some understanding of how changes have evolved, and the extent to which these have been durable, the study incorporates a longitudinal study of comparative cases. The inductive study design enables divergent experiences to be documented at each site. This approach will offer insights into the extent to which local context is important and identify common elements across the participating organisations. The longitudinal

aspect of this study enables the researcher to determine the ways in which sociotechnical integration has evolved over time, in order to examine its influence upon how organisations use digital technologies to interact with community residents. The findings of the comparative cases will indicate the similarities or differences of integration approaches and the affects of such integrations.

4.3.1 Matters influencing research design

Practical factors influenced the design of this study. An example is that the author is based in Perth, WA, employed full-time, has family commitments and limited financial resources. These matters contributed to the rationale for identifying and inviting organisations to participate in this study. The rationale included the cost associated with travel and accommodation to visit locations outside of the Perth metropolitan area, and the distance to travel by car from Perth, WA, to regional areas to conduct the research.

Once potential locations were determined, organisations within these locations were identified that were considered responsible for or were aiming to take a prominent role in the sustained engagement with community residents through the use of digital technologies. It should be noted that during the first wave, there appeared to be interest from both public and private sectors to fulfil the role of being the lead in community engagement activities (Sellar, 2001). The interest of the private sector did not seem to be as prominent during the second wave of interviews. Preliminary discussions were subsequently held with organisations to gauge their willingness to participate, and to identify the appropriate person to participate in an interview for this study.

The study was conducted over two waves. During the first wave, the Delphi Method was used to reach a consensus view. The Delphi Method involves identifying and enlisting participation of a group of experts. For this study, the five experts for the first wave were the people identified to participate in this study. The experts were assured they would remain anonymous through the process. As part of the Dephi process, the transcripts from their respective interviews were summarised into one document and distributed among participants for review and feedback. Ideally, this process would continue until a consensus view was reached. The process to obtain consensus can be repetitive and can take more time and effort than some participants are willing or able to give. In this instance, the experts did reach consensus during the first iteration of the document. At the conclusion of this initial wave, consensus was reached regarding the focus, themes and challenges of the study.

4.3.2 Genesis of the longitudinal study

The second wave of the longitudinal study occurred 10 years after the initial wave. This second wave of interviews was not initially planned. However, after the first wave, personal and professional aspects of my life affected my studies. During the first wave of this study, I had a wife, two children, and worked full-time within the WA public sector. Although I completed a Master's degree, without first attaining an undergraduate degree, I lacked the confidence in academic writing and how to structure and present my research. Upon reflection, I found this time of my life difficult and challenging. I attempted to balance family, work and study. I wanted to be successful as a husband, parent, employee and student. This challenge was compounded by the death of my father toward the end of the first wave of this study. Shortly after my father's death, my marriage broke down with divorce the result. These challenges took time and effort to overcome. However, I was determined. My interest in sociotechnical research remained high and relevant to my work. I enjoyed study and wanted to complete my PhD. I changed universities and supervisors and continued my pursuit of my PhD. I recommenced my studies with the first wave of interviews completed. An appropriate option was to progress the research as a longitudinal study.

Longitudinal research involves the study of evolving phenomena over time (Halinen and Mainela, 2013). This study had evolved into data collection at two points in time: the initial data collection commencing in 2006, and the second collection completed in 2018. The longitudinal study includes revisiting the organisations that initially participated in this study and where possible, reinterviewing each participant. The questions used for the second wave would be as similar as possible to the first wave. Organisations were contacted and most participants who were involved in the first wave were willing and available for a second wave of interviews with two exceptions. One exception was that a private sector participant ceased operating as a business. Another exception was that a participant from a metropolitan organisation was not available. However, a former local government council member from the same community as the metropolitan organisation agreed to participate in place of this person in the study.

In preparing for the second wave of interviews, the research conducted during the first wave was reviewed. My thinking, professional experiences, technology and its use evolved since the first wave of interviews. The thinking was to determine if the general themes and issues identified in the first wave were generally the same. If they were the same, it may be of benefit to better understand how human and non-human actors

interacted, why they interacted to try to achieve the desired results. It was also recognised that to achieve the desired result, organisations would need to evolve as their project evolves.

The possibility that the initial interview may have influenced organisations participating in this study to undertake actions that are reflected in the second interview is recognised. This aligns with the rationale for this longitudinal approach and the assumption that tangible changes have occurred over time in how communities used and integrated digital technology to service and support their social, economic, and political networks. Therefore, it was determined to be important to examine this change over time, given the changes in how technology can influence and work within the community (Brynjolfsson and Hitt, 2000), and in view of the findings that integration can be beneficial and evolve over time (Kingsley et al., 2014). Collecting data over this time period provides insights into the process of integration along with its benefits and/or outcomes.

4.3.3 ANT as a method

As established in previous chapters, a review of the data collected from primary and secondary sources suggested that ANT was a useful theoretical lens as well as a method in which to analyse, interpret, and explain the data gathered from the organisations. ANT has also been applied as a method to identify reasons for IS projects failing in organisations and then used to guide their recovery (Pollack et al., 2013). ANT was adopted because community organisations' engagement with residents is a relationship-based sociotechnical activity, in which people, text, devices, and infrastructures take the form of interdependent networks. ANT focuses on the ability to trace intricate networks and their associations with human and non-human networks (Doolin and Lowe, 2002).

ANT was used in other studies to analyse, describe and guide complex projects; to foster changes to organisation practice and behaviour through digital technologies (Linde and Linderoth, 2006); and to assist people to recognise then consider the consequences of intended or non-intended actions and unpredictable behaviour related to digital transformation projects (Pollack et al., 2013; Sage, Dainty, and Brookes, 2011). These ANT concepts align well to the needs identified in this study.

This research, through the framework described in this study, aims to synthesise the complexities concerning interdependence of the human and non-human actors and activities to guide changes to organisational practice and behaviours through digital technologies.

4.4 Data sources

Data sources for this study included primary and secondary sources. Semi-structured interviews were the primary source of data. The intention of the interviews was to help me better understand and explore opinions, behaviours and experiences of participants involved in strategic and/or operational activities of using digital technology as part of the community consultative process.

Secondary sources included academic articles, annual reports and other government reports and publications, research reports, news reports and commentary, magazine articles, websites, podcasts and social media. Secondary data sources allowed this research to consider theories in a broader context and contribute to strengthening reliability and validity of existing theory (Bowler, Julien, and Haddon, 2018). Specifically, insight about current and proposed consultative activities, plans and strategies of respective organisations' digital and face-to-face interaction with their community members.

Table 4.1

Data types, sources, and purpose

Data type	Data source	Purpose / Information collected	Data links to research question and objectives
Primary	Interviews	How the participants perceive the world, experiences associated with their organisation's past, present and future community engagement activities	Opportunity to understand and explore opinions, behaviours and experiences of participants
Secondary	Annual reports and government reports and publications	Information about the organisational vision, mission, strategic initiatives, emerging operational focus, digital and non-digital services for residents	Validate chronology of events and accounts of key developments in the organisational cases
Secondary	Research reports	Comprehensive background information about community engagement, application of knowledge management, organisational change initiatives	Background information to support understanding and validation of data collected from interviews
Secondary	News reports, commentary and magazine articles	Emerging development, potential organisational opportunities and threats	Contributes to process for validating the chronology of events and accounts of key developments in community engagement
Secondary	Websites and Social media	Organisational operational insights, application of digital technology and knowledge management	Background information and to provide links to past and contemporary development. Provides a link to news and other online resources

4.5 Data collection, reduction and research instruments

To investigate the strength and weaknesses of models and frameworks that may be used to transform how WA community organisations engage residents and manage knowledge obtained through these interactions, data was collected, reduced and analysed. Multiple data collection methods were employed to help gain in-depth knowledge from a variety of perspectives, including past experiences and current frames of reference (Xu, 2003). Triangulation is assured by multiple data collection methods, allowing a substantiation of findings (Eisenhardt, 1989) that are data rich, thus providing validity and reliability and increasing confidence in the findings of the research data (Thurmond, 2001).

Section 4.5.1 and Section 4.5.2 briefly describe the data collection and reduction processes for the first and second waves of the research. Section 4.5.3 briefly outlines how data collection and analysis from waves one and wave two contributed to development of the framework.

4.5.1 Data collection

The data collection process commences with the identification of organisations as study participants. The criteria for selecting suitable organisations to be involved in this study included the requirement that they engaged residents through digital technology. Furthermore, organisations would use this technology to provide information to residents within their geographical community. Once the organisations were identified, they were invited to participate and to select an expert to represent them and act as a contact point. Written consent was then obtained from each participant, and an outline of the interview process was provided to the representative. Interviews were scheduled and reminders were sent and questions the representative had were answered where necessary.

In relation to participant selection criteria, it was required that those interviewed have a role and/or responsibility in the leading or managing processes associated with community engagement and/or knowledge management through the integration of geographical communities and digital technology. This might include people with a leadership role on matters relating to integrating digital technology and the community, and/or people creating a culture within their respective organisations to support community knowledge management and related processes.

The identified person was then invited to participate in the study. First, they were called and briefed about the research, and then asked if they were interested and willing to

participate. This verbal request to participate was followed up by a formal written invitation. Each participant accepted the invitation to participate in the first wave of the study. The locations for the interviews were selected by the participants. For both waves, the interviews were conducted on the premises of the participant's organisation. The duration for each interview was scheduled for sixty minutes.

The interviews conducted for the first and second waves consisted of similar structured, open-ended questions. The interview schedule consisted of three parts. Part A consisted of questions about the organisation, and depth of experience with community engagement through digital technologies. Part B of the interview consisted of questions about how the community engagement projects were guided and operated. Part C provided the opportunity for the participant being interviewed to provide additional information if they were interested in sharing. The interview questions for the first wave can be found in Appendix A and for the second wave in Appendix B. During the first wave five interviews involving six interviewees were conducted. During the second wave there were four interviews conducted with four participants.

Table 4.2

Organisations interviewed, number of interviews, and position of those interviewed

Organisation and location	**No. of people interviewed**	**Position of interviewees**
FA1 (Metropolitan WA area)	Wave 1: 1	General Manager
	Wave 2: 1	Former City Councillor
FA2 (Metropolitan WA area)	Wave 1: 1	Manager, IT
	Wave 2: 1	Same as Wave 1.
FA3 (Regional WA area)	Wave 1: 1	Chairman
	Wave 2: 1	Operations Manager
FA4 (Regional WA area)	Wave 1: 2	Business owners
	Wave 2: 0	No longer operating as a business
FA5 (Metropolitan area)	Wave 1: 1	A leader within IT
	Wave 2: 1	Same as Wave 1.
Totals interviewed		
Organisations, Wave 1: 5	People, Wave 1: 6	
Organisations, Wave 2: 4	People, Wave 2: 4	

4.5.2 The first wave: Purpose, data collection and reduction

Data was collected from primary and secondary sources, with the interviews from the case organisations being the initial data set. This data would become the benchmark to compare with data from the second wave of the longitudinal study. For both the first and second waves, the interviews were transcribed, and the draft transcripts were returned for review. This process of member checking was used to confirm that the transcripts were a true reflection of views expressed during the interviews.

After the completion of the interview and transcription process, concepts of Henderson and Venkatraman's (1993, 1999) IS strategic alignment model (SAM) were used to guide data coding of data sources. SAM is considered influential and transformative and since its introduction in 1993, SAM continues to reveal the positive effects of human and non-human alignment and interaction of business strategy and IT actors (Coltman et al., 2015). The coding reflected how the model's four key artefacts, business strategy, IT strategy, organisational infrastructure and IS infrastructure, interacted with one another. The primary data was reduced and categorised. All reductions can be traced to their data source.

During the first wave, the Delphi Method was used as a guide, to reach consensus from participants concerning the accuracy of the themes and their interaction. During the first wave, I adopted the Delphi Method as a form of member checking and to gain consensus of focus of the research and the themes identified from the data, including their transcripts. In using the Delphi Method, the document distributed to seek consensus was formatted in a way to ensure the contributors remained anonymous. All participants willingly participated in the Delphi Method process and consensus concerning the research focus, the themes and challenges was reached during the first cycle. Although I was satisfied that the Delphi Method was appropriately followed, that the response rate was 100 per cent and that the results were meaningful, I considered the lack of dissent from the experts a concern and a potential weakness. One participant suggested a correction, but this change was not considered significant.

Therefore, after a review of the data, including new transcripts from the second wave, I concluded the results would be similar to those of the first wave. Instead of conducting a second Delphi study, I used a simpler member checking process: the interview transcript was returned for comment or additions.

4.5.3 The second wave: Purpose, data collection, and reduction

The purpose of the second wave was to capture changes since the first wave in how the community organisations engage with residents and manage knowledge from these interactions through digital technologies. For the second wave of the longitudinal study, data was again collected from primary and secondary sources. As part of the interview process, the questions reviewed and slightly modified (e.g., the word online replaced with digital). Another change was that the thematic coding was more aligned with ANT terminology. ANT terminology also aligned well with the themes emerging from the first wave of the longitudinal study. With the adoption of ANT the interaction within and between the themes were able to be better explored, adding depth to how the findings influenced and interacted with one another.

Primary data collected from the first and second waves allowed analysis about the evolution of the vison, strategy and the adoption of models and frameworks used to assist with guiding how the community organisation engages with residents through the use of digital technologies and manages knowledge from these interactions. Secondary data provided insight into the similarities, differences, subtleties and complexities involved with engaging residents and associated knowledge management activities through the use digital technologies. With this insight, I anticipate a better understanding of how a model may align actors and networks to guide sociotechnical projects and identify potential improvements to help improve the success rate of such projects.

4.6 Data Analysis

The data analysis process commenced as soon as I collected the first set of data. I undertook data analysis as an iterative process. This means that what I learned from the data first gathered from an article of literature or an interview helped me learn and consider when reviewing other documents, or what questions to ask during subsequent interviews.

4.6.1 Step one: Analysis and themes derived from data

This step involved the collection of and coding of data from primary and secondary sources and considering potential topics and themes. The data analysis process started with reading of the literature and the transcripts from the interviews. This assisted me to identify actors, their networks and their focus.

During the first wave, I adopted the Delphi Method to seek consensus on the research focus, the themes identified from the data, including their transcripts, and the challenges

to sociotechnical projects. The Delphi Method is a structured process of collecting and refining knowledge from a group of experts. Experts are invited to respond to a series of questionnaires and provided feedback in a controlled manner until a consensus is reached (Brown, 1968). The Delphi Method is used to facilitate problem solving and to assist model development. It is also considered well suited to capture qualitative data (Skulmoski et al., 2007). A strength of the Delphi Method is that it consolidates the testimony of multiple experts into a common perspective.

According to (Skulmoski et al., 2007) criteria for experts are based on:

1. knowledge and experience with issues being investigated;
2. capacity and willingness to participate;
3. sufficient time to participate;
4. effective communication skills.

The number of experts participating in the Delphi study depends on the number of experts available. According to Rowe and Wright (1999) between five and twenty experts is considered sensible, with small groups or panel (comprising three, five, seven, or nine experts) resulted in no clear distinctions in the panel's accuracy. Furthermore, it is also suggested that the smaller the panel of experts, the more opportunity for more in-depth feedback.

The Delphi Method process allow the development of group judgment in a manner that reduces or eliminates direct confrontation of the experts, reduces the risk of individual bias, or the "follow the leader" tendencies of group meetings (Brown, 1968; Dalkey and Helmer, 1963). The process used to reach a consensus through the Delphi Method also allows the experts to abandon or refine their previous views and opinions with reduced reluctance (Rowe and Wright, 1999). The Delphi Method is also used when there is incomplete knowledge about a problem or phenomenon (Skulmoski et al., 2007).

The strength of the Delphi Method is that it incorporates education and consensus building into the multistage data collection process, enabling general agreement (Rayens and Hahn, 2000). Delphi is also beneficial in situations where the experts are geographically dispersed and not able to meet as a group (Rowe and Wright, 1999) as was the situation for this study in which the experts were geographically dispersed in the metropolitan and regional areas. A weakness of the Delphi Method is that they can require a great deal of time, in particular if there are multiple questionnaires to gain consensus (Skulmoski et al., 2007).

When adopting an interpretive approach, a common dilemma is the management of the quantity of material that is a result from gathering data from the literature and transcripts without discounting the data before determining if it has an integral role or not. To help solve this dilemma a more descriptive model is used. The model evolved between the first and second waves of this study. For the first wave the initial themes were titled "process" and "product". Under the process theme the focus was on activities to undertake change. This encompassed management activities, including culture change. Under the product theme, the focus was on process and technology networks that supported outputs.

For the second wave, I revisited the themes identified during the first wave. I found that the "process" and "product" themes used during the first wave to be ambiguous and confusing. After reviewing the data, the similarities appeared to align with the themes of "strategic" and "operational" in place of the first wave themes of process and product.

The themes evolved, were refined and clarified across the process of data analysis. The category titles of culture, process and technology remained the same as during the first wave. The survey instrument questions for the first and second waves remained similar. A difference between the two interview instruments was the use of the term online. This model embeds Callon's four stages of translation (i.e., problemisation, interessement, enrolment and mobilisations) throughout my interpretation of sociotechnical aspects obtained from the data.

I used the conceptual framework to describe, understand, and analyse how the different actors focused their attention and efforts to engage community residents and manage the knowledge from these interactions. Through the model, I was able to consider assumptions, and the effect of different scenarios, actors, networks and focal actors. I was able to consider the behaviour of actors and networks described in the literature and contrast to those of the interviews, seeing their connections, and following the path between actors and networks to consider the effects. This process was not about simply collecting and inspecting data and labelling common topics and themes, but to analyse in a methodical and systemic manner through an iterative process. Through this process I was able to identify patterns, relationships and common themes.

As part of this iterative process, I went back and forth between the data and the emerging narrative. As part of this narrative I was able to align a number of actors, networks and activities to form a journey from a current position to a desired position of actors and networks. During this process there was continuous interplay between reviewing of the literature, the interview transcripts, and translating them into writing. As

I worked through this process, it helped me refine and improve my focus on matters that are important but may have otherwise been taken for granted, or gone unnoticed.

Concerning the interviews, they were viewed through the ANT lens. The interviews were treated more as a narrative that contributed to better understanding the actors, their networks, stage of translation and interactions. Within ANT, interviews are not necessarily considered as facts or represent reality as it is (Ponti, 2010).

4.6.2 Step two: From the analysis, a narrative is developed

During the first step, the analysis focused on development of themes and their interaction. During this stage, the construction of a research narrative for community engagement and associated knowledge management is presented. The goal of this narrative is to outline how the data was able to create a journey that involved actors, their networks and how they interact with one another. This involves the examination of the interaction, including the translations, between actors and networks for a sociotechnical initiative – in this instance, community engagement and associated knowledge management activities.

With the themes identified in stage 1 coding, the data can then be organised in an order and structure that allowed coherent narrative. From this coherent narrative I was able to create a journey which commenced with the initiation of the sociotechnical initiative, to the end of a cycle. At the end of the cycle, the knowledge gained during the journey can be the catalyst the next cycle of the initiative. This cycle consists of a sequence of actions captured by and within the themes. The themes reflect actors and networks that are influenced to undertake actions for a particular purpose. Within the themes of the strategic and operational, data was able to be further categorised into networks of leadership and management, culture, process and technology. Leadership and management as well as the culture network aligned to the strategic theme, while the process and technology network aligned to the operational theme. From this, I was able to examine how a series of activities that involve the interactions of actors and networks resulted in outcomes. The data helped me understand how the activities unfolded and how the actors and networks responded to one another. Through this analysis, the narrative, the activities and the journey was able to be replicated, and not just depend on the intuition of the researcher. The results of the journey can also be influenced by the interpretations and decisions of those making the journey.

As part of this stage, in both the first and second waves, my goal was to examine the connections between the actors and the networks, the roles of the actors in the networks,

and how and why they influence one another. To understand these interactions, I needed to unpack the narratives of the actors and their networks. I needed to consider what in theory was expected to occur, learn the expected results and determine what actually did occur and why. I had to consider how the actors and the networks responded to different situations, and the results of the responses. I also had to consider if there was a consistent pattern of action from the actors and networks.

Through the lens of ANT influence of circumstances on an actor or network can be traced. This process of aligning actors and networks to focus on a common interest of fostering change from a current state or situation to a desired one requires them to interact and collaborate. Analysing this process can be daunting because of the variety of actors that are involved and the number of associations that may need to be considered. This can result in a complex and dense number of relationships. To help me better understand this complex tangle of relationships I constructed a sequential series of events or activities. Some activities may be essential points in the translation journey. My assumption is that the analysis of these activities and their translation can lead to a better understanding of the risk involved in community engagement and knowledge management, and it can lead to activities to help mitigate these risks and therefore enhance the possibility that the sociotechnical initiative can be considered successful by stakeholders.

4.6.3 Step three: Development of the sociotechnical model

This step involved the search for patterns across the focal actors participating in this study. These patterns highlight similar findings across all the focal actors regarding the sociotechnical activities that interact with community engagement and associated knowledge management activities. Some characteristics identified may be relevant or interesting to other fields that have an interest in sociotechnical projects, or in how the model may assist further understanding the effect of digital technology on society and business. During the analysis of the data, I attempted to make clear the relevance of the findings to new settings or cross settings for the purpose of enhancing the generalisability of this research and also to provide a resource for other academics and professionals involved in complex sociotechnical projects.

4.7 Role of the researcher

The role undertaken by the researcher to perform this qualitative research included isolating, defining, and identifying themes from issues related to transforming the community engagement and knowledge management processes through digital

technologies. This involved planning and designing a methodological approach which contributed to the type of interviews that were conducted. The researcher conducted interviews with specified open-ended questions to elicit detailed responses from interviewees. The interviews were digitally recorded, transcribed, coded and analysed by the researcher. At the conclusion of this process, the data was verified and the findings reported (Fink, 2000), bearing in mind that the role of the researcher includes the ability to be reflective, and examine without claiming epistemic superiority (Mahmoud, Jerneck, Kronsell, and Steen, 2018).

4.8 Ethics, reliability, and validity

Validation incorporates the extent to which honesty, depth, richness, and scope of the data are achieved, the appropriateness of the participants, the extent of triangulation, and the objectivity achieved through the process. To help ensure validity, the researcher avoided ambiguous instructions, terms, and questions (Cohen, Manion, and Morrison, 2007). The information obtained from interviews was reviewed and verified by those interviewed.

Two primary considerations for validity that affect this research are internal validity and external validity. Internal validity is concerned with how well the findings or conclusions reflect the experience – in particular, if the essence of the problem and solution are adequately captured. External validity is concerned with the credibility of the findings and whether they can be generalised in similar circumstances to those described in the study (Cohen et al., 2007). Validity and reliability are the tenets of trustworthy or rigorous evaluation (Cohen et al., 2007; Morse, Barrett, Mayan, Olson, and Spiers, 2002). Verification strategies were adopted to ensure validity and reliability. These strategies consist of methodological coherence, appropriateness of the sample, concurrent collection and analysis of data, theoretical analysis, and theory development (Morse et al., 2002).

4.9 Conclusion

This chapter outlines the research methodology and methods to answer the study's research question and objectives as identified in Chapter 2. Framed by an ANT theoretical foundation, this study used interviews and cases in a triangulated methodology. The methods of data collection described in this chapter included: processes for determining the research data to be collected, the identification of the sources of data, data categorisation, linking coded data to appropriate theme, how the themes interact and transcript verification. The changes of methods between the first and second waves were discussed. The strengths and limitations of the methods were also presented.

Chapter 5

Findings: First Wave of Interviews and Observations

5.1 Purpose and chapter structure

For this longitudinal study, two waves of interviews and observations were conducted. The two waves helped the researcher gain a better understanding of how community organisations used digital technologies to engage with and manage knowledge of residents. This chapter presents results from the first wave of interviews, observations, and analyses of five organisations that participated in this study. In the following chapter, the results for the second wave interviews are presented. Research interviews for the first wave were conducted between 2006 and 2007.The participating organisations, referred to as focal actors, use digital technologies to engage residents and associated knowledge management activities for residents in the communities where they are located.

The five focal actors are from differing WA local government areas, with each local government area consisting of multiple smaller communities. The interviews and observations provided an understanding of how focal actors operate in relation to engaging with multiple networks and human and non-human actors. This includes how knowledge from community engagement was captured, managed, and used. The chapter concludes with a discussion of insights obtained, with a focus on those that influenced the approach towards the second wave of interviews and observations.

5.2 The organisational cases

Each case discussed in the following sections includes background information about the community from the Australian Bureau of Statistics (ABS) to capture the demographics at the two points of time when this study takes place. The background information about each community also includes general information about focal actors responsible for community engagement and knowledge management activities. Furthermore, as described in Chapter 3, this study consists of longitudinal research with data collected from participating community organisations at two points in time: the initial data collection commencing in 2006, and the second collection completed in 2018. Changes in community engagement activities during this time are reflected in the cases. Each of the cases is structured as follows:

1. A description and overview of the geographical community includes information about the location, population, key demographics, and main industries of the communities. This is intended to give the reader a sense of the diversity of communities and their commonalities. It is also an important context for understanding the scale of focal actors' efforts to integrate community engagement and knowledge management activities. For example, a community with a higher percentage of aging residents (e.g., above 59 years old) may be more reluctant to integrate technologies compared with a community with a higher proportion of younger people (e.g., 25-34 years old). Local government boundaries have been used to define the size and demographics of the communities. The boundaries generally encompass a city as the "hub" or focal point of information and service provision but may also include surrounding suburban areas and regional towns.
2. An overview of the catalyst driving community engagement knowledge management activities for the organisation is presented. This section covers the leadership and governance activities to guide the initiative.
3. Then there is a discussion of the activities associated with the collection and dissemination of community related knowledge.
4. Participants' views concerning the sustainability of their community engagement and knowledge management solution are presented.

Quotes from the interviews are used to provide context for each case and the findings. Where quotes are attributed to particular focal actors, only the specific position of the interviewee is given to ensure strict anonymity and confidentiality. To maintain the anonymity of study participants, during both the first and second waves, information such as the exact population and demographics at the time of the interviews was not used.

5.2.1 Case 1: Focal actor supporting community 1 (FA1)

Case 1 overview

This focal actor is a public sector organisation that supports multiple communities within a defined local government area (LGA) in the southern metropolitan area of Perth, WA. The interviewee for the focal actor was a General Manager and a member of the focal actor's executive team. The interviewee was responsible for the information technology division, as well as a number of other business units. At the time of the first wave interview, the focal actor had over 200 staff and supports a city and multiple suburban communities with a population greater than 40,000 people but fewer than 100,000.

The following demographic information intends to provide a brief insight into the relationship between residents, industry and the local economy. The key age demographics for FA1 during the first wave interview included the following:

- 16% of the population aged 25–34
- 21% of the population aged 35–49
- 12% of the population aged 50–59
- 9% of the population aged 60–69[1] (Australian Bureau of Statistics, 2016, 2020).

The largest service age groups within the LGA are parents and people eligible to build a new home or able to undertake significant renovations of their own home. This service group is known as homebuilders by the ABS (Australian Bureau of Statistics, 2020; The Treasury, 2020). This key demographic consists of people aged 35–49. Some 59 per cent of people within the LGA had access to the Internet and were therefore able to engage and interact with FA1 through the use of available digital technologies (Australian Bureau of Statistics, 2020).

Regarding the economic focus of the community, within the recognised local government boundaries of the focal actor, operate a mix of residential, commercial and light industrial businesses. The city is located close to major transport hubs for rail, road and air ([FA1], 2017). The three main industries during the first wave according to Australian Bureau of Statistics (ABS) 2016 are:

- retail trade
- healthcare and social assistance
- construction.

Catalyst, leadership, and governance for community engagement and knowledge management

The representative for FA1 stated that their online presences started in 1997 through their website and were used to complement traditional paper-based content (e.g. newspapers and newsletters). The catalyst for their online presence was the "provision of information about the organisation, the businesses in the area, community activities … giving people access to information" (FA1 2006).

[1] The key demographic tables concerning each focal actor (FA) do not include age groups unlikely to be current drivers or involved in discussions regarding industry and the local economy.

Regarding leadership and governance, during the Wave 1 interview, FA1 managed online presence. Their online presence primarily consisted of their website, social media accounts and associated operations to support and maintain these services for the organisation. Within FA1, staff members engaged to lead, manage, and operate community engagement and knowledge management activities included a combination of executives (4), managers (5), technical staff (up to 2), and operational/administrative staff (2). Staff managing and operating digital solutions to deliver, engage and share knowledge with community residents performed their roles as part of wider roles or part-time. This initiative was led by an executive committee that guides community engagement plans and operations. FA1 stated:

> … executives all are involved in determining what goes [on]. What's in there. Virtually everyone's part-time, it is very rarely we have anyone full-time dedicated to it. At some point we will a have … a manager deciding what goes in, what's in there ...

Regarding who determines the content that was to be made available online, FA1 stated:

> It's usually determined at the managerial level – they decide the need to get information out there and available to the community … there is currently a process in place where we have a publisher, an editor and an approver in terms of the content management.

For the technical management of their website, the FA1 representative said "… we actually outsource the process. It'll all be changing shortly." The FA1 representative stated there was uncertainty about the future role of the executive committee in relationship to overseeing the content of their website. The executive committee had responsibility for setting strategic directions and should not directly be involved with matters such as selecting content for delivery to residents.

The FA1 representative stated that although they had business plans, these did not address their online presence or knowledge management activities. Furthermore, this representative stated they did not have processes converging content from physical and electronic content or how to leverage knowledge from the online solutions to better understand the needs or views of community residents.

FA1 does not use volunteers as a resource to support their online community engagement and knowledge management activities. FA1's activities, including their digital technology solutions for engaging with residents and creating community knowledge, were funded through State and Commonwealth grants and supplemented from revenue generation activities such as taxes and fines.

Content collection, dissemination, and target audience

Regarding content creation for the community, FA1 stated that business units are the primary producers of information for delivery to the community through the various digital (e.g. website, email) or non-digital (e.g. mail) delivery channels. FA1 highlighted that managers from the business units identify and provide the content that will be provided online.

The representative for FA1 stated that the residents are the primary audience for the content, followed by businesses. The information that FA1 makes available to the community can be categorised and prioritised as follows:

1. Social content was considered the highest priority. However, the FA1 representative stated that "… social interaction is probably fairly way down the list at the moment in the context that the website itself is not interactive". Furthermore, the FA1 representative stated residents did not have direct input into the selection, or the creation of online content: "… at the moment, there is a feedback mechanism, yes, but it is not tied to any particular process at this point, [perhaps] at some stage in the future".
2. Economic/business content: FA1 sought to enable "… people to access and find out about the City and opportunities that we might have to develop and enhance their business in the City whether they are internal or external to the area".
3. Political content is not supported. Concerning the provision of politically related information, the FA1 representative stated "I suppose if you are talking about political in the context of parties and party politics in Australia, no. If you are talking about political in terms of local political environment having an impact on what local elected members are undertaking, how they go then yes, absolutely".

It was the view of FA1 that in five years' time these priorities would probably remain the same.

During the period of the first wave of interviews, the information can be interpreted to mean that the content management process was didactic and not intended to be interactive or shaped by those who were the targets of the information. Digital technologies were not being used in a structured, generalised manner to interact or gather data from residents – they were only used as another form of one-way communication.

During the interview, the representative for FA1 stated their organisation shared community information through a combination of traditional channels such as counter services, letters and newsletters, and digital channels (e.g. website, email, phone, fax etc.). FA1's website is hosted by a third party.

In response to a question regarding the availability of an archive by the focal actor, the representative for FA1 stated they have an archive, with limited public access to it. This archive belongs to FA1 but is maintained by the organisation that hosts their website.

Sustainability of the community engagement and knowledge management solution

In Chapter 2, challenges to sustainable community engagement solutions were identified. These included challenges involving leadership and management, culture, processes and technology. Participants in this study were asked to consider their level of maturity against these focus areas.

The FA1 representative considered that they were operating at the adoption stage concerning activities to influence the culture of the focal actor and community. Leadership and management, processes, and technology within the focal actor were considered as being at the integrated level of maturity.

During the interviews, the focal actor's representative gave examples of several activities being undertaken to influence their culture. These included creation of a communications plan that outlined how the focal actor would interact with stakeholders. However, during the interview, there were no specific aspects of the communications plan devoted to the adoption and use of digital technologies. FA1 stated they promote community engagement through word-of-mouth and interactions with other communities. Print media is also used to interact with the community as well as through their website, email, phone, counter services and "…faxes obviously, those newsletters and bulletins, a whole range of strategies for communicating" to inform members of their community.

The representative for FA1 stated their organisation provides training that covers a broad range of topics available to staff on an as-required basis. Some of this training forms

part of their employment conditions. The training offered does not appear to offer content specifically related to current or potential community engagement or knowledge management activities. Neither was it evident from the interview that there was a strategy or plan to develop the capacity of staff on matters related to community engagement and knowledge management through the use of technology. The focus for future development is to increase opportunities for online interaction with the community. In addition to the creation of a new, more user-friendly website, FA1's efforts include planning and developing services to provide information and the ability to transact with residents. This effort to change process to increase interaction, to inform and transact with residents is supported by FA1 that stated:

> … interactivity is another aspect to it, currently people can pay their rates and debtors' account. Enhancement of these processes will enable payments basically of all they're able to obtain from the organisation. Access to these systems are [is] currently available, we just haven't had the opportunity to progress them to the pre-lodgement [stage] for things like planning and building applications. They *[community]* will be able to go in and find out about zoning of properties and what they are able to do before they actually go ahead with the property. The ability to inquire on your own rates accounts and have a look at what's outstanding, that's an opportunity out there.

The representative for FA1 went on to state:

> [We are also interested in] customer requests online … we're currently handling those in the very system that can deal with that, but [we are] handling those [requests] over the counter, on the phone, that sort of thing. [The ability to] log-in and lodge an online request. So, one of the biggest focuses I suppose is the interactivity of the system and bringing the community closer to the organisation, in that context.

5.2.2 Case 2: Focal actor supporting community 2 (FA2)

Case 2 overview

FA2 is a public sector organisation supporting multiple communities within their LGA south of the Perth metropolitan area of WA. The interviewee for the focal actor was the manager of their information services division. The responsibility of the interviewee

includes leading the Information Management, Spatial Services and Information Technology branches. The Manager reports through a General Manager to the Executive Team. The focal actor has over 400 staff. The FA2 provides a broad range of services that include building and maintenance of roads, bridges, footpaths, drainage, waste collection, water and food inspections, immunisation, and noise and animal control. FA2 manages and maintains community recreation facilities that include libraries, a museum, leisure centres, sports areas and a number of parks. FA2 also undertakes services to support seniors, youth , and people with disabilities ([FA2], 2007a, 2007b). These services support a city and multiple suburban metropolitan communities with a resident population of approximately 100,000 people.

The key age demographics for FA2 during the first wave of interviews include the following:

- 10% of the population is aged 18–24
- 15% of the population is aged 25–34
- 22% of the population is aged 35–49
- 13% of the population is aged 50–59
- 8% of the population is aged 60–69 (Australian Bureau of Statistics, 2016, 2020).

The key demographic of parents and homebuilder (aged 35–49) are the largest of the service age groups within FA2. Within the community 82 per cent of people had access to the Internet and were able to engage and interact with FA2 through the use of digital technologies (Australian Bureau of Statistics, 2020). Within the recognised local government boundaries of FA2, the three main industries are:

- manufacturing
- retail trade
- healthcare and social assistance (Australian Bureau of Statistics, 2016).

Catalyst, leadership, and governance for community engagement and knowledge

The FA2 representative stated their online presences commenced in 1999 through their website which was used to complement traditional paper-based content (e.g. newspapers and newsletters). The participant interviewed stated there was currently no clear vision or mission for their online presence. Furthermore, the roles and responsibility for the online presence continued to evolve. The representative for FA2 stated:

> There was [a mission or vision statement] in the early days but the organisation has gone through some changes. We have a brand-new CEO on board for example and he has only been here for seven weeks. We've only met a few times and discussed business matters. We discussed our online presence, where it should be going from here. I was quite strongly of the view, and he agrees, that it moves, as far as the online presence itself the technology, I can provide all of that. But the content management and everything needs to move into our marketing and PR [public relations] group. They should manage it as an oversight rather than us trying to do the shifting, we're on shifting sands.

In response to a business plan for their online presence, the FA representative stated: "There was in the beginning but, again, it's come to a halt".

FA2 reported that the purpose of the focal actor's online presence was to inform multiple audiences:

> … you obviously do want to support and get information out to your residents of your city, obviously. So, whether it's about you know a picnic in the park or you want to go to leisure [centre] for a swim, or you want to go and visit the library and get a book out because you know library catalogues online and all that sort of stuff. But library members can come from anywhere as well, but you also want to do business with people, you want them to – you want developers to come and do intelligent developments within the city and you'd want business to be – a business owner could be, live, anywhere but he could have a business here that he would want to develop – I don't know, it would be very hard to come up with a single focus.

FA2 representative advised during the first wave interview that staff involved in managing and supporting their online presence included the one manager, two technical staff, and eight operational and administrative staff. These staff were working on FA2 online presence on a part-time basis. FA2 does not use volunteers as a resource to support their online community engagement and knowledge management activities.

Leadership of the organisation can be considered passive regarding how it guides the strategic planning and development of FA2's online presence. When asked about leadership of the online presence, the FA2 representative stated:

> Not leadership, well that probably does not sound right – what happens is, how it happened in all reality is that when I or someone else perceives it there is something else we can do on the website with regards to providing a utility or service or whatever that goes through an approval process and these people are involved so they ask the question presented in the material but they don't have a formal role, there's nothing to say that every time you do something I have to sign it off we don't have formal meetings about that subject only, if that answers your question.

When asked if the leadership of their online presence was at the adoption, implementation or integration stage, FA2 stated they were transitioning from the adoption to the implementation stage. The FA2 representative briefly outlined their role in the process of guiding the digital transformation within the organisation:

> Well other managers [in FA2] deal with me, but at the end of the day it would be me who would either support the concept or whatever and take it to the Exec for approval if required, or just action it … basically it rests with me … they [the Executive] know what I tell them, they understand that they're going to go through that process to move into here [the online environment] so they understand about the opportunities that we have to move forward with.

When asked about the creation of a culture that supports the acceptance and growth of their online environment, processes, use of and support of technology, the FA2 representative stated it was between the adoption and implementation stages. FA2's activities for engaging with residents and creating community knowledge were funded through State and Commonwealth.

Content collection, dissemination, and target audience

The FA2 representative outlined a process used to determine content for their online presence. They stated the process involved:

> … we [representatives from business areas within the organisation] basically sat back and said that if we are going to have an online presence which people find useful and of benefit and the Council agenda [and] minutes was an obvious one, job vacancies was another one so we advertise all our vacant positions through our website and we accept job applications through our website.

The representative for FA2 stated that the organisation uses various digital channels (e.g. website, email, phone and fax) or non-digital (e.g. mail, counter services) to share information with community residents. They added some challenges encountered to enable processes to allow interactive engagement between FA2 and external organisations:

> We advertise all our tenders through the website but we don't accept tenders through the web, they still have to go into the tender box. A legal mire but yes, basically the Local Government Act says how you will manager tenders.

However, the benefits of making content available online began to influence the culture to accept the changes of transitioning to services and processes delivered online. The FA2 representative observed:

> Building services said it would cut down on our phone calls if we provided lots of application forms or information online. [For example, if a resident calls and said] I want to put up a dividing fence, the staff got in the habit of referring people to the website instead of saying "I'll send you something in the mail".

From the interview, it was determined that the primary audience for the focal actor's online presence are the people residing in the LGA. The secondary audiences are people and businesses external to the city.

According to the FA2 representative, the priority of content being delivered by FA2 to the community during this first wave was firstly, content to facilitate social interaction, secondly, economic content, then content of a political nature. The FA2 representative suggested that in five years' time, the priority would be economic content, followed by social content, with political content last. The representative explained the reason for the change in priority from social interaction to one that is more economic in focus reflected

a view that there would be an opportunity for increased business and commercial related activities through engagement and knowledge management to benefit the community.

Matters regarding politics were considered more difficult for the focal actor to share with the community. The FA2 representative also advised that the organisation does not promote political interaction and has made a minimal amount of political information available through digital channels. The FA2 representative stated it was important for the focal actor to be independent and apolitical. Political information provided was limited to "… during an election time, but [only] the positions that are up for election and these are the people who have nominated. There was no campaign material if you like".

The FA2 representative stated that the primary sources of community knowledge are drawn internally from its business units. There are few external links to the focal actor's digital channels, as their content is considered difficult to maintain, support and monitor.

FA2 owns and maintains an archive, but it is not accessible to the public. "There is an archive in terms of we can look at a page as it was six versions ago, but the public can't".

Sustainability of the community engagement and knowledge management solution

The FA2 representative described the status of community engagement as being at the implementation stage.

Aspects to support community engagement and knowledge management, such as training and awareness of staff, processes, and workflow, and matters related to technical infrastructure to support the initiative, were described as in transition from adoption to the implementation stage.

Although activities associated with communication and members of the community was prominent in 2007 ([FA1], 2017), the focal actor did not have a communication plan developed to help promote FA2's community engagement and knowledge management efforts through the use of technology. The interviewed representative stated that awareness of FA2's community digital presence and knowledge management capabilities were through word of mouth, occasional radio advertising, print media, and information printed on promotional pamphlets and bills to their customers.

The representative for FA2 stated the organisation does not promote or leverage its community engagement or knowledge management expertise for commercial gain. The FA2 representative, and supported by the annual report ([FA2], 2007a), stated the

organisation provided training to support community engagement through digital technology, including use of the Internet through their public libraries; however, scheduling for this training was not consistent. Multiple digital and non-digital channels are used by FA2 for interacting with residents and businesses. These channels include the website, email, phone, counter services, letters, and fax.

Looking towards the future, the FA2 representative stated the organisation seeks to increase citizen and business self-service capabilities and enhance interaction/integration between their internal business systems. The Interviewee stated that "one of the things that's been holding us back is our content management system" as it does not have the suitable capabilities.

FA2 described future challenges to include the management of expectations. They mentioned that expectations of demographics are only one of the factors that should be better understood and considered when creating content:

> If you are out in your community or at home using [the Internet to] browse a large company or organisation's website that allows you to interact and do business and you think 'why can't I' [do the same with FA2's website] … I think [expectation] is rising across the community, certainly with the young people. Now [the young people] would just expect [the content] because they don't know any different … I've [also] dealt with some people who are well retired, into their retirement years and they're terribly active, whereas others obviously aren't. So [content is] not always strictly [focused] on demographics I don't think.

In contrast to the challenges mentioned by the FA2 representative, they also remarked there were future opportunities to improve community consultation through the use of digital technologies. Regarding future opportunities, FA2 stated:

> … community consultation is something that local government tries to be very much involved in. I think there are enormous opportunities for online communities to be part of a consultative process and to reach more people and for more people to have the opportunities. For example, we might advertise and a lot of our advertising is statutory so therefore the law says if you're going to do an "X" sort of development or someone's looking to develop … a childcare centre on this block of

> land, you must notify all the people within a certain radius and they must be able to comment and all that sort of thing. It would be really good to be able to do all that online rather than how we do it now. We do it by writing to everyone and people write back to us and everything.

The FA2 representative identified other potential community engagement opportunities that may become available through the use of digital technologies:

> ... trying to track a customer's request. You know… it might be interaction with online applications and [residents] being able to track them and that sort of thing. We would also like to have better online reporting for our community about the organisation – how we are performing, how we are going against our budget – that sort of thing.

In closing the interview with FA2 they stated: "Your survey could last for hours couldn't it? Once you get going it's a pretty interesting topic".

5.2.3 Case 3: Focal actor supporting community 3 (FA3)

Case 3 overview

FA3 is an independent small business located within and supported by a community encompassing a regional centre and multiple rural communities in the south-western region of WA. FA3 provides information to residents and businesses within the LGA predominantly through their website. The interviewee was the Chairperson of the Board for the focal actor. The interviewee was responsible for the strategic direction, priorities and governance of the focal actor. During the first wave interview, the FA3 had a population of fewer than 100,000 people. FA3 operated with fewer than 10 staff.

Key age demographics of the city from 2007 include the following:

- 7% of the population is aged 18–24 years
- 11% of the population is aged 25–34 years
- 20% of the population is aged 35–49 years
- 14% of the population is aged 50–59 years
- 11% of the population is aged 60–69 years

(Australian Bureau of Statistics, 2016, 2020b).

Within the city boundary, there are fourteen geographical communities with clearly defined borders. The main three industries within the LGA for FA3 according to Australian Bureau of Statistics (ABS) 2016 are:

- retail trade
- healthcare and social assistance
- construction (Australian Bureau of Statistics, 2016).

During the time of the first wave there were distinct differences between communities in metropolitan locales and those in rural and remote areas. These differences, often referred to as the digital divide, included challenges faced by regional and remote communities when compared to focal actors located in or near Perth, WA. This digital divide includes differences in the availability and use of technical infrastructure, which had a negative influence on Internet speed, access to technical knowledge and advice, and business process and services not suitable for the online environment in rural and remote areas.

Catalyst, leadership, and governance for community engagement and knowledge

The FA3 stated the organisation was established in 1999. When asked what the purpose of FA3 was, the interviewee stated:

> I'm not sure what the purpose of it is right now … The original idea is basically to provide an opportunity for communities in the broader sense of community to get their word out. I would say that the current use of the FA3 is to provide social interaction. The line we are pursuing at the moment is that the community organisation and the people in the community do not stand apart from business activity in the community, and we are looking more and more to a sort of … this nexus between business and community and an opportunity [for the services of FA3].

During the first wave of interviews, the representative for FA3 described their organisation as a not-for-profit incorporated body required to have a Board of Management (Board). FA3 has a business plan that was endorsed by their Board. Regarding guidelines for guiding content development, the FA3 representative stated:

> No, we don't have those guidelines – it's basically conceptual at this time. I've spent a lot of time to convince FA3, that FA3 is in fact a media operation [similar to the news and social media services] and obviously we need to try to change [our current business model].

FA3 operates with a part-time manager with other technical and support services outsourced. The Board, the manager and plan led FA3's efforts to create and disseminate community knowledge activities through digital technologies. There was no administrative support allocated. However, FA3 used volunteers to edit and manage content. FA3 was funded solely by advertising with in-kind support from the city and local government.

Content collection, dissemination, and target audience

Regarding content creation for the community, the FA3 representative states:

> We basically allow open slather on pages … if you have an organisation, you can have a page; when you have a page you can edit that page – it is as simple as that. If you have a town like say [Town A] for example, [Town A] will appoint an editor for the [Town A] town page and they will look after that and there is actually very little maintenance at this stage at head office so to speak about what actually happens on those pages.

According to the FA3 representative, the primary audience are the people residing in the city, with a secondary audience being current and potential tourists. This is followed by businesses external to the city. These businesses are targets for business development opportunities within the city. This is also reflected in the focus of the current and future content of FA3, with the Interviewee stating that social interaction rated as the primary focus, economic interaction a secondary focus, and political interaction with the community as the third priority.

The FA3 representative stated that no marketing or communication plan has ever been developed for the organisation. They added that FA3:

> … there will be a communication plan to come into place in the future. At the moment our major communication device is through word of mouth. The only other aspect we have is we do radio and tradio where

> we have a trade-off with the local radio station and we promote them [through our website].

The FA3 representative stated that the organisation does not promote or leverage its community knowledge, or the expertise gained through developing and providing their community knowledge service to other organisations, for commercial gain. The representative for FA3 stated that the organisation provided training on how to use the Internet through the library on an ad-hoc basis. In addition to this training, libraries within the community offered training in a range of computer applications, and tutoring for school age students ([FA3], 2007).

The FA3 representative stated that the type of content currently available online and to be delivered in five years would be likely to remain the same: first social content (with a focus on community information), followed by economic content then political content.

When asked about an archive, the FA3 representative stated:

> … there is an archive kept but we've actually found that more by accident than by any sort of archival control, but there's a website called www.archive.org … where we have actually been able to go back and trace previous lives of our site, but as I say it was more by accident.

However, after further discussion FA3 conceded *"*we don't keep any electronic archive*"*. The representative for FA3 stated that they have a dedicated content management system (CMS) and the organisation utilises their website and email (to distribute newsletters to registered users).

Sustainability of the community knowledge management solution

A focus of FA3 was to position the organisation for the future desired state. The representative for FA3 stated this would involve:

> … looking to sell [stakeholders] into the opportunity of a dynamic portal. The electronic environment has changed lots since 1999 and 2000. People are more aware of the opportunities. What I'm trying to sell to the Board is the simple understanding of what [we do] … We do news, we do advertising, we do social media all which we can move into cyber space. We are interested in generating traffic, so we generate

> traffic by traffic. Traffic converts to audience, audience converts to market possibilities, market possibilities converts to advertising …

During this first interview, the FA3 representative stated that a significant challenge "…is proving to be a financial one and it is because we have been envisaged as a community organisation.… consequently, nobody is being paid anything for our services so consequently we've got no money". Another challenge related to culture: "I think there's still a number of cultural challenges in terms of how a community could benefit operating through a portal such as us rather than on a stand-alone site".

A fundamental challenge is the transformation required from the current state to the desired state:

> I think we can basically say that at this stage we don't have a model. The newspaper model – say the traditional media model – is the model I've been floating around the Board meetings because it is one that the Board members can relate to. Look at the newspaper – we can drive this centralised from our office from the FA3 office; this is part of a new organisation which we can drive from our central office so we can edit content – we can provide news, we can go our and take photographs of people at parties, we can do all that sort of stuff. On top of that there's the other which we can run as well – which we can run at arm's length is the facility for other opportunities which I say in a town like [Town A] or a place like [Town B] they could run these sort of a … or a new type organizations themselves without us actually having to provide content, so we're not providing content into those areas. These are the two sides of the coin that I think we need to come to terms with. I think they can both operate at the same time.

To successfully make the transition outlined by FA3 is a complex endeavour. It may require multiple iterations to successfully make the transition. Many risks will need to be identified and resolved. This transformation will require leadership, culture change, new processes and adoption of the appropriate technologies.

5.2.4 Case 4: Focal actor supporting community 4 (FA4)

Case 4 overview

FA4 was a private sector focal actor, located in a southern region of WA. Two people participated in the interview representing the focal actor, the two owners of the business. One owner was responsible for the external facing strategies and sales activities, the other responsible for internal operations, include information technology. During the first wave of interviews for this research, the focal actor had fewer than 10 staff, and operated in a community that included a regional city and multiple surrounding rural communities with a population of fewer than 100,000.

The key age demographics for FA4 during the first wave of interviews include the following:

- 9% of the population is aged 18–24
- 14% of the population is aged 25–34
- 21% of the population is aged 35–49
- 13% of the population is aged 50–59
- 9% of the population is aged 60–69 (Australian Bureau of Statistics, 2016, 2020b).

The largest service age groups within the FA4's LGA are parents and homebuilder key demographic (people aged 35–49). The main three industries (of employment) within local government boundaries of FA4 are:

- construction
- manufacturing
- retail trade

(Australian Bureau of Statistics, 2016; Informed Decisions, 2020d).

Catalyst, leadership, and governance for community engagement and knowledge

The representatives for FA4 informed me they commenced operation in 2001 with the aim of providing a digital channel of community information for residents and businesses in the region. Concerning this, the FA4 representative stated:

> The reason for the website anyway, was quite selfish really. We just established it to test the technology and media, be a maverick, maybe make a bit of money. Yes, it is a little bit of fun to do it. We certainly can't claim to have any novel community purpose behind it, although it does serve that purpose. There's a lot of information on there about things to do and local events.

When FA4 was established, the online presence of public sector organisation responsible for engaging with the community was minimal. However, between 2001 and 2007, the online presence of public sector organisation changed significantly ([FA4], 2007). This may have contributed to the decision to create the business. However, by the first wave of interviews, the online presence of the public sector organisation had increased significantly, potentially impacting the viability of FA4.

One of the FA4 representatives stated that because of its small size, there was no executive or steering committee involved in the management of community engagement and knowledge management activities. Both executives worked part-time. The focal actor did not have a business plan incorporating plans, a budget, clear decision-making process to support community engagement activities.

The interview participants described the focal actor as being at the integration stage of engaging with and managing community knowledge and leveraging technology. The FA4 representatives perceived the focal actor as at a mature stage in relation to community engagement and knowledge management.

The FA4 representatives stated that their organisation had plans for community engagement and promotion of their community engagement activities. However, FA4 interviewees stated there were no plans or activities to train staff in community engagement or knowledge management. They described their organisational culture as being more aligned with the implementation stage of maturity than the adoption stage.

The representatives for FA4 stated that all operations for engaging with the residents online were managed from within the organisation and "there's nothing outsourced at all". In response to questions regarding revenue, the focal actor stated that revenue was generated through sponsorship and advertising. Their focus is to increase profits. One of the representatives participating in the discussion stated:

> … [our attention is] just to make the website profitable for us. We've got quite a large social site which attracts 25,000 visits a month. So we want to be able to harness some of that into make some return for what we're doing, I suppose. So that's the main consideration for us. Which just means making the website as attractive as possible for people to visit.

During the discussion the FA4 representatives stated that the primary audience for their products/outputs are the people residing in the region. The secondary audience was people within Australia residing out of the region, because they were considered a potential tourist market for the community. Overseas tourists were considered the third priority for the focal actor. When asked about a communication plan, the FA4 representative stated none existed. They also stated that their marketing activities, albeit minimal, focused on local businesses. From the interview, it was understood that

increasing awareness of the focal actor was primarily through search engines rather than the local community.

In discussions with FA4 interviewees it was stated that the organisation did not promote or leverage community knowledge or expertise. The FA4 representatives stated that "… the overwhelming majority of people finding a website, find it through a search engine, okay. Because they might be looking for information on a particular festival or something, and we'll all come up". There was no internal or external training provided to help the focal actor to enhance engagement with residents, influence culture, review and streamline business processes, or better leverage technology.

When questioned about the method of interacting with residents and business, the FA4 representatives stated this was done through their website and email.

Content collection, dissemination, and target audience

In discussion with the FA4 representatives, they stated that stakeholders within the geographical community were the primary sources of information for the focal actor. Local residents and businesses had the capability to "… fill in a form and submit their information. They can upload their photos and all that kind of information". There were no links to other communities, but there were links to other external digital sources of content, such as local news and weather.

The FA4 representatives stated they as the two staff coordinated activities to obtain and manage content. This process continued to evolve and at the time of the interview it was recognised that there was a lack of documentation regarding content management. FA4 did state that residents suggested and created content, which included local news and online advertisements. Identified also in the interview were no formal guidelines about the methods for converging traditional and digital content, although this was part of FA4's focus.

The current priorities regarding content were social content first, followed by economic related content, with no political content available through FA4 services. Both interview participants believed their focus for the upcoming five years would be social content, followed by economic content. There were no plans for content of a political nature.

There was an archive that was accessible to the public. This archive was owned and maintained by FA4. FA4 representatives stated they did not use a content

management system (CMS) and mainly utilised a website and emails to disseminate community knowledge.

Sustainability of the community knowledge management solution

Looking forward, the FA4 representatives stated that they sought to increase profitability and were developing plans for this to occur from 2007. The FA4 representatives also identified challenges that could hinder the sustainability of their operation. One of the challenges raised by the organisation related to monitoring and managing the accuracy of information submitted by members of the community for digital publication:

> There's a real problem with information being accurate online. Things change ... [people] don't always recall [the previous content] or when to update [an event] that they submitted. So, there's a good chance that some information online is out of date.

Another challenge identified during discussions with FA4 representatives related to competition from other, larger organisations aiming to provide similar services in the region. The comment was:

> I can't I don't know why whether it was a previous question that made me think about this, but there's another big online portal down here that's funded by the state government, millions and millions of dollars to do that … I often think about how [our website] gets as many hits to our side as them and all that kind of stuff. We've managed to achieve that in our spare time. They had literally millions of dollars of funding to develop that site, and advertise on TV, and radio and all that kind of stuff. I wonder, comparing the expenses, whether that's worth it. The State Government is pouring that much money in, and they don't get any more traffic than us. My query - why do that? I don't know … that's one of our other challenges.

5.2.5 Case 5: Focal actor supporting community 5 (FA5)

Case 5 overview

FA5 is a public sector organisation in area north of the metropolitan area of Perth, WA. FA5 supports a city and multiple suburban communities. The interviewee for the

focal actor was a leader of their information technology branch and works with and across multiple business units. The focal actor employs more than 200 staff. FA5 supports a city and multiple suburban communities with a population of more than 100,000 people.

The key age demographics for FA5 during the first wave of interviews include the following:

- 11% of the population is aged 18–24
- 11% of the population is aged 25–34
- 24% of the population is aged 35–49
- 15% of the population is aged 50–59
- 8% of the population is aged 60–69 (Australian Bureau of Statistics, 2016, 2020b).

Within the recognised local government boundaries of FA5, the main three industries are:

- retail trade
- healthcare and social assistance
- construction (Australian Bureau of Statistics, 2016).

Catalyst, leadership, and governance for community engagement and knowledge

The representative for FA5 stated that the focal actor commenced online operations through their website in 1996. Concerning a mission statement for the transition to the online environment, the interviewee stated: “I have not seen a mission [statement] – it is probably the mission of the city actually ... I know we have the values of the city. It is probably to reflect those values online, but … I have not seen that statement”. The interviewee believed the effort to pursue community engagement and associated knowledge management is to increase social interaction and enhance economic opportunities. At this stage the FA is not progressing political activities through community engagement.

Documents supporting the governance of FA5 included a business plan. However, the plan did not specifically address matters related to community engagement and knowledge management. The FA5 representative stated that there was no communication plan in 2007 to guide the use of digital technologies for community engagement and knowledge management activities. However, the FA5’s online presence is promoted in a multitude of ways. The FA5 representative provided the following example:

> … when you have a public survey or seek comment on a new project, it is advertised in the paper and there is a link to the website as well. It is a way to promote the website. When we have job opportunities, or job openings, they are always linked to the website, so people [can now] come to the website.

Regarding support for community engagement and knowledge management activities, the FA5 representative stated that a member of the focal actor's executive team had responsibility for publishing and for the content of their website. In addition to this executive, FA5 also had the support of an IT manager who was responsible for the technology and associated infrastructure to support the organisation's online presence. The FA5 representative stated there were 1.5 positions involved from marketing and another resource focused on promoting local businesses through their website:

> In marketing … there is one [person] who is updating the website all the time, so you can say one and a half (1.5) [people involved from marketing]. [We also have another person] who is working, not on the website, but just to promote business in [the area supported by FA5] and he has a section [on the website] where he can publish [content] there.

At the time of the first wave of interviews, FA5 undertook a marketing campaign to gain support of residents and other targeted stakeholders for online delivery of community related news([FA5], 2007). Activities to raise awareness of community engagement ,and knowledge management activities, were promoted through word of mouth and radio. During this period the FA5 representative advised they did not promote or leverage their community knowledge or expertise.

The FA5 representative stated that strategic and operational activities to support their online activities take place within FA5, with some technical activities, including the website hosting being outsourced. During the first wave interview, the FA5 representative considered that activities associated with transformation to the online environment such as leadership and management, culture, process, and technology were primarily at the adoption stage of maturity.

Community engagement and knowledge management activities are funded by grants from State and Commonwealth Government and supplemented from revenue generation activities such as taxes and fines.

Residents, including volunteers engaged as content creators and editors, and businesses, can contribute content to the FA. The FA5 representative also noted that guidelines for converging traditional and electronic content are informal.

Content collection, dissemination and target audience

In response to questions regarding the focus on community engagement activities, the FA5 representative stated the primary audience members for FA5 are the residents within the LGA. The secondary focus was the people residing outside the LGA. Activities to attract businesses residing outside the LGA were considered the third priority. When asked whether the focus of projects for community engagement and knowledge management through digital technologies are social, economic or a political activity, the FA5 representative stated: "there is a bit of everything …".

The FA5 representative provided a brief overview of a content creation process that they adopted:

> … the way it is organised now [the content creation process] is more centralised. So marketing gets the request, and they publish. Now [there is a] push to get the organisation decentralised … There is a content owner in each department; they are responsible for what goes on the intranet, and they have …depends on the software we have, the CMS we have, or the Content Management System. That means there will be more people involved in the [creation of] content.

In terms of direct interaction with residents, FA5 gave an example of online surveys, information on road closures, and feedback:

> … the main one is the online surveys on what we are doing. There is a public notice section [on the website] where we say 'well there will be a road closure there' and 'there are new parking fees' if you think you are unhappy with this, just send us an email or fill out a form.

The representative also stated that training for the online environment was the library. "It is more to do with the online catalogue and update their profile or do different things on the library section of the website". Although there is use of the website, the representative for FA5 stated that the main channels used for interacting with residents and businesses were email, phone, and letters.

Sustainability of the community knowledge management solution

The FA5 representative stated there are no primary external organisations that the focal actor sources for information for creating content. There are links to content from external sources of information:

> … the library is the major [contributor for providing links to our website. Through the library] … we have memberships to online databases, where people can look for journal articles, there are a lot of things. Like medical journals, how to fix your car by brand, by whatever. It is huge. A big database that's accessible if you have … a library card.

The representative for FA5 stated that the barriers associated with users creating and posting content on their website is the potential fear [that the organisation] may lose control of the content being published. This includes the potential risks of people posting messages that could tarnish the image of the city:

> … the way I see it [content] is not something that we totally control, so as you develop it, you promote it, you are not really sure what will happen with it … So, if you let other people say what they want, through external forums … [people within FA5] won't like it because if [residents] don't say something good about [FA5], [management] are not going to be happy about it.

> It could be that [FA5] could … fear that it is going to [have a problem], because they don't control the content – that it could come back [to haunt them]. Like it could affect their image in a way, because they don't control everything [regarding the creation and production of content].

The FA5 representative believed the future direction of community engagement and knowledge management includes the challenges of uncontrolled growth of online engagement. A reason for this is that the human and financial resources to support manual engagement and knowledge management are finite. Automating the processes may reduce pressure on the limited human resources.

The FA5 representative stated the types of content provided by the focal actor to residents comprised both social and economic content. According to the interviewee, there

was no political content, with the possible exception of the council minutes and agendas: "I think probably the main … political content is … the minutes and agendas from the local council so people can check what they are doing you know". The representative predicted that in five years the focus of the focal actor would be social content, followed by economic content, with the third priority being political content.

During the period of the first wave, the representative for FA5 stated that multiple channels were utilised to engage with residents and to disseminate content, including their website, email, phone, counter services, and letters. FA5 maintained a dedicated Content Management System (CMS) to assist them in managing community knowledge. Concerning an archive, the representative said there was no archive managed by FA5. However, a historical copy of the focal actor's website can be found at http//:archive.org.

5.3 Key strategic findings influencing the second wave of interviews and observations

This section presents the key findings that influence the strategic delegates of leadership, management and culture. These findings are further explored during the second wave of interviews and observations. Section 5.4 will present key findings that influence the operational delegates of process and technology.

5.3.1 Leadership and management delegate

> There was some success in the early periods with some electronic interaction with the community but there has been a very flat stage since then…and we are facing a number of technological and cultural challenges about how we can develop…and make it work.
>
> *(FA3 Interviewee, 2007).*

The focal actors that participated in this study provide support for community engagement and knowledge management activities. The depth and breadth of community engagement and knowledge management varies between focal actors and communities. This may be attributed to action taken by the leadership team within each focal actor, including priority they placed on community engagement and knowledge management activities. The leadership team influences the behaviours and attitudes of individuals and the interaction between groups to create a focus to achieving goals. Leadership teams work through multiple initiatives and issues that can be strategically linked through a vision, planning, and alliances.

These community engagement and associated knowledge management initiatives competed for time, financial and human resources. In the FA1, FA2, and FA5, the change from traditional methods to more electronic methods appeared to be more organic than a planned and structured evolution. The non-public sector organisations, FA3 and FA4 considered community engagement a higher priority. It appeared to be the reason for their creation and existence, while there was less emphasis on knowledge management. How the leadership team works through multiple activities and risks has an influence on the success of the focal actors' initiatives. To work through the range of interconnected activities related to community engagement and knowledge management, the leaders of focal actors, influenced by their stakeholders, set directions. From these directions, the managers are responsible for allocating, aligning, and motivating staff. In supporting leadership, management is also involved with development, execution and monitoring of plans and mitigation of risks; this may include safeguarding the privacy of residents' information.

Multiple interconnected networks and activities are involved in how an organisation engages with community residents through digital technologies. Leading and managing this transition can be a complex endeavour. These interconnected issues may involve the leadership's vision for the focal actor, which links to the focal actor's management plan for obtaining and leveraging knowledge about residents, and potential areas of alliances, collaboration and partnerships. Failure of the leadership and management team to adequately address these and related activities may lead to the failure of the community engagement and knowledge management initiative.

5.3.2 Culture delegate

> There is a little bit of a marketing plan.
>
> *(FA4 Interviewee, 2007)*

During the first wave, no focal actors demonstrated plans, strategies, or structured activities to foster a culture that aligned resident engagement with the use of digital technology and knowledge management. The absence of specific strategies and plans for community engagement and associated knowledge management activities is consistent with challenges identified with other knowledge management initiatives. These consistent challenges include recurring themes of complexity, inadequate leadership support, political matters, organisation processes, inadequate infrastructure, and a culture not willing to accept the changes required for knowledge management.

As outlined in the literature review, how leaders communicate with their organisation's workforce and the community in general, and the frequency and tone of messages given, is vital to managing stakeholder understanding and expectations. However, none of the focal actors had a communications plan that described the vision, plans, activities, and potential benefits from engaging residents and obtaining and leveraging community knowledge.

Although multiple communication channels were identified for interacting with community stakeholders, including residents, to increase awareness and understanding of community engagement knowledge management activities, word of mouth was the preferred method. FA3 recognised that word-of-mouth communications has a major impact on influencing consumer behaviour. Although FA3 did not have a marketing plan, and did not appear to have significant funding for promotion, they acknowledged the importance of word-of-mouth communications to raise awareness of their community engagement activities.

5.4 Key operational findings influencing the second wave of interviews and observations

This section presents the key findings that influence the operational delegates of process and technology are. These findings are further explored during the second wave of interviews and observations.

5.4.1 Process delegate

> We don't have a model.
>
> *FA3 Interviewee (2007)*

The community knowledge process involves the creation, dissemination and leveraging of knowledge to assist in making informed decisions that may affect residents. These processes increasingly are driven through the use of technology that contributes to stakeholders' efforts to attain the vision of the focal actor to enhance engagement with community residents.

Most of the people interviewed from the focal actors participating in this study stated their preference was to focus on engaging with the community for generating social content first, followed by economic content, then political content. Although it is recognised that the use of digital technologies can assist communities with social change, most focal actors that participated in the interviews did not appear to have processes in

place to use digital technologies so that the knowledge obtained from community engagement could be used or translated into practical actions. This includes opportunities to leverage knowledge to foster changes discussed during the interviews related to social, economic, or political discourse and actions to influence community residents.

5.4.2 Technology delegate

> There is *[sic]* always opportunities isn't there? To treat the resident more as someone special in the community so that when you visit the [organisation] and you log on – "Hi [name] – how are you today? Here's all your information that you'd like to know," instead of having a website and you go there and have a look around.
>
> *FA2 Interviewee (2007)*

The findings discussed in this section focus on how digital technology supports the vision and processes for engaging residents and obtaining and managing knowledge from the interactions. Community engagement and knowledge management activities outlined in this study are not feasibly possible without technology. It is important to note that there have been many academic studies about initiatives with digital technologies at the core that fail to meet stakeholder expectations. The findings from discussions with representatives of participating focal actors did not identify significant dissatisfaction with their expectations being met from a technological perspective; rather, they expressed a level of frustration, a lack of funding to maintain or update systems in some instances, and inability to leverage existing technology for the benefit of the community.

5.5 Wave 1 challenges, opportunities and future directions

In this study, the focal actors consider challenges to be issues that may inhibit their progress but are not necessarily immediately detrimental to their operations. Opportunities are regarded as situations in which the actor can gain an advantage. During the interviews, participants were asked to identify and discuss the challenges and opportunities for capturing and leveraging community knowledge through the use of digital technologies. The opportunities are briefly mentioned in this section, with more information provided in Chapter 7.

From the first wave, this section presents the strategic and operational challenges the focal actor had or anticipate they will encounter. Table 5.1 summarises the potential strategic and operational challenges distilled from the first wave of interviews.

Table 5.1

Summary of challenges identified during wave 1 (2006-2007)

Summary of challenges (2006/7)	FA1	FA2	FA3	FA4	FA5
Leadership and management					
Uncontrolled growth or demand of digital technology/services				☑	☑
Boundaries of control will change (e.g., from within the focal actor, or control shifts to residents)			☑		☑
Managing community perceptions	☑		☑		☑
Competing with other potential focal actors				☑	
Maintaining increasing human and financial resources			☑	☑	
Building support and the market for increased usage of digital services	☑		☑	☑	☑
Culture					
Organisation loses control of its digital services to external stakeholders					☑
Meeting rising community expectations, dealing with a better-informed community	☑	☑	☑		
Raising community awareness of the digital channels				☑	
Changing the focal actor to better leverage digital services/content/knowledge			☑		
Processes					
Redeveloping processes to engage with the community as a result of digital technology	☑	☑	☑		☑
Determining how to automate and integrate online forms into the focal actor		☑			☑
Determining how to integrate online surveys into the focal actor					☑
Monitoring accuracy of information including security	☑			☑	
Monitoring community provided content	☑			☑	
Technology					
Technology integration, business systems integration		☑			
Need to refresh website, technology	☑	☑	☑		
Accessibility			☑		

From the strategic perspective, challenges related to leadership and management and influencing the culture of community engagement and knowledge activities will be discussed. This is followed by challenges relating to operational challenges related to the processes and technologies to support of community engagement and knowledge management activities.

From a leadership and management perspective, four out of five focal actors from the 2007 data collection considered matters relating to building the market, business development, and increased usage as their primary challenge. The next most prominent challenge related to how the leadership and management is managing community perceptions. Three of the five focal actors considered this to be a challenge.

From a culture perspective, three of the five focal actors considered meeting rising community expectations as a challenge. Focal actors noted their organisation's reluctance or wariness to give residents an online platform to complain about the organisation and the services they provide. To understand and manage these expectations, the focal actor can engage and consult with residents and other stakeholders and progress mutually agreed actions.

In relation to operational aspects, four of the five participants believed the availability and management of the self-service online forms to be an important challenge to address for residents. The theme of using technology to automate processes and increase self-service continued, with two of the five focal actors considering the preference of residents to engage with the focal actor online a challenge. The focal actors were asked about online polling and voting activities, but it was generally considered an area beyond the remit of online engagement plans.

5.6 Summary

The experiences of five focal actors have been presented through the prism of a representative vantage point. Through their descriptions, focal actor representatives revealed how they used digital technology to engage with community residents and shed light on their knowledge management initiatives. The research identified issues faced by focal actors as they aimed to continually improve how they interact and share knowledge with community residents. Furthermore, information related to population or demographics appears to have little or no impact on longitudinal research into community engagement activities of participating organisations.

To understand the key issues, common themes were identified in the interviews held with the five focal actors. Their challenges and opportunities were identified and discussed. During the first wave, focal actor engagement with residents through digital technologies appears to be more advanced and better understood than the management of community knowledge.

Chapter 6 discusses the findings of the second wave of interviews and observations. The process to determine the challenges to community engagement and knowledge management for Wave 1 is replicated during the second wave of interviews. The findings of the first and second waves are then compared to determine changes between the first and second waves.

Chapter 6

Findings: Second Wave of Interviews and Observations

6.1 Purpose and chapter structure

This focus of this chapter is to present the findings of the second wave of interviews and observations concerning the use of digital technologies and associated knowledge management activities to engage with community residents. Since the first wave of interviews and observations 10 years previously, the evolution of digital technology and how it is deployed to engage residents in communities changed. The chapter then presents the findings from the second wave of interviews and observations. During the first wave of interviews, five organisations were participating in this study. During the second wave, there were four organisations participating in the study. The reduction in the number of participants is because FA4 has closed and ceased operations. Therefore, no interview with FA4 for this study was conducted during the second wave.

After presenting the second wave of interviews, the first and second wave of the now four focal actors are compared. The changes that occurred since the first wave are then discussed. As with the first wave, this chapter aims to provide a better understanding about how the focal actors interact with multiple networks to engage with community residents and how knowledge from these activities are captured, managed and used.

The chapter concludes with a summary of how the focal actors from the first and second waves compared to one another. While Chapter 5 compares the changes between the individual focal actors (for example FA1 Wave 1 compared to FA1 Wave 2), this chapter will summarise the findings from the first and second waves from a holistic approach.

6.2 The organisational cases

In the following sections, four cases from the second wave are presented. One of the cases, (FA4) was no longer in operation at the time of the second interview was therefore not considered part of the longitudinal research. Since the first wave, there were shifts in terminology and prominence of social media as a method of engaging residents increasing. These changes warranted nuanced changes in survey instruments from the first wave of interview questions. The themes and categories remain relevant and were not altered. As with the first wave, the anonymity of study participants is maintained.

6.2.1 Case 1: Focal actor supporting community 1 (FA1)

Case 1 overview

In comparison to the first wave, the focal actor had no significant changes in its status as a public sector organisation. FA1 continues to support multiple communities within its defined LGA in southern metropolitan Perth, WA. The interviewee for FA1 was different from the initial wave of interviews. For the second wave, the interviewee is the treasurer of the residents' action group and was a recently an elected member of the city council. In this role, as a former council member, the interviewee represented the interest of residents, provided leadership, guidance and facilitated communication between members of the community and the council. At the time of the second wave of interviews, the focal actor had a slight increase in the number of staff (greater than 200 staff, but fewer than 250) and supports a city and multiple suburban communities with a population greater than 40,000 but less than 100,000 people.

Table 6.1 compares FA1's demographic and industry data from the first and second wave of interviews.

Table 6.1

Comparison of FA1's key age and industry demographics between the first and second wave of interviews

Wave 1: **2006 include the following demographics**	**Wave 2:** **2016 include the following demographics**
10% of the population is aged 18–24	10% of the population is aged 18–24
16% of the population is aged 25–34	22% of the population is aged 25–34
21% of the population is aged 35–49	21% of the population is aged 35–49
12% of the population is aged 50–59	12% of the population is aged 50–59
9% of the population is aged 60–69	9% of the population is aged 60–69
Main industries within the recognised local government boundaries of FA1.	
2006 **Industry sector of employment**	**2016** **Industry sector of employment**
retail trade	healthcare and social assistance
healthcare and social assistance	retail trade
construction	manufacturing

(Australian Bureau of Statistics, 2006, 2016; Informed Decisions, 2020a)

The service age groups for LGA remain steady, with the exception of an increase of 6 per cent to the young workforce group (25–34 age group). The FA1 representative stated

"… we've got a fair amount of aged population here that don't know how to turn a [mobile] phone on, let alone a computer".

Of the leading sectors for employment identified in the first wave, retail trade and healthcare and social assistance remain on the list of the top three employing industries for LGA. Manufacturing is new to the industry list for the second wave, replacing construction which did not retain a place in the top three industries for the LGA. For the second wave healthcare and social assistance replaced retail trade as the leading community employer.

Catalyst, leadership, and governance for community engagement and knowledge

The FA1 representative stated the purpose of the digital services provided by the focal actor was to ensure the focal actor's information is available widely twenty-four hours a day, seven days a week. "... it's not to do with economics, they're not providing social interaction, and we have an issue with transparency here in [FA1]". As during the first wave interview and observations, the community engagement and associated knowledge management activities remain within the focal actor. A catalyst is a drive to continue to improve how the focal actor engages with the community, and enhances customer services and the workflows, and with the processes that support the services. Management of this service is led by an executive committee ([FA1], 2017). The responsibility of FA1's executive committee includes the setting of strategic directions.

During the interview, the FA1 representative stated their belief that the management of the organisation was "definitely on an implementation phase". Regarding culture, they stated:

> I think again you could put that implementation, because [digital technologies are] not accepted or used by the community broadly.

Regarding processes, the interviewee stated:

> the process I would say is adopted. It [processes for engagement] may very well be implemented but [they are] not available to be used broadly by the community … they've got process[es] but it's [sic] not widely available and it's not well known".

Concerning technology, the interviewee stated:

> "… you could probably put [that the] majority of the technology is integrated because they've got the website online and that it's available for staff, for community, too, providing the community know how to use computers ...

During the second wave, the number of employees within the focal actor increased from 195 to over 230 when compared to the first wave ([FA1], 2017). In terms of recording of assets, during the second wave, the focal actor changed the way information technology is listed on its balance sheet when compared to the first wave. Information technology was now considered an asset, making its utilisation more transparent and also increasing its strategic visibility ([FA1], 2017).

As in the first wave, FA1 did not use volunteers for community engagement and knowledge management activities. Funding arrangements were also similar to the first wave of interviews.

Content collection, dissemination and target audience

Regarding content, a significant difference identified between the first and second waves was FA1's increased use of social media to share information with residents. The Interviewee was hesitant to use the term engage:

> It depends what you're talking about with the engagement … but that's just using Twitter, and the website, and all this kind of [social media] stuff. I mean, if you're talking about engagement, all you really have is [people visiting] the website, and phoning up, or going up to the offices.

The Interviewee raised the issue of having the technology not aligned with process:

> I do know processes that I don't feel are there … one of them is the management of complaints [through the website or social media]. There's supposed to be a process whereby you are given a reply to say, "Well, we're going to look at this, and we'll answer you in so many days," or whatever, and … I don't feel that that is being correctly used.

When compared to the first wave, a review of the organisation's plans was seen as an increased focus on knowledge management ([FA1], 2008, 2017). During the second wave,

FA1 had plans to pursue community knowledge management activities that could be leveraged to better understand and gain insight from community residents that may assist with decision making ([FA1], 2016, 2017, 2018). However, the links between engagement with residents and knowledge management seem to be more incidental than requisite.

During the interview, the FA1 representative stated that the focal actor's business units remained the primary producers of content for community residents delivered through multiple physical and digital channels, that now include social media. Managers from the business units identify and provide the content. When asked if residents, or people on behalf of their businesses are able to add content to FA1's website, the Interviewee said "Oh, God, no [and laughs]". Residents and businesses have no direct input into the selection, or the creation of content provided through FA1's delivery channels.

Digital technologies were used as a substitute for more traditional means of providing information. During the second wave of interviews and observations, FA1's website and other digital technologies, such as emails and social media were being used to inform residents. FA1's website included links to external sources of content (e.g. community related statistical data) and incorporated the ability for online payment, including council rates, invoices, a range of infringements and fees, venue hire and to health registration ([FA1], 2020a). The number of services available for online payment increased significantly when compared to the first wave.

From the interview with the FA1representative, the priorities for digital content were the same at second wave as at the first wave. Social content was considered the highest priority, followed by economic, then political content. The focal actor allows elected officials to use social media to promote activities of the organisation to residents. However, policies are in place to guide how they use social media. This includes compliance with the State Records Act 2000 which requires all email and social media posts relating to the business of the focal actors be retained in official records. Furthermore, if material posted in social media by the elected official is considered to be campaign material, or to promote the candidate, it will be removed ([FA1], 2020b).

It was anticipated that over the next five years the priorities relating to content would not change. The interviewee stated that the residents remain the primary audience for community engagement and knowledge generated by the focal actor, with business being the secondary audience. As with the first wave, there was little evidence of politically

related information provided though the digital channels to residents. FA1's archive is still maintained by the organisation that hosts their website.

Sustainability of the community engagement and knowledge management solution

Similar to the first wave, promotion of community engagement and knowledge management activities identified during the second wave involved multiple methods. These methods included people sharing information through word of mouth and through digital technologies such as email and their website. Print media remains a method used by FA1 to communicate and keep community residents informed. This includes promotional information accompanying pamphlets and invoices, for example land rates) that are regularly distributed to residents and businesses. FA1 continues to provide a broad training to support staff to learn and adopt digital technologies. A difference between 2007 and 2018 is a strategy for community engagement. This plan is funded over a four-year period and recognises the need to develop the capacity of staff on matters related to community engagement ([FA1], 2018).

Considering the cultural aspects of specific community audiences was a matter that was not addressed by FA1 during the first interview. During the second wave, the FA1 representative raised concerns about the challenges now being faced by youth and the rise of digital technology:

> I see some changes in the kids and using technology; and I think that [technology] it's, in some ways, grown too big too quick with some of them, and I think in some ways that they need to scale it down, because you've got a lot of bullying etcetera issues and that that need to be looked at with the digital delivery. The Facebook and everything else, you used to get bullied at school, it used to stop at the gate. Now, it's being taken with them everywhere and we've got suicides and stuff like that so, yeah, going forward they're going to have to look in the future at how they can monitor this kind of thing, because it's ... the monitoring's going to be hard.

Another significant change between the first and second interviews raised by the FA1 representative was related to security and risk related to processes:

> Yeah, I think there's always going to be changes in security and risk. I think because you can go onto the [FA1] website and you can actually

> go and get information about blocks [of land], so you could go and look up my block and see what it's zoned as, what it's this, what it's that, so you put information out there but you always have to worry about what somebody's going to do with that information … Going forward I think it's becoming more like that now, because you've got scams going off and people are selling people's houses and everything else, and then you wonder how they got the information. So it's not that the information may have changed, it's the way some people are using it that is now changing.

As with the first wave, FA1 does not actively promote or leverage its community knowledge or expertise.

During the second wave, the amount of content available online had increased. A strategy for knowledge management was developed with a focus on the collection and analysis of data, information and knowledge ([FA1], 2018). Multiple opportunities for future development were mentioned in the interview and supported by the plans of the focal actor, including creation of a community hub where members of the community can learn to use or access computers and the Internet as part of a public service ([FA1], 2017).

6.2.2 Case 2: Focal actor supporting community 2 (FA2)

Case 2 overview

Like FA1, FA2 had no significant changes in its status as a public sector organisation when compared to the first wave of interviews. The focal actor continues to support multiple communities within its defined local government area in a southern metropolitan area of Perth, WA and serves a resident population of over 100,000 people. The population for the area FA2 is responsible for increased by over 20,000 people. At the time of the second wave of interviews, the focal actor employed more than 600 staff. This is an increase over the first wave of interviews when FA2 had fewer than 500 employees. The interviewee at FA2 for the second wave was the same person interviewed during the first wave, and they remained the leader of their information technology branch.

Table 6.2 compares demographic and industry data from the first and second wave of interviews for the LGA in which FA2 operates.

Table 6.2

Comparison of FA2's key age and industry demographics between the first and second wave of interviews

Wave 1: **2006 include the following demographics**	**Wave 2:** **2016 include the following demographics**
10% of the population is aged 18–24	11% of the population is aged 18–24
15% of the population is aged 25–34	16% of the population is aged 25–34
22% of the population is aged 35–49	22% of the population is aged 35–49
13% of the population is aged 50–59	11% of the population is aged 50–59
8% of the population is aged 60–69	9% of the population is aged 60–69
Main industries within the recognised local government boundaries of FA2.	
2006 **Industry sector of employment**	**2016** **Industry sector of employment**
manufacturing	healthcare and social assistance
retail trade	retail trade
healthcare and social assistance	construction

(Australian Bureau of Statistics, 2006, 2016; Informed Decisions, 2020b)

The service age groups that the FA2 is responsible for remain steady, with only minor variations in percentages. Of the leading sectors for employment identified in the first wave, retail trade and construction remain on the list of the top three employing industries for the LGA. The most significant change is that healthcare and social assistance is new to the top three listing and replaces manufacturing as the most dominant industry for the LGA. Manufacturing did not retain a place in the top three industries for the LGA.

Catalyst, leadership, and governance for community engagement and knowledge

The purpose of the focal actor's community engagement and knowledge management activities remained the facilitation of social interaction with residents, followed by enhancing economic opportunities. A key focus is the continued improvement to the delivery of customer services ([FA2], 2017). The representative for FA2 described the primary and secondary audience for the focal actor's community engagement efforts remained aligned with the first wave of interviews with the primary audience the people residing in the city and surrounding suburbs. The secondary audiences were people and businesses external to the city. The FA2 representative stated that the focal actor still does not promote political interaction and a minimal amount of political information was available through its digital channels.

During the second wave, FA2 continued to engage residents and business within the community using multiple traditional and electronic methods. During the interview, the FA2 representative stated that the management and operation of community engagement and knowledge management activities remained within the same business units, which were those responsible for the focal actor's administrative and corporate activities. They also stated that their operational activities to support community engagement and knowledge management efforts were similar. This included the process whereby content created to support online interactions with residents was distributed throughout multiple divisions and business units of the organisation.

The FA2 representative explained that a team had been established to provide support services to other business units which was a change to support operations since the first wave of interviews. Within that team, a staff member was responsible for supporting the focal actor's website and social media platforms. The representative for FA2 stated this action increased the capacity to assist their business units on matters related to the adoption and use of digital technologies. It is also seen as a tangible way of responding to an increased uptake in digital technologies and services within the community, and response to the expectations of local residents to enhance their ability to interact with the organisation. As with the first wave, FA2 has not engaged volunteers to create or edit content.

The FA2 representative stated another difference between the first and second waves of interviews was that residents and businesses now had the capability to engage with the focal actor through social media, in particular Facebook, Twitter, and more recently, Instagram.

> We have some social interaction, I suppose, through our Facebook pages, but it's not a high usage. You could say we are increasing the transparency of government, because we actually ... one of the highest uses on our website is the council agendas and minutes, that's where council make decisions about planning matters, and all that sort of things. So it's quite a high usage. And the other one is … well, it's businesses that come to our website to … especially developers, looking at our land (FA2 Interviewee, 2016).

This included the ability of community stakeholders to provide unsolicited feedback and suggestions to news that the organisation published through social media. However,

the manager has commented that interactions with residents through social media were new for the focal actor, and there was the opportunity in the future to learn how to leverage knowledge from this type of engagement.

> Yeah, I mean we do some, but it's not really high at the moment, so, yeah. I mean, I don't think it's been developed anywhere near … there is a lot of debate on about … no, the problem with providing social interaction is that it is something that has to be monitored 24/7, and responded to, and it is having the resources, to do that, that is often the issue (FA2 Interviewee, 2016).

Content collection, dissemination and target audience

The representative for FA2 explained that the organisation had a business services team with a resource focused on supporting and maintaining the website and the use of other digital media. The representative described the actual content for the digital media as coming through the various business units of the organisation. However, it is the responsibility of the Communications and Marketing Team to authorise the public release of anything to do with the website or social media.

The FA2 representative stated that business units within the focal actor either sourced content from external organisations, or the organisation created content that would be prepared and distribution by an internal group responsible for engaging with the community. The FA2 representative stated that to publish through the digital channels, the business units must adhere to the focal actor's marketing department guidelines and templates. Community engagement and knowledge management activities are self-funded by the focal actor.

The representative of FA2 gave the following example of the collection and dissemination process

> …if we wanted to provide more new information about our library services, that would come from the library management area. They would send that information through [to the communications and Marketing Team]. Might [sic] massage it a bit, so that it is consumable on the digital place. Sometimes people write reams and you don't want reams … But the information actually comes from the business areas (FA2 Interviewee, 2016).

The representative of FA2 stated no other business area can publish directly to the digital channel. “If ever we have any doubt over content that someone wants to put up, it goes up to the communications and Marketing Team, to actually get their final approval” (FA2 Interviewee, 2016).

The FA2 representative confirmed the primary target audiences for the focal actor are the residents and then businesses external to the local community. The focus on business external to the community is for transactional reasons. The primary purpose is to provide information on a twenty-four hour seven day a week basis, followed by social interaction.

Regarding business and economic activity, the FA2 representative also stated:

> You could say we are increasing the transparency of government, because we actually ... one of the highest uses on our website is the council agendas and minutes, that’s where council make decisions about planning matters, and all that sort of things. So it’s quite a high usage. And the other one is … well, it’s businesses that come to our website to … especially developers, looking at our land (FA2 Interviewee, 2016).

When asked about political interaction with the community, the FA2 representative stated that is not something the organisation does.

The focal actor owns and maintains an archive, but it is not accessible to the public. The focal actor also has a dedicated CMS for managing the creation, editing and publishing of their website content. The CMS was also used by members of FA2’s call centre. When a resident contacts the call centre requesting a service or to ask a community related question, the operator accesses the CMS to obtain required information. The integration of the call centre solution within an organisation can be a complex endeavour from both a technical and a knowledge management perspective. FA2 continues with activities to further integrate and optimise the call centre within the organisation. This includes developing the ability to analyse data collected from the engagement with residents.

During the second wave, the focal actor utilised multiple digital channels, including their website, social media, and email, as well as non-digital channels such as the telephone, counter services, letters, and other methods such as fax, to share knowledge with residents.

Sustainability of the community engagement and knowledge management solution

In a change from the first wave, the FA2 representative stated during the second wave interview that the focal actor published a marketing and communications plan. The plan was developed to motivate the focal actor to consider innovative ways to engage with their community. During the first wave, awareness of the focal actor's community digital presence and knowledge management capabilities were through word of mouth, occasional radio advertising, print media, and information printed on their promotional pamphlets and bills to their customers. In the second wave, word of mouth remained prominent, and print media continue to be used. However, use of promotional pamphlets to share knowledge with residents, although still considered important, had decreased, and radio advertising had ceased. Conversely, use of social media, in particular Facebook, had increased.

As with the first wave, FA2 does not promote or leverage its community knowledge or expertise for commercial gain. During the second wave, training continues to be provided, but the number of times this training is provided has been reduced as the number of people seeking training had declined. The FA2 representative attributed this to the increase in people with internet-enabled mobile devices when compared to the first wave and less demand for training to be provided by the focal actor.

During the second wave, the focal actor continues to use multiple digital and non-digital channels for interacting with residents. These channels include the website, email, social media, phone, counter services, letters, and fax.

Looking towards the future, the FA2 representative stated that the focal actor seeks to increase citizen and business self-service capabilities and enhance interaction/integration between their internal business systems. However, there are no specific plans about when and how this will occur. A growing difference between 2007 and 2017 was an increased interest by the focal actor in its ability to manage and understand data. The representative for FA2 considers community engagement using digital technologies to leverage social, economic and political knowledge as inevitable in future. The reason given was the emerging digital intellect and community appetite for information. However, as of the second wave interview, there were no plans on when, or how this will be achieved.

6.2.3 Case 3: Focal actor supporting community 3 (FA3)

Case 3 overview

The third focal actor operates in in the south-western region of WA. During the second wave of interviews and observations, the focal actor had been sold and now operates as a small business.

> We were a not-for-profit ... we sat under the arm of the [a] Business Centre, which is who I was employed by. The business centre had to restructure, and one of [the] things was that [FA3] was no longer going to fit in with their new structure, which is why they decided to sell. Now, I worked with them … obviously that's where my business background comes from, and that's where a lot of our clients are coming from. We are obviously out there trying to help small businesses get [online], which is part of why we gained such credibility. So we have come from a not-for-profit side, which was obviously heavily strategically planned, to obviously, a private … But you know, sales haven't changed, and the content hasn't changed, and everything else, it's just run a little differently now.

This was a significant change from the funding model, as the focal actor previously received funding and support from local government. The focal actor is now a commercial enterprise with its main source of income generated from advertising.

The interviewee for the focal actor during the second wave was the operations manager. In this role, the operations manager was responsible for operating the stakeholder relationships, technologies as well as supporting process, performance improvements and operations strategy. At the time of the second wave of interviews, the focal actor had a slight decrease in the number of staff employed by FA3. FA3 has fewer than 10 staff and supports a city and multiple suburban communities with a population of fewer than 50,000 people.

Table 6.3 compares FA3's demographic and industry data from the first and second wave of interviews.

Table 6.3

Comparison of FA3's key age and industry demographics between the first and second wave of interviews

Wave 1: **2006 include the following demographics**	**Wave 2:** **2016 include the following demographics**
7% of the population is aged 18–24	7% of the population is aged 18–24
11% of the population is aged 25–34	11% of the population is aged 25–34
21% of the population is aged 35–49	20% of the population is aged 35–49
14% of the population is aged 50–59	14% of the population is aged 50–59
10% of the population is aged 60–69	13% of the population is aged 60–69
Main industries within the recognised local government boundaries of FA3.	
2006 **Industry sector of employment**	**2016** **Industry sector of employment**
retail trade	healthcare and social assistance
healthcare and social assistance	retail trade
Education and Training	construction

(Australian Bureau of Statistics, 2006, 2016; Informed Decisions, 2020c).

The service age groups for LGA remain steady, with the exception of an increase of 3 per cent to the number of empty nesters and retirees (60–69 age group). Of the leading sectors for employment identified in the first wave, retail trade and healthcare and social assistance remain on the list of the top three employing industries for LGA. Construction is a new addition to the industry list for the second wave, replacing education and training which did not retain a place in the top three industries for the LGA. For the second wave healthcare and social assistance replaced retail trade as the leading community employer.

Catalyst, leadership, and governance for community engagement and knowledge

The representative for FA3 stated that during the second wave of interviews, their status changed from a not-for-profit to a for-profit organisation in 2015. A catalyst now included revenue generation and the operation of a viable customer focused organisation. The representative stated that with the change of status, there is no longer a Board, executive group, or steering committee involved in the management of the organisation. The new leadership and management structure for coordinating the community engagement and knowledge management activities through digital technologies involve two part-owners of the business. The focus of the business was as it was when operating as a not-for-profit organisation, to: "…we are still very much about helping out the community".

Operational support to maintain the information and services offered by FA3 is through a small team (fewer than five people) of part-time administrative and technical staff.

Currently, the primary audience for the focal actor are the people residing in the city, with a secondary audience being businesses. A change from the first wave is the focus on local business and businesses external to the community.

For the second wave, the focal actor included social media, specifically Facebook, to promote their organisation. The organisation also works with Google to drive traffic to businesses operating on FA3's website. The focal actor does not use other social media channels such as Twitter or Instagram. The FA3 representative stated the organisation had previously used radio and television to promote their services but appear to be focused on Facebook as a lower cost option than traditional broadcast media. The FA3 Interviewee stated: "… we have done television in the past, and we have done radio in the past. We just have not had great results with it".

As with the first wave, FA3 does not promote or leverage its knowledge, or expertise that was gained through developing and providing their service to the community. The representative for FA3 stated that they had attempted to partner with local businesses and industry associations; however, to date, expanding their existing network was not considered successful:

> I think, a lot of people think that they can do it [FA3's online services] better. But if you don't have the technical online knowledge, and also it's if you know anything about online, it takes a long time to get a good online presence – it's not an instant, It's not an instant success, so … hence you are still dealing with people like that, all the time, that think that they can do it better, cheaper, but muck it up.

Where there was once some training on how to use the Internet provided through the library on an ad-hoc basis in 2006, in 2016 this service is no longer provided by FA3. In its place is a person-to-person training for residents and organisations to load, manage and monitor their content. This training is delivered on an ad-hoc basis.

Content collection, dissemination and target audience

In 2006, content was originally provided to FA3 by residents and businesses creating and managing their own online pages. The practice of organisations managing their pages continued during the second wave:

> I suppose we can't say we don't have any volunteers, because that's probably not technically accurate. You have got to remember that a lot of our content comes from … community individuals, logging on, and putting their own stuff on ... or put their classifieds on, or add their community calendar entries, or write a blog article, and send it in. So I suppose, in a technical aspect, they would be volunteers.

The focus continues to be on residents first, followed by businesses. The importance of having a service that is relevant, responsive to the needs of local audiences is important to FA3. Failure to generate and maintain traffic to FA3's website could lead it to the focal actor ceasing to operate as a service provider. The representative for FA3 explained:

> Well, predominantly we are targeting our residents, because obviously business directory doesn't function without people using it. However, obviously some of those residents are business owners as well. So that becomes a little bit of a blur, because I mean they are one and the same. So, definitely residents would be the first one, then businesses, obviously, would be our second, obviously. We need our businesses.

The FA3 representative went on to say engagement with the community went beyond local residents and businesses:

> So if we don't have traffic content coming to the site, we don't exist. So, obviously, they [local residents and businesses] are the ones that we rely on most heavily … We do get a lot of tourists using it when they come through. So obviously, probably, our next biggest user after the residents, and the businesses locally, would be tourists. But we have found, and we have anecdotal evidence, that we actually do also get a lot of people from interstate and other countries, that use us for relocating.

Because FA3 had to increase its focus to revenue generation as the focal actor transformed from a not-for-profit, to a small for-profit organisation, it looks at various ways to generate revenue. One method to assist in the generation of revenue is through FA3's relationship with Google:

> We have a Google bot that sits on [our website], who trolls through [the content we have about our subscribing businesses] all the time, which

> means that all of our advertisers are getting value for money, and their information is getting out there 24/7 … So yes, we do help our small business community, heavily.

The FA3 representative stated that for the second wave interview that social content remained the first priority, economic focus had become the second priority, with political content shifting to third priority.

There is an archive of information that is accessible to the public. This archive is owned and maintained by the focal actor. FA3 states:

> We have got everything dating back to 1999. Even screenshots on the old original websites, and we have backups, obviously, from the old original websites, yeah, it's pretty cool. One day it would be really good to release it, just because it's such a laugh. I mean, some of the things that they have done over the years, you, kind of, go, "Ohh".

FA3 continues to manage and operate a dedicated content management system (CMS) to support their website.

Sustainability of the community engagement and knowledge management solution

During the first wave, the focal actor was seeking to increase usage of online forms and online surveys, and to increase social and political interaction. However, there were no specific plans when and how this would occur, and these no longer seem to be a priority during the second wave interview. The FA3 representative stated: "I suppose you have got to remember the difference between city, and country, is … country always takes a long time to catch on".

The interviewee from FA3 considers the convergence of digital and geographical communities to provide social, economic, and political knowledge an emerging trend. There was a recognition the process of change is constant and iterative, the FA3 representative stated "… there's never a finished product, there is always something to be added, or something to be changed, or something that you can [modify]."

In discussion about the sustainability of FA3 as a business, the Interviewee stated:

> I am hoping that in the future we can obviously service more of our business clients. Obviously, by servicing more of our business clients,

> it helps our bottom line, and also gives us more money to spend, on redevelopments, and keeping up with the community needs, because without that we are going to be a little bit stuffed.

The FA3 representative reflected upon the work being done behind the scenes that may not be recognised by their customers to maintain the service the focal actor provides:

> … unbeknownst to the public, you know, big developments like we do, are expensive … the last big development that we did, which was about three years ago … cost us [tens of thousands of dollars]. I don't always think the community understands that. They rely on [FA3] to be there, but obviously, … we need their support in traffic, which we get, but we also need … their support, by making sure that their businesses, or businesses that they use, advertise with us.

6.2.4 Case 4: Focal actor supporting community 4 (FA4)[1]

Case 4 overview

When the first stage of the research took place in 2007, FA4 was a private sector focal actor, located in a southern region of WA. It is no longer in operation and no second interview was able to be conducted for the longitudinal research.

6.2.5 Case 5: Focal actor supporting community 5 (FA5)

Case 5 overview

Like FA1 and FA2, FA5 had no significant changes in its status as a public sector organisation when compared to the first wave of interviews and observations. The focal actor continues to support multiple communities within its defined local government area in a northern metropolitan area of Perth, WA and serves a resident population of over 100,000 people. The population for the area FA2 is responsible increased by fewer than 10,000 people in the time between the first and second waves. At the time of the second wave of interviews, the focal actor employed more than 600 staff. This is an increase over the first wave of interviews when FA3 had fewer than 500 employees. The interviewee at

[1] FA4 is no longer in operation and a second interview was not able to be conducted for the longitudinal research.

FA5 for the second wave was the same person interviewed during the first wave, and a leader within their information technology branch.

Table 6.4 compares demographic and industry data from the first and second wave of interviews for the LGA in which FA5 operates.

Table 6.4

Comparison of FA5's key age and industry demographics between the first and second wave of interviews

Wave 1: **2006 include the following demographics**	**Wave 2:** **2016 include the following demographics**
11% of the population is aged 18–24	9% of the population is aged 18–24
11% of the population is aged 25–34	11% of the population is aged 25–34
24% of the population is aged 35–49	21% of the population is aged 35–49
15% of the population is aged 50–59	16% of the population is aged 50–59
8% of the population is aged 60–69	12% of the population is aged 60–69
Main industries within the recognised local government boundaries of FA5.	
2006 **Industry sector of employment**	**2016** **Industry sector of employment**
retail trade	healthcare and social assistance
healthcare and social assistance	construction
construction	education and training

(Australian Bureau of Statistics, 2006, 2016; Informed Decisions, 2020e)

The service age groups that FA5 is responsible for remain steady, with a decrease in the parents and homebuilders, as well as the older workers and pre-retirees service age groups. Of the leading sectors for employment identified in the first wave, retail trade was no longer in the top three industry employment list, being replaced by education and training for the LGA. Healthcare and social assistance became the most dominant industry for the LGA since the first wave of interviews.

Catalyst, leadership, and governance for community engagement and knowledge

During the second wave of interviews, the focal actor had developed plans and a governance structure, with documented support of the organisation's leadership to advance community engagement and knowledge management activities. The catalyst for the support included the goal to maximise opportunities and benefits from digital transformation. The commitment to transformation is included in a digital strategy ([FA5], 2013), a strategic community plan ([FA5], 2018c) and corporate business plan ([FA5],

2018a) that provided direction and allocation of resources to support community engagement and knowledge management operations of the focal actor. The FA5 interview participant stated:

> The business development team created a digital strategy document. I would say one years old, one or two years old. It is very well done, very practical, it has a number of recommendations of what we should do, and some of these have been … it's mostly for business development initially, and also, social, in a way. There is a big focus on how to attract businesses, and how to set up the city, so that it can attract business technology. They have got a couple of things they're trying to work with the universities … and to work with local businesses, and to do a bit more collaboration.

Regarding communications planning for the second wave interview, the FA5 representative stated that a communications plan was in place which considers community engagement and knowledge management activities. Similar to the first wave, community engagement and knowledge management activities were promoted through word of mouth, radio and now increasingly through social media. The FA5 representative advised that the focal actor was more involved in activities to promote and leverage their digital transformation expertise through seeking awards and other ways to change the profile and influence the culture of the community. The representatives stated that the purpose was to communicate that the focal actor is innovative in their approach to community engagement and knowledge management.

The purposes in integrating community engagement and knowledge management solutions are greater social interaction and enhancing economic opportunities. At this stage there is little consideration of progressing political activities through the focal actor. The representative for FA5 stated that the primary audience for the focal actor continues to be people residing in the region, with the focus being communities in the city where the focal actor is located. The secondary audience is people external to the region.

The FA5 representative considered the organisation's leadership, culture, process, and technology activities to be in the integration stage. This is a shift in maturity from when the organisation was considered to be primarily at the adoption stage of maturity.

Even with some maturity, the alignment between strategic and operational areas of FA5 may still need some work. The FA5 representative provided an example of this

concern in which the Marketing Team did not sufficiently consult with operational technical teams:

> When you get to the management level, you can't do everything, [the Marketing Department] needs strategic advice from us, to actually go to the right direction, and so, I think, there has been a little bit of a learning curve [in the Marketing Team], because marketing owns the website in a way. But the people we have [in marketing], don't necessarily follow what needs to be done. So, there's been a couple of mistakes in picking the wrong technology because [the Marketing Team] have been approached by vendors.

Issues related to the power dynamics were discussed during the interview. The FA5 representative provided the following insight related to the alignment and power between Marketing Team and IT Team. Although lessons can be learned from mistakes, the example illustrates the potential negative impact on time and resources:

> We tell [Marketing], "Hey, hey, don't jump so quick to pick a solution, there's new [products and services] around, we should consider using." But of course, the vendors [suppliers] have an opportunity to have a contractor [employed], and [as contractors] there is the perception they as the experts add a bit more weight because they have the nice suits, and the shiny brochures. … As a result, we have had a couple of mistakes [failed solutions], but now I think they [Marketing] have a bit better understanding. Now when we pretty advised them, "Don't go that way, there's a new way" ... I guess … they kind of understand [that] now.

Management and operational activities for community engagement and knowledge management continue to take place within FA5, including the technical activities such as maintaining and supporting the digital technologies such as the website, as well as the necessary infrastructure. The actual hosting of the website remains outsourced.

In discussions with the representative for FA5, it became evident that the process of identifying content has become more structured since the first wave interview. The focal actor operations community engagement and knowledge management solutions continued to be funded by the city and State government.

Content collection, dissemination and target audience

The type of content and how FA5 use the content to engage with residents and businesses was seen to evolve during the second wave. The evolution involved an iterative process that involved a transition from a service that provided information, to a more desired state that is more focused transactional activity. The FA5 Interviewee stated:

> Because the site is changing from informational, to transactional, more and more, the input from IT is a bit more important, because we are actually integrating our systems, and we do … it doesn't mean that it's going to be a super technical site, that you don't know how to use, but we … it's important that people can now [better interact] … we are focusing a bit on the UK model, gov.uk, which is a good reference, I believe. So we are trying to push to really provide services to the website, and not so much informational stuff. We're trying to now focus on what the user needs.

In describing the desired state, FA5 remarked:

> What I am trying to get to, is to have almost like a knowledge base, kind of site, which you have your question, and you have your answers. So it is very topical. Instead of the long pages talking about what the [Park Rangers] do, [you can ask], "I have a dog barking problem, what can I do?" Or, "I want to register my dog, what can I do?"

FA5 explained that the Marketing Team is having difficulty sharing knowledge and expertise working with the IT Team to development of new solutions for engaging with residents and managing knowledge:

> They are not used to that at all. We are doing that exercise at the moment, and they are a bit struggling with that concept. So, it's a bit of … I think we'll get there, but it's a bit of a challenge. It's also a challenge for us to do it the right way.

During the second wave interview, training identified for the public included how to access the Internet, but also Internet security, and use of some mobile devices. The FA5 interviewee stated that training had expanded to include training of the public at community libraries:

> We have a lot of sessions delivered at the library for the community. Typically, how to deal with Internet security, or how to use your iPad, use the Internet, like mostly for the community. That's fairly new, [I would say, the training] started probably two, or three, years ago.

This is a change from the first wave where training was limited to internal stakeholders, primarily editors who create or review content. Also, during the second wave, the use of digital technology was broadened when compared to the first wave to include links to other digital services, including social media, advertising on other websites, and paying search engines to promote their online presence. This also involved more interaction between FA 5 and community residents:

> The other big change … is the changes to events [management]... or it's more functionality of the website. We now have a fully functional Event Management System. Which means that we list all the events, and people can book their events online, they can pay online for events, can buy tickets, that sort of stuff. So, that is fairly … well, it's very interactive, compared to what we had before, so that, in a way, it serves the community in that sense, because, there's interaction there.

In essence, during the second wave, the focal actor progressed changes, including the integration of processes and technologies to transform largely didactic forms of engagement and knowledge management to more interactive methods of engaging with the community. FA5's Event Management System is an example of such a solution in which the customer's satisfaction is enhanced by the experience.

The focal actor maintained and operated a dedicated CMS to assist them in managing community knowledge.

> [The Marketing Team] have access to a CMS, or a Content Management System, they can do whatever they want, in the way of content … there are a number of business units, within the organisation, that create content, and so the Marketing Team reviews the content, before it is published.

A difference was that during the second wave social media played a more prominent role than the first wave.

Sustainability of the community engagement and knowledge management solution

From a sustainability perspective, the community engagement and knowledge management sociotechnical solution continued to evolve. Within the organisation there was evidence of increased leadership participation, activities to influence the culture of the focal actor and community stakeholders, processes apparently more defined, and continued investment in technology.

An example of this commitment from an operational perspective, during the second wave interview, the representative from FA5 stated that Council minutes and supporting documents were now made available to members of the community through digital technologies. Furthermore, the archive maintained by the focal actor was expanded to include minutes, agendas, and audio records of Council meetings that were made available to the community. This information, as evidenced when comparing the FA5's website during the first and second wave of interviews, shows that there is a broader range of corporate documents now available through digital technologies than at the initial interview.

The evidence indicates that the work being done to advance community engagement and knowledge management has been able to be sustained. It also appears from the literature published by the focal actor, that there is interest, committed leadership for the continued development of community engagement and knowledge management activities ([FA5], 2013, 2018b, 2018c). To illustrate this, the FA5 representatives provided an example of another change from the first wave. This change involved forms being made available to the public and the potential value gained from this activity: "We have a lot of forms on our website … you can register for something, or do some surveys about new projects, and [it lets us know] what people think about it".

The FA5 representative commented on the change witnessed over the past ten years. These changes involved how the Executive Team views about the use of technology, in particular social media, to engage with the community have evolved.

> I would say ten years ago, probably the executive team was quite scared to use that sort of tool. And now I think it is hard to avoid using those tools, because they probably get a lot of information from it, but … and I think it is common practice to have a way for people to say what they think. The other big one, I think, is because everyone, every Council, has a Facebook page, and that has pushed them in everything, because

> you can't stop someone from saying something on Facebook. So suddenly you have a place where people can express their views and it's potentially … I think they can still moderate it, but I think they are getting used to that idea that people express themselves online.

During both the first and second waves of interviews it was predicted that in five years, the focus of the focal actor would primarily be on social content, followed by economic content, with the third priority being political content.

6.3 Wave 2 challenges, opportunities and future directions

As in the first wave, representatives for the focal actors were asked about the challenges that may inhibit their progress but were not necessarily immediately detrimental to their operations. They were also asked to provide information about the opportunities in which they may be able to gain an advantage. These opportunities are briefly mentioned in this section, with more information provided in Chapter 7. Finally, during the interviews, each participant was asked to identify and discuss the future directions for leveraging community knowledge through the use of digital technologies.

Each focal actor identified a number of strategic and operational challenges they had or anticipate will be encountered. Table 6.5 summarises the potential strategic and operational challenges distilled from the second wave of interviews. Similar to Chapter 5, the key strategic and operational challenges will be discussed. Chapter 7 compares the strategic and operational challenges between the first and second waves of interviews.

Table 6.5

Summary of challenges identified during wave 2 (2017/18)

Summary of Challenges (2017/18)	FA1	FA2	FA3	FA4	FA5
Leadership and Management					
Uncontrolled growth of or demand for digital technology / services					
Boundaries of control will change (e.g. from within the focal actor, or control shifts to residents)					
Managing community perceptions		☑	☑		☑
Competing with other focal actors, including online communities			☑		
Human and financial resources		☑	☑		
Building the market, business development, increase usage			☑		☑
Culture					
Organisation loses control of its digital services to external stakeholders					
Meeting rising community expectations, dealing with a better-informed community		☑	☑		
Raising awareness of the digital channels					
Changing the focal actor to better leverage digital services/content/knowledge		☑	☑		☑
Processes					
Redeveloping processes as a result of digital technology		☑			
Determining how to integrate online forms into the focal actor					
Determining how to integrate online surveys into the focal actor		☑			
Monitoring accuracy of information including security			☑		☑
Monitoring / managing community content					☑
Technology					
Technology integration, business systems integration		☑	☑		☑
Need to refresh website, technology			☑		☑
Accessibility					

From the strategic perspective, regarding leadership and management, three out of four focal actors from the second wave of interviews considered matters relating to managing community perceptions to be a challenge. The reasons for this may involve leadership, management, and cultural considerations. For example, the public focal actors involved in this study are holding an increasing amount of privileged and sensitive information about their community, including their residents. This information may include personal data such as name, address, date of birth, age, sex, bank details and services the focal actor provided.

To gain and maintain community support, the focal actor will need to be perceived by residents as being trustworthy and having integrity instilled within. From the culture perspective, three out of the four focal actors considered the challenge to be changes needed to better leverage digital services, content, and knowledge. The challenge includes training and awareness activities related to community engagement and knowledge management, which are essential to fostering organisational change. Without this, there is a risk that the online engagement and knowledge related initiatives will be hindered.

From an operational perspective, two out of the four participants considered monitoring the accuracy of information and security to be a challenge to the community knowledge process. This challenge can be linked to trust and integrity matters raised in the previous paragraph. From a technical perspective, three out of the four focal actors considered technology and business systems integration to be a challenge. Integration allows sociotechnical systems to interact and share knowledge seamlessly. An example of how this can enhance the customer experience is the call centre FA2 set up, and to a lesser degree, FA5's Event Management System.

6.4 Summary

In this section, the second wave of interviews and observations have been presented. Within each case the findings of the interviews, supplemented with reviews of reports and websites, report the changes that had occurred between the two waves. For each case, information about the intended target audiences, for type of content being developed and disseminated, was discussed. Finally, the perceived sustainability of the community engagement and knowledge management solution was discussed compared and contrasted with the first wave.

This chapter focused on an analysis of individual cases and how they compared between the first and second waves. Th1is comparison included investigating the leadership and governance of community engagement and knowledge management solution by the focal actors. The influence of age demographics, industry types, community engagement and associated knowledge management was considered. Content collection, dissemination and target audiences were examined. Matters related to sustainability of solutions were also explored. In the next chapter (Chapter 7) the cases will be aligned with strategic operational themes and their associated delegates.

Chapter 7

Discussion

7.1 Purpose and chapter structure

This chapter presents, interprets and discusses the findings from this longitudinal study in a logical process designed to address a relevant and real-world problem of the high failure rate of sociotechnical initiatives. A purposeful use of influential models and frameworks is intended to successfully guide sociotechnical initiatives such as community engagement and knowledge management initiatives that were used as an example in this study. The chapter structure reflects the format of the conceptual framework described in Chapter 3 to logically progress the discussion.

7.2 Key findings: Addressing the research question and objectives

In this section, first the research question and then the research objectives that guided the analysis are presented and aligned with the key findings.

> What are the strengths and weaknesses of various sociotechnical models or frameworks used in a sample of WA community organisations to transform how they engage residents and then manage knowledge collected through the use of digital technologies?

The findings indicate that there was no clear evidence of influential sociotechnical models or frameworks used by the focal actors to advance community engagement and associated knowledge management efforts. Furthermore, the link between community engagement and knowledge management was minimal. Only one of the organisations participating in this study (FA1) had plans to progress knowledge management.

Although the literature supports the view that synergies between community engagement and knowledge management are mutually beneficial, there remains no evidence in this study that influential models or frameworks have been adopted to progress community engagement and associated knowledge management activities. This finding supports the view taken by some academics that linking community engagement processes and management of knowledge remain at an early stage of development.

As advocated in the literature, use of models and frameworks by local governments for community engagement is encouraged as they may assist organisations with their

community engagement strategy to align the focal actor's business and information technology activities to better support community engagement and knowledge management efforts.

The focus of research objective 1 (RO-1) was to identify and categorise factors that may contribute to reducing risk for successful transformation of community engagement and associated knowledge management initiatives. Through the lens of ANT, three constants were identified as illustrated in Table 7.1. The first constant is that networks can be either strategic or operational. The second constant is a human or non-human actor may interact or transcend between the networks of alliances and delegates to share expertise or information. The third constant is the delegates: leadership and management, culture, process, and technology. Actors and their networks can be aligned to one of these delegates. It is important to note that actors linked to the delegates may vary and evolve as the initiative moves from its current state to the desired state.

Table 7.1

Orientation of alliances, delegates and actors

	Alliances	**Delegates**	**Actors** ***(Human and Non-human)***
Focal Actor	Strategic Network	Leadership and management	There are multiple actors enrolled by delegates. These actors influence the power and activities of delegates. This influence evolves as a result of social, economic, political circumstances.
		Culture	
	Operational Network	Process	
		Technology	

The second research objective was to investigate opportunities to enhance an existing or create a new model or framework that may assist organisations to successfully transform how they engage with community residents and manage associated knowledge through the use of digital technologies.

The research indicated that the sample influential models and framework considered for this study do not fully reflect current practice. There is the opportunity through the use of a model to recognise the ability of actors to share knowledge and transfer power between alliances, delegates and actors as the initiative evolves towards the desired state. A framework should also incorporate a stronger focus on addressing complexities

associated with influencing culture. There is also the opportunity to recognise and mitigate risk as the initiative evolves through iterations of a maturity process. The adoption of such a framework may help manage the complexity in a methodical manner and contribute to reducing the existing high failure rate of sociotechnical transformational initiatives. The ability to collect, manage and leverage knowledge through engaging with residents has not progressed significantly during the time of this longitudinal study. The knowledge management activities may need to be considered after the fundamentals of community engagement are operational. This may reduce complexity to a more manageable state.

7.3 Contrast with findings from the literature review

In this section, the gaps between the theoretical conditions found in the literature against what was found in practice is presented. From the first wave to the second wave it was anticipated that models and frameworks would be clearly adopted by at least some of the focal actors. It was also believed that matters relating to culture would be more thoroughly addressed by the focal actors to mitigate a risk identified as a barrier to community engagement and associated knowledge management initiatives. Another gap of significance between the literature and the findings is that although the benefits of knowledge management presented in the literature, there was little or no evidence of aligning community engagement and knowledge management.

Table 7.2

Theoretical conditions and the actual conditions identified

Theoretical conditions	Alliance / Delegate	Actual conditions
Governance: Endorsed strategies and plans provide vision for community engagement through sociotechnical solutions.	Strategic / Leadership	Strategies and plans in place but may not provide a vision for community engagement or knowledge management.
Culture: People and business units within the organisation share power and knowledge. Strategies and plans for communicating within and external to the organisation are in place. Activities to influence internal and external stakeholders, using multiple methods are consistent and persistent.	Strategic / Culture	The importance of culture and the success of sociotechnical initiatives may be recognised, but activities to influence culture across multiple audiences are insufficient. The challenge to change culture is underestimated and under-resourced.
Collaboration: Multidisciplinary approach from concept to completion of the initiative. Discipline areas share power and knowledge.	Strategic / Culture	Collaboration is undertaken, but it is based on loose alliances, not as a strong collective. Power is consolidated within a discipline and not shared during the life of the initiative.
Knowledge management: Knowledge gained from the organisation's engagement with the community through sociotechnical solutions are used for decision making.	Strategic / Culture	Knowledge from the systems are not yet captured and used for decision making.
Models and frameworks: Influential models or frameworks are used by organisations to guide their sociotechnical projects.	Operational / Process	Organisations have not adopted influential models or frameworks.
Process creation and management: Process developed with input from multiple disciplines. Consideration how knowledge obtained from processes can assist in organisational decision making.	Operational / Process	Little tangible evidence of knowledge being collected and used for strategic decision making. One organisation is explicit with plans to progress using knowledge captured for strategic decision making.
Technology: Business areas of the organisation drive technology to support the vision for engaging with the community.	Operational / Technology	Technology facilitates community engagement. Governance activities, including plans and strategies, follow.
Application of technology: Technology fosters changes in how organisation engage residents for social, economic and political purposes.	Operational / Technology	Technology is used to share information with residents and for transactional purposes (e.g., pay land rates, parking fines etc.).

7.3.1 Influential sociotechnical models or frameworks on focal actors

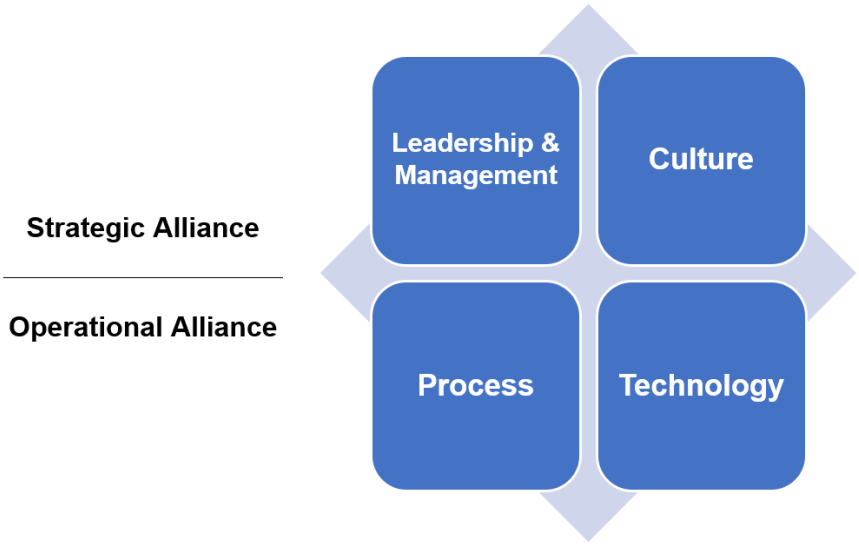
A fundamental objective for a sociotechnical model or framework is that a focal actor would accept it, and then use it to transform ways in which they engage residents and have a positive influence on their community. For this to occur, the model or framework needs to be accepted by multiple actors and networks, including people from different backgrounds, skills, and experience. However, instead of using models and frameworks, the sociotechnical initiatives relating to community engagement often evolved organically and were not guided by the influential models or frameworks. No explicit evidence was presented of a theoretical sociotechnical model being used by any of the focal actors.

7.4 Process mapping

The results of data mapping to reflect the actors and networks involved in community engagement and associated knowledge management activities and their interaction is presented in this section. First the strategic alliance and its delegates is discussed, followed by a discussion about the operational alliance and its delegates.

Figure 7.1

Configuration of strategic and operational alliances with sociotechnical delegates



7.5 Strategic alliance and aligned delegates

Within the strategic alliance a direction of the focal actors emerged and influenced how they engaged with community residents and captured and used knowledge. The theme encompasses how leaders and managers within focal actors plan and guide the use

of digital technology to transform engagement with residents and manage community knowledge. Decisions made by the strategic alliance influence the transition from a current state to a desired state, including directly influencing the activities of the operational alliance.

Potential conditions include the opportunity for the strategic alliance to capture and use knowledge to better influence community residents' perceptions about engagement and knowledge management initiatives. There is an opportunity to better monitor and where necessary influence activities to mitigate risks, including risks associated with resistance to change.

The success of the strategic alliance includes at least three factors distilled from the risk identified in Section 2.6.2:

1. valid analysis of the results from the community residents' engagement to contribute to the focal actor's decision making;
2. appropriate resources allocated to reduce risk and perception of the operational alliance failing;
3. the initiatives considered beneficial to the community and support from residents maintained.

7.5.1 Leadership and management delegate

Actors within the leadership and management delegate undertake activities related to leading, managing, and monitoring activities for engaging community residents using digital technologies. The leadership and management of the community engagement activity can also be linked to the creation, diffusing and leveraging of community knowledge. In fulfilling these activities the leadership and management delegate set the vison that influences the actions for engaging with community residents and for how they manage community related knowledge obtained through the interaction with residents.

To help ensure the vision has the desired effect, the leader may need to develop an understanding of the challenges posed by community engagement and associated knowledge management activities. This understanding can contribute to communications to the community that address challenges and help facilitate paradigm shifts in culture, processes, and the application of technology within the anchor focal actor and the community it supports.

From interviews conducted during both the first and second waves, it was clear there was an opportunity to improve the provision of visible and tangible leadership to support community engagement and knowledge management initiatives. However, it is recognised that community engagement and knowledge management initiatives are competing with other activities within the focal actor.

The depth and breadth of community engagement and knowledge management vary between focal actors and communities. This can be attributed to the leadership activities within each of the focal actors, and the degree of emphasis placed on community engagement and knowledge management activities. It is clear from the literature that leadership influences attitudes, and the behaviours and actions of individuals and how groups and networks interact for the purpose of achieving goals.

Leadership may work through multiple initiatives and issues that can be strategically linked through a vision, planning, and alliances. These initiatives competed for time, financial and human resources in the focal actors. The effort and focus of the leadership, including whether the community engagement and knowledge management initiative is a high or low priority can impact on the success. To progress actions related to community engagement and knowledge management initiative, the focal actor leaders set directions. From these directions, the leaders and managers are responsible for allocating, aligning, and motivating staff as well as developing, executing and monitoring plans and the mitigation of risks.

Multiple interconnected activities are involved with leading and managing how the focal actors engage with community residents through digital technologies and leverage community knowledge. These interconnected, often complex, issues may involve leadership's modifying the vision of the focal actor, which links to the focal actor's management plan for leveraging community knowledge from engaging with residents. Failure of the leadership and management team to adequately address these and related activities may lead to risks that may impede the success of community engagement and knowledge management initiatives.

The findings align with the strategic theme of leadership and management and include categories that provide commentary on vision, planning, alliances, and the differences between the public and private sector focal actors undertaking community knowledge initiatives and activities.

Vision and strategic direction

Focal actor leaders outline their formal vision with the intent to influence stakeholder behaviours, policies, and practices, to achieve strategic goals. Although not captured or clearly articulated within the focal actors' vision statements or strategic plans, all study participants stated their interest to learn and observe change and transformation through community engagement and knowledge and the use of digital technology. Without linking the focal actor's plans, strategies and vision, community engagement and knowledge management initiatives will have difficulty enrolling support and the initiative succeeding. This can be linked to a view expressed in the interviews, that focal actor leadership had allocated little time to understanding or providing visible, tangible support and guidance to both staff and the community to influence community engagement and knowledge initiatives.

Planning

Plans that intend impact on residents need to consider that communities are diverse and complex environments. According to the literature, leadership sets a focal actor's vision and strategic direction, and managers are responsible for developing and executing the plans. The planning activity includes the allocation of human and financial resources to achieve the plans. In practice, four of the five participants in the study recognised significant challenges in enhancing how residents were engaged, but these issues were not sufficiently addressed in current plans, and no plans were yet developed to address the concerns. Furthermore, three of the five focal actors noted the significant challenge of managing community perceptions, and the absence of plans to influence perceptions of the community.

Alliances, collaboration and partnerships

Leadership and management have a key role in creating and maintaining partnerships with business, government and civil society to build capability, transfer knowledge, and innovate. There is some evidence from the study data that focal actors had formed alliances with other organisations to support their community engagement and knowledge management initiatives. This includes having third parties provide support of their website, archive, strategy. One focal actor was exploring an opportunity to establish a partnership with tourism, leisure, and recreational groups, which may be further enhanced through better business and communication planning.

There are opportunities to form alliances with organisations that can provide experience, support, content, and/or services. Alliances with education or training providers can contribute to a more aware and skilled workforce that will have a better understanding of the social and economic activities that can influence decisions concerning the community.

Gaps in practice: Leadership and management

Across each of the focal actors, there was a lack of awareness of the potential value that can be gained from engagement with residents and their associated community knowledge. Consequently, there was little evidence of a documented vision, or strategic planning, or activities to align and combine community engagement with knowledge management. Although most focal actors had content management and archives available, these tools seemed to evolve organically and not through a community engagement strategy. Similarly, there was no specific framework or business model with the purpose of engaging with residents and managing knowledge resulting from such engagement. Alliances could be formed to contribute to their efforts or promote engagement and knowledge management activities. These partners may include content providers, training providers, researchers, technology providers. With the exception of one focal actor there was little evidence of strategic business planning, policies, and guidelines for aligning community engagement and community knowledge.

As a result of lack of a vision, strategic direction setting, plans for community engagement and associated knowledge management activities can continue to evolve organically, including from the bottom up. The implications can influence the resources allocated to the initiative, speed of adoption, the ability to gain support of stakeholders and form deeper alliances that can support community engagement and community knowledge management activities. Such alliances may contribute to expertise and knowledge to enrich the community engagement and knowledge and influence residents.

A limitation was my assumption that the link between community engagement and knowledge management would be stronger. There was also an expectation that the alignment between community engagement and knowledge management would have evolved to the point where more benefit would be obtained through the initiatives with more knowledge gained from interaction with community residents used in focal actor decision making.

7.5.2 Culture delegate

The culture of the focal actors and the community they support can be influenced by leadership and their use of tools and activities to communicate and build support of the vision, strategy and plans for community engagement and associated knowledge management actions. Activities to influence culture also include promoting and raising awareness of the initiative, conducting training sessions for stakeholders, and related activities to increase the likelihood that community engagement and knowledge management activities initiatives will be accepted and maintained. The results of the longitudinal study showed that awareness of digital technologies and opportunities for integrating their use into the community were organic, rather than being a structured and planned approach. From the first wave and second wave, there appeared to be little change in planning to influence culture and acceptance of digital technology to engage and capture and use knowledge gained from community residents. There was also little evidence of the focal actors fostering training or awareness programs or plans concerning campaigns to communicate potential benefits regarding community engagement and knowledge management activities.

How leaders communicate with their organisation's workforce and the community in general, and the frequency and tone of messages, is vital to managing stakeholder understanding and expectations of sociotechnical initiatives. However, none of the focal actors had a communications plan that described the vision, plans, activities, and potential benefits from engaging residents in obtaining and leveraging community knowledge.

Although multiple communication channels were identified for interacting with community stakeholders, it was not clear who was the intended target audience, for example age group, family with young children, or couples with dual income, no children. To increase awareness and understanding of community engagement knowledge management activities and organic spread of knowledge through residents, talking amongst one another, also known as word of mouth, was the preferred method. Furthermore, word of mouth is recognised in the literature as having a major impact on influencing consumer behaviour. For example, although FA3 did not have a marketing plan for community engagement and did not have significant human or financial resources for promotion, they acknowledged the importance and benefit of word of mouth communications to raise awareness of their community engagement activities.

With the exception of FA1 during the second wave, no focal actors demonstrated plans, strategies, or structured activities to foster a culture that leveraged engagement with the use of digital technology to create and use knowledge. The absence of specific strategies and plans for community engagement and associated knowledge management activities is consistent with challenges identified with other knowledge management initiatives.

Existing models and frameworks identified in this study for deploying digital technologies have stated familiar factors that include the support from leadership, resources allocated to properly deliver the initiative, sufficient operating processes, and having the appropriate technology for the initiative. Some models and frameworks consider the alignment of an organisation's business plan and information technology plans. A broad perspective of culture in these existing models and frameworks may be implied at best but does not appear to be a sufficiently prominent factor. From the literature, interviews and observations, a view emerged that culture is a more prominent factor in the success of complex sociotechnical systems than articulated in the existing models and frameworks examined.

The implications are that there is a risk that resistance can be high for a community engagement initiative. The risks include insufficient human and financial resources that may be used to foster innovation, including more meaningful dialogue with the community and the sharing of knowledge. This innovation can also lead to improved products and the delivery of services provided by the focal actor.

A limitation of the study was that residents were not interviewed to gain their insights and perspectives related to the culture of the community and their attitudes towards community engagement and knowledge management.

Training and skills: Human resource requirements

Within focal actors and the community in general, awareness of how to use digital technologies, including social media as a method of disseminating information and services to residents continues to evolve. However, there was little knowledge of potential efficiencies gained through engaging with the community through a range of available digital channels.

It was difficult for focal actors to determine the human resources required, and the specific skills needed for viable and sustained community engagement and knowledge management operations. Increased executive awareness and skills in understanding the

digital environment would assist in strategic planning and execution of activities for community engagement and knowledge management. Therefore, in relation to training, while development of knowledge is typically considered essential for cultural change, participants' interviews revealed that they had limited knowledge about the impact of digital technologies. With more understanding of the impact, the outcome of the development of a training strategy would be to help cultivate a culture receptive of community engagement and knowledge management practices.

Training to support aspects of engagement and knowledge management and its benefits were either non-existent or delivered on an ad-hoc basis. This ad-hoc training included FA3 teaching people how to access the services and input and edit classified advertisements on a request basis. This training is conducted face to face or over the phone. The administration, segmentation, type, content, delivery, and monitoring of training was not a significant consideration within the focal actors. None of the participating focal actors had alliances with education or training providers or leveraged education or training providers to raise awareness or understanding of how knowledge management may contribute social and economic value to the community.

Contribution of knowledge sharing alliances to culture change

Focal actor engagement with residents can involve acquiring and creating new knowledge. This knowledge can be used to generate opportunities for innovation. None of the focal actors participating in the study were sharing or had shared their experience of community engagement and knowledge management with other similar focal actors. The literature recognises that successful community engagement and knowledge management initiatives involve developing a culture and the expertise to change the way focal actors and individuals interact. It is recognised that this change is often initially resisted. Reasons for resistance are described in the literature and include the need for leaders and managers to provide clarity about how to achieve a change in culture and encouraging and supporting knowledge sharing across the focal actor. This may explain why none of the focal actors participating in this study had formed alliances with other organisations to formally share community engagement and knowledge management experiences.

Gaps in practice: Culture

Each focal actor participating in this study was undertaking activities that used digital technologies to engage with community residents; however, the knowledge from these engagements may be able to be better leveraged to support services for residents. The

study found that the method of engagement between the focal actor and residents evolved from the initial interviews in 2006 to the final ones in 2018, in particular through the adoption and increased use of new technology. The increased use of technology redefined the interactions and relationships between the focal actor and residents. For example, FA2 identified that the expectations of residents had changed with regard to times of response to enquiries made through digital methods. During the time of the initial interviews, residents would place an order for a product or service and wait three to four days for delivery. However, during the 2018 interview with FA2, it was stated that residents were becoming accustomed to quicker responses as a result of online interactions.

With increased availability and application of digital solutions, how community residents are engaged, and services are delivered continues to be transformed. Failure to adequately plan for the change puts well-intentioned initiatives at risk. Although organisational leaders may conclude that transformation through the use of digital technology offers significant opportunities that may benefit stakeholders, there is little evidence of holistic strategies being deployed to foster a change of culture within focal actors or the community. The significant gap is in training and awareness activities that are essential for shaping organisational and community culture; these activities are consistently highlighted in the literature as beneficial to sociotechnical initiatives. This includes the development of skills, capability, and capacity to link community engagement and knowledge management through the use of digital technology. The failure of an existing training, awareness, and skills development regime is a gap that can hinder the ability to leverage community knowledge for the benefit of residents. There is the opportunity to learn from other focal actors; however, there is minimal evidence that the focal actors have developed the culture to learn from others how to enhance their engagement and knowledge management practices.

7.6 Operational alliance and aligned delegates

The operational alliance includes processes and technologies that support community engagement and associated knowledge management activities. The scope and quality of operational alliance process and technology networks are influenced by the strategic alliance. The strategic alliance sets the direction for the operational alliance and includes allocation of human and financial resources for the alliance’s initiatives. For instance, inadequate funding, or a workforce with inadequate skills, can have a negative impact on operational alliance initiatives. The operational alliance provides input and feedback to the strategic alliance about the adequacy of human and financial support. This feedback

may influence decisions by the strategic alliance. The operational alliances influence activities related to process and workflow design; for example, the detailed processes for ensuring that the engagement process is efficient and secure. It also influences technology and associated technical infrastructure that may consist of applications, configuration, hardware, communications, and data.

The success of operations alliance is based on at least the following three issues distilled from Sections 2.5.5 and 2.6.2:

1. ability to deliver on vision outlined by the strategic alliance at a time, cost, and quality expected from the actors;
2. provision of feedback strategic alliance consideration. The strategic alliance may be influenced by to reconsider allocation of human and non-human actors to reduce risks and enhance opportunities for perceived success;
3. the ability to change operations in a methodical and iterative manner to support the focal actor to achieve its community engagement and associated knowledge management vision.

7.6.1 Process delegate

The process delegate considers the focal actor's sociotechnical, administrative, and operational processes. These processes support resident engagement and community knowledge management from interaction with residents. The processes also include functions that support community engagement and knowledge management, financial services, supply chain activities, the delivery of education, training and professional development, audit, human resource management, production and assembly, security, marketing, and promotion services. The application of these processes is influenced by the leadership and management and culture delegates. For this reason, the process delegate is more operational than strategic.

The focal actors participating in this study undertake processes to support community engagement and knowledge management activities that are increasingly reliant on digital technology. This study considered these processes to be practical activities used by focal actors to engage with residents as directed by leadership and management activities, with culture influencing how the processes are performed.

Most of the focal actors' representatives interviewed for this study stated their preference was to focus on engaging with the community for generating social content

first, followed by economic content, then political content. Although it is recognised by the focal actors that the use of digital technologies can assist communities with social change, most participating focal actors did not appear to have processes to use the knowledge gained from community engagement activities to improve their products or service delivery.

Community engagement process

Since the first wave of interviews, most focal actors seemed to have made important incremental changes about how they engage with the community. For example, over the past decade, FA2 has adopted minor changes such as generic email addresses, and underlying processes aimed to help provide more efficient responses to customers' enquiries. FA2 has also recognised that there has been an increase in the ability of organisations to leverage digital technology to submit reports electronically through mobile devices, instead of filing reports when staff return to the office. FA2 has adopted this process for inspections of health premises.

The trend towards transaction services or accessing information from mobile devices such as mobile phone and tablet computers, is also being adopted by FA3 and FA5. This allowed FA5 to engage with residents while in the community to complete forms related to inspections and maintenance work. FA3 stated the ability to operate the community engagement activities from anywhere would have been more difficult when they were first interviewed for this study. FA5's websites were updated so that residents and others can use their mobile devices to view their websites. This has increased the number and types of digital devices residents can use to access community information that FA5 publishes.

Community knowledge management

There was evidence of incremental improvements during the second wave including the process for identifying, collecting and then publishing content targeting residents. However, without exception, the links between community engagement and associated knowledge management practices can be improved. Although the study found that each focal actor was actively involved with community engagement, the knowledge from the engagement process was under-utilised, which might result in missed opportunities for stakeholders and residents.

Focal actors managed content and archives, but there was no common method across the organisations to capture, store, accumulate and maintain knowledge from engagements

with community residents in an archive. However, some knowledge, mainly related to websites and social media is being captured stored and accumulated, but with little evidence of this knowledge being used for strategic purposes.

In addition to websites and social media, other knowledge management solutions were implemented during the second wave of this study. However, like websites and social media, their links to community engagement could be stronger. To illustrate this, FA2 implemented a call centre to complement their existing community engagement process; however, they acknowledged that information obtained by the call centre as a result of the engagement between the focal actor and residents was under-utilised.

Gaps in practice: Process

The study found continued interest in progressing initiatives for engaging with community residents for the purpose of sharing knowledge with them. During the second wave participants increased the use of social media as a form of engagement with community residents. However, although focal actors maintained content management systems and archives, there were no clear processes linking them to processes to enhance community knowledge management. Overall, the processes related to community engagement and knowledge management can be considered uneven. Therefore, community knowledge is under-utilised, which can result in missed opportunities to enhance the support and services for community residents.

7.6.2 Technology delegate

The findings discussed in this section focus on how digital technology supports the strategic and operational alliances for engaging residents and associated knowledge management activities. It is important to note that there have been many academic studies about initiatives with technology at the core that do not meet expectations (Frost, 2014). The findings from discussions with representatives of participating focal actors did not identify significant dissatisfaction with their expectations being met from a technological perspective; rather, they expressed a level of frustration and difficulty to leverage existing technology for the benefit of the community.

A difference in the types and uses of digital technology between the first and second wave are the increased use of social media by the focal actors, and how such technology is being incorporated into delivering information and services to community residents. Although the popularity of social media increased (Sharif et al., 2016), social media was

primarily used as an additional channel to complement the existing web presence. How focal actors implement social media continues to evolve. This evolution is not just on technical integration, but also on how to manage the views expressed by residents. The feedback through social media and how to respond was foreign to the focal actors.

Linking technology delegate with community engagement and knowledge management

Community engagement was considered a primary focus. From community engagement the theory was that knowledge would be captured and managed to support and influence support and services for community residents. However, most focal actors' knowledge management activities are at the adoption stage. With the exception of one focal actor, there is little evidence of a knowledge management strategy or of processes developed to use knowledge acquired through resident engagement.

Most focal actors did accumulate and hold information in CMS and archives. However, there was little evidence that the process to pool, assemble, transfer and assess knowledge from engagement with residents was being undertaken on a regular basis for strategic use.

Technology upgrades

One of the challenges identified by a majority of those interviewed was the steady evolution of technology and the need to monitor the changes and pressures to upgrade technology. As described by the literature, this pressure may relate to the increasing amount of data, information, and creation of knowledge that is emerging through sociotechnical interactions. FA2 and FA3 highlighted this matter and expressed the view that technological updates were necessary to remain relevant to their residents. Furthermore, FA3 identified that funding for technology to keep pace with upgrades remains a challenge for the focal actor. FA5 noted that their website requires a refresh, and progress is being made to update it. Funding was not the fundamental issue for FA3 at the time of the 2017 interview; it was able to satisfy the needs of the customer through the use of technology. A serious weakness for all participants related to the technical upgrade discussion was the need for more consideration of potential impact of the changes, including associated costs to the focal actor in upskilling staff, and reviewing and revising processes.

Gaps in practice: Technology

The literature suggest that digital technology and associated infrastructure should be developed to align with the business strategy of the focal actor. Although engaging and sharing knowledge with the residents was implied by those interviewed, with the exception of FA1's second wave finding, it was not explicitly articulated or sufficiently detailed in the focal actors' plans.

Although the literature highlights how focal actors and individuals interact with one another to create, share, and leverage knowledge. Organisations participating in this study are using technology to engage with residents to capture and share knowledge. However, the processes for leveraging the knowledge from these engagements are at an early stage of maturity with processes needing to be better defined to support the knowledge activities.

7.7 Current model or framework usage and suitability

As presented in the literature review, a model or framework can provide structure and support sustained engagement between the focal actor and community residents through the use of digital technologies. A more structured approach, considering the sociotechnical matters, including the need to support multiple perspectives through a model or framework may support community engagement and knowledge management efforts. Such a model or framework may assist focal actors to achieve better interaction with community actors. However, none of the focal actors provided overt evidence of using the influential sociotechnical models and frameworks.

Each focal actor in this study stressed a desire to enhance engagement with residents of their community. They agreed that to achieve a desired state of engagement and associated knowledge management, the adoption of a suitable framework or model would be beneficial. Although there were existing frameworks identified in academic literature, it was not clear if the focal actors were aware of them. Furthermore, a number of existing formal or informal models and frameworks may have been considered, and although no focal actor in this study appeared to have adopted a framework to enhance engagement with residents, or to capture and leverage community knowledge, other plans may have been used.

Although existing models and frameworks may have assisted, there would still be gaps that could hinder the success of the community engagement initiatives. Research for this study has shown that the influential models and framework considered in this study

of community organisations engaging with residents and capturing knowledge from such engagements using digital technology do not fully reflect current practice.

Study interviews were conducted with actors with differing competencies and responsibilities from multiple disciplines, including a web developer, a public sector management company, an information technology manager, a professor, business development officers, and marketers. In addition to the diversity of those interviewed, actors involved in community engagement and associated knowledge management activities may include a combination of Federal, State, and Local Government representatives, actors associated with economics and finance, social sciences, law, information systems and information technology, as well as actors representing the residents. Although there was evidence that some focal actors were undertaking multidisciplinary collaboration, these interactions did not appear to be formal, consistent or linked to a model or framework to guide community engagement, much less knowledge management activities. For example, FA5 described an initiative in which one team was responsible for technology, another team responsible for the website, and another team for strategic advice. Although they were working to achieve the same goal, they worked separately, and did not consider themselves as part of the same project team; this meant that decisions were made in isolation of other teams. This lack of coordination caused friction within FA5 and contributed to increased project risk.

7.7.1 Why existing models and frameworks may not be suitable

One reason the existing models or frameworks may not be suitable is the way they consider culture. According to the literature, culture evolves through continuous communication (Lawrence, 2015). This evolution can be fostered through training, marketing and promotional activities, including communications services through digital technologies. Activities to influence culture can contribute to processes for sustained engagement, including the creation of trusted support with multiple stakeholders (Balestrini et al., 2014).

Another reason the proposed frameworks may not be suitable relates to power. As recognised through ANT, power can be transferred between alliances, delegates and actors as the initiative evolves towards the desired state. The framework also incorporates a stronger focus on culture as well as recognition and a process to identify risk as the initiative evolves through a maturity process. The adoption of such a framework may help manage the complexity in a methodical manner and contribute to reducing the existing

high failure rate of sociotechnical transformational initiatives. Furthermore, the ability to manage and leverage knowledge through the process of engaging with residents does not appear to be significant. The issues identified in this research need to be addressed to improve potential opportunities afforded in the engagement between community organisations and the residents they support.

7.8 An enhanced or new sociotechnical model

The finding of this study outlines the opportunity to create a model to assist focal actors sustain engagement and associated knowledge management activities with community residents through the use of digital technologies. From the interviews, there was a common desire from the focal actors to interact with residents, share knowledge. However, as confirmed, no common sociotechnical model or framework was adopted by the focal actors.

The purpose of the model is to guide sociotechnical change in an iterative manner, that aligns networks, culture and power. Through each iteration, strategic and operational activities and risks are able to be identified and prioritised, and resources allocated. Actions can then be undertaken, monitored and risks mitigated. This model can support community engagement and knowledge management interaction between actors and reduce the risk of the initiative failing.

7.8.1 Model components and operation

This proposed model is based on the sociotechnical concepts with the intention of reducing risks of focal actors' failure to successfully adopt community engagement processes and knowledge management activities. The community engagement and associated knowledge management activities outlined for the model are deliberative, structured, and iterative, and involve consideration of strategic as well as practical operational activities (Davis et al., 2014; Mumford, 2006). These strategic and operational activities can be applied to multiple WA communities, other Australian jurisdictions and internationally.

Prior to addressing the model's components and operation, it is important to reflect upon an important tenet: to transform a process from its current state to a desired state. As illustrated in Figure 7.2 this involves understanding of the current situation, a vision for the desired situation, undertaking actions to transform, achieving the desired state, ensuring knowledge of this journey is captured. This cycle helps structure a previously unstructured organic process.

Figure 7.2

A simplified transformation cycle informed by Karp (2006)

The model aims to guide focal actors through this process. The conceptual framework introduced the ANT terms used in this thesis: focal actors, alliances, delegates, and actors. The following section briefly describes how these networks operate and interact.

The following sections describe the activities and interactions associated with alliances (i.e., the strategic and operational alliances), followed by a discussion about delegates (i.e., the leadership and management, culture, processes and technology delegates), and finally an overview of actors. Regarding the alliances, it must be noted that they are discussed as associations, not in the context of global or local, but in the context of how and why they are connected. This is because the strategic and operational alliances are part of a flat structure and as important as each other. Strategic alliances provide a perspective that may be of more interest to some networks, while the operational alliance may be of more interest to other networks (Rowland, Passoth, and Kinney, 2011).

From a strategic perspective, the model aims to support initiatives to transform how focal actors undertake community engagement and associated knowledge management activities. However, to get the initiative going, an actor will need to first enrol allies. The purpose of enrolling allies is to gain and sustain support for the initiative. This would involve gaining support of actors and networks that can inform and gain the support of the

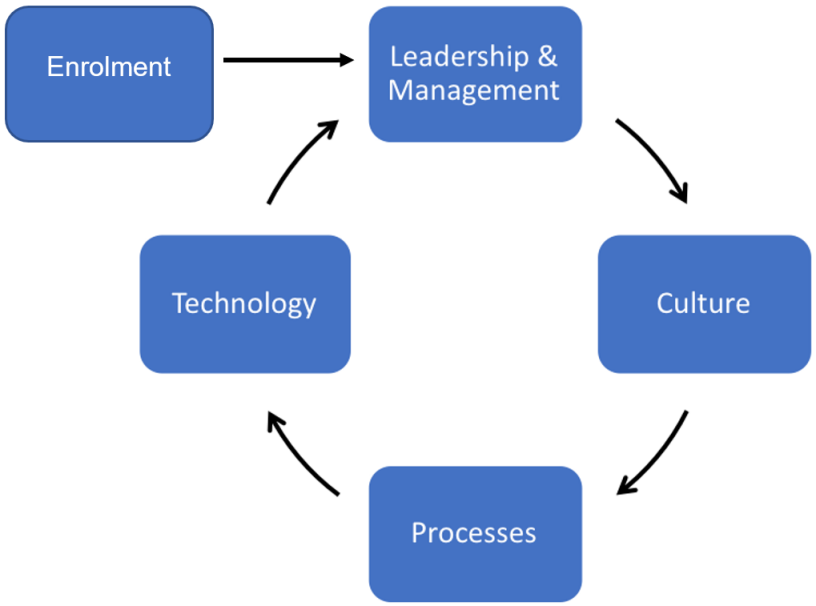
leadership and management delegate. Once enrolled, the leadership and management delegate provide tangible and visible commitment to the initiative through a number of activities. These activities include the allocation of time and resources to move from the current state of the situation, and then undertaking activities to enrol the culture, process, and technology delegates.

The importance of the leadership and management delegate is the power they have to influence all other delegates (i.e., culture, process, and technology). From an operational perspective, the processes and technology delegates are used to engage with appropriate networks to install the solutions that enable community engagement and knowledge management.

As illustrated in Figure 7.3, the model consists of four heterogenous, but interacting networks, individually referred to in ANT as delegates. Each of these delegates has authority from the focal actor to perform distinctly different activities.

Figure 7.3

Enrolment as the catalyst of a community engagement initiative



Note: Illustration of enrolment being the catalyst for commencing the cycle. The delegated network of actors then undertakes activities to achieve the initiative on behalf of the focal actor.

The following describes how the four delegates of the proposed model relate and interact with one another.

These delegates interact with one another to foster change from an existing situation to a desired state. To gain support for an initiative that involves engaging community

residents, an actor articulates a compelling reason that acts as a catalyst for changing an existing state to a desired state. If the actor is to be successful, a series of activities will be initiated that involves methodically enrolling delegates to foster transformation.

Leadership and management: Actors within the leadership and management delegate set the direction, expectations, and allocation of resources for transformation activities. The leadership and management delegate encompasses: Henderson and Venkatraman (1993, 1999) business strategy and IT strategy domains; aspects of legitimacy and support and public value from the strategic triangle (Moore, 1995); and the goals domain from the Sociotechnical System (Davis et al., 2014).

Culture: After the leadership and management delegate, the culture delegate is enrolled and power is transitioned. Even with strong leadership and management in place, if matters related to culture are not thoroughly considered and incorporated into the planning process, and then properly communicated and actioned, the vision will fail to meet the intended outcomes (Lawrence, 2015; Stam et al., 2014). The following briefly explains this logic. Within the leadership and management delegate, actors and networks undertake activities to create a vision for an initiative. This vision drives the strategic planning process, which also forms part of the leadership and management delegate. Organisational and community culture are considered as part of the leadership and management delegate's planning processes (Lawrence, 2015; Mumford, 2006). As part of this planning process, the culture delegate may provide input that includes identification of potential gaps in the skills and competencies of people in the workplace, as well as of community residents, and appropriate actions to address them (Jones, Skinner, High, and Reiter-Palmon, 2013). Without planned actions to change culture, there is the risk that significant resistance can develop among the stakeholders, limiting the effectiveness and ultimately the value that can be provided to the community (Alvesson and Sveningsson, 2015). To gain insight and support, interaction between the leadership and management and culture delegates takes place in an iterative process.

Process: The focus of the process delegate consists of actors and networks that produce information, services, and/or products (Jarulaitis, 2015). These processes support resident engagement and community knowledge management through tangible activities to interact with residents. Within this delegate new processes are created and existing processes redesigned (e.g. new or revised accounting, procurement and contract activities, online

education and marketing processes). The application of these processes is influenced by the leadership and management and culture delegates.

Technology: The final of the four sociotechnical delegates outlined in this section is the technology delegate. The actors and networks within this delegate contribute to the means by which community engagement and associated knowledge management practices are performed. To put this delegate in context with the other three delegates, the technology delegate requires the support of activities that are undertaken within the leadership and management delegate (Cresswell and Sheikh, 2013). The technology delegate is also reliant on the culture delegate activities to shape community understanding of and support for the purpose of an initiative, as well as for ensuring the residents have the skills and competency to use the technology. The technology delegate is influenced by the process delegate, as the processes for engaging and capturing community knowledge need to be developed with, then supported by, the appropriate technologies (Jamil and Lodhi, 2015).

Model alignment with ANT: As stated in the literature review, enrolling actors and, through power, influencing change is an activity referred to as interessement, in which one delegate, in this instance leadership and management, imposes a view and stabilises other actors, networks, or delegates, in this instance, culture (Callon and Blackwell, 2007; Heeks and Stanforth, 2007). This iterative process of imposing and stabilising is part of a journey that influences the maturity of focal actors and community as they seek to improve engagement activities and how community knowledge is managed.

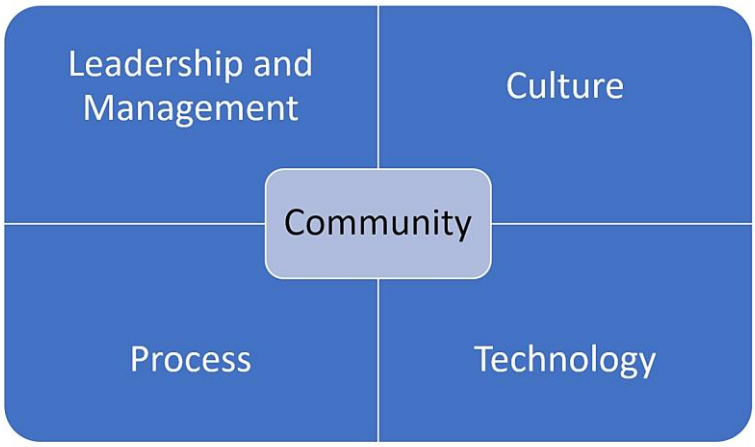
Each delegate consists of multiple actors that help transform community engagement and community knowledge management practices. The type of actor enrolled by delegates changes. These changes are due to the trajectory of the initiative's development, as well as to social and economic circumstances (Dopfer, Foster, and Potts, 2004).

In this context, a strength of ANT is its inherent ability to identify and describe the enrolment of actors and their evolution as a progress through stages of maturity. Conversely, a weakness of the existing sociotechnical models and frameworks discussed in this study is their lack of clarity in explaining how they guide, build and maintain support for a maturing initiative.

The synthesised domains of SAM, strategic triangle, and the sociotechnical model have been considered and presented in the following simple model which includes actors and networks represented as leadership and management, culture, process and technology delegates.

Figure 7.4

Relationship between the four domains and interactive influence with the focal actor operations or community residents

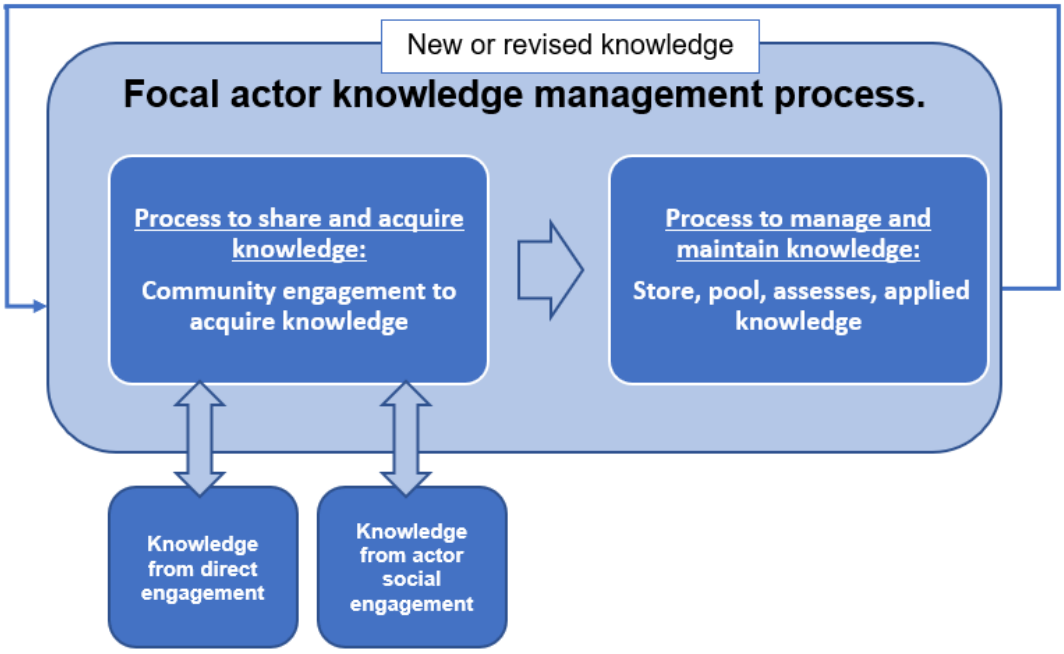


7.8.2 Separation of community engagement and knowledge management initiatives

In itself, community engagement is a complex endeavour. Implementing community engagement and knowledge management as one project adds to the complexity. This added complexity increases the risk that the initiative will fail. To reduce this risk, it is suggested knowledge management be considered a separate, but linking initiative. As illustrated in Figure 7.5 the community engagement and associated knowledge management process has two distinctive elements that can be progressed as two initiatives. The first initiative involves engaging with residents to share existing knowledge, and acquire, or capture new knowledge. The second initiative would involve the management of this knowledge, including the storage, pooling, assessing and application or use of knowledge. Knowledge from this second element is fed back into the community engagement process.

Figure 7.5

General overview of focal actor knowledge management elements and process



Based on Evans et al., 2015 pp. 92-94

7.8.3 Multidisciplinary approach to community engagement and knowledge management

Community engagement and knowledge management require a multidisciplinary approach that enables focal actors to gather different perspectives of issues. This approach provides focal actors with opportunities to develop more considered and effective community engagement and associated knowledge management solutions (Geisler & Wickramasinghe, 2015). Multidisciplinary teams using their collective knowledge make better decisions, which can result in improved quality results for the community residents (Patkar et al., 2011). However, as stated in the literature review, community engagement and knowledge management practices is a complex subject. One reason for the complexity is that the responsibility for these areas involves many diverse stakeholders.

To illustrate this, interviews for this study were conducted with actors with differing competencies and responsibilities from multiple disciplines. The actors included a web developer, a public sector management company, an information technology manager, a professor, business development officers, and marketers. In addition to the diversity of those interviewed, actors involved in community engagement and associated knowledge management activities may include a combination of Federal, State, and Local

Government representatives, actors associated with economics and finance, social sciences, political sciences, law, medicine, information systems and information technology, as well as actors representing the residents.

Although there was evidence that some focal actors were undertaking multidisciplinary collaboration, these interactions did not appear to be formal or consistent. For example, FA5 described an initiative in which one team was responsible for technology, another team responsible for the website, and another team for strategic advice. Although they were working to achieve the same goal, they worked separately, and did not consider themselves as part of the same project team; this meant that decisions were made in isolation of other teams. This lack of coordination caused friction within FA5 and contributed to increased project risk.

The objective may have been to gain input from subject experts with the aim of improving their community engagement efforts. However, each team acted independently. In contrast, a regular and sustained multidisciplinary collaboration aims to facilitate an exchange of information and ongoing communication, learning from the multidisciplinary team and using collective knowledge to make better decisions, which can result in improved quality results for the community residents (Patkar et al., 2011).

7.9 Challenges identified in the first and second waves

This study has identified and discussed the challenges facing focal actors that are involved in community engagement and knowledge management activities during two waves of the longitudinal study. As reflected in Table 7.3, some of the challenges identified by the focal actors during the first wave were still present during the second wave. Some may consider that the amount of time it is taking the focal actors to address the challenges of engaging community residents and supporting this service with sufficient knowledge management excessive. However, the amount of time it is taking to address these challenges also re-emphasises the view that sociotechnical initiatives, specifically those that incorporate knowledge management are complex endeavours and success can be elusive.

Challenges identified during the findings of the first or second wave of interviews are indicated by “Wave 1” or “Wave 2” respectively. Challenges that were identified in both findings are highlighted in yellow.

Table 7.3

Summary of Challenges During the first and second waves

Summary of Challenges (2017/18)	FA1	FA2	FA3	FA4	FA5
Leadership and Management					
Uncontrolled growth of or demand for digital technology / services				Wave 1	Wave1
Boundaries of control will change (e.g. from within the focal actor, or control shifts to residents)			Wave 1		Wave 1
Managing community perceptions	Wave 1 Wave 2	Wave 2	Wave 1 Wave 2		Wave 1 Wave 2
Competing with other focal actors, including online communities			Wave 2	Wave 1	
Human and financial resources		Wave 2	Wave 1 Wave 2	Wave 1	
Building the market, business development, increase usage	Wave 1		Wave 1 Wave 2	Wave 1	Wave 1 Wave 2
Culture					
Organisation loses control of its digital services to external stakeholders					Wave 1
Focal actor's ability to meet rising community expectations, dealing with a better-informed community	Wave 1 Wave 2	Wave 1 Wave 2	Wave 1 Wave 2		
Raising awareness of the digital channels				Wave 1	
Changing the focal actor to better leverage digital services/content/knowledge	Wave 2	Wave 2	Wave 1 Wave 2		Wave 2
Processes					
Redeveloping processes as a result of digital technology	Wave 2	Wave 1 Wave 2	Wave 1		Wave 1
Determining how to integrate online forms into the focal actor		Wave 1			Wave 1
Determining how to integrate online surveys into the focal actor		Wave 2			Wave 1
Monitoring accuracy of information including security	Wave 1 Wave 2		Wave 2	Wave 1	Wave 2
Monitoring / managing community content	Wave 1			Wave 1	Wave 2
Technology					
Technology integration, business systems integration	Wave 2	Wave 1 Wave 2	Wave 2		Wave 2
Need to refresh website, technology	Wave 1	Wave 1	Wave 1 Wave 2		Wave 2
Accessibility	Wave 2		Wave 1		

In addition to the challenges that were identified through the interviews with the focal actors, there are a number of challenges that focal actors identified in this study when attempting to advance community engagement initiatives. These challenges include: gaining support; having an adequate number of appropriate resources to undertake the engagement and knowledge management activities; performing activities to gain the resident's acceptance and use of the community engagement solution. The literature supports the view that a factor that contributes to the slow pace of change is the lack of a model or framework to help guide community engagement and knowledge management implementation and change activities.

From the strategic perspective, specifically in the leadership and management areas, three of the focal actors that provided input into this study considered that managing community perceptions during the first wave was a challenge. The same focal actors considered this an issue during the second wave of interviews. A reason for this may include a growing awareness of the need for security and privacy in the use of digital technology and the need to methodically work through culture change activities.

There are two new challenges that emerged from the second wave of interviews that were not considered a challenge during the first wave. One is strategic and relates to changing the culture of focal actors to better position them to leverage digital services, content, and knowledge. The other challenge is operational and of a technical nature, concerning the integration of technology and business systems.

7.10 Emerging challenges

The emerging challenge that was raised by three focal actors during the second wave concerned the need for a change in organisational culture. This challenge aligns with views identified in the literature, arguing that a factor in complex sociotechnical systems' failure to achieve expected benefits is inadequate planning and lack of tangible actions to guide a sustained change in organisational culture. The challenge of integrating technology and business systems was also identified by three focal actors. This concerns combining often distinctively different systems in a manner that appears to customers to operate as one seamless system. This challenge is compounded by the view that new technologies and associated processes are being introduced before existing technologies are thoroughly understood and able to operate at optimum effectiveness. But more fundamental issues may be that leaders and managers in the focal actor may not have sufficient knowledge about how technology and business may interact and therefore lack an approach to align the two.

Conversely, some challenges have reduced in significance or are no longer considered a challenge to the focal actors over the period of this longitudinal study. The most notable change, from a strategic perspective (Leadership and Management), is the belief that the effort to build the market to interact with residents and expand the development of online business activities has reduced as a challenge. During the first wave of interviews, this was considered a challenge by four focal actors, and is now considered a risk by two of them. This may be a result of increasing access to technology and the ease in using technology, as well as a broader acceptance of its usefulness for engagement between the focal actor and community residents.

From the operational perspective, redevelopment of processes as a result of digital technology activities was no longer considered a significant challenge by focal actors. Only one focal actor continued to consider this a challenge during the second wave of interviews, while three considered it a challenge in during the first wave. The reasons for the change are not clear from the interviews, and the shift was not identified until the interviews were complete, and the analysis of data undertaken. However, in the literature there are process maturity models in which there is a point where management becomes satisfied that the focal actor can implement and operate the technology, and that processes are no longer *ad hoc* and can be repeated. It may be that the managers of these focal actors are content with their ability to develop and reengineer their processes. Another reason that this is not considered a challenge may be that it is simply no longer seen as a challenge in comparison to other activities related to community engagement and knowledge management.

The above identifies the most significant challenges common to the study participants. However, there were a number of individual challenges each participant identified that may have been unique to the focal actor at the time of the interviews. With the increasing adoption and use of technology, FA2 believed that there would be customers who did not want to interact with them in a digital manner. They gave an example of bill payment. FA2 stated that the number of people who pay bills through their digital channels has increased significantly, but some people would still rather pay in person. A challenge for FA2 is to ensure they are able to maintain an adequate and customer focused level of personal contact with these residents.

FA3 raised the individual challenge of remaining relevant, with the rise of competition from organisations like Google. One of the factors they believe will keep them relevant is the local, personal service they can provide. FA3's challenge can be considered an external threat, whereas FA5's individual challenge related to an internal initiative: how

to better present digital content to residents. Instead of organising content through standard webpages, FA5 is looking at packaging content in different, more personalised and secure ways. This is posing a challenge for them strategically and operationally, but they are attempting to work through the issues. FA5 also identified a challenge related to how they define and manage the identities of their community residents as the types and number of digital transactions and interactions increase.

7.11 Opportunities for community knowledge improvements

This section presents the opportunities identified during this study for leveraging community knowledge to influence support and services for community residents. The strategic and operational opportunities identified in this study remain fundamentally similar between the first and second wave of interviews. This contrasts with the challenges discussed in the previous section, where there were clear, pronounced strategic and operational shifts.

In Table 7.4, the opportunities for improvement are presented. They are aimed at closing gaps that have been identified and addressing areas where the literature indicates a risk of failure if they are not done. The opportunities are listed according to three categories:

- Blank – No action
- ☐ - Partially complete
- ☑ - In place

To attempt to gain benefit from the potential opportunities, the stakeholders will need to see value and provide support to invest human and financial resources for community engagement and associated knowledge management activities. The literature endorses the view that tangible leadership is needed to drive this sociotechnical solution. Without this leadership, the opportunities to gain benefit from sociotechnical initiatives risk failure.

Table 7.4

Potential opportunities identified from waves one and two

Areas of Opportunities	FA1	FA2	FA3	FA4	FA5	Comment
Leadership and Management (Strategic)						
Executive leadership: Visible, tangible support for engagement and knowledge management strategy	☑	☐	☐		☐	Some support for community engagement, less for knowledge management
Strategy/plans for community engagement and associated knowledge management activities	☐				☐	None with the exception of some plans by FA5
Engage volunteers and build community support/sense of community						None
Form alliances with organisations to share and learn about engagement and knowledge experiences					☑	FA5 only
Allocation of human and financial resources for engagement and knowledge management activities	☐	☐	☐		☐	Some support for engagement, less for knowledge
Activities to enhance community discourse, consultation and increased transparency	☐	☐	☐		☐	Minimal, but all linked to social media
Plan for managing resident information						None
Analysis, interpretation and reporting of community knowledge		☐				FA2 only

Areas of Opportunities	FA1	FA2	FA3	FA4	FA5	Comment
Culture (Strategic)						
Plan and activities to raise awareness of community engagement and knowledge management	☐	☐	☐		☐	Minimal, through limited advertising
Share knowledge and expertise related to engagement and community knowledge						None
Sustained awareness and training activities for stakeholders on privacy and security and other related matters						None
Use engagement and knowledge management activities to enhance community perception						None
Processes (Operational)						
Documented process for secure and sustained engagement with residents						None
Use of multiple channels to engage and share knowledge with community residents	☐	☐	☐		☐	Minimal, websites and some social media
Process for managing community knowledge						None
Technology (Operational)						
Technology for engagement and knowledge management activities integrated					☐	
Align technology with business strategy		☐			☐	Implied links
Progressively move towards content availability securely on multiple devices at any time	☐	☐	☐		☐	Minimal, through limited advertising

Note: The above table summarises potential community engagement and knowledge management opportunities identified over the 10 year period of this study.

7.12 Summary

This section of the research provides examples of a broad range of challenges and opportunities that influence the success of community engagement and associated knowledge management activities. Although there are some common areas of association between the organisations, their plans, and desire for engaging with community residents through a model or framework for transforming the current practice to a desired one is not clearly evident in either strategic or operational perspectives.

Furthermore, the approaches to them are clearly not given equal priority, with a stronger focus on community engagement through digital technologies than on knowledge management practices. The study reveals significant gaps in the use of community engagement and links to knowledge management in theory and practice. Plans and activities associated with engaging with residents appear to be more advanced and better understood than is management of community knowledge. Additional analysis and reflection uncovered issues that may contribute to improving how focal actors can align and undertake community engagement and knowledge management activities. This misalignment may be at least partially addressed through a model that considers a more holistic approach. This would not only align business and technology strategies, but also strategic and operational activities that have an iterative approach to focusing of community organisations on engaging residents and then the creating, maintaining, and leveraging of knowledge from such interactions.

The research also found that although there is a focus on aspects of both community engagement and knowledge management, they do not appear to be strongly linked in plans and strategies of most focal actors. Furthermore, the approaches to them are clearly not given equal priority, with a stronger focus on community engagement through digital technologies than on knowledge management practices. The study reveals significant gaps in the use of community engagement and links to knowledge management in theory and practice. Plans and activities associated with engaging with residents appear to be more advanced and better understood than is management of community knowledge. This misalignment may be at least partially addressed through a model that considers a more holistic approach. This would not only align an organisation’s business and technology strategies, but also their strategic and operational activities. An approach focusing community organisations on engaging residents and then the creating, maintaining, and leveraging of knowledge from such interactions would by nature be iterative.

Chapter 8

Conclusions, Implications and Future Research

8.1 Purpose and chapter structure

This final chapter concludes the research activities outlined in the conceptual framework of Chapter 3. Conclusions are synthesised from the research activities with a focus on addressing the research question. Within the conclusion the limitations and implications are reviewed. Implications relate to business practice and research related to guiding organisations through change through the use of digital technologies.

The chapter first responds to the research question and objectives based on the findings presented in Chapter 5–Chapter 7. This is followed by the key conclusions concerning the research design. The limitations of the research and implications of the thesis in practice are then presented with recommendations for future research. The chapter concludes with final statements that reconnect the research outcomes with the catalyst for this research.

8.2 Key research conclusions

The result of this research contributes to a more thorough understanding of the issues associated with the challenges and complexities related to sociotechnical initiatives of public and private sector organisations, specifically community engagement and associated knowledge management activities. This research provides significant insight and knowledge into the discipline of Information Systems, with a particular focus on knowledge management.

The impact on everyone of digital technologies, including the associated opportunities for knowledge management generated through how organisations engage with customers, has been extensively studied in the past two decades However, the link between the high failure rate and models and frameworks used to implement them remains relatively unexplored. In this work, I sought to examine the model or framework that may be used by a sample number of organisations to assist them to transition from a current state of engagement with residents, to a more desired state. The strengths and weaknesses of these models and frameworks were investigated to determine ways to reduce risk and lessen the failure rate of the sociotechnical initiatives.

8.2.1 The importance of culture and culture change is underestimated

The prominence of culture and its impact on sociotechnical initiatives was a key theme of this study. This includes considering culture from multiple perspectives. These perspectives included an understanding and consideration of the current culture, and the activities needed to influence the culture of multiple networks within the organisation and external to the organisation. These networks may include the community, residents, organisation, as well as other stakeholder networks that may cross multiple boundaries internal and external to the organisation.

Not only are there a number of networks to be considered, an understanding of their current culture and the activities required to influence their culture needs to be understood and addressed. The activities to undertake the necessary culture change can be an iterative process that does not appear to be clearly articulated in most models and frameworks.

8.2.2 The delegation of power

The delegation of power between networks was identified as a prominent factor that can influence the success of sociotechnical solutions. Understanding power and when and the circumstances in which it is delegated can help reduce the risk associated with sociotechnical solutions. In this study, I explored the way power may shift from the strategic network to the operational network, as well as between delegates within these networks, such as between the leadership and management, and culture networks. This transfer of power can impact on, and influence risk associated with sociotechnical initiatives. A contentious transfer of power from strategic to operational can create animosity that may be difficult for some organisations and communities to overcome.

8.2.3 Manage complexity as a risk

A key finding in the literature, and supported through the analysis of interviews, and through observations of the online presence of organisations and their operations, is that implementation of community engagement and associated knowledge management activities is complex. The broad range of issues, the iterative process of change to internal and external networks, their cultures, and associated power dynamics during sociotechnical transformation can be complex.

This complexity was identified in the research as a significant reason for the high failure rate of sociotechnical initiatives such as community engagement and knowledge management. However, many of the sociotechnical models and frameworks did not appear

to recognise, or much less, acknowledge complexity. Through the proposed model, risk linked to complex issues may be able to be identified, better understood and mitigated. ANT takes into consideration that the power relationships between the networks are dynamic; and it is capable of tracing the ebb and flow of the power dynamics between networks, within and between changes to stakeholders according to stages of implementation or events.

8.3 Response to the research question and objectives

This study recognises digital technologies are driving significant social and economic change both globally and within WA. The academic literature includes a number of sociotechnical models and frameworks that seek to help organisations successfully foster change by assisting them to navigate risks associated with a transition from a current state, to one that is envisaged and desired. However, even with models and frameworks that are considered influential, the academic literature recognises that the failure rate of sociotechnical initiatives remains high.

This study set out with the purpose of examining how a sample of WA organisations used digital technologies to influence community engagement and associated knowledge management activities. Specifically, I was interested in the models and frameworks used to transform these activities. This research found that during the period of this longitudinal study, community engagement initiatives evolved more organically than through the use of a model or framework.

8.3.1 Addressing the research question

The following research question sought to identify key themes to consider when using digital technology to successfully engage with the community residents and leverage knowledge gained from the interaction.

The research question is:

> What are the strengths and weaknesses of various sociotechnical models or frameworks used in a sample of WA community organisations to transform how they engage residents and then manage knowledge collected through the use of digital technologies?

With the exception of traditional project management standards and methods guiding their initiatives, no sociotechnical model or framework was used to transform community

engagement and associated knowledge management activities. Initiatives for community engagement and knowledge management evolved without thorough plans that aligned the focal actor's business and technology strategies. The links between community engagement and knowledge management were not yet considered significant. Knowledge obtained from community engagement through digital technologies was generally not used to provide a competitive advantage. Knowledge obtained was not often treated as a key asset, or the potential benefits of intellectual work from community engagement and knowledge management activities realised.

8.3.2 Addressing the research objectives

In this section, two research objectives are addressed.

> **RO-1**: Identify and categorise factors that may contribute to reducing risk for successful transformation of community engagement and associated knowledge management initiatives.

The research identified that most of the sociotechnical risk found in this study can be reflected in two themes (or alliances when observed from the ANT lens) and four categories (or delegates when observed from the ANT lens). The alliances and delegates consist of actors and networks that interact with one another to identify and mitigate risk in support of community engagement and associated knowledge management activities. This study found that these strategic and operational networks enrol actors, form new networks, obtain and relinquish power as they interact with one another to contribute and influence sociotechnical initiatives. Table 8.1 illustrates the alignment of alliance and delegates.

Table 8.1

Alignment of alliances (themes) and delegates (categories)

Focal Actor (Organisation)	
Alliances (Themes)	
Strategic networks	Operational networks
Delegates (Categories)	
Leadership and management delegate	Processes delegate
Culture delegate	Technology delegate

More information about risks and their management are summarised in Appendix C.

Regarding RO-2, the objective and how it is addressed follows:

> **RO-2:** Based on the findings of this research, enhance an existing or create a new model or framework that may assist organisations to successfully transform how they engage with community residents and manage associated knowledge through the use of digital technologies.

The outcomes of note for research objective 2 is the creation of sociotechnical model which influences networks through guiding strategic and operational activities, including the identification and mitigation of risks for initiatives that transform engagement and knowledge management activities.

8.4 Conclusions concerning research design

The theory, method and data evolved during this study and was influenced by a number of factors. An example of this evolution is that this research was not initially designed or intended to be a longitudinal study. However, the circumstances and experiences of life and work as well as the gap in time between the first and second waves of interviews influenced the research question and methods. Concerning ANT, this approach contributed to presenting a more holistic understanding of the complexity of aligning networks to deliver a sociotechnical solution in a setting to engage community residents. These networks and their interactions influenced the sociotechnical model presented in Chapter 7 of this study.

This research clearly illustrates the continued interest in sociotechnical solutions to enhance engagement between community organisations and residents, but it also raises the question about the lack of progress in linking community engagement and knowledge management. From the literature, it is clear that the promise and challenge of knowledge management is recognised, and I had an expectation that its awareness, benefit, and adoption would be more prevalent from both strategic and operational perspectives. I expected that the wealth of knowledge that could be gained from community engagement through digital technologies would be used in decision making processes for the community. This link was not evident.

8.5 Contribution

The proposed model interprets the initiative through the lens of ANT and how the delegates of leadership and management, culture, processes and technology interact.

Through ANT, the model considers the delegation of power across networks, how risks are identified and mitigated. This model may assist in reducing the high rate of failure of sociotechnical initiatives such as for community engagement and associated knowledge management solutions.

Through ANT, a model was created to help guide sociotechnical initiatives such as engagement between a focal actor and community residents and initiatives that contribute to community knowledge through the use of digital technologies. From a practice perspective, the model allows:

1. Change as the project matures from adoption, to implementation to integration.

   Sample models and frameworks currently available for sociotechnical transformation may not sufficiently consider and adjust activities, risk, and the transference of power as initiatives transitions through the adoption, implementation and integration cycles.

2. Adaptability to the scope and requirements of organisations and the community residents they serve.

   The model allows both strategic and operational concepts to be considered and prioritised in an iterative manner. This includes consideration of culture and adjustments in ways the focal actor influences culture throughout the initiative's journey rather than providing a prescriptive model.

3. Progress and risk that are measurable.

   Progress can be measured, including activities to mitigate risk associated with power, culture and complexity. Progress is based on evidence. Organisations have the ability to highlight and adjust tactics and strategies based on progress to achieve a desired result.

8.5.1 Opportunity to better align theory and practice

Although the use of digital technologies increased between the first and second waves, the opportunity to gain and leverage knowledge from the organisation's engagement with residents can be improved. The research clearly illustrates improvements engaging with residents through the use of digital technologies. However, the research also raises the question of why the links to knowledge management have not evolved within the study organisations at a similar pace.

One reason is that community engagement is complex, as is knowledge management. The initial focus of the organisations is community engagement. With the exception of operational archives and content management solutions, there was little evidence of efforts to align community engagement knowledge management. Of the organisations participating in the study, the leadership and management of one community organisation commend a strategic approach towards knowledge management.

Whether engaging with the community residents, or managing knowledge gained from such interactions, a focus of this study is the investigation of why sociotechnical initiatives fail. A review of a sample of influential models and frameworks suggests they are not being adopted. The reason is not clear and was not investigated. The sample models and frameworks did not reflect current practice.

8.6 Limitations

This study selected communities and focal actors that varied in terms of location, type, and purpose, in order to explore whether there were any common approaches and strategies for using digital technology for community engagement and associated knowledge management activities. No two communities are exactly alike, and the importance of particular strategies or tactics in the use of digital technologies to engage and interact with residents may differ depending on the community's local particular subtleties, including local political power dynamics, and the desired strategic outcomes which are linked to and drive operational activities (Jarulaitis, 2015).

The communities and focal actors that are the focus of this study are not static and are constantly evolving. The sample of influential models and frameworks explored in this study may not adequately cater to this complexity.

The results of this research should be interpreted with the limitations presented in this section considered. The scope of the study was guided by the research question and objectives. A result was a potential improved model to help guide a focal actor's community engagement and associated knowledge management activities. A limitation is that the model was not tested in a real-world environment as part of the study.

This limitation acknowledges opportunities to perform more extensive ANT analysis on transforming community engagement and associated knowledge management initiatives through the use of digital technologies. This analysis can be conducted in future research and consider the detailed mapping of the actors, networks and interactions described in the findings. This includes the analysis of actors' roles and interests, a deeper

exploration of power; consideration of insights obtained from the analysis that can then be used to develop an implementation plan of the model.

The investigative process undertaken for this study included theoretical and empirical research but was limited in depth of practice, penetration and coverage of the types and location of community. This contributed to the limitation that only five WA organisations were selected to participate in the study. An increased sample size may have increased the likely precision of the findings regarding how organisations engage residents, and capture and leverage knowledge gained from such interactions (Bryman, 2016). Another limitation is that the interviews of focal actors representatives were focused on one individual's perspective. By increasing the number of people interviewed from within the focal actors may have had an impact on the findings. This increased sample size would contribute to the validity of the findings.

An alternative to increasing the number of focal actors participating in the study could have been to focus on the three similarly sized local government organisations. This would have provided the opportunity for a more in-depth investigation of the differences between local government perspectives on community engagement and knowledge management practices.

A logical implication gained through enhancing community engagement and related knowledge management activities may include improved organisational performance and improved relationships with residents. The study does not pursue or consider improved organisational performance or the impact on residents. Furthermore, no interviews with residents were undertaken. Therefore, views of residents have not been accounted for in this study.

8.7 Implications and recommendations for future research

This research will have implications for knowledge management practice regarding the use of technology to enhance community engagement, including the opportunity for focal actors to enhance their current capabilities of interacting and exchanging knowledge with community residents.

Based on the conclusions, practitioners, in particular organisation leaders and managers, should consider:

- Practical activities to reduce risk to the initiative by placing greater emphasis on activities to influence culture within the organisation and the community. This is an

iterative process that includes activities that enrol the focal actor and residents to change the manner in which they interact and how matters relating to capturing and sharing knowledge are handled. During the iterations there is the opportunity to learn and make improvements for the next cycle.

- With community engagement capabilities, the literature supports the view that there is the opportunity to capture and leverage knowledge from such interactions. Capturing and using this knowledge can aid in focal actor decisions, providing the opportunity to create, reflect and modify norms to improve decision-making and actions that can help shape future policies, plans and initiatives.
- A strength of the influential models and frameworks identified in this study was the focus on aligning business and technology. However, these models and frameworks were considered weak in the essentials of culture change and the delegation of power. The importance of culture change and power can be better incorporated into current knowledge management theory by making associated activities to foster change more explicit.

To better understand the implications of these results, further development of the proposed model could prove beneficial. Most of the sociotechnical models and models identified in this study failed to address the importance of an iterative approach, the delegation of power and activities to influence change that would reduce the risks of the sociotechnical initiative. The generalised nature of the model outlined in this study may be applied across Information Systems initiatives related to complex multidisciplinary sociotechnical initiatives.

8.8 Concluding statements

The research examined the key sociotechnical factors that contribute to engagement and associated knowledge management activities. The catalyst for the research was the high failure rate of sociotechnical initiatives. The research found that, in practice, each focal actor had different approaches to community engagement and associated knowledge management activities. The only common factor appears to be a more organic approach then a structured one.

The result of this research is a detailed study of an emerging opportunity to reduce risk and enhance the success rate of sociotechnical initiatives, including projects for community engagement and associated knowledge management. The research provides

insight and understanding of the alliances, delegates, and actors to be considered for such initiatives to succeed.

Evidence from the literature supports the findings of this research that there is no consensus model or framework to a holistic approach for engaging community residents and the creation and dissemination of community knowledge.

Previous academic research presents models and frameworks related to the implementation of systems linking business strategy, processes, and technology. A common weakness across the sample influential models and frameworks identified, for this study, insufficient consideration of activities to influence culture within the focal actor, as well as within the community. Another weakness of the models and frameworks is the identification and mitigation of risks. As a result of this study, a model is proposed with potential to reduce the chance for failure, while providing a higher degree of confidence to practitioners concerning community engagement and knowledge management initiatives.

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APPENDICES

Appendix A

Wave 1 Interview Question Template

Interview Questions

[City / Location]

[Website of the organisation]

Interviewer: Arthur Wilson

Template Version: 3.0

Date of Version: 13 November 2007

Part A: Foundation Questions

1. What is the name of the physical community being supported by the online community?

   a) Are there other physical communities that the online community supports?

2. What is the name and web address of the online community?

3. How many years has the online community been in operation?

4. This question aims to determine the stage of development you consider your organisation is in regarding managing and providing community knowledge. For this question, development is divided into three (3) stages:

   a) **Adoption Stage:** During the adoption stage, support is being built for developing the online community. This stage involves raising awareness of the concept and undertaking activities to test concepts and processes.

   b) **Implementation Stage:** During this stage the online community may be operating as a pilot. Solutions, fundamental concepts, processes and tools are developed, installed and tested.

   c) **Integration Stage:** The integration phase refers to the community being operational. This includes a stable management structure, culture change activities, processes for managing community knowledge, technologies for maintaining and supporting knowledge activities.

	Adoption *(Concept selling, building support)*	**Implementation** *(Solution building)*	**Integration** *(Solution broadly accepted and used by the community)*
Management			
Culture			
Process			
Technology			

5. In what locations do management and operational activities take place?

Part B: Process Emphasis

Management

1. Is there an operational executive committee, or steering committee?
    a) Do they determine, or provide input to the selection of content?
2. What is the purpose or mission of the online community?
3. Is there a business plan for the online community?
    a) Does the business plan describe progress towards convergence of traditional content (e.g. printed newspapers) and electronic content?
4. Are there guidelines for converging of traditional media and electronic content?
5. What is the organisational structure?

Position	Part Time	Full Time
a. How many Executives?		
b. How many Managers?		
c. How many technical staff?		
d. How many operational and administrative staff?		

6. Do you use volunteers?
    a) If volunteers are used, what service do they provide?
7. How is the online community funded (revenue and capital)?

Funding	Yes / No
a. Revenue from business generated	
b. Sponsorship	
c. Advertising	
d. Partnerships	
e. Donations	
f. Government	Local State Federal
g. Other sources of funding	

Management of Content

8. How are sources of traditional content determined?
9. How are sources of electronic content determined?
10. Are citizens and businesses able to add content?
11. Who is the primary audience of the online community?

Primary audience	Tick One
a. People residing in the physical community	
b. Consumers of business residing in the physical community	
c. Business in the physical community	
d. People external to the physical community	
e. Business external to the physical community	
f. People and businesses external to the physical community	
g. Other:_____	

12. Is there a secondary audience?
13. If yes, is the secondary audience?

Secondary audience	Tick One
a. People residing in the physical community	
b. Consumers of business residing in the physical community	
c. Business in the physical community	
d. People external to the physical community	
e. Business external to the physical community	
f. People and businesses external to the physical community	
g. Other:_____	

14. What is the purpose of the online community (select all that apply):

a. To provide social interaction	
b. To enhance economic opportunities	
c. To contribute to political interaction	
d. Other:_____	

Culture Related Questions

15. Is there a marketing or communications plan?

16. How does your organisation raise awareness about the online community?

a. Word of mouth	
b. Radio	
c. Links to other online communities	
d. Television	
e. Print media (e.g. newspapers, magazines)	
f. Other (e.g. pamphlets):_____	

17. Do you specifically promote community knowledge and expertise?

18. Is there training for staff and community stakeholders (e.g. citizens and businesses)?

    a) If yes, what type of training?

    b) Is this training conducted on a regular basis?

19. How do you interact with your stakeholders, customers?

a. Through the website	
b. Email	
c. Phone	
d. Counter services	
e. Letters	
f. Other (e.g. fax):_____	

Part C: Product Emphasis

Processes

1. What are the primary sources of traditional content (e.g., newspaper) used populate the online community?
    a) How is news about the specific online community obtained?
2. What are the primary sources of electronic content?
    a) Are there links to other online communities?
    b) Are there links to other electronic sources (e.g., News, weather, etc?)
3. How is the traditional and electronic content converged?
4. How is the content to be provided through the online community determined?
5. What are the first, second and third priorities of the online content today?

Position	First	Second	Third	None
a. Social content				
b. Economic content				
c. Political content				
d. Other				

6. What may be the first, second and third priorities of online content in five (5) years?

Position	First	Second	Third	None
a. Social content				
b. Economic content				
c. Political content				
d. Other				

7. Is there an assessable archive of community knowledge? (Yes/No)

a. Is this archive accessible to the public?	
b. Is this archive part of your organisation?	
c. Is this archive part of another organisation?	
d. If yes, what organisation?	

Technology Related Questions

8. Is there a dedicated Content Management System (CMS) used to manage content?
9. What "channels" are used to distribute information to customers?

a. Through the website	
b. Email	
c. Phone	
d. Counter services	
e. Letters	
f. Other	

Future Developments

10. What future social, economic and political developments are being considered?
11. Is the convergence of physical and online communities that incorporate social, economic and political activities an emerging concept?
12. What are some challenges facing online communities to provide social, economic and political benefit?
13. What direction will online communities take in the future?

Part D: Conclusions

1. How do you wish your organisation / online community can best contribute to the citizens and business in the "real" community?
2. Are there any other aspects of community knowledge you think should be included, or is there any topic you believe I should ask that was not?

Please Note: The interview will be transcribed and a copy sent to the interviewee for their comment and review.

End of Interview.

Thank you for your time.

Appendix B

Wave 2 Interview Question Template

Interview Questions

[City / Location]

Interviewer: Arthur Wilson

Template Version: 0.5

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Contact Details

Name of person being interviewed:	
Position:	
Location of interview:	
Date of Interview:	

Part A: Foundation Questions

1. 1. What is the name of the location / community being supported by the online community?

    a) Are there other physical communities that the online community supports?

    b) Do the management of delivering digital services and the operational to support the delivery of services take place at the same location?

2. What is the name and web address of the online / digital presence?

3. How many years has the online / digital presence been available to the community?

4. This question tries to determine your organisation's stage of development in relation to managing and providing community knowledge. Development is divided into three (3) stages:

    a) **Adoption Stage:** During the adoption stage, management team support is being built for developing the digital services. No formal culture change process, but there may be some awareness of the concept. Activities to test concepts and processes may be undertaken. No new technologies are required.

    b) **Implementation Stage:** During this stage your management team provides visible and tangible support for the digital services. Some training is undertaken that can influence organisation culture quality or the service provided. A pilot may be operating to test processes and services. Technology to improve the digital services may be developed, installed and tested.

    c) **Integration Stage:** The integration phase refers to the digital services being operational. This includes a stable management structure, culture change activities, processes for managing community knowledge, technologies for maintaining and supporting knowledge activities.

For the management, culture, process or technology – What stage is your organisation in: the adoption, implementation or integration stage?

	Adoption *(Concept selling)*	**Implementation** *(Solution building)*	**Integration** *(Solution broadly accepted and used by the community)*
Management (Why?)			
Culture (Why?)			
Process (Why?)			
Technology (Why?)			

	Social	**Economic**	**Political**
5. Are you generating knowledge in the following areas for the community?			
6. Are social, economic and political knowledge from community residents and businesses captured?			
7. Is knowledge captured utilised to influence social, economic and political activities			

Part B: Management and Culture

Management

1. What is the purpose or mission for the digital delivery of information and services?
2. Is there a business or strategic plan for the delivery of digital services?
    a) Does the plan describe progress towards the integration of traditional content (e.g. printed information) and digital content?
3. Is there a working party, executive, or steering committee overseeing this?
    a) How would you describe their role?
    b) How would you describe their role?
    c) How often do they meet?
    d) Can you give some examples of how they have influenced / directed the work?
4. Are there guidelines for converging of traditional media and electronic content?
5. What is the organisational structure?

Position	Part Time	Full Time
a. How many Executives?		
b. How many Managers?		
c. How many technical staff?		
d. How many operational and administrative staff?		

6. Where does the integration of physical digital content for the community take place within the organisation?
7. Do you have volunteers involved with collecting or distributing community related information (e.g. newspapers) or knowledge?
    a) If yes, what tasks and services do they undertake (e.g. preparing newsletters)?

8. How are the digital services funded (revenue and capital)?

Funding	Yes / No
a. Revenue from business generated	
b. Sponsorship	
c. Advertising	
d. Partnerships	
e. Donations	
f. Government	Local State Federal
g. Other sources of funding, e.g. in-kind contributions	

Managing Content

9. How are sources of traditional content determined (e.g. community newspapers)?
10. How are sources of digital content determined (e.g., website content)?
11. Are community residents and businesses able to add content?
12. Who are the primary audiences for the digital services?

Primary audience	Tick One
a. People residing in the local community	
b. Consumers of business residing in the physical community	
c. Business in the local community	
d. People external to the local community	
e. Business external to the local community	
f. People and businesses external to the physical community	
g. Other:_____	

13. What is the purpose of the digital services (select all that apply):

a. To provide social interaction	
b. To enhance economic opportunities	
c. To contribute to political interaction	
d. Ensure the organisation's information is available widely and 24/7	
e. Increase transparency of governance	
f. Other:_____	

14. From your perspective, has the integration of physical community and technology facilitated significant changes in how security and risk are managed over the past 10 years?

    a) If yes, can you please explain how?

    b) Has this influenced the content and means of delivering information through digital technology your organisation provides?

Culture Related Questions

15. Is there a marketing or communications plan for your organisation?

16. How does your organisation raise awareness of your digital presence?

a. Word of mouth	
b. Radio	
c. Links to other digital services, including social media	
d. Website advertising, including paying to be on search engines	
e. Television	
f. Print media (e.g. newspapers, magazines)	
g. Other (e.g. (e.g. pamphlets, other paper documents): _____	

17. Do you specifically promote community knowledge and expertise?

18. Is there training for staff and community stakeholders (e.g. citizens and businesses)?

    a) If yes, what type of training?

    b) Is this training conducted on a regular basis?

19. Does your use of digital technologies influence your organisation brand, or what your community is known for?

    a) f yes, can you explain how?

20. How do you interact with your stakeholders, customers?

a. Through the website	
b. Email	
c. Phone	
d. Counter services	
e. Letters	
f. Other (e.g. fax):_____	

Part C: Process and Technology

Processes

1. What are the primary sources of traditional content (e.g., newspaper) used populate the digital services?
   a) How is news about specific digital services obtained?
2. What are the primary sources of digital content?
   a) Are there links to other digital services or online communities?
   b) Are there links to other digital sources (e.g., news, weather, etc?)
3. How is the traditional and digital content converged?
4. How is the content to be provided through the digital sources determined?
5. What are the first, second and third priorities of the digital content today?

Position	First	Second	Third	None
a. Social content				
b. Economic content				
c. Political content				
d. Other				

6. What may be the first, second and third priorities of digital content in five (5) years?

Position	First	Second	Third	None
a. Social content				
b. Economic content				
c. Political content				
d. Other				

7. Is there an assessable archive of community knowledge? (Yes/No)

a. Is this archive accessible to the public?	
b. Is this archive part of your organisation?	
c. Is this archive part of another organisation?	
d. If yes, what organisation?	

Technology Related Questions

8. Is there a dedicated Content Management System (CMS) used to manage content?
9. What "channels" are used to distribute information to customers?

a. Through the website	
b. Social media, including Facebook, Twitter, Instagram, etc.	
c. Email	
d. Phone	
e. Counter services	
f. Letters	
g. Other	

Part D: Future Developments and Conclusions

Future Developments

1. To date, what have been the costs and benefits of the efforts to integrate physical information and digital technologies?
2. What future social, economic and political developments or activities are being considered for digital delivery for the community?
3. Do you consider the integration of physical communities and digital technologies that incorporate social, economic and political activities an emerging or growing concept?
4. What are some challenges with the use of digital services to provide social, economic and political benefit to the wealth of the community? To the wellbeing of residents?
5. What direction will digital service delivery take in the future?
6. Has there been any significant changes to how digital technology helped you support the community over the last 10 years?
7. If yes, what are the changes?
8. What are the most significant developments from the integration of the community and technology has had on:
    a) The wealth of the community; and
    b) The wellbeing of residents.

9. Over the past 10 years, how has the use of technology changed:
    a) The way management is undertaken within your organisation?
    b) Influenced the organisational culture?
    c) Influenced and impacted on processes?
    d) How the organisation interacts with the community?
    e) How the community is being influenced?

Conclusions

10. How do you wish your organisation / online presence can best contribute to the residents and business in the "real" community?
11. Are there any other aspects of community knowledge you think should be included in this study that were not?

Please Note: The interview will be transcribed and a copy sent to the interviewee for their comment and review.

End of Interview.

Thank you for your time.

Appendix C

Example of Managing Risks

The following is an example of how the sociotechnical model proposes to assist actors within organisations track and manage risk.

C.1 Actors influence delegates

Strategic and operational alliances and the four delegates aligned to them are influenced by actors. Each actor represents multiple activities that contribute to the success of the delegate reaching the desired state. The actions or their intent has been drawn from the literature. To describe how the actors influence delegates, two examples are provided. The first example describes how an actor for the creation and development of a vision statement may contribute to influencing the 'leadership and management delegate'.

The second example provides more detail about how the actors work to facilitate change. The second example again focuses on the leadership and management delegate; however, instead of focusing attention on the creation and development of a vision, the actor for this example focuses on assessing the commitment of leaders to influencing the attitudes and behaviors that support an initiative.

Example 1: Monitoring leadership support for an initiatives vision

To support the leadership and management delegate, the actors involved in creating and endorsing the vision are described. A vision endorsed by the leaders of the focal actor can have a positive influence on the perceived success of the sociotechnical initiative (Cresswell & Sheikh, 2013; Stam et al., 2014). The following five scenarios outline how the actors responsible for creating and advancing the vision may influence the leadership and management delegate:

1. *Vision rejected* and initiative abandoned: if actors responsible for leadership and management decline to adopt the vision, the initiative may be considered a high risk, and actors involved with the culture, process and technology delegates may consider they will not commit to the vision – the risk being, if the initiative were to proceed, it may fail to meet stakeholder expectations.
2. *Work in progress – some challenges:* if actors undertaking activities to gain the support of the leadership and management delegate to adopt the vision, face

significant challenges that remain unresolved, there is a risk stakeholders may not sufficiently accept the vision for the initiative to succeed. The risk of insufficient support for the vision may include resistance to allocate appropriate human or financial resources to adequately advance the vision.

3. *Work in progress – minimal challenges:* Challenges to advancing the vision are minimal and resistance is considered low. The risk of this activity failing is reduced.
4. *Partially implemented:* the vision is endorsed, but not sufficiently communicated to stakeholders that will be impacted by the vision. Actors of the leadership and management delegate have yet to develop strategies for promoting the vision or for having sufficient human and financial resources allocated. However, with the support of leadership and management actors, the vision is marginally positive.
5. *Vision fully completed/integrated:* The focal actor endorses the vision. Actors and their respective delegates that are impacted by the vision are informed, consulted, and influenced. As part of this consultation process, strategies and plans for achieving the vision have been developed. Human and financial resources have been adequately allocated. Support for the vision increases across all delegates.

The above example presents a potential iterative scenario transitioning from a current state, to a desired state. As presented above, activities to be undertaken to develop and realise the vision can change. For example, the status and associated risk can change and be reduced during each iteration.

Example 2: Gaining and sustaining leadership's support for an initiative

For this second example, a brief explanation provides context and demonstrates how the proposed model operates in more detail than provided in the first example. In the proposed model, each delegate has a group that consists of five actors. In Example 2, Leadership and Management Actors (LMAct) are coded LMAct 1 to LMAct 5. As outlined in Table C.2, each of the five actors has a title. This title is followed by a description of the actor's purpose and its desired end-state.

Under the delegate's description are five statements that outline the various stages to achieve the dimension's desired state. Each statement is linked to a score that, although it may be considered subjective, indicates a status of how well the actor is aligned with the desired state. A status of five indicates the highest rate, as it indicates the desired state has been achieved and thus risk of failing is reduced. Conversely, if the element is one, it indicates the desired state is not yet attained, and if not addressed the risk of the initiative

failing is high. The Likert Scales are used as they are easy to create, they are considered reliable, and they are easy to understand (Bertram, 2007).

With the above context in mind, Table C.1 is an example of how a leadership and management delegate, associated criteria, and potential scores are aligned with the Likert Scale.

Table C.1

Example of how criteria for the Executive Steering Committee Actor (LMAct 1) influences the leadership and management delegate

LMAct 1: Executive Steering Committee	**Likert Scale (1-5)**
Baseline Criteria: *"Leadership consists of influencing the attitudes and behaviors [sic] of individuals and the interaction within and between groups for the purpose of achieving goals." (Bass & Stogdill, 1990, p. 9)*	
If the executive leadership/steering committee meets regularly, membership participation is consistent and there is a sense of real and perceived effectiveness, this dimension may be considered a 5 on a five point Likert scale. This criterion is based on (Stam et al., 2014)	5
If the executive leadership/steering committee meets regularly, membership participation is consistent and there is a perception of effectiveness, the stakeholder may consider allocating this dimension a 4 on a five point Likert scale.	4
If the executive leadership/steering committee meets, but meetings and membership are not consistent, the stakeholder may consider allocating this dimension a 3 on a five point Likert scale.	3
If executive leadership/steering committee is allocated accountability, but fails to facilitate meaningful progress, or is considered dysfunctional, the stakeholder may consider allocating this dimension a 2 on a five point Likert scale.	2
If no there is no executive leadership/steering committee, this is considered a risk (Cabral, 2017) and the stakeholder would allocate this a 1 on a five point Likert scale.	1

As outlined in the example, each actor can achieve a maximum score of 5 points. Within each delegate, there are five actors, meaning each delegate can have a maximum of 25 points. The proposed model consists of four delegates that can collectively accumulate a maximum of 100 points. With higher points, the risk of the initiative failing is reduced.

C.2 Considering the maturity of actors

The model takes into consideration the maturity of actors. For example, the actors applied during an adoption stage of an initiative may differ from actors during the implementation stage. To cater for this, at the conclusion of the adoption stage, some or all the actors may be replaced by delegates with actors more relevant for an implementation stage. This process can be repeated at the end of the implementation stage, where more appropriate actors for the integration stage can be used.

This interaction between the alliances, the delegates and actors are important because they convert engagement with residents into visible and tangible action. Through the use of the proposed model described in this study, the risks to the success of the success of the sociotechnical initiative can be mitigated. A unique characteristic of the proposed model is that it incorporates the ability to be iterative and evolve as the sociotechnical initiative changes. This iterative capability appears to better reflect transformation when compared to Henderson and Venkatraman (1993, 1999) Strategic Alignment Model (SAM), M. H. Moore (1995) Strategic Triangle, and Davis et al. (2014) Sociotechnical Models presented in this study.

C.3 Predicting risk with delegates and actors

Continuing with the leadership and management delegate as an example (refer to Table C.1) each delegate allows the ability to review and evaluate progress against the desired state that may be linked to a strategy or policy objectives, etc., with the aim of ensuring sustained legitimacy and accountability (Stoker, 2006) of the delegates by the focal actors, or other stakeholders. This process of review and evaluation also allows the focal actor to assess risk and develop appropriate risk mitigation strategies (Department of Finance and Administration, 2006, p. 9; Malmsjo, 2003, p. 248).

For example, if a delegate is to reach a desired state, but the work has not commenced on three out of the five actors, or work may have started, but has not been completed, or the work does not meet the required standard, the risk of meeting the desired state may be compromised. This unsatisfactory state is reflected in the lower end of the Likert Scale rating. Overtime, if all five actors are completed to delegate's satisfaction, the score allocated to the actor increases, thereby increasing the overall score of the delegate and indicating to the focal actor that the risk to the initiative has been reduced.

To illustrate the predictive characteristics for the framework, Table C.1 through to Table C.3 list possible actors that may influence the leadership and management delegate activities at three different stages of maturity: the adoption stage, the implementation stage, and the integration stage.

C.3.1 Adoption stage: Delegate and actor interaction

In this example, the actors that influence leadership and management during the adoption stage are:

- LMAct 1: Executive steering committee
- LMAct 2: Vision statement
- LMAct 3: Community engagement team plan
- LMAct 4: Human and financial resource allocation
- LMAct 5: Support and service alliances

Table C.2

Example of the relationship between the leadership and management delegate and actors for the adoption stage

Delegate	Leadership and Management Actors (Adoption Stage)	Scale 1-5 (Example)
Leadership and Management	(LMAct 1) An executive steering committee is established (Stam et al., 2014)	4
	(LMAct 2) Vision statement endorsed (Berson et al., 2015; Grover, 2016)	1
	(LMAct 3) Community engagement included in a team's plan (Greaves & Romice, 2015; Thompson & Riedy, 2014)	1
	(LMAct 4) Human, financial and system resource requirements are clear and allocated (Drnevich & Croson, 2013; Thompson & Riedy, 2014)	2
	(LMAct 5) Support and service alliances in place and effective (Riege & Lindsay, 2006; Zhang et al., 2010)	3
	Points accumulated	11 out of 25
	Per cent chance of delegate success	44%

In this example, during the adoption stage, the focal actor's leadership team supports the concept of an initiative that will involve community engagement. The leadership team supports the establishment of a steering committee (LMAct 1), members are selected, and they meet regularly to guide the initiative (allocated a score of 4). However, the need for a vision (LMAct 2) to focus the initiative has been discussed, but the vision statement has not yet been developed (allocated a score of 1) and plans for engaging with the community (LMAct 3) are at an embryonic stage (allocated a score of 1). Human and financial resources (LMAct 4) are being identified to support the initiative, but the resources are not yet secured (allocated a score of 2). Support from vendors (LMAct 5) are being negotiated, including desired determination of service levels (allocated a score of 3).

C.3.2 Summary and analysis of adoption stage status

As outlined in the above example, the leadership and management delegate are at a high risk of failing, as a score of only 11 of a possible 25 points has been achieved (44%). To reduce the risk of the leadership and management delegate failing to meet the desired state of the focal actor, work to improve the scores aligned with the leadership and management delegate is required, or the adoption stage will not achieve the desired state.

C.3.3 Implementation stage: Delegate and actor interaction

The actors influencing the leadership and management delegate during the implementation stage are:

- LMAct 1: A leader accountable for community engagement and knowledge
- LMAct 2: Alignment to Vision statement
- LMAct 3: Increased community engagement activity
- LMAct 4: Human and financial resources allocated to community engagement and knowledge management activities
- LMAct 5: Alliances established

Table C.3

Example of leadership and management delegate and actors at the implementation stage

Delegate	Leadership and Management Actors (Implementation Stage)	Scale 1-5 (Example)
Leadership and Management	(LMAct 1) A leader is clearly accountable for sociotechnical community engagement and knowledge	4
	(LMAct 2) Links and aligned to focal actor's vision statement	1
	(LMAct 3) Increasing community engagement to ensure resident support/involvement to the decision-making process	1
	(LMAct 4) A business unit has human and financial resources allocated to support community engagement and knowledge management	2
	(LMAct 5) Formal alliances with focal actors to provide for sociotechnical support and services established	3
	Points accumulated	13 out of 25
	Per cent chance of delegate success	52%

Following the focal actor's leadership team's satisfaction that the desired state of the adoption stage has been reached, they focus on implementation stage activities. The actors of this stage replace those from the adoption stage and reflect activities that are more mature and required to implement the initiative. A leader for the initiative has been allocated (LMAct 1) and they are engaged (allocated a score of 4). The initiative is being aligned to the focal actor's strategic vision or mission statement (LMAct 2). This may involve developing links within, or across departments, or business units (allocated a score of 2). To ensure the activities are able to meet community expectations, it may be appropriate to consult with residents (LMAct 3); however, this has not yet progressed sufficiently (allocated a score of 1). In this scenario, human and financial resources have been identified and allocated (LMAct 4) to support the initiative (allocated a score of 3). To implement the initiative, leaders have agreed that formal alliances with focal actors to provide for sociotechnical support and services (LMAct 5) be established, and the score in the table indicates that the majority of this has been done, although more work is needed to further reduce risk of the delegate failing to meet the desired state (allocated a score of 3).

C.3.4 Summary and analysis of implementation stage status

In the above example, the 'leadership and management delegate' can be considered as having marginal success, but with a moderate risk of failing to meet stakeholder expectations, since a score of only 13 of a possible 25 points has been achieved (52%). To increase the leadership and management delegate's chances of success, work will need to be done to improve the scores of the actors, with a focus on actors with the lowest scores:

- Links to focal actor's vision/ mission statement (LMAct 2), which currently has a score of 2
- Improving community engagement (LMAct 3) to ensure resident support and involvement to drive well-being initiatives, which currently has a score of 1.

C.3.5 Integration stage delegate and actor interaction

The actors influencing the leadership and management delegate during the integration stage are:

- LMAct 1: Strategic plan for community engagement and knowledge
- LMAct 2: Community residents link the initiative to focal actor decision making
- LMAct 3: Increased community engagement through multiple channels
- LMAct 4: Human and financial resources sustained
- LMAct 5: Alliances providing support and services

Table C.4

Example of leadership and management delegate and actors at the integration stage

Delegate	Leadership and Management Actors (Implementation Stage)	Scale 1-5 (Example)
Leadership and Management	(LMAct 1) Initiative incorporated in focal actor's strategic plan	4
	(LMAct 2) Residents in the community can link this initiative to decision making	1
	(LMAct 3) Interactive, omni-channel engagement with the community	1
	(LMAct 4) Sustained human and financial resources allocated	2
	(LMAct 5) Sustained alliances with focal actors to provide support and service for sociotechnical systems	3
	Points accumulated	16 out of 25
	Per cent chance of delegate success	64%

In this final example, during the integration stage, the focal actor's leadership team has successfully gained support to incorporate the initiative into the strategic plan (LMAct 1, the actor allocated a score of 4). However, the need to improve the community's perception of how this initiative may improve their well-being (LMAct 2) requires more effort (allocated a score of 2). The focal actors can interactively engage with the community using multiple methods (LMAct 3), including digital technologies (allocated a score of 3). Human and financial resources are allocated (LMAct 4), and this allocation is sustained (allocated a score of 3). In this scenario, alliances are operating sufficiently (LMAct 5), and desired service levels obtained (allocated a score of 4).

C.3.6 Summary and analysis of integration stage status

In this above example, the leadership and management actions to support the delegate can be considered more successful than in the previous examples. The potential success rate increased to 64 per cent. As with the other stages, the leadership and management table provide insights into areas of potential improvements. However, if the delegate and focal actor are satisfied that the risk is sufficiently mitigated, they can determine that the initiative, or a phase of the initiative complete.