Self-service for public transport payments:
A business case for conversational artificial intelligence

BY

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Abstract

Although self-service (i.e. mobile top-ups) is at the heart of Snapper's customer service offering, customers have a disjointed experience managing their public transport payment cards across a range of customer service touchpoints, including more traditional support channels such as helpdesks and in-person support centres. Customer feedback indicates that some Snapper users perceive the process of resolving support issues through these traditional support channels to be inconvenient and time-consuming. Activity through these traditional channels still forms a large proportion of Snapper's customer service, despite Snapper's ongoing investment in their self-service channels; including mobile applications, the website, the MySnapper desktop application, and kiosks.

Just as Snapper innovated to meet customer demand for self-service through a mobile app (Snapper Services Ltd., 2017a), the evolution of conversational artificial intelligence (AI), or chatbot technology, presents an opportunity for Snapper to lead the way in meeting customer demand for a faster, more accessible way to resolve common support issues. The successful development of such a solution will further position Snapper as a market-leader in customer-centric innovation.

In order to understand the commercial potential of such an automated customer service offering, the research aims to understand customer use and perceptions of Snapper's support channels; to identify barriers to the adoption of self-service, and understand how these can be addressed; and to understand customer attitudes towards automated customer service. Using a mixed methods approach, research began with analysis of secondary data accessed from Snapper's internal customer service reporting. Findings validated customer demand for additional self-service options, as well as the repetitive nature of Snapper's customer service queries, indicating that these are ripe for automation. In-depth interviews were conducted with Snapper cardholders, giving further insight into how they select and interact with Snapper's customer service channels. The avoidance of perceived effort was identified as a key theme when explaining how customers navigate service channels, supporting the role of "ease of use" in explaining customer adoption of self-service technologies (Davis, Bagozzi, & Warshaw, 1989). Types of perceived effort were identified as social, cognitive and logistical effort. These categories are proposed as an extension to the Technology Acceptance Model (Davis et al., 1989), giving additional insight into what

constitutes “ease of use”. Following the in-depth interviews, market analysis and discussions with AI and chatbot service providers explored best practice in automated customer service, to understand the adoption of conversational AI technology in the New Zealand context, as well as how other companies have successfully implemented a chatbot product.

The project report concludes with a stand-alone business case for applying conversational AI technology to Snapper’s customer service offering. The business case summarises the business model and delivery methodologies recommended for the project development (see Section 6.1), including LEAN startup methods. The market validation phase (Section 6.2) then addresses the strategic business case, assessing the case for change and incorporating key findings from the customer and market research conducted earlier in the research. Building on the opportunities identified in the PESTEL analysis, the product validation phase (Section 6.3) utilises a SWOT analysis, before providing clear recommendations around the required feature-set of the proposed solution, and a possible roadmap for implementing these features. Finally, the economic, financial and commercial cases are addressed; including a cost-benefit analysis of the proposed solution, a recommended development methodology, and high-level resources and requirements required for implementation. By validating that delivering such an enhanced self-service offering is commercially viable, the project aims to deliver a more delightful experience to Snapper users, driving better uptake of Snapper’s self-service channels.

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1.0 Introduction

1.1 Background to project

Snapper Services is a public transport ticketing company based in Wellington, New Zealand. They have gained international recognition for their innovative work in a niche area, offering customers the ability to reload Near Field Communication (NFC) transport cards from their Android mobile phones. Although self-service (e.g. mobile top-ups) is at the heart of Snapper's customer service offering, customers have a disjointed experience managing their public transport payment cards across a range of customer service touchpoints.

Continuing their focus on customer-centric solutions, the company now offers 'Ticketing-as-a-Service' to the Greater Wellington Regional Council, and partners with ticketing companies and regional authorities to offer their software to customers around the globe. Snapper's suite of white-labelled software is designed to extend existing ticketing schemes, and includes a range of self-service technologies, designed to improve the customer experience when managing public transport payment cards.

Despite Snapper's focus on delivering self-service functionality through a wide range of channels to their customers throughout the Wellington region, Snapper's monthly reporting shows that many customers still manage their Snapper cards through traditional customer service channels (Snapper internal reporting, 2017). This includes more traditional support channels such as helpdesks and in-person support centres. Customer feedback gathered via AskNicely (Snapper's Net Promoter Score tool) indicates that some Snapper users perceive the process of resolving support issues through these traditional support channels to be inconvenient and time-consuming (Snapper internal reporting, 2017). Activity through these traditional channels still forms a large proportion of Snapper's customer service, despite Snapper's ongoing investment in their self-service channels; including mobile applications, the website, the MySnapper desktop application, and kiosks (Snapper Services Ltd., 2017a).

Over the past five years, Snapper has delivered several key improvements to their service offering in Wellington and Whangarei to enhance customers' ability to self-serve when managing their Snapper cards. These developments include the ability to collect refunds through self-service channels, initiate refunds remotely through the Customer Service

Application, building a responsive website to allow customers to check their balance and transaction history, and upgrading their stand-alone kiosks, which allow customers to check balances and top up their Snapper card (see Figure 1.1).

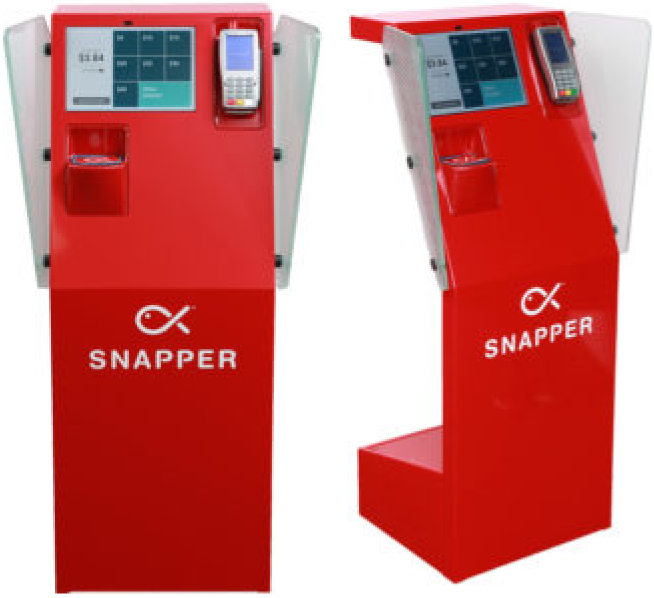


Figure 1.1: Snapper's upgraded self-service kiosks

The project seeks to identify how Snapper can continue to offer sustaining innovation (Christensen & Raynor, 2003) by enhancing their self-service offering. The project aims to understand customer perceptions of self-service and traditional service channels through in-depth customer interviews and thematic analysis of customer feedback. By identifying customer pain points when managing their Snapper cards, the project will propose how these can be addressed through self-service.

This project is being undertaken in partnership with Snapper. Information accessed prior to the project via the researcher's role at Snapper has not been included in the project report. Data accessed or gathered during the project research phases has been clearly identified below.

1.2 Opportunities

Just as Snapper innovated to meet customer demand for self-service through a mobile app (Snapper Services Ltd., 2017a), Snapper has an opportunity to lead the way in meeting customer demand for a faster, more accessible way to resolve common customer support issues. The successful development of such a solution will aim to further position Snapper as a market-leader in customer-centric innovation.

Increasing uptake of self-service channels amongst Wellington cardholders offers Snapper two key benefits. Firstly, self-service vastly increases the scalability of Snapper's 'Ticketing-as-a-Service' offering, enabling them to provide a higher standard of service to a greater number of customers at a lower cost. As the provider for the Greater Wellington Regional Council's Interim Ticketing Solution, Snapper is now serving significantly more customers across the Wellington region. With customer satisfaction (as measured through AskNicely NPS ratings) a key performance indicator for this contract, it's critical that Snapper's customer service channels perform at scale.

Secondly, in addition to the benefits that an enhanced self-service offering will provide Snapper within the domestic market, the software could also be on-sold to regional authorities overseas (helping them to solve similar pain points for their customer base). Snapper's international offering focusses on delivering software-based solutions that integrate with existing ticketing systems (see Figure 1.2). By offering 'bolt-on' self-service technology, Snapper helps regional authorities around the world leverage their existing investments to offer modern, customer-facing solutions (see Figure 1.3).

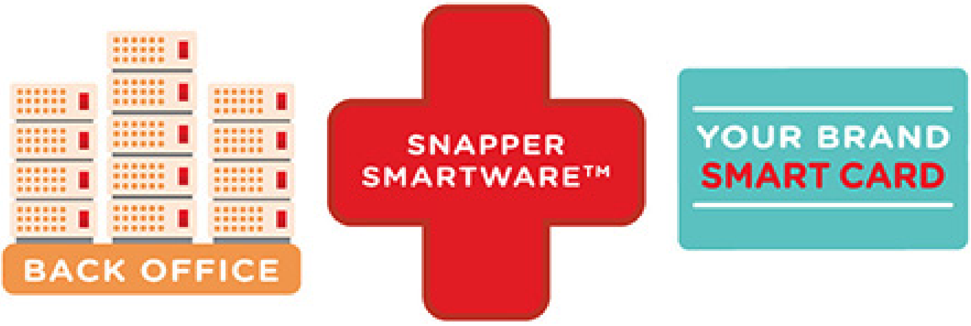

BACK OFFICE
SNAPPER SMARTWARE™
YOUR BRAND
SMART CARD

Figure 1.2: Snapper Smartware

Snapper Smartware™ is a bolt-on technology that sits between a ticketing system's back office and the smart card. It mobilises the services that can be used to manage the card. This provides an open and flexible platform, making it easier to provide innovative services, such as self-service mobile and web applications.

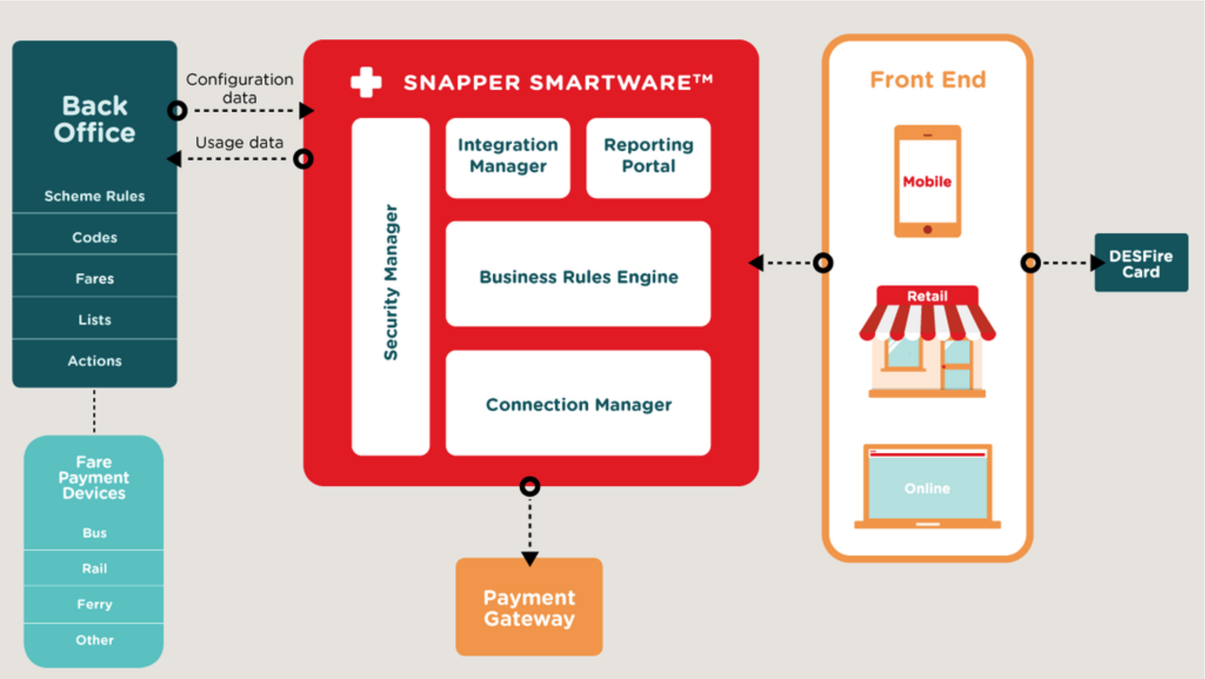

Back Office
Scheme Rules
Codes
Fares
Lists
Actions
Configuration data
Usage data
Fare Payment Devices
Bus
Rail
Ferry
Other
SNAPPER SMARTWARE™
Security Manager
Integration Manager
Reporting Portal
Business Rules Engine
Connection Manager
Payment Gateway
Front End
Mobile
Retail
Online
DESFire Card

Figure 1.3: Snapper Smartware architecture.

Snapper's solutions are designed to integrate with an existing system to maintain the integrity of the back-office, business rules and smart card investments. Snapper uses modern technologies and interfaces to ensure that the resulting services are flexible and open.

1.3 Project objectives

This project is a response to the demand from Snapper customers for a faster, more accessible way to resolve common and predictable customer support issues. A recurring theme in customer feedback is the effort required to resolve common issues through current customer support channels. Multiple customers describe the process of dealing with Snapper's call centre as inconvenient, or "a hassle" (customer feedback via Apptentive in-app messaging, 2017).

A significant portion of Snapper's support requests is driven by recurring issues, such as queries around incorrect fare charges, with refund requests consistently driving around 10% of helpdesk calls (Snapper internal monthly reporting, 2016–2017). To receive a refund, customers must escalate the issue through traditional support channels, such as calling the helpdesk or visiting an in-person support centre. These channels are time-consuming and costly for both Snapper and their customers.

The simple and recurring nature of queries such as refund requests indicates an opportunity for automation to provide a faster and more consistent experience (Bortolotti & Romano, 2012).

This project seeks to understand how automated self-service can deliver a more consistent, real-time experience to Snapper customers who currently rely on traditional channels to resolve common support issues, and to assess the commercial potential of such a solution.

In order to understand the commercial potential of an automated customer service offering, the research aims to achieve the following objectives:

1. To understand customer use of Snapper's support channels;
2. To understand customer perceptions of Snapper's support channels;
3. To identify barriers to the adoption of self-service, to understand how these can be addressed; and
4. To understand customer attitudes towards automated customer service, to validate the proposed solution(s).

Research outcome

The purpose of this study is to validate automated customer service as a commercially viable offering. The project includes developing a business case for enabling self-service in public transport payments via automated customer service, including scoping resource requirements and returns.

1.4 Project scope

This research project will focus on the public transport industry, using the example of Snapper's service offering in Wellington, New Zealand to better understand customer attitudes to self-service channels, and the market potential for an automated service offering.

Building on Snapper's service-oriented framework and customer-centric approach, this research project seeks to better understand customer perceptions of their current support offering. Through qualitative research that builds on existing knowledge from Snapper's customer feedback channels, the project explores customer demand for self-service resolution of common support issues. Through the validation and development of an enhanced self-service offering, the project aims to deliver a better experience for Snapper customers.

This research project focuses on the delivery of self-service to existing Snapper cardholders, so Snapper customers are defined as existing cardholders (who already use a Snapper card to pay for their public transport within Wellington) who own a smartphone. The small minority of Snapper cardholders who do not have access to a smartphone and/or internet-connected device will not be considered for the purposes of this research.

The project will consider cardholders who rely on a range of Snapper's customer service channels, both traditional and non-traditional, to understand a range of customer attitudes to self-service and other service channel options, as it is expected that customer willingness to self-serve will vary greatly.

The proposed solution will be validated and developed through further customer interviews, along with techniques advocated in the discipline of service design, such as customer journey-mapping, service blueprinting and moderated usability testing.

Finally, this project seeks to validate that delivering such an enhanced self-service offering is commercially viable, building a business case for applying this to public transport payments. Ultimately, it is hoped that enhancing customers' ability to self-service will deliver a more delightful experience to Snapper users, and drive better uptake of Snapper's existing self-service channels.

While the project focuses on Wellington customers, Snapper has a proven business model of applying their learnings from the domestic market for the benefit of overseas clients. Assessment of product-market fit (Andreessen, 2007) will need to include how relevant this technology will be for overseas clients.

1.5 Structure of thesis

This report seeks to understand the business opportunity presented by automated customer service, and to validate this as a commercially viable offering. The project explores the potential for technologies such as customer service chatbots to assist customers in embracing self-service as a better way to manage their public transport smartcards. Figure 1.4 (below) outlines the structure of the report, with Chapters 1 through 5 following the structure of a traditional thesis, and Chapter 6 summarising the preceding research to provide a business case suitable for a Snapper management audience.

This first chapter introduces Snapper as the project partner, and provides background to the customer service challenges they face, as they seek to prioritise self-service, leading to the identification of the opportunity addressed in this research project. In Chapter 2, related research is discussed, providing further context for how consumers perceive and interact with self-service technologies, and input into the design of the proposed solution. Frameworks for innovation and business model design are also addressed, providing context for the implementation recommendations outlined in Chapter 6, the business case.

Chapters 3 through 4 follow the structure of a traditional thesis (see Figure 1.4). Chapter 3 describes the methodology used to collect and analyse data during the research phases. Chapter 4 presents the findings and analysis from Snapper's existing customer research, as well as themes identified in the in-depth customer interviews carried out for the project, presenting the results and interpretation of these. Chapter 5 discusses the findings and analysis outlined in the previous chapter, reflecting on what these results mean for the project, and the associated business opportunity.

Chapter 6 departs from the structure of a traditional Master's thesis, presenting a business case for the proposed offering. This section of the report is designed as a distinct document, drawing on information from previous chapters, but presenting these in a format suitable for a commercial audience. After evaluation of the feasibility of these opportunities, the Business Case section provides more detailed recommendations for Snapper, alongside next steps for validating the product and market, as well as the high-level resources required to implement this technology. Finally, Chapter 7 concludes the project report, summarising key findings from the research, and the implications of these findings.

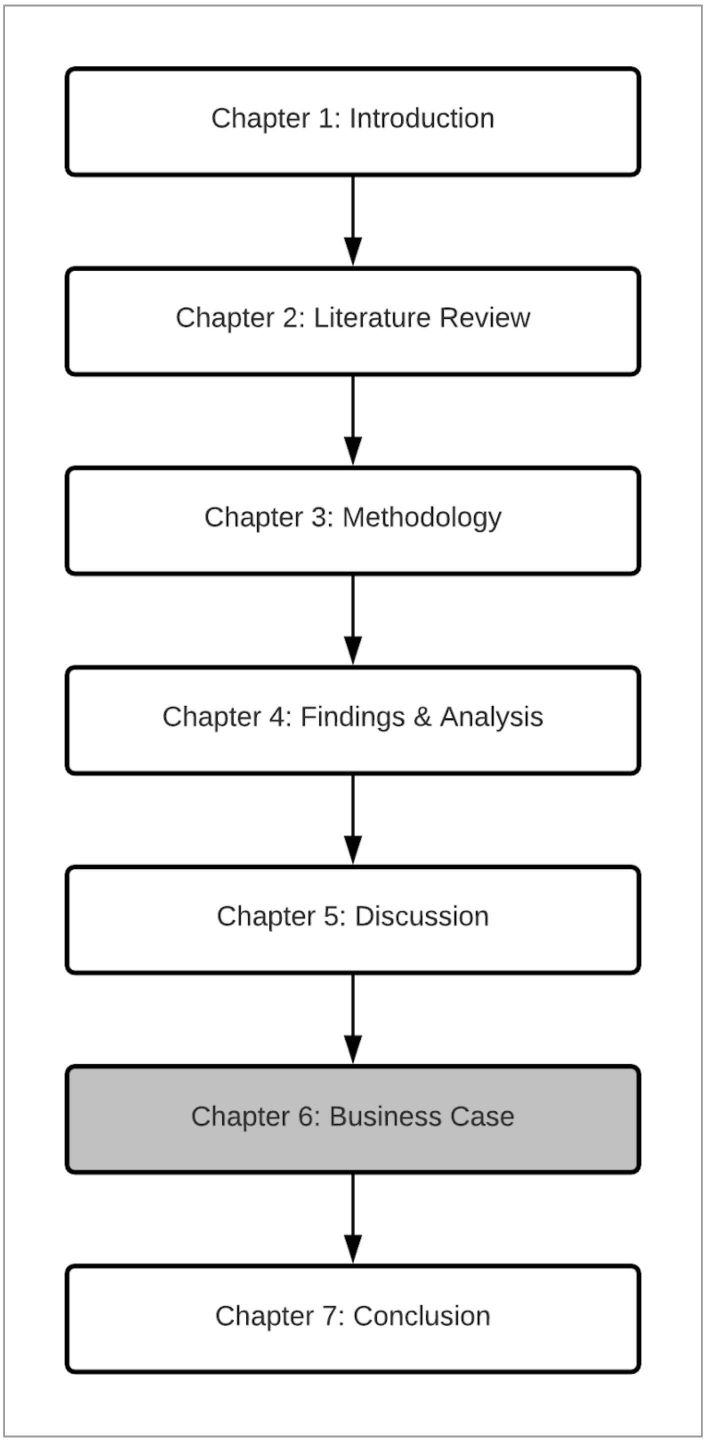

Chapter 1: Introduction
Chapter 2: Literature Review
Chapter 3: Methodology
Chapter 4: Findings & Analysis
Chapter 5: Discussion
Chapter 6: Business Case
Chapter 7: Conclusion

Figure 1.4: Diagram of report structure

2.0 Literature review

2.1 Introduction

Internationally, Snapper has positioned itself as being at the forefront of customer-centric innovation (Snapper Services Ltd., 2017a). Innovation research emphasises a focus on services as being critical for keeping customer experience at the core (Patricio & Fisk, 2011), building on the wide body of literature exploring service-dominant logic (S. Vargo & Akaka, 2009; S. L. Vargo & Lusch, 2014; S. Vargo & Lusch, 2006b, 2008, 2016). Service-dominant logic emphasises the role consumers play in co-creating value in the value exchange. Similarly, self-service literature explores a range of aspects of the implementation and adoption of self-service channels, focussing on the importance of the customer's role in the creation of value (Prahalad & Ramaswamy, 2004).

Several frameworks have been explored when seeking to understand how customers use and perceive self-service technologies, including the Theory of Reasoned Action (Bobbitt & Dabholkar, 2001; Davis et al., 1989; Fishbein & Ajzen, 1975); the Technology Acceptance Model (Davis et al., 1989), the Theory of Trying (Bagozzi & Warshaw, 1990; Bobbitt & Dabholkar, 2001); and the Theory of Planned Behaviour (Ajzen, 1991; Bobbitt & Dabholkar, 2001). Using these frameworks, existing research has identified a wide range of intrinsic and extrinsic factors that may influence customer uptake of self-service technologies. Of these factors, convenience, or the avoidance of effort, is a key theme reiterated throughout self-service literature (Roy, Shekhar, Lassar, & Chen, 2018).

Existing literature provides a wealth of research on customer perceptions of self-service technologies, but there has been little investigation into automation in a service context. There is research on *how* successful automation projects may be developed, but little on the *why* of automation. There is limited insight into where companies should focus efforts when seeking to automate (Meuter, Ostrom, Roundtree, & Bitner, 2000).

2.2 Customer-centric innovation

Following innovation best practice, Snapper Services advocates a customer-centric approach to their service offering (Snapper Services Ltd., 2017a). A wide body of business literature advocates for a customer focus to ensure innovation and R&D efforts deliver meaningful change (Patricio & Fisk, 2011; Prahalad & Ramaswamy, 2004; Tseng & Piller, 2011). In addition, customer-driven innovation is advocated to ensure innovations align with market demand (Selden & MacMillan, 2006), to generate competitive advantage during new product development through the delivery of unique features and superior products (Souder, Buisson, & Garrett, 1997), and to facilitate sustainable, long-lived innovation (Desouza et al., 2008).

To meaningfully consider customer input during the innovation process, the literature suggests a focus on customer outcomes, rather than on specific products (Ulwick, 2002). Drucker (2011, p. 54) highlighted the importance of customer focus when describing how successful innovators “go out and look at the customers, the users, to see what their expectations, their values, their needs are.”

2.3 Self-service and the co-creation of value in the service exchange

Research recognises that the co-creation of value requires involving customers in the innovation process (Desouza et al., 2008). Service-dominant logic provides a broad framework from which to understand the role of the customer in this co-creation process.

Echoing the innovation literature’s focus on outcomes over products, service-dominant research advocates replacing a product focus with a focus on value-in-use (S. Vargo & Lusch, 2008). The alignment between service-dominant logic and public transport was explored by Heikkila (2014), highlighting the need for increasing “servicization” of the transport and mobility sectors to meet customer demand (Orsdemir, Deshpande, & Parlakturk, 2015). In keeping with the service-oriented nature of Snapper’s value offering, this project was undertaken within this service-dominant framework. The field of service-dominant logic views markets as an exchange of services, and describes the co-creation of value during a service experience (S. Vargo & Akaka, 2009; S. L. Vargo & Lusch, 2014; S. Vargo & Lusch, 2006b, 2008).

Building on his earlier work, Vargo (Hilton & Hughes, 2013) explored how service design and design thinking are integral to customer-centric innovation. Within the framework of service-dominant logic, the emerging discipline of service design (Hilton & Hughes, 2013; Patricio & Fisk, 2011; S. Vargo & Akaka, 2009) advocates methodologies for better understanding customer needs and perceptions during the service experience. The discipline of service design examines the interaction between a service designer and their customers (Reason, Løvlie, & Flu, 2015), advocating a range of techniques (Morelli, 2006), with the intention of improving the quality of these interactions (Holmlid, 2009). These techniques include service blueprinting (Bitner, Ostrom, & Morgan, 2008; Radnor, Osborne, Kinder, & Mutton, 2014) and customer journey-mapping (Temkin, 2014).

Vargo et al. (2016) identified the active role of the customer in value creation as one of the four key axioms of service-dominant logic. Despite ongoing academic debate regarding the nature of this role (Hilton & Hughes, 2013; Payne, Storbacka, & Frow, 2008), the rise of self-service technologies has been identified as a prime example of consumers playing an active part in the service exchange for the mutual benefit of all parties. While value is co-created by the combined efforts of businesses, employees, customers and other actors, the value is always determined by the customer or beneficiary (S. Vargo & Lusch, 2008).

Self-service technologies allow the customer to provide the resources required for the creation of value, empowering them to perform actions previously undertaken by employees. Given this pivotal role, customer perceptions and user experience have been identified as core to the successful adoption of self-service technologies (Hilton & Hughes, 2013; Schmitz, Bartsch, & Meyer, 2016). This key role of the customer's experience is summarised in one of the foundational premises of service-dominant logic (S. Vargo & Lusch, 2006a, Chapter 3), which states “The customer is always a co-creator of value: There is no value until an offering is used—experience and perception are essential to value determination.”

Alongside an increasing focus on self-service, the framework of customer-dominant logic (CDL) has emerged (Heinonen et al., 2009). Building on the tenets of service-dominant logic, CDL takes a customer-centric approach in seeking to understand how a company's offering can become integral to their customers' lives and embedded in their processes (Heinonen & Strandvik, 2015; Heinonen, Strandvik, et al., 2010). Aligning with Snapper's customer-centric approach, customer-dominant logic (CDL) emphasises the customer as the main stakeholder, rather than focussing on specific interactions between the customer and the provider. Instead, CDL focusses but on how customers interact with service elements, or “multi-contextual value formation involving the company” (Heinonen, Voima, & Strandvik, 2010, p. 3). A key aspect of CDL is acknowledging customer interactions as occurring within a wider customer ecosystem.

Customer-dominant literature advocates that providers rethink their approach to service delivery, seeking not to involve customers in the company’s business, but to better understand how the service provider can be involved in customers’ lives. This new approach requires first understanding customers and the context in which they carry out tasks, in order to understand how the company can be involved in this wider customer ecosystem (Heinonen, Strandvik, et al., 2010).

A managerial implication of this approach is that companies are required to take a broader lense, continuously striving to better understand the goals, tasks, experiences and reasoning of their customers (Heinonen & Strandvik, 2015). Heinonen et al. (2010, p. 3) advocate looking beyond customer-company interactions to focus on the “highly dynamic and multi-contextual reality and life of the customer”. In practice, customer-dominant logic requires focussing not on the capabilities of a service offering, but on the job a customer wants it to accomplish (Heinonen, Strandvik, et al., 2010).

2.4 Customer acceptance and use of self-service technologies

Customer perception of self-service technologies has been widely explored in the literature, with self-service research focussing heavily on adoption and uptake of these technologies. A range of frameworks has been proposed for understanding consumer attitudes toward self-service technologies and their resulting adoption of these channels, identifying several key influencing factors.

Bobbitt & Dabholkar (2001) proposed using the Theory of Reasoned Action or TRA (Fishbein & Ajzen, 1975) as a basis for understanding consumer behaviour in regards to self-service, exploring the link between attitude and intention as well as between intention and behaviour. The TRA (see Figure 2.1) suggests that individual behaviour is driven by behavioural intentions and that the stronger an individual's intentions to engage in a given behaviour, the more likely they are to actually exhibit that behaviour (Sheppard, Hartwick, & Warshaw, 1988).

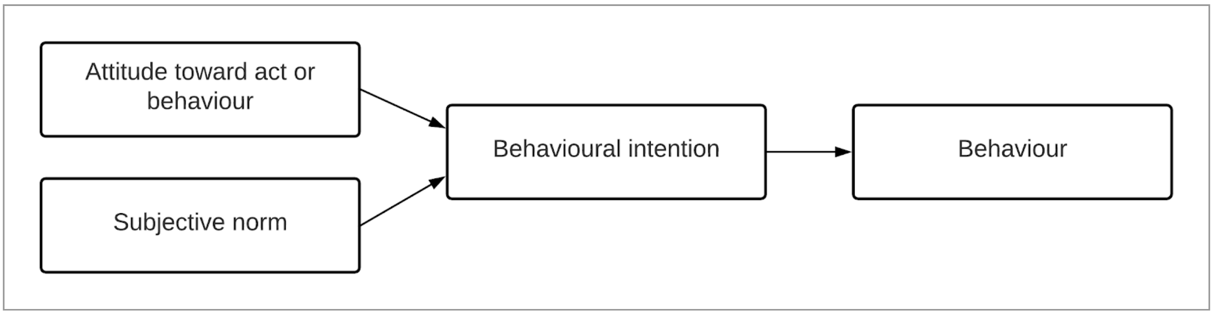

Attitude toward act or behaviour
Subjective norm
Behavioural intention
Behaviour

Figure 2.1: Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975)

Drawing from the Theory of Reasoned Action (Fishbein & Ajzen, 1975), Davis et al. (1989) also proposed the Technology Acceptance Model (TAM) for seeking to predict consumer acceptance and use of new technologies (see Figure 2.2). A number of extensions to TAM have been proposed, such as the Technology Acceptance Model 3, which better reflects the determinants of perceived usefulness and perceived ease of use (Venkatesh, 2000; Venkatesh & Bala, 2008). However, this model has been criticised for its complexity (Momani & Jamous, 2017). Furthermore, the determinants identified by Venkatesh, such as computer anxiety or computer self-efficacy, are intrinsic factors specific to a customer's interaction with self-service technology. The Technology Acceptance Model 3 does not reflect a customer-dominant perspective, acknowledging that a customer's interaction with a self-service technology occurs within a wider ecosystem, and that perceived ease of use and perceived usefulness are also determined by broader situational factors.

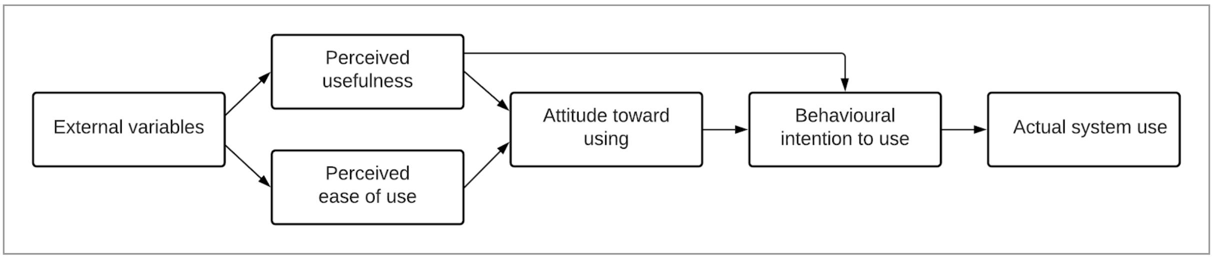

External variables
Perceived usefulness
Perceived ease of use
Attitude toward using
Behavioural intention to use
Actual system use

Figure 2.2: Technology Acceptance Model (TAM) (Davis et al., 1989)

Bobbitt and Dabholkar (2001) differentiate between consumer attitudes to the technology itself and consumer attitudes to the use of the technology, noting that previous research has focussed heavily on consumer attitudes to the technology itself, although this may not correlate to how the consumer perceives the use of the technology.

The Theory of Trying (Bagozzi & Warshaw, 1990) has also been put forward as a framework for understanding the ongoing adoption of self-service technologies (see Figure 2.3). This theory suggests that behavioural consequences can influence consumer attitudes toward trying to achieve an outcome, e.g. a consumer who unsuccessfully attempts to use a self-service technology will have their perceptions of that technology shaped by their experiences (Bobbitt & Dabholkar, 2001; Gould, Houston, & Mundt, 1997). Conversely, the successful use of technology contributes to positive consumer perceptions and increased usage (Gardner, Dukes, & Discenza, 1993). This reinforces the importance of managing consumer perceptions when seeking to drive adoption of self-service technologies.

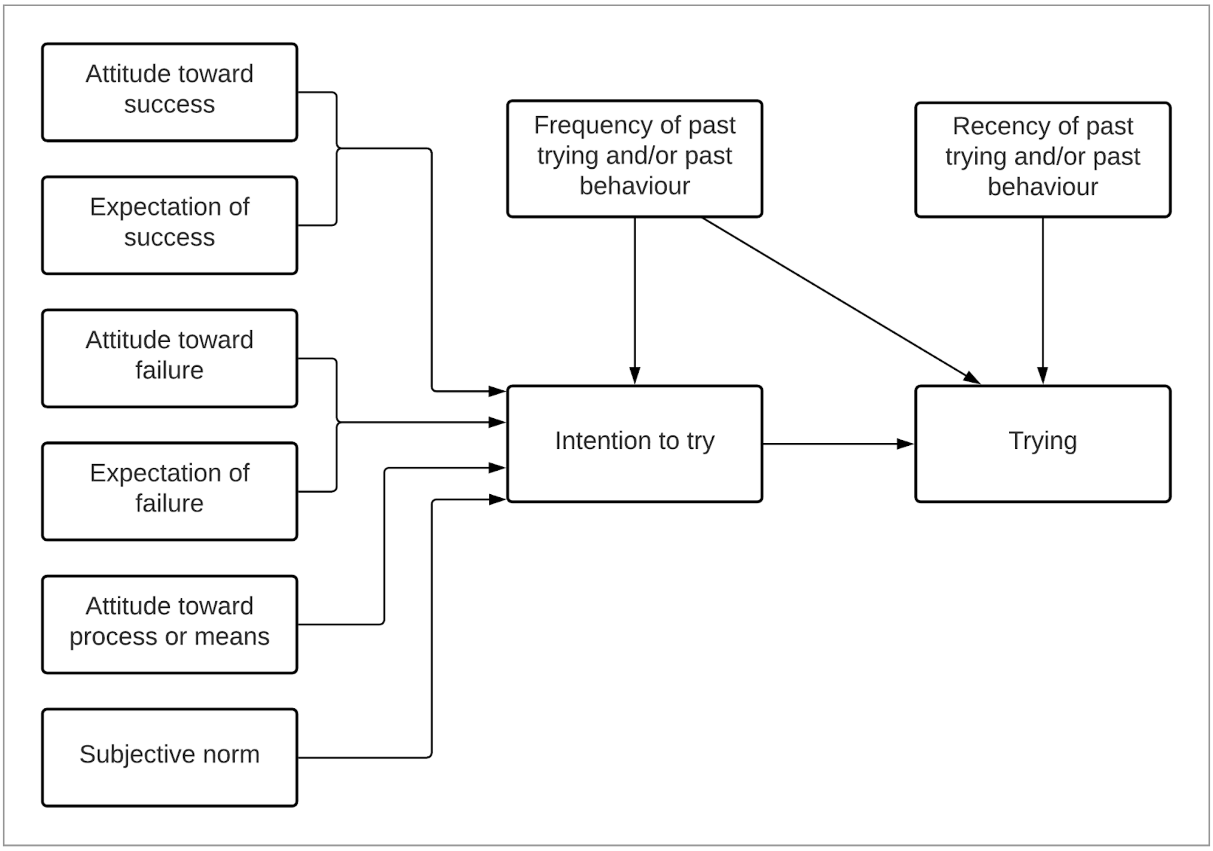

Attitude toward success
Expectation of success
Attitude toward failure
Expectation of failure
Attitude toward process or means
Subjective norm
Frequency of past trying and/or past behaviour
Recency of past trying and/or past behaviour
Intention to try
Trying

Figure 2.3: Theory of Trying (Bagozzi & Warshaw, 1990)

2.5 Customer perceptions of self-service technologies

Existing research demonstrates a strong relationship between customer satisfaction and their interactions with self-service technology. While Snapper believes that automated customer service and self-service technologies (SST) offer a superior service experience, the literature makes clear that this is dependant on the quality of the self-service delivered. Customer satisfaction with a self-service technology has shown to have a significant mediating effect on the customer's loyalty and behavioural intentions (Shahid Iqbal, Ul Hassan, & Habibah, 2018).

Bobbitt & Dabholkar (2001) explored the Theory of Planned Behaviour (Ajzen, 1991) as a framework for understanding consumer perceptions of self-service technology (see Figure 2.4). This model emphasises perceived behavioural control, i.e. the perceived ease of performing the behaviour. This framework supports the focus on perceived control and ease of use as key factors in driving uptake of self-service technologies (Dabholkar, 1996; Davis et al., 1989; Klobas, 1993; Shahid Iqbal et al., 2018).

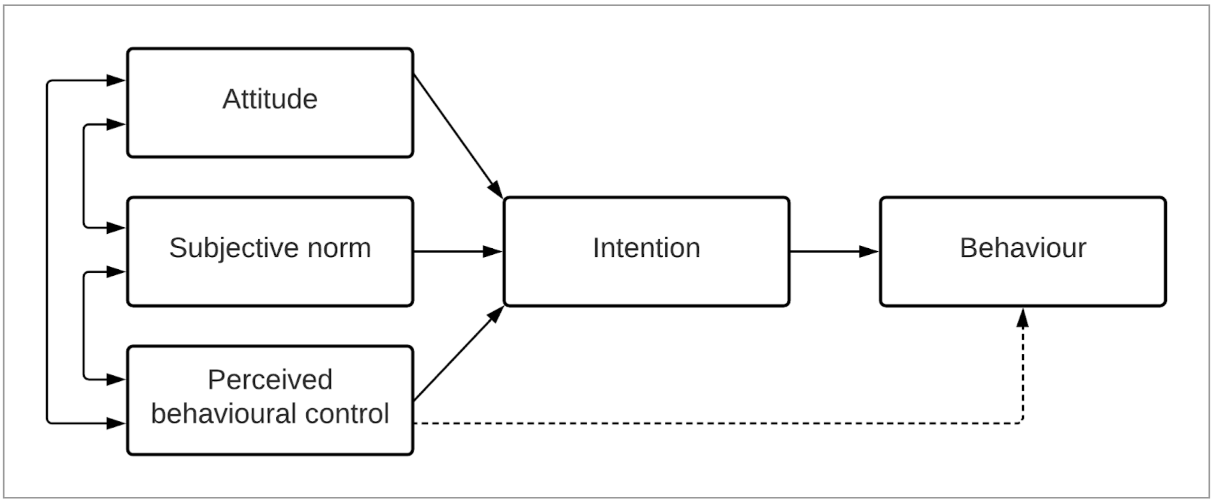


Figure 2.4: Theory of Planned Behaviour (Bobbitt & Dabholkar, 2001)

Customer attitudes towards self-service technologies are influenced by both individual and situational factors (Oh, Jeong, Lee, & Warnick, 2016; Simon & Usunier, 2007). A wide body of research has explored what these factors are, and to what extent they shape customer attitudes to SST.

2.5.1 Intrinsic factors influencing customer perceptions of SST

Meuter et al. (2000) found that dissatisfaction with self-service technologies was driven by two key factors: technology-driven failure and customer-driven failure. This shows that customers are aware of the role they play in self-service success, and presents an opportunity for companies to drive customer satisfaction by helping customers to help themselves (avoiding these customer-driven failure scenarios).

Earlier research also supports technical literacy as an influencing factor in attitudes to self-service, with consumers describing themselves as feeling intimidated when attempting to use technology without assistance (Mick & Fournier, 1998; Pavitt, 1997). Although there is little research exploring to what extent the widespread adoption of self-service technologies has reduced this influence, later research continues to identify technological anxiety in the face of self-service technology failure as a driver of channel-switching behaviour (Collier & Sherrell, 2010), and advocates that companies target SST to technically-literate consumers in the first instance, as these customers are more likely to engage in self-recovery rather than channel-switching behaviours (Zhu, Nakata, Sivakumar, & Grewal, 2013). Strategies for encouraging self-recovery in the face of self-service technology failure include ensuring that the service incorporates ways for customers to request help or in-person support, and providing supporting information when the system detects issues with customer input (Green, 2009; Singh, 1990; Zhu et al., 2013).

Another factor negatively influencing customer attitudes to self-service was the preference for interaction with service staff (Forman, A. M., & Sriram, V., 1991; Zeithaml, V. A., & Gilly, M. C, 1987), which was found to vary significantly amongst consumers (Dabholkar, 1996). This reinforces that it is difficult to generalise regarding customer attitudes towards the use of self-service (Bobbitt & Dabholkar, 2001).

2.5.2 Extrinsic factors influencing customer perceptions of SST

Of the external or situational factors influencing consumer uptake of self-service technologies, the perceived risks of using these channels was a recurring theme. Perceived situational risks (Gillett, 1976) could include financial risks, such as the insecure handling of credit card information, security risks around the capturing of personal information (Baig, Stepanek, & Gross, 1999), or the psychological risk of dealing with an unknown party (Jones & Vijayasarathy, 1998). Narteh (Narteh, 2015) reiterated the role of security and privacy as dimensions of the service quality.

Early research also identified efficiency as a key factor in customer attitudes towards self-service, with customers who preferred self-service perceiving it to save time and effort, and customers who avoided self-service associating it with increased time and effort (Bateson, 1985; Langeard, 1981). Positive attitudes towards self-service were also associated with a perception of having greater control of the interaction and higher service quality (Dabholkar, 1996). Customers' desire to control the interaction was also evident in the role of increased customisation in driving customer satisfaction with self-service technologies (Meuter & Bitner, 1998).

Meuter et al. (2000) explored factors influencing customer satisfaction and dissatisfaction with SST and identified that customers who perceived a relative advantage to using self-service, who found self-service immediately accessible for urgent service, and who considered the self-service technology to have delivered the required service ("did the job") were satisfied with the experience. In the banking sector, the role of task-channel fit (TCF) has been shown to be a strong predictor of customer perceptions of the usefulness of self-service technologies (Hoehle, 2011), further reinforcing the importance of SST helping customers achieve a specific job or goal, as advocated in customer-dominant logic.

Narteh (2015) explored customer satisfaction in the context of banking self-service, and reiterated the role of convenience, reliability, ease of use, responsiveness and fulfilment in driving customer experience with self-service experiences. Despite the many approaches taken to understanding customer attitudes to self-service, the literature agrees that both the attitudes towards and adoption of these technologies are changing rapidly (Bobbitt & Dabholkar, 2001), and many factors currently influencing negative perceptions are likely to dissipate over time.

2.6 Convenience: the avoidance of effort

In this exploration of factors that influence customer attitudes and behaviours around self-service technologies, convenience and ease of use have been highlighted repeatedly. Yale & Venkatesh (1986) identified attributes of convenience, including effective time utilisation, portability and the avoidance of unpleasantness. Later, Brown (1989) defined convenience with a focus on the service itself, rather than the individual. Brown identified five dimensions: time, place, acquisition, use and execution. Building on this earlier research, Clulow & Reimers (2009) conducted a meta-analysis of convenience studies and applied this to the retail context; defining convenience as minimising the costs of time, space and effort.

The literature shows a wide consensus that convenience is a key factor in determining customer attitudes and customer engagement behaviours (Roy et al., 2018). Service-dominant logic places greater importance on customer convenience, as it is amplified in value co-creation activities (Sweeney, Danaher, & McColl-Kennedy, 2015). Berry, Seiders & Grewal (2002) advocated for recognising the unique role of convenience in the service experience. More recent literature has explored this in a range of service contexts, including banking (Kaura, 2013a, 2013b; Wasan, 2018), home delivery (Chen, Chang, Hsu, & Yang, 2011), e-commerce (Duarte, Costa e Silva, & Ferreira, 2018; Jia, Xue, Fu, & Xu, 2018), and fitness centres (García-Fernández et al., 2018).

The literature shows a wide consensus on the importance of convenience when seeking to improve the service experience. Reflecting this, the Customer Effort Score has become an increasingly popular customer loyalty metric (Dixon, Freeman, & Toman, 2010; Nicereply.com, 2018). This metric allows companies to quantify the ease of effort in the service experience, reinforcing the role of convenience in driving adoption of a service offering.

2.7 Service automation best practice: when and why companies automate

As early as 1996, self-service technologies were identified as having fundamentally changed the way consumers interact with companies, and how services are delivered (Zeithaml, Berry, & Parasuraman, 1996). However, much of the literature exploring customer service best practice has focussed on interpersonal interactions, rather than customer interactions with this new technology (Meuter et al., 2000).

While significant research explores strategies for and benefits of automation in a manufacturing context, there is relatively little addressing automation in a service context, or where companies should focus their efforts when seeking to automate their service offering. Existing literature identifies reasons why businesses may seek to automate their service offering, including saving time and cost, increasing their operational efficiency, or reducing service failures. Delivering on rapidly changing customer expectations is also a key motivation for increased automation, as customers demand self-service alternatives for handling transactional queries, demonstrated across a range of industries (Cunningham, Young, & Gerlach, 2008; Riebeck, Stark, Modsching, & Kawalek, 2008; Stockdale, 2007).

Automation literature identifies processes that are repetitive and time-consuming as being ripe for automation (Carline, 2007; Chang & Yang, 2008; Oh, Jeong, & Baloglu, 2013; Slifka, 2010). Building on existing automation literature, Bortolotti & Romano (2012) explored automation within a service context, advocating a “lean first, then automate” approach. This aligns with Snapper’s approach of ‘simplification’, where complex customer service processes are identified and simplified before seeking to automate them.

2.8 Frameworks for innovation

Design thinking, and the associated service design practices (see Section 2.3), have become increasingly popular as a framework for innovation, allowing design methodologies to be applied to complex problem-solving (Beckman & Barry, 2007; T. Brown, 2009; T. Brown & Wyatt, 2010; Lockwood, 2010). However, a number of other frameworks with a similar customer focus have also seen widespread adoption by organisations seeking to more effectively deliver customer value during the innovation process.

The writings of Peter Drucker laid the foundation for many innovation frameworks to follow, particularly those outlined in his seminal work “Innovation and Entrepreneurship” (Drucker, 2011; Drucker & Noel, 1986). Building on the Theory of Inventive Problem Solving (Terninko, Zusman, & Zlotin, 1998), popularised by Altshuller, Al’tov and Altov (1996), Drucker advocated for Systematic Innovation, highlighting the need to identify the problem to be solved, before ideating solutions (Drucker, 1985; Drucker & Noel, 1986).

2.8.1 LEAN Startup Methods (LSM)

Further developing the principles of Systematic Innovation advocated by Drucker, the LEAN Startup Method (LSM) builds on the principles of lean manufacturing (Womack, Jones, & Roos, 1991) and lean software development (Poppendieck & Poppendieck, 2003), seeking to eliminate wasteful practices and increasing value-production, to maximise early-stage business success (Maurya, 2010). Originating from the writings of serial entrepreneur Steve Blank (2005), and later refined by Eric Ries (2011a), LEAN startup methodology places great importance on "learning about customers and their problems as early in the development process as possible" in order to minimise wasteful practices, i.e. building a product or service that does not deliver value for customers (Blank, 2005). LEAN startup methodology proposes two principle ways of ensuring this continuous customer validation: the use of key performance indicators (Schonfeld, 2011), and the use of a continuous deployment process (Adler et al., 2011; Ries, 2011a). Aligning with these principles, LEAN startup methodologies advocate for the release of a Minimum Viable Product (MVP), rather than seeking to bring a highly polished product to market, to ensure that early customer feedback can be captured and applied in future iterations of the product (Tokareva, 2018).

The stated aim of LEAN startup methodology is to deliver on customer demand as efficiently as possible, i.e. delivering the most customer value using the least required resources (Ries, 2011a), which aligns strongly with the design thinking ethos of “doing more with less” (T. Brown, 2009). Focussing the initial implementation on simple, high-value use cases also aligns with Drucker’s framework for innovation, where he proposes that successful innovation must have a clear and considered focus. “An innovation, to be effective, has to be simple and it has to be focused. It should do only one thing, otherwise it confuses. All effective innovations are breathtakingly simple.” (Drucker, 1985, p. 71).

Although originating in startup culture, and offering an entrepreneurial focus, LEAN methodologies have now seen widespread adoption amongst larger, more established organisations; who see value in a customer-centric, iterative development process; allowing them to more efficiently deliver customer value (‘The Lean Startup | Case Studies’, n.d.). LEAN startup methodologies have been utilised for this project where appropriate; as a customer-centric, iterative approach aligns strongly with the ethos and practices of the project partner, Snapper (Snapper Services Ltd., 2017a).

2.8.2 Theory of Disruptive Innovation

Contributing to the theory of innovation, Cristensen proposed the theory of disruptive innovation, coining the term “disruptive technology” (Bower & Christensen, 1995). The concept of disruptive innovation has been used to describe an innovation that creates a new market and value network, disrupting existing markets, and displaying established products or services. Further exploring the ideas of disruptive and sustaining innovations, Christensen (Christensen, Anthony, & Roth, 2004) went on to identify three types of customers. “Non-consumers” refer to customers who currently cannot complete a job themselves, relying on inadequate solutions or hiring someone else to complete the task. Non-consumers may be targeted by new-market disruptive innovation when a product or service is provided that allows these consumers to complete a task that they are already trying to get done. “Undershot customers” refers to consumers using a product or service, but frustrated by its limitations. In this context, innovation is likely to be sustaining. Whether this innovation is radical or incremental, it will result in new products or services being introduced to the existing consumer base. Finally, Cristensen identified “overshot consumers”, where customers are no longer willing to pay for further improvements to the service, and instead, either low-end disruptive innovation or displacing innovation will occur.

Sustaining innovations focus on meeting existing customer needs, serving to make a good product into a better product (e.g. more responsive service over Snapper's email or call centre channels). Conversely, disruptive innovations address a market that is invisible or not yet attractive to the mainstream (e.g. the as-yet unidentified customers willing to use chatbot technology). Christensen identifies one of the signals of disruptive innovation as a marketplace where consumers are currently trying to achieve something through processes that are inconvenient, offering an opportunity for a product or service to present a new way of achieving the same goals.

In the context of this project, conversational AI is a highly disruptive technology, and Snapper must respond to how this technology will continue to shape ever-advancing customer expectations. More specifically, Snapper customers relying on traditional service channels and/or expressing frustration at the limitations of the self-service tools currently available, are behaving in a way consistent with undershot customers (Christensen et al., 2004). As such, these customers are likely to be receptive to disruptive technologies, such as conversational AI. This project proposes the adoption of a disruptive technology to support radical sustaining innovation; namely, the implementation of conversational AI for Snapper customer service.

2.8.3 Frameworks for business model design

Innovation requires that organisations be prepared to both adopt new business models and continue to innovate on their existing business models (Aarntzen, 2016). To assist with this process, a number of approaches have been proposed (Hamel, 2000; Morris, Schindehutte, & Allen, 2005). The most widely recognised of these frameworks is the Business Model Canvas or BMC (Osterwalder, 2004; Osterwalder & Pigneur, 2010), alongside the accompanying Value Proposition Canvas (VPC). Later, Maurya (2010) proposed the LEAN Canvas, exchanging some components of the BMC for others, in order to better identify organisational risks. Building on LEAN startup methodologies, Maurya described his objective for proposing this extension to the BMC as "making it as actionable as possible, while staying entrepreneur-focused" (Maurya, 2012, para. 7).

Despite the widespread popularity of visual business models such as the BMC and LEAN Canvas, there is not yet an agreed definition of the business model concept (Demil & Lecocq, 2010; Linder, 2000). A business model has most simply been defined as showing “how a company makes money” (Rappa, 2001, para. 2) or as “an abstraction of a business identifying how it profitably makes money” (Betz, 2002, p. 21). Similarly, Magretta (2002) describes a business model as demonstrating an exchange of value - exploring how the business can profitably make money in exchange for delivering customer value. Building on this concept of how business components combine to support a value exchange; Osterwalder, Pigneur & Tucci (2005) propose that a business model must include four key aspects in order to support the creation and delivery of value: the value proposition, the profit formula, the key resources and the key processes.

Furthermore, there is a lack of consensus around the elements that need to be included in a business model framework (Demil & Lecocq, 2010; Fielt, 2014; Osterwalder, 2004), as well as how these frameworks should be applied. The use of business model frameworks varies significantly across organisations, with some businesses seeing frameworks as helpful tools or guidelines, while others consider completing a business model framework as a critical step in the business model design process (Aarntzen, 2016). The business model may be viewed as a static representation of how core components relate to each other or as a more transformational tool that allows the business to address innovate in response to internal or external change (Demil & Lecocq, 2010).

Despite their differences, these business model frameworks all provide a method of demonstrating how a business creates and captures value (Hoffmann, 2013). Research suggests that the use of these frameworks improves the process of business model development, providing organisations with a better understanding of the innovation process (Aarntzen, 2016; Hoffmann, 2013). In keeping with the LEAN startup approach utilised for the project, the LEAN Canvas (Maurya, 2010) was used to assist with product and market validation during the business case development, helping to capture key assumptions and unknowns throughout the project (see Chapter 6).

2.9 Conclusion

While existing self-service literature has explored a wide range of factors influencing customer perceptions and adoption of self-service technology, much of this research is dated, given the rapid uptake of these technologies. Additionally, there is little research relating to essential services, or to the public transport industry specifically. In her formative work contributing to the adoption of the “Mobility-as-a-Service” concept, Heikkila (Heikkilä, 2014) provides a clear link between a services approach and the requirement for public transport authorities and regional authorities to deliver on ever-changing customer requirements. However, while self-service is implied in the “Mobility-as-a-Service” movement, there is little research relating to the adoption of self-service channels within the public transport sector, and the move from more traditional customer service channels.

This research project focuses specifically on the public transport industry, as existing self-service research has largely avoided this domain. However, the conflict between traditional customer service channels and self-service spans many essential service industries, including banks, telecommunication providers and power companies, and the project findings are therefore likely to have relevance for these industries.

In order to understand the commercial viability of the proposed self-service solution, the project has considered a range of frameworks for understanding customer acceptance and use of self-service technologies, particularly the Technology Acceptance Model (Davis et al., 1989)), which highlights both perceived usefulness and perceived ease of use as crucial factors in determining the likely uptake of a technology. Based on this, literature around convenience, or the avoidance of effort, was explored, further emphasizing the importance of these factors in the successful development of the proposed offering.

A customer-centric approach has been utilised throughout the project, applying the principles of service-dominant logic, customer-dominant logic and service design (see Section 2.3). This focus on the customer is further reiterated through the use of the LEAN Canvas as the chosen business model framework (see Chapter 6), as well as the application of Drucker and Christensen’s innovation theories (see Section 2.8), which prioritise customer validation through iterative development and rapid feedback cycles, rather than lengthy product development timeframes.

3.0 Methodology

3.1 Introduction

As previously discussed, Snapper customers are able to manage their cards through a wide range of customer service touchpoints, including self-service or digital channels, as well as more traditional support channels such as helpdesks and in-person support centres. Activity through these traditional channels still forms a large proportion of Snapper's customer service, despite Snapper's ongoing investment in their self-service channels, including mobile applications, the website, the MySnapper desktop application, and kiosks.

Through regular reporting on helpdesk support requests and customer feedback, Snapper has already begun to identify the recurring nature of issues affecting their customers and drive call centre activity. Customer feedback from Asknicely and Apptentive suggests that customers affected by these issues are dissatisfied with Snapper's traditional customer service channels, such as the call centre or in-person support centres, finding the resolution process both inconvenient and time-consuming.

Building on this existing knowledge, the project's research design aimed to validate the following key assumptions:

1. Snapper's self-service channels can deliver a better customer experience than traditional service channels.
2. Barriers affecting adoption of Snapper's self-service offering can be identified and addressed.
3. Addressing these barriers will improve customer experience and increase uptake of self-service.
4. Delivering such an enhanced self-service offering is commercially viable.

3.2 Research design

3.2.1 Research design process

As this project aims to better understand the behaviour of Snapper cardholders, the research was undertaken from an inductive paradigm (Thomas, 2006). The research sought to reach a rich understanding of Snapper customer behaviour and perceptions in order to propose an appropriate business solution, rather than to generalise these findings to larger groups (Hackley, 1998).

To address the research purpose and validate these project assumptions, mixed methods research was undertaken, as shown in Figure 3.1, enabling the project to both “verify and generate theory in the same study” (Tashakkori & Teddlie, 2009, p. 127). Aligning with the definition of theory put forward by Corley and Gioia (Corley & Gioia, 2011, p. 12), this project seeks to generate “a statement of concepts and their interrelationships that shows how and/or why a phenomenon occurs.”

Quantitative secondary data available from existing Snapper reporting channels was analysed to provide a background on how customers use Snapper’s customer support channels, and the types of queries driving this traffic. In order to better understand this quantitative data and gain a richer understanding of customer perceptions, needs and behaviours (Taylor, Bogdan, & DeVault, 2015) relating to Snapper’s customer support channels, qualitative secondary data was also analysed from NPS comments (via AskNicely).

Finally, primary data was collected from in-depth interviews with Snapper customers. Analysis of this qualitative data from in-depth interviews was inductive or “bottom-up”, developing theory on the basis of the data collected, rather than aiming to validate an existing hypothesis (Bryman & Bell, 2015). Grounded theory was produced by gathering the qualitative data and analysing the emergent themes. Interview data was analysed iteratively to identify and group codes, until overarching themes emerged.

The research project acknowledged that customers may have a limited understanding of how innovative self-service technologies can be applied, and so the customer insights gathered during the research were supplemented with analysis of market-leading companies and their automated service offerings.

As a primarily qualitative research project, the research was not based on a predetermined hypothesis of what an enhanced self-service solution for Snapper might look like, but rather a clearly defined problem or topic to be explored, guided by the theoretical lens of service-dominant logic.

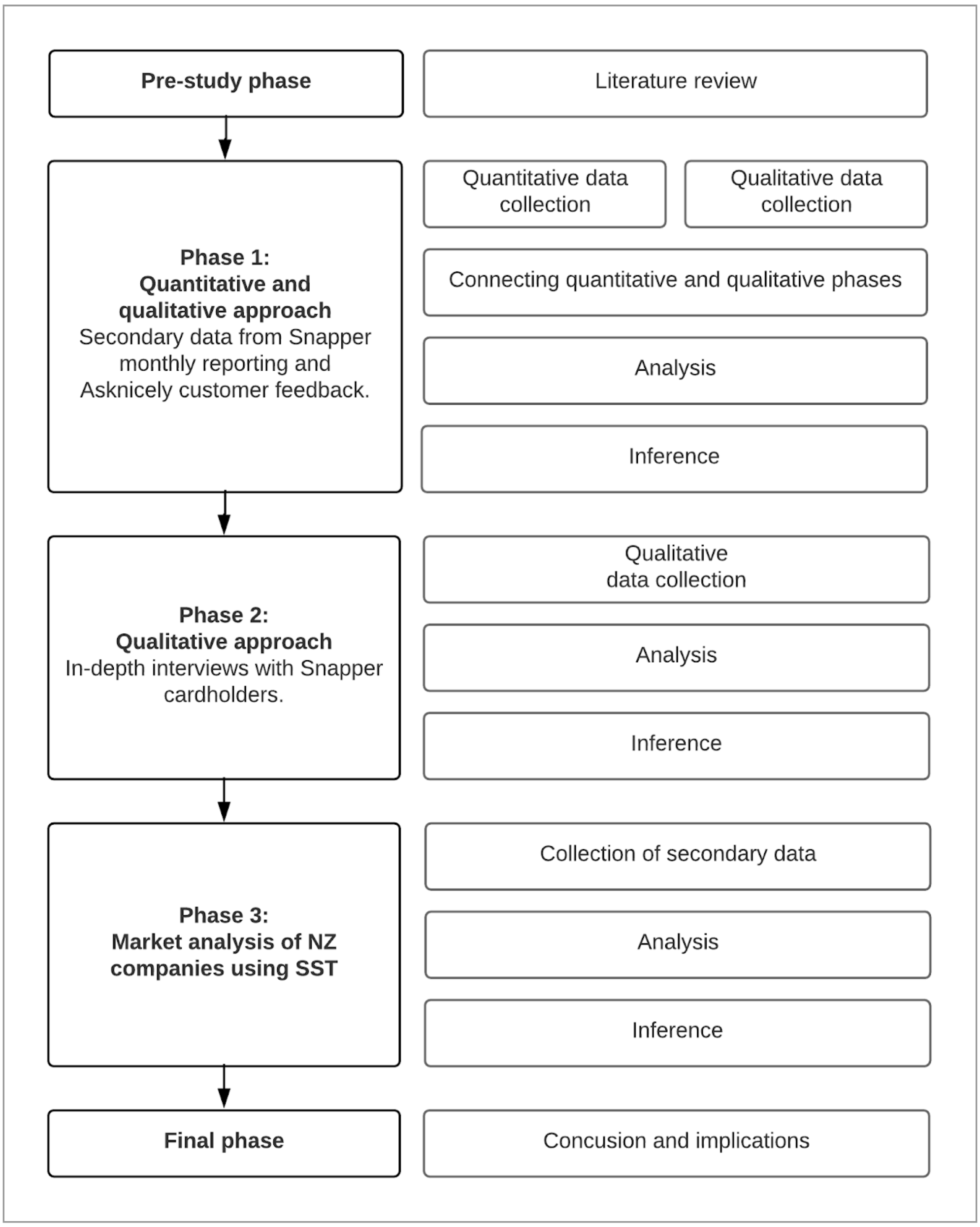

Pre-study phase
Literature review
Phase 1:
Quantitative and qualitative approach
Secondary data from Snapper monthly reporting and Asknicely customer feedback.
Quantitative data collection
Qualitative data collection
Connecting quantitative and qualitative phases
Analysis
Inference
Phase 2:
Qualitative approach
In-depth interviews with Snapper cardholders.
Qualitative data collection
Analysis
Inference
Phase 3:
Market analysis of NZ companies using SST
Collection of secondary data
Analysis
Inference
Final phase
Concusion and implications

Figure 3.1: The study's mixed methods research design, showing quantitative and qualitative research phases

Although it was expected that data collection and analysis for this project would be iterative, the following key areas were addressed in the initial research design:

1. Problem validation - that Snapper customers are not satisfied with traditional service channels, and increased adoption of self-service would improve customer satisfaction (see Section 3.5.1.2)
2. Market validation - that there is customer demand for an enhanced self-service offering, with increased automation (see Section 3.5.2)
3. Product validation and development - that customers are receptive to the proposed solution, and that this is commercially viable (see Chapter 6.0)

3.2.2 Considerations during research design

Snapper's existing data was a key consideration during the research design project, as the research sought to build on what Snapper already knows about their customers. The majority of existing Snapper data relating to their customer service offering is quantitative, giving a picture of *how* customers engage with Snapper customer service, but not *why* they engage with Snapper customer service in those ways.

Other areas not yet well understood by Snapper management include customer attitudes toward self-service. Although Snapper already uses Net Promoter Score (NPS) to gather regular customer insights, the company faces the challenge of relating this back to products and services in an actionable way.

3.2.3 Iteration of research methodology

Following Lean Startup methodologies (Ries, 2011a), the research design was iterative in nature, aiming to apply the learnings from previous research phases in order to continuously validate the proposed solution through rapid feedback loops.

Throughout the research, feedback was sought from both Snapper customers and Snapper employees to ensure the proposed solution aligned with genuine customer need, as well as Snapper's business goals.

Early findings from the initial analysis of Snapper's existing data were shared with Snapper's Customer Care team for feedback. Interview guides for in-depth interviews were peer-reviewed by Snapper user experience (UX) and research and development (R&D) staff, and recruitment of interview participants was overseen by Snapper's customer care team. Findings from in-depth interviews were shared widely within Snapper prior to developing the proposed solution to ensure the research was building on other customer research initiatives undertaken by Snapper, rather than being conducted in isolation.

3.3 Development strategy assumptions

As addressed in Section 2.3, the research component of this project has been guided by the principles of service-dominant logic, and the practices advocated in the emerging field of service design (Hilton & Hughes, 2013; Patricio & Fisk, 2011; S. Vargo & Akaka, 2009). The project partner, Snapper, advocates a focus on delivering customer value, rather than on specific products; so this approach was chosen to align with the service-oriented nature of Snapper's value offering. Emerging from the wide body of service-dominant literature (S. Vargo & Akaka, 2009; S. L. Vargo & Lusch, 2014; S. Vargo & Lusch, 2006b, 2008), the framework of customer-dominant logic has also been utilised (Heinonen et al., 2009); as this aligns with Snapper's customer-centric approach throughout the design, development and delivery of their service offerings (Snapper Services Ltd., 2016).

Echoing this customer focus, the development strategy for this project has been guided by LEAN Startup methodologies (Ries, 2011a), beginning with validation of the problem being addressed. The LEAN model advocates iterative development in order to facilitate rapid feedback cycles from stakeholders (see Section 2.8.1). LEAN Startup Methods lean heavily on the principles of Agile software development, the methodology currently in use by the Snapper development teams. Based on the principles of LEAN and Agile, the project assumes an incremental approach, developing a first iteration or "minimum viable product" (MVP) of an enhanced solution that will allow for in-market validation with beta users. Although customer validation of an MVP or prototype is outside the scope of this research project, the proposed resources and timeframes for development outlined in Chapter 6 assume an iterative delivery.

While an Agile approach has been assumed for the product development, a range of off-the-shelf software products have been identified, which allow chatbots to be implemented with minimal coding. Use of an existing chatbot product will significantly reduce Snapper's time to market for the MVP of a customer service chatbot, allowing for more rapid customer validation, as advocated by LSM. It has therefore been assumed that utilising off-the-shelf software, with customisation or integration with Snapper systems as required, is the preferred development option, at least for the initial implementation phases of a customer service chatbot.

3.4 Business model assumptions

As discussed in Section 3.3, LEAN startup methodologies have been utilised for this project where appropriate; as a customer-centric, iterative approach aligns strongly with the ethos and practices of the project partner, Snapper (Snapper Services Ltd., 2017a). In keeping with the LEAN startup approach, the LEAN Canvas has been utilised for this project (Maurya, 2012). While a range of frameworks for business model design was considered (see Section 2.8), the LEAN Canvas was chosen for providing a more actionable framework, as compared to its predecessor, the Business Model Canvas (Osterwalder, 2004; Osterwalder & Pigneur, 2010). The LEAN Canvas was used to assist with product and market validation during the business case development, helping to capture key assumptions and unknowns throughout the project (see Chapter 6).

While the business model was refined throughout the project, the commercial viability of the project makes two key assumptions (see Project Assumptions outlined in Section 3.1). Firstly, it is assumed that delivering an enhanced self-service solution will increase the uptake of self-service amongst Snapper customers. This assumption is critical to the proposed business model, as an increase in self-service (and the resulting decrease in the use of Snapper's traditional service channels) will result in a reduction in the ongoing costs associated with Snapper's customer service, particularly the cost-to-serve via the call centre, service sites and other person-to-person support channels. Secondly, it is assumed that the delivery of this enhanced self-service solution is commercially viable, i.e. that the development costs of this solution will not be greater than the anticipated cost savings resulting from decreased traffic to Snapper's traditional service channels. Validation of these assumptions, alongside additional detail of the proposed business model, are addressed in the Business Case (see Chapter 6).

Within the New Zealand market, Snapper offers “Ticketing-as-a-Service” (TaaS) solutions to public transport operators and regional councils. This service offering includes the delivery of customer care across a range of channels, and so Snapper directly benefits from delivering more efficient and scalable customer service.

As a TaaS provider, Snapper absorbs the cost to serve for their customer care channels to Wellington cardholders, and benefits directly from increased efficiency in delivering this customer service. Snapper’s traditional channels (call centre, email and in-person support) have a significantly higher cost-to-serve than self-service channels. The cost of these channels, particularly the call centre, increases as customer service traffic increases. This is in sharp contrast to Snapper’s self-service channels, where cost-to-serve increases only marginally when customer uptake increases.

While the solution has not been preempted, it’s assumed that the implementation of automated self-service will be financially self-sustaining for Snapper, saving significant resource costs across their traditional service channels. Snapper currently outsources in-person support and their call centre, meaning that customers who choose to engage via these channels have the greatest cost-to-serve. The project assumes that an iterative approach to an enhanced self-service offering will allow Snapper to benefit from the time and cost savings of increased automation, while providing valuable user feedback for future iterations.

3.5 Data collection and analysis

Although this research was iterative in nature, data collection was conducted in three main phases:

1. Phase 1: Secondary data from Snapper’s existing reporting channels, including quantitative data from their regular customer service reporting, and qualitative data comprised of customer comments from their Net Promoter Score (NPS) rating tool.
2. Phase 2: Primary data was gathered through in-depth customer interviews with Snapper cardholders.
3. Phase 3: Market analysis of companies from other essential industries, including information shared with Snapper by other customer-centric companies using self-service technologies.

3.5.1 Secondary data from Snapper’s customer service channels

3.5.1.1 Understanding how customers use Snapper’s support channels

Following Lean Startup methodologies (Ries, 2011a), the research design began with validation of the problem that the project is seeking to address. In order to validate the assumption that Snapper customers are not satisfied with traditional service channels and would be better served through an enhanced self-service offering, this research phase addressed the first research objective; namely, to understand customer use and perceptions of Snapper’s support channels.

In order to better understand key drivers of Snapper customer service interactions, quantitative secondary data was reviewed from Snapper’s existing customer service reporting channels (see Table 3.1).

Snapper’s customer service team identified seasonal variation in query drivers (e.g. the majority of February queries being related to the expiry of child fare concessions), it was considered necessary to review secondary data from a full year, and data was reviewed for January through to December 2017.

Reporting from Snapper’s four main customer service channels was analysed, including Telnet (the external call centre), Service Centres (in-person support available through i-SITEs), GoToAssist tickets (an incident management tool for escalations from external support channels), and AskNicely.

AskNicely (www.asknicely.com) is a customer research tool prompting users to provide an NPS rating, with the opportunity to provide a supporting comment. Snapper regularly polls its database of registered customers using AskNicely, and these comments provide rich insights into their wider customer base, both active and inactive users, across a range of customer service channels.

Table 3.1: Overview of quantitative secondary data accessed from Snapper's existing reporting channels

Customer service channel	Type of data accessed	Data available from
Telnet (external call centre)	Categories, subcategories and counts on types of inbound calls and emails handled by the call centre, by month	Telnet Reporting Portal
Service Centre (i-SITE service centres)	Reason codes and counts on refund requests, by month	Snapper's internal reporting portal
GoToAssist issues (escalations from call centre and service centres to Snapper HQ)	Categories and counts on types of issues, by month	GoToAssist Dashboard
AskNicely (email surveys prompting customers for an NPS rating and supporting comment)	NPS rating over time, count and associated average NPS rating for each "theme bucket" (comments automatically grouped by keywords or phrases)	AskNicely Dashboard

This quantitative data analysis sought to understand the type of queries driving Snapper customer service interactions, whether these drivers varied across channels, and whether self-service options already existed for these query types.

Since secondary data was not available for some customer service channels, customer queries from several months (October to December 2017) were also reviewed from the following low-volume channels to understand whether there was any substantive difference in the types of issues driving queries to these channels, as compared to the channels above.

- Apptentive - customer queries via in-app messaging platform accessed through the Snapper Mobile Android application
- Facebook - customer queries via direct messages and public posts/comments
- Twitter - customer queries via direct messages and public tweets

3.5.1.2 Understanding how customers perceive Snapper's support channels

Building on this understanding of how customers currently engage with Snapper's support channels, the next research phase sought to understand how they perceive these support channels. To get a holistic understanding of cardholder perceptions of Snapper's service offering, NPS data was analysed from AskNicely.

Thematic analysis was conducted on all AskNicely comments received in June 2017 using the steps outlined below. This time period was selected because, in mid-2017, Snapper updated the list of customers being polled for feedback to exclude customers who had not been active Snapper users for some time.

Comments from ‘detractors’ (customers who gave Snapper a rating of 6 and below), ‘passives’ (customers who gave a rating of 7 or 8), and ‘promoters’ (ratings of 9 and above) were analysed. The nature of the comments did not always align with the numerical rating (some promoters gave negative feedback and vice versa).

After review of Snapper’s existing “theme buckets” in AskNicely (comments automatically grouped by keywords or phrases), findings were interpreted using an iterative process adapted from the six stages of thematic analysis (Braun & Clarke, 2006):

- Familiarisation with data - reviewing the customer comments and ratings
- Generating initial codes - identifying recurring words and phrases from customer comments
- Searching for themes among codes - analysing comments to identify key themes, using mind mapping software to identify relationships between codes and group these into themes
- Reviewing, defining and naming themes - revising initial themes into themes and subthemes, visualising this using mind mapping software
- Producing a final report.

3.5.2 Understanding barriers to self-service: in-depth customer interviews

To understand why customers choose to engage with traditional customer care channels and to identify barriers to the adoption of self-service, themes identified during the analysis of secondary data from AskNicely were validated and explored during in-depth interviews with Snapper customers. Prior to beginning data collection, the research was approved by the Victoria University of Wellington Human Ethics Committee (#0000024670). These in-depth interviews sought to identify barriers limiting the adoption of self-service and to understand how these can be addressed by exploring how customers manage their Snapper cards, their motivations to choose particular service channels, and their perceptions of those channels.

To ensure the interviews delivered rich insights into Snapper’s customer base, participants for these in-depth interviews were recruited from a range of channels, based on having had a recent interaction with Snapper customer service. Efforts were made to

recruit participants across Snapper’s recognised customer segments (facilitators, dependent and independent travellers - see Appendix A), as well as having representation across genders and age groups (see Table 3.2).

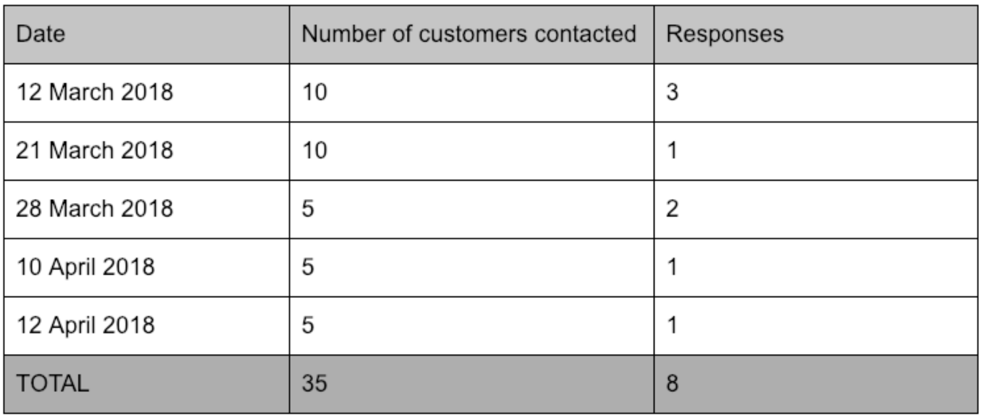
Table 3.2: Demographics of research participants for in-depth interviews

Interview No.	Customer segment	Age range	Gender
1	Independent traveler	18–25	Female
2	Independent traveler	36–45	Male
3	Independent traveler	36–45	Female
4	Facilitator	46–55	Male
5	Independent traveler	46–55	Female
6	Independent traveler	26-35	Female
7	Facilitator	46-55	Male
8	Independent traveler	18-25	Female

In-depth interviews were carried out amongst cardholders who had interacted with Snapper's traditional service channels, as well as those who primarily rely on self-service to manage their Snapper cards. 6–8 interviews across this group were expected to provide data saturation (Guest, Bunce, & Johnson, 2006).

Customers who had recently interacted with Snapper customer service were identified through email, Twitter, Facebook, AskNicely, Apptentive and Snapper's internal Customer Service Application (CSA). Potential research participants were contacted by Snapper's Customer Care team, asking if they would like to participate in the research. The response rate from potential research participants was low, so 5–10 customers were contacted at a time until the required number of participants had been found (see Table 3.3).

Table 3.3: Response rate when contacting customers to participate in in-depth interviews



Date	Number of customers contacted	Responses
12 March 2018	10	3
21 March 2018	10	1
28 March 2018	5	2
10 April 2018	5	1
12 April 2018	5	1
TOTAL	35	8

Eight in-depth interviews were conducted with Snapper customers, selected based on having had a recent customer service interaction with Snapper, including digital and in-person support channels.

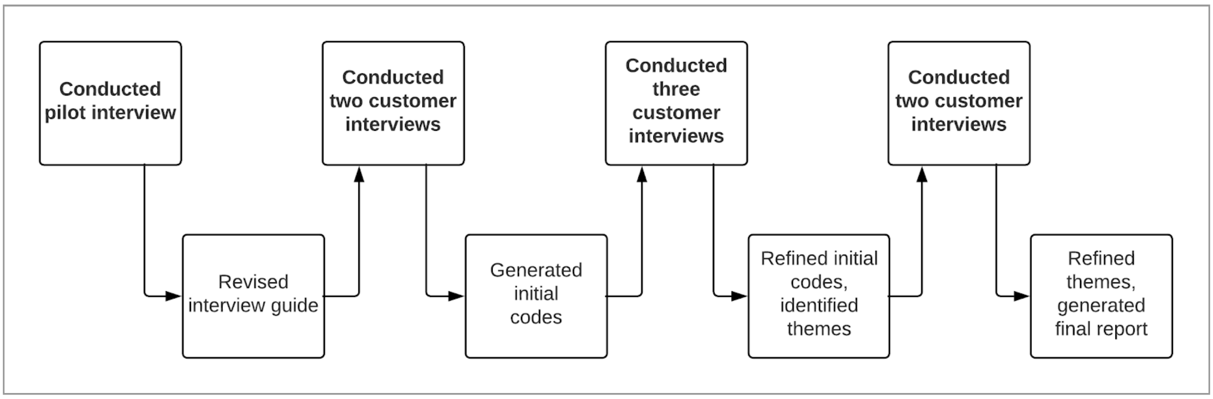

Conducted pilot interview
Revised interview guide
Conducted two customer interviews
Generated initial codes
Conducted three customer interviews
Refined initial codes, identified themes
Conducted two customer interviews
Refined themes, generated final report

Figure 3.2: Process for data collection and analysis for in-depth interviews with Snapper customers

A pilot interview was conducted to validate the interview format, during which follow-up questions were identified to further prompt the participants for insights into their attitudes to self-service in relation to other companies.

Interviews were 30–60 minutes in duration and were recorded for later transcription, which allowed for familiarisation with the data. Interviews were conducted face-to-face to build rapport with participants.

As above, findings were interpreted using an adaption of the six stages of thematic analysis (Braun & Clarke, 2006). Initial interview codes were noted in a mindmap during this thematic analysis, and this mindmap was iterated and refined following later interviews as clearer themes emerged.

3.5.3 Market analysis of self-service offerings across other essential industries

The purpose of this research phase was to validate demand for the proposed solution, exploring best practice in self-service technologies, and identifying ways in which other industries have successfully delivered better customer service outcomes through automation and self-service.

This phase began with a market analysis to understand best practice in customer service amongst not only public transport payments providers but also other essential industries. Market-leaders in customer service, and the extent to which they offer self-service abilities, were identified through both investigative research and open-ended questions during the in-depth customer interviews. This research phase utilised information shared publicly, as well as learnings shared with Snapper by other customer-centric companies using self-service technologies. This analysis sought to understand best practice in automated customer service, exploring the target market's attitudes toward these self-service technologies, along with any barriers to adoption.

3.6 Research challenges

One of the challenges faced during the research was recruitment for in-depth interviews, as key customer groups (such as facilitators, who manage multiple Snapper cards) had extremely low response rates to requests to participate in the research (see Table 3.3). However, after several iterations of contacting prospective participants, two facilitators were identified who were willing to participate.

Dependent customers (who only manage their own Snapper cards) were most likely to be available and willing to participate in the research, but access to a wider variety of Snapper customers and a larger sample size would provide more informed conclusions about Snapper customer attitudes towards self-service.

3.7 Conclusion

Building on Snapper's service-oriented framework and customer-centric approach, this research project seeks to better understand customer perceptions of their current support offering. Through qualitative research that builds on existing knowledge from Snapper's customer feedback channels, the project explores customer demand for self-service resolution of common support issues. Through the validation and development of an enhanced self-service offering, the project aims to deliver a better experience for Snapper customers.

4.0 Findings and analysis

4.1 Introduction

The project seeks to understand how automation and self-service can deliver a better user experience to Snapper customers who currently rely on traditional channels to resolve common support issues, and to assess the commercial potential of such a solution. This section outlines the analysis and key findings resulting from the data collected in the phases described above. The chapter includes analysis of the data collected in these phases and links key findings back to the research objectives (see Table 4.1).

To understand customer use and perceptions of Snapper's support channels, particularly traditional channels, secondary data was accessed from existing reports covering a wide range of customer service channels, as well as secondary data around Snapper's NPS (accessed through the Telnet call centre reporting portal and AskNicely automated NPS emails).

To understand barriers to self-service and how these can be addressed, in-depth interviews were conducted, which included exploration of customer perceptions of the proposed offering and attitudes towards automated customer service.

To understand customer perceptions of the proposed offering, and attitudes towards automated customer service, market analysis was conducted and industry insight was gained from discussion with leading companies within the New Zealand context. Detail around conducting a trial phase in order to further validate the proposed solution with Snapper customers is outlined in the business case (see Chapter 6.0).

Table 4.1: Key research findings by research objective

Research Objective	Key finding	Description
1. To understand customer use of Snapper's support channels	Snapper's customer service is ripe for automation	Common queries are informational and transactional Common queries are routine and repetitive
2. To understand customer perceptions of Snapper's support channels	Customers are highly motivated to self-serve	Customers expressed a preference for digital, self-service channels; over traditional support channels such as the call centre
	Customers are loyal to channels that work (and unforgiving of channels that do not)	Customers are quick to form opinions on channels and demonstrate channel "stickiness"
3. To identify barriers to the adoption of self-service	Social effort is a barrier to using a channel	Customers seek out self-service options to reduce social effort
	Cognitive effort is a barrier to using a channel	Customers do not want to research channel options, or ways of resolving issues. Customers want highly contextual support
	Logistical effort is a barrier to using a channel	Customers seek out channels accessible via mobile or online to reduce logistical effort
	Self-service for urgent issues	Customers want highly responsive support, particularly with urgent queries (queries impacting ability to travel, queries with financial impact)
3. Customer perceptions of automated customer service	Customers perceive automated service options as a way to to reduce effort	When avoiding social or logistical effort, customers favour digital and self-service options.
	In some scenarios, customers perceive avoiding automated service options as a way to reduce effort	When resolving urgent issues, or when dealing with uncertainty, customers reduce cognitive effort by relying on traditional channels (a "don't tell me how to fix it, fix it for me" approach).

4.2 Research findings

4.2.1 Research objective 1: To understand customer use of Snapper's support channels

To understand how customers use Snapper's support channels, and to better understand key drivers of Snapper customer service interactions, data was reviewed from across a wide range of customer service channels, including:

- Telnet reporting (the external call centre handling inbound calls and emails)
- Service Centre reporting (customer requests handled by i-SITEs)
- GoToAssist issues (escalations from the call centre and service centres to Snapper)
- AskNicely (email surveys prompting customers for an NPS rating and supporting comment)
- Apptentive (messenger service available via Snapper Mobile Android application)

Analysis of these channels sought to answer the following research sub-questions:

- What type of query or issue drives a Snapper customer to seek support?
- Do these query drivers vary across Snapper's support channels?
- Are these drivers predictable, or is there a wide variety of possible query drivers?
- Is there a self-service option for the most common query drivers?

What type of issue drives a Snapper customer to seek support?

Regular internal reporting at Snapper already monitors the key drivers of customer traffic to traditional support channels (call centre and in-person service centres) by reporting on the actions taken through Snapper's Customer Service Application (CSA). Discussions with Snapper's Customer Care team, along with an initial review of these monthly reports, indicated that actions were generally consistent from month to month, with some variation on concession expiry dates (a spike in concession enquiries during February and March). Data was then analysed for 12 months (January 2017 to December 2017) to identify the top issues across the board.

Data from 2017 (see Table 4.2) shows that the top three issues consistently driving customer service traffic are requests for refunds for bus overcharges, card replacements or balance transfers for lost or damaged Snapper cards, and applying or managing concessions (e.g. for discounted child fares).

Table 4.2: Top drivers of customer queries to Snapper's traditional support channels (2016–2017)

Telnet (external call centre)	**Service centres** (in-person support)
1. Requests for refunds / account credits (for bus overcharges)	1. Card replacements or balance transfer for lost/stolen/damaged/faulty Snapper cards
2. Card replacements or balance transfer for lost/stolen/damaged/faulty Snapper cards	2. Card replacements or balance transfer for native Snapper cards (an older card version that is no longer supported)
3. Concession (discount fares) - applying or managing concessions	3. Requests for refunds / account credits (for bus overcharges)

A limitation of the CSA Reporting is that this data only includes customer service activity that requires a refund to be applied to a card, and does not provide insight into other query types, such as requests for information.

More detailed data around query drivers was available via the Telnet Reporting Portal, so the Call Breakdown Report was reviewed for the same time period (January 2017 to December 2017). Although this report only reflects call centre activity, and not all customer service channels, this report gave insight into the volume of informational queries driving customer service traffic (see Table 4.3).

Table 4.3: Top drivers of customer queries to Snapper's call centre (Jan 2017–Dec 2017)

Call category	**Percentage of calls**
Block / unblock card	22.8%
Credit / refund request	16.6%
General query	32.7%
Hung up / wrong number / test call	15.4%
Other	6%
Account maintenance	3.8%
Technical issues	3%
TOTAL	100%

The Telnet data provided further insight into call drivers that might not necessarily require the customer care team to provide a refund. While the majority of queries related to a request to take an action against a Snapper card or Snapper account, 32.7% of calls were categorised as “General query”, meaning they could usually be resolved by providing the customer with information. Historically, Snapper’s focus had primarily been on delivering self-service options for transactional queries (requiring that an action or update be made to a Snapper card or account), rather than on encouraging customers to self-serve for informational queries.

Peppers (2013) argued that the standardisation appropriate for a customer service interaction is determined by the type of interaction. Morgan (2015) proposed a distinction between transactional and highly collaborative customer service interactions. Based on these categories and analysis of Snapper customer service interactions, the following interaction types were identified (see Table 4.4). A distinction was made between transactional queries (requiring information or actions to be taken relating to a specific Snapper card or account) and informational queries (relating to Snapper products or services in general). These categories are now used internally by Snapper customer service and marketing staff when describing customer service interactions.

Table 4.4: Types of customer service interactions with Snapper cardholders

Informational - inbound	Requests for information around Snapper products and services	e.g. How do I use Snapper? Where can I top up? Can I buy a card at the airport?
Informational - outbound	Initiated by Snapper - Cardholder comms, updates on known issues, product updates.	e.g. New feature coming soon!
Transactional	Requests for actions to be taken on a Snapper card	e.g. I want to hotlist my card and transfer my balance. I want a penalty refund.
Collaborative	High-value, unique interactions - feedback, relationship building, or technical support.	e.g. helping customers with low digital literacy, helping customers with urgent/critical requests, fringe cases

Are these query drivers predictable?

It was clear that across channels, a few key issues were responsible for the majority of customer queries. Reviewing i-SITE service centre traffic for a full year indicated that the majority of customer queries related to transactional queries from two key categories: balance transfers and bus refunds (see Table 4.5).

Table 4.5: Top drivers of customer queries to Snapper's service centres (Jan 2017–Dec 2017)

Query category	Percentage of queries
Block / unblock card, balance transfers	84%
Credit / refund request	10%
Other	6%
TOTAL	100%

Analysis of Telnet call and email activity for October to November 2017 showed the same key drivers for customer queries, alongside a general "Product Queries" category. This reinforced the predictable nature of Snapper's customer service traffic, showing consistency across the traditional service channels. Further investigation into the Product Queries category, which was responsible for 24% of call traffic, showed that Product Queries subcategories were duplicates of other categories, and many of these calls were being miscategorised. Updated reporting categories were provided to Telnet in November 2017 and the data around Product Queries prior to this point was excluded from analysis. Recoding the product query data did not alter the top drivers, as the calls categorised as product queries related to a wide variety of lower volume subcategories

Is there a self-service option for all top query drivers?

In order to understand why customers might be choosing traditional service channels such as calling or in-person support for these queries, Telnet call drivers were assessed against whether a self-service option exists for those query types (see Table 4.6). This highlighted an opportunity to significantly reduce customer service activity through these channels by offering a self-service alternative.

Subsequent to data gathering, a self-service option was developed for blocking and unblocking Snapper cards. However, requesting a refund and managing Snapper accounts still constitute a major pain point for customers who prefer self-service, as many of these issues cannot be resolved without interacting with customer service staff, meaning resolution is restricted to extended business hours and may not be real-time.

As shown in Table 4.6, the majority of calls to the call centre can be resolved through Snapper's self-service channels.

Table 4.6: Call drivers to call centre for October 2017

Call category	Percentage of calls	Does a self-service option exist?
Informational query (product queries, store locations, technical queries)	31%	Yes - most information available through snapper.co.nz
Block/unblock card	26%	Yes - via snapper.co.nz (although this feature was not yet available at the time of data gathering)
Credit request (bus overcharge queries)	17%	No
Other (transaction queries, balance queries, account maintenance, etc.)	36%	Yes - most queries can be answered through FAQs on snapper.co.nz, Snapper card balance can be viewed through all self-service channels

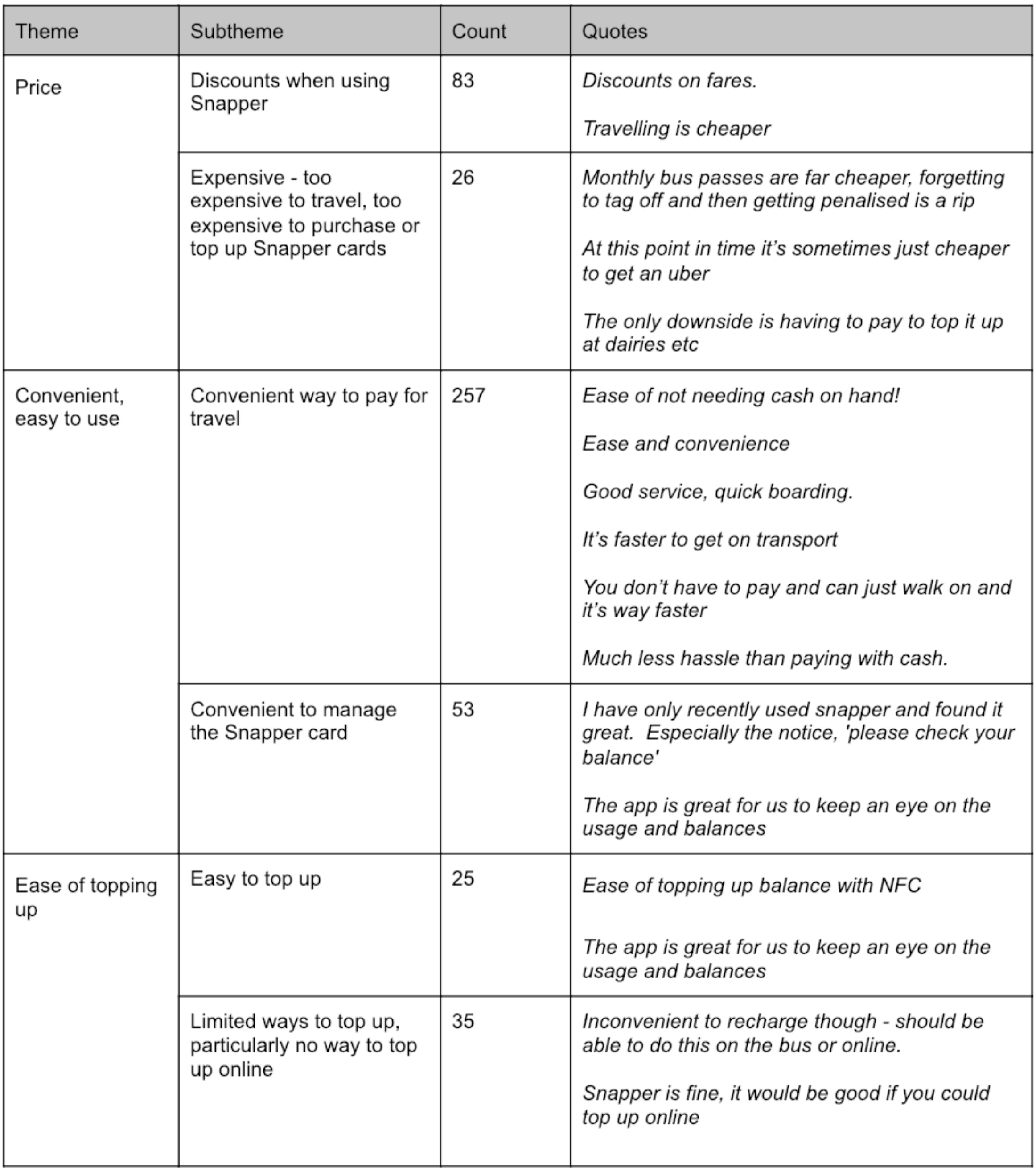
4.2.2 Research objective 2: To understand customer perceptions of Snapper's support channels

To understand customer perceptions of Snapper's customer service offering, thematic content analysis was conducted on the 498 AskNicely comments received in June 2017 (see Section 3.5.1.2). 300 customers selected randomly from Snapper's registered customer base are polled by AskNicely emails each business day, meaning these comments reflect feedback from a broad cross-section of Snapper users. To ensure the wider organisation has visibility of these voice of customer insights, AskNicely feedback is integrated within Snapper's internal messaging tool, and all staff members can view customer comments. Although AskNicely offers the ability to group and filter comments by keyword, Snapper operational staff do no further research on trends across these comments, although all feedback is reviewed by the customer service team and actioned as required.

While becoming familiar with the data, two keywords were identified, occurring in the vast majority of comments—'cheap' and 'easy'. These and other initial codes were assigned to the data, and further analysis was conducted to identify themes. As comments were grouped into these themes, sub-themes were identified, as described in Section 3.5.1.2.

While grouping these initial codes into themes, it became clear that customers were expressing the idea of ease or convenience in reference to two distinct activities: some customers described the process of actually paying for their travel, i.e. ‘tagging on’ to the bus as simple or easy, while others were describing the more general process of managing their Snapper card as easy—topping up, checking balances, dealing with issues, etc. After further revision, the following themes and sub-themes were identified (see Table 4.7).

Table 4.7: Themes from analysis of AskNicely customer feedback (June 2017)



Theme	Subtheme	Count	Quotes
Price	Discounts when using Snapper	83	*Discounts on fares.* *Travelling is cheaper*
	Expensive - too expensive to travel, too expensive to purchase or top up Snapper cards	26	*Monthly bus passes are far cheaper, forgetting to tag off and then getting penalised is a rip* *At this point in time it’s sometimes just cheaper to get an uber* *The only downside is having to pay to top it up at dairies etc*
Convenient, easy to use	Convenient way to pay for travel	257	*Ease of not needing cash on hand!* *Ease and convenience* *Good service, quick boarding.* *It’s faster to get on transport* *You don’t have to pay and can just walk on and it’s way faster* *Much less hassle than paying with cash.*
	Convenient to manage the Snapper card	53	*I have only recently used snapper and found it great. Especially the notice, 'please check your balance'* *The app is great for us to keep an eye on the usage and balances*
Ease of topping up	Easy to top up	25	*Ease of topping up balance with NFC* *The app is great for us to keep an eye on the usage and balances*
	Limited ways to top up, particularly no way to top up online	35	*Inconvenient to recharge though - should be able to do this on the bus or online.* *Snapper is fine, it would be good if you could top up online*

	Need a way to top up via iPhone	17	*I wish there is app for iPhone too, so I can top up easily from my phone.* *Easy, hassle free. Would love to be able to check my balance on iPhone*
Integrated ticketing	Snapper isn't available on all public transport	47	*Because it's simple and efficient. But it would be great if we could use it on the trains and ferries too* *Convenient and cheaper fares but can't use on trains* *It'd be great if snapper was used on all public transport in Wellington, I'd be more inclined to use trains if it were*
	Snapper integrates with parking, taxis, etc.	20	*Because it's user friendly for the public transport system and also in various shops in town.* *excellent way to travel. can use for parking etc.* *It can be used on transport services such as taxis and buses.* *Snapper remains an important component of using public transport, taxis, parking and other services in Wellington. It would be difficult to imagine life in Wellington without Snapper.*
Trustworthy / reliable system	Reliable service	34	*It makes life very easy, is reliable* *From what I have heard Snapper are good about correcting mistakes* *Good service when updated to new card* *i had no issues with snapper so far. Great work*
	Unreliable service, incorrect charges	31	*Sometimes there have been significant issues on being charged incorrectly* *It's s*** and useless. No refunds. F***ing thieves* *You rip people off*

These themes can be divided into two key groups: areas over which Snapper has control (the ease of use of the service, the reliability of the service), and areas controlled or influenced by others, particularly the regional council or public transport operators (price, which modes of transport Snapper is available on).

Snapper already ‘owns’ the idea of simplicity and ease-of-use, as a pillar of their internal design philosophy, a brief to all project teams, and an overarching goal of all Snapper customer experiences. In stark contrast to this, the customers expressing delight at the discounted price of their Snapper travel are doing so through no prompting by Snapper. To the contrary, ‘detractors’ commenting on price displayed a fundamental miscomprehension of Snapper’s business model, using strong wording such as *“robbers”, “I felt robbed”,* or *“predatory fee structure”.*

Analysis of these AskNicely comments made it very clear that ease-of-use and price are the two most powerful ‘drivers of delight’, and play a key role in whether a customer rates their Snapper experience positively or negatively. Snapper’s failure to engage with the idea of travel costs, price, or discounts is a stark contrast to the extent to which they have owned the simplicity and ease-of-use across their offerings, and presents an opportunity to better own this conversation.

The vast majority of comments relating to the amount of effort required to use, top up or manage a Snapper card were strongly positive, with customers describing the service as *“Easy, hassle free.“* and many comments comparing Snapper cards positively to the cash payment alternative: *“Much less hassle than paying with cash.”* Despite these positive perceptions of the Snapper service as a whole, AskNicely feedback showed wide variation in customer perceptions of Snapper’s customer service channels, with correlation to the support channels being used by the customers. While the negative or detractor comments did not identify any key issues with Snapper’s customer service channel that are not already in the company’s project pipeline to address, these findings do reinforce what Snapper already knows about their overshot vs undershot customers (Christensen, Baumann, Ruggles, & Sadtler, 2006), where users of the Snapper Mobile Android application have a superior customer experience compared to those relying on retailers or kiosks to load their Snapper card or check their balance. This was demonstrated by similar numbers of customer comments including positive feedback and negative feedback about the ease of topping up (25 and 35 comments respectively).

Furthermore, this feedback from AskNicely revealed low awareness of Snapper's current product and service offering. While the comments analysed were provided by customers in June 2017, a surprising amount of feedback provided related to services that Snapper no longer offers (e.g. the ability to pay with Snapper cards in convenience stores), or requested features that Snapper was already offering at the time (e.g. balance notifications on the bus). While Snapper is consistently working to improve the customer experience, this suggests that a “build it and they will come” approach to new features and a changing product set may not be having the desired cut-through with their customer base.

4.2.3 Research objective 3: To identify barriers to the adoption of self-service

Interpreting findings from in-depth interviews

Findings from the in-depth interviews conducted with Snapper customers were interpreted iteratively (see Figures 4.1 and 4.2). Mindmap software was used to visualise the research findings at each stage, helping to group initial codes into themes and subthemes.

Following the pilot interview and the first two interviews, these initial codes were identified:

- *Customers are creatures of habit* - unwilling to seek out new/better channels, unwilling to switch despite being aware of better channels
- *Convenience* - avoiding physical/mental effort, avoiding waiting/queueing
- *Financial gain/loss* - customers will seek support when a sufficient amount of Snapper credit is at stake
- *Trust* - customers are unlikely to monitor their Snapper card balance or transaction history unless given a reason to
- *Speed of resolution* - when ability to travel is impacted
- *Self-service preferred (for some users) / in-person support actively avoided*
- *Expectation of proactive and contextual communication from Snapper*

Subsequently, mindmap software was used to group these initial codes into themes and subthemes (see Figure 4.1).

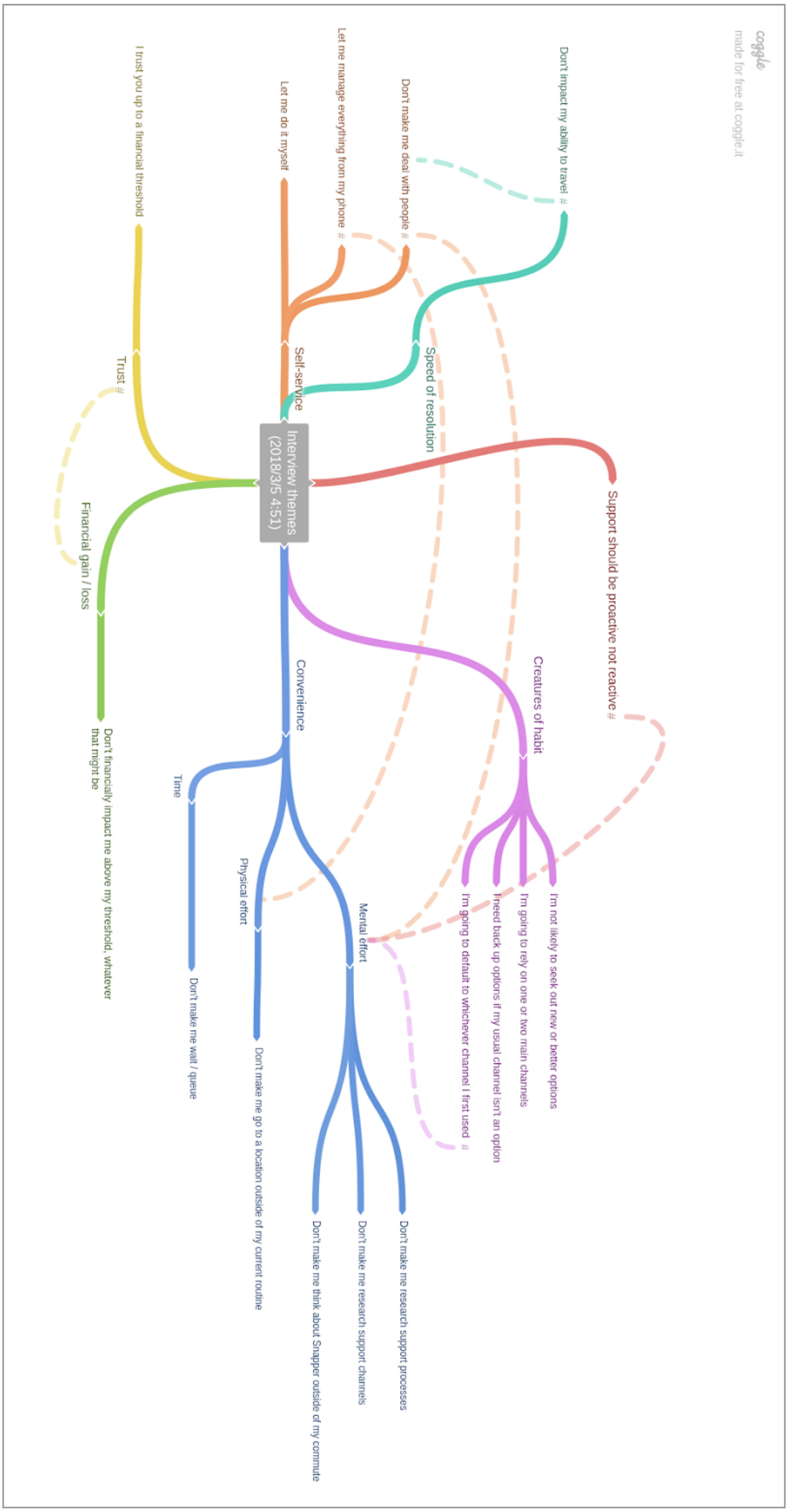

coggle
made for free at coggle.it
Interview themes
(2018/3/5 4:51)
Self-service
Let me do it myself
Let me manage everything from my phone #
Don't make me deal with people #
Speed of resolution
Don't impact my ability to travel #
Support should be proactive not reactive #
Creatures of habit
I'm not likely to seek out new or better options
I'm going to rely on one or two main channels
I need back up options if my usual channel isn't an option
I'm going to default to whichever channel I first used #
Convenience
Time
Don't make me wait / queue
Physical effort
Don't make me go to a location outside of my current routine
Mental effort
Don't make me research support processes
Don't make me research support channels
Don't make me think about Snapper outside of my commute
Trust #
I trust you up to a financial threshold
Financial gain / loss
Don't financially impact me above my threshold, whatever that might be

Figure 4.1 Initial mindmap of themes from in-depth interviews with Snapper cardholders

These preliminary findings reiterate the themes of *ease of use* and *convenience* identified in AskNicely comments, but provide further insight into the extent to which customers aim to reduce the effort associated with paying for travel, and the types of effort they seek to avoid.

Following a further three interviews, the same process was used to refine this visualisation of the themes and subthemes, reflecting any new codes identified in the subsequent interviews, and clarifying the relationships between these themes and subthemes (see Figure 4.2). Findings from these interviews provide a richer understanding of the ways customers avoid effort during the support process, and the factors that impact the amount of effort customers are willing to exert.

Analysis of these further interviews reinforced the idea of avoidance of effort, but provided greater clarity around the types of efforts customers seek to avoid. This suggests that how customers choose to engage with Snapper's customer service channels is best modelled as a low-involvement decision, where consumers seek to minimise effort by engaging in simple decision-making tactics (Hoyer, 1984). This refinement of the codes and the interrelationship between types of effort is shown in Figure 4.2.

Customers described an unwillingness to seek out new or better channels and an unwillingness to channel-switch, despite being aware of better channels. Customers demonstrated low awareness of Snapper's customer service channels and processes and were not interested in actively seeking more information about how best to resolve their issues. Customers relied heavily on previous experiences and were willing to settle for channels that had worked previously, with several participants explaining that they continued to use the call centre because they'd been able to resolve an issue through that channel previously.

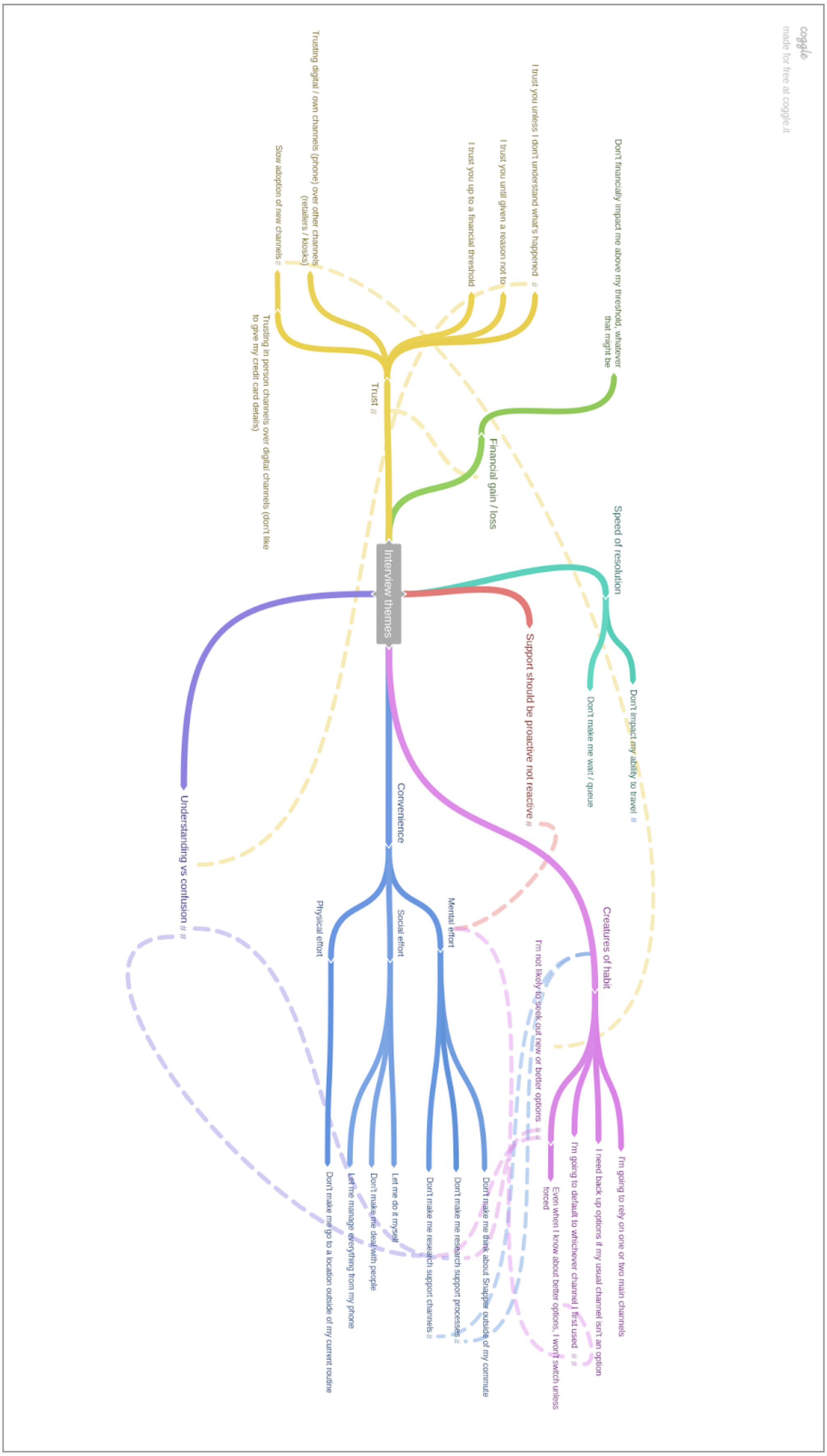

coggle
made for free at coggle.it
Interview themes
Trust #
I trust you unless I don't understand what's happened #
I trust you until given a reason not to
I trust you up to a financial threshold
Trusting digital / own channels (phone) over other channels (retailers / kiosks)
Slow adoption of new channels #
Trusting in person channels over digital channels (don't like to give my credit card details)
Financial gain / loss
Don't financially impact me above my threshold, whatever that might be
Speed of resolution
Don't impact my ability to travel #
Don't make me wait / queue
Support should be proactive not reactive #
Creatures of habit
I'm not likely to seek out new or better options # #
I'm going to rely on one or two main channels
I need back up options if my usual channel isn't an option
I'm going to default to whichever channel I first used # #
Even when I know about better options, I won't switch unless forced
Convenience
Physical effort
Social effort
Mental effort
Don't make me go to a location outside of my current routine
Let me manage everything from my phone
Don't make me deal with people
Let me do it myself
Don't make me research support channels #
Don't make me research support processes #
Don't make me think about Snapper outside of my commute
Understanding vs confusion # #

Figure 4.2: Revised mindmap of themes from in-depth interviews with Snapper cardholders

All research participants indicated a desire to reduce the effort associated with resolving Snapper card issues. While historically Snapper has focussed on reducing the *time* and *logistical effort* required to access support channels, it was interesting to note that research participants spoke most often about reducing the mental or *cognitive effort* associated with accessing support channels, such as the effort required to manage a Snapper card outside of the context of their commute, or the effort of researching support channels and processes.

At this point, it became clearer that some of the early codes identified were antecedent factors that impacted customers' willingness to engage with customer service channels, both self-service channels and traditional channels. The amount of effort customers are willing to exert when engaging with traditional channels (e.g. being on hold with a call centre, or navigating their way through the call centre's IVR system) was influenced by whether something was impacting their ability to travel, and by whether they had been financially penalised over a certain threshold. A customer's willingness to use self-service channels was determined by whether they had used the channel before, and by their self-described technical literacy.

Following the final interviews, the transcripts were once again analysed to identify codes, and the mindmap of themes and subthemes was revised. Counts and illustrative quotes were then identified for the key themes. At this point, it was clear that what had originally been labelled as "trust" could be better described as apathy. The hands-off approach most customers took to their Snapper cards appeared to be motivated by an attempt to minimise effort, rather than by a conviction that the Snapper system would get it right.

The overarching theme reiterated throughout customer interviews was the avoidance of effort (see Section 2.6), with customers consistently evaluating ease of use (see Section 2.4). Further supporting the findings from AskNicely, this avoidance of effort helps to explain how customers interact (or choose not to interact) with Snapper. This was categorised into social, cognitive and logistical effort (see Table 4.8), providing further insight into the "Perceived Ease of Use" described by Davis et al. (1989) in the Technology Acceptance Model (TAM).

Social effort refers to the human interactions involved in accessing Snapper support, including retailers, call centre staff and in-person support staff. Cognitive effort includes the mental exertion required when identifying how to resolve a Snapper issue, or when choosing a Snapper support channel. Logistical effort related to extrinsic factors, such as the time or distance required to access a support channel.

Avoiding social effort

Avoiding human interaction

Customers expressed reluctance to interact with Snapper customer service staff, particularly in the context of topping up or transferring a balance via Snapper retailers. This avoidance of human interaction was given as a reason for preferring kiosks over Snapper retailers. *“I liked the kiosk because I didn't have to talk to anybody. Not that I mind talking to people, but I didn't have to gauge whether or not someone's in a good mood.”*

In addition to a general unwillingness to interact with staff, participants described feelings of guilt, that they were inconveniencing Snapper retailers when topping up, expressing a fear that Snapper retailers would be resentful and/or enforce another purchase. *“Why would I bother walking into a dairy to top and they make me feel like I have to buy a 99 cent pack of gum, then top up thirty dollars.”*

It was unclear how this perception was formed, with participants saying it was not based on any particular interaction. *“It’s just a general vibe, but now I just don't care at all. I do it anyway, but I feel kind of bad like I should buy something, but, now I don't, I don't know. I don't feel like the margins on my Snapper would be that high, I don't know how that works. They just don't seem very happy when you don't buy anything.”*

One participant held this perception and expressed a preference for kiosks, despite only being able to describe positive interactions with retailers. “*It's actually better than I expected ...they didn't come across like annoyed or anything...they were actually quite receptive and helpful.”*

Avoiding explanations

More specifically, customers found the process of identifying and explaining issues to service staff burdensome. Follow-up questions from service staff were negatively perceived. *“Currently I use email to solve any issues that come up because I found that using the telephone was too difficult...If you're trying to explain it over the phone they're challenging you as you go and they don't listen to the whole story.”*

Participants identified the call centre and in-person support channels as involving this explanatory effort. *“The problem with the telephone was that...you had to explain the problem to someone. After you explain the problem to someone they would challenge you on the validity of the problem.”*

This explanatory effort was compounded at in-person support channels where the staff are not dedicated Snapper support, so the customer needs to communicate that they require help with a Snapper card. *“The kiosk is way better. Because you used to have to go to the library to get the credits and you used to have to explain what you were there for...it was very difficult.”*

Interacting with service staff through the call centre or service sites was described by some participants as being challenging compared to self-service options. Customers demonstrating avoidance of social effort showed a greater willingness to use self-service options.

Avoiding cognitive effort

Avoiding cognitive effort when evaluating channels

Participants described an unwillingness to research or explore support channels and processes, relying instead on established routines. To avoid cognitive effort, customers were unlikely to evaluate the different support channels available; instead, heading to Google or directly to the website and reaching out through the first support channel they found: *"I probably just Googled Snapper and called".* Another participant described similar behaviour, *"If there's a form there then I'll use it. If I have to go looking through pages and pages of cr*p, then I'll get a phone number and ring them, because I just can't be bothered going through so much cr*p, and trying to find the stuff that I need."*

An internet search for the Snapper website was considered the quickest way to identify a support channel, with the least cognitive effort. Even participants who were primarily Snapper Mobile users headed to the web when trying to resolve an issue, rather than reaching out through their preferred top-up channel, with one participant saying *"I'm not sure if there's a tab on the app for help, I've never used it if there is one. Maybe it's not clear."*

Avoiding cognitive effort through channel loyalty

If a support channel resulted in the issue being resolved, participants described strong loyalty to that channel. *"I used it once, and then I got such a good response, that I was like, 'Why would I ever do anything again?' I was like, 'Well, that was so easy, I'll just do it again.'"*

In some cases, this customer loyalty is perhaps better described as apathy, where customers demonstrated channel 'stickiness' without having considered alternatives, and without any compelling reason, other than that the first channel they attempted resulted in a satisfactory resolution. Customers clearly demonstrated low-involvement decision-making behaviours (Hoyer, 1984) when selecting customer service channels. *"I could've emailed, that would've been fine...I could've done that online, that would also be fine."*

Some participants explained their reluctance to switch channels from a channel delivering a passable resolution as resulting from a lack of confidence that other channels would deliver the same experience. *“Customer service channels, you might offer five different channels. They should all provide me with the same result or the same outcome or the same level of service...Some companies it's like, "Okay, I've rung them, got no response. Emailed, nothing. I'll tweet it, and someone responds straight away. It's like, ‘Okay, why can't I get that response when I rang you up?’”*

These research findings help to explain why customers continue to use traditional support channels, even when Snapper offers a self-service alternative that’s more convenient and easier to access or use. The in-depth interviews made it clear that Snapper customers are seeking to avoid effort, not just in the way they manage their Snapper card, but in the process of identifying and selecting the channels by which they manage their Snapper card. Snapper’s “build it and they will come” approach to self-service is unlikely to be helping the maximum number of customers benefit from the tools and channels they have developed.

Avoiding cognitive effort when finding out how to resolve an issue

Some participants demonstrated a similar avoidance of cognitive effort when it came to researching support processes. Customers showed two different ways of avoiding cognitive effort when understanding support processes. In some cases, this manifested as participants being unlikely to reach out to Snapper to resolve an issue at all: *“I think I did have it registered but I thought it would be quite cumbersome to try and get the funds off the registered one...I don't think I had a lot of money on it anyway. I don't know whether they did replacements or how that worked so I just got a new one because I was in a hurry.”*

Other participants avoided cognitive effort by reaching out to in-person support, rather than trying to resolve the issue themselves through Snapper’s self-service channels, transferring the effort to a Snapper staff member, rather than avoiding it altogether. This was more common when participants weren’t confident in the process, indicating that customer willingness to self-serve is negatively impacted if they are not confident in the process. *“I just phone, because people can explain it to you, and it’s much safer than trying to research...but it depends how easy, if it’s really easy on my end, I’ll do it online.”*

These customers expressed a desire for the staff member to share responsibility for the outcome, and were not calling for assistance in order to self-serve, but rather for the staff member to perform the task on their behalf. *“It's not priority enough to sort it out or work out who to talk to about that.”*

These findings indicate that customers’ lack of knowledge about support channels is a barrier to seeking support, and their lack of knowledge about support processes is a barrier to both seeking support and choosing to use self-service channels. If customers are not sure how an issue can be resolved, they are less likely to attempt self-service. Furthermore, earlier findings indicate that once a customer has had an issue resolved via a traditional support channel, they are unlikely to channel-switch, in order to avoid the cognitive effort of evaluating channel options.

Avoiding cognitive effort by ‘trusting’ the Snapper system

Avoidance of cognitive effort was also demonstrated by participants describing hands-off behaviour when managing their Snapper card balances. When asked, all participants said they did not actively monitor charges to their Snapper card. With the exception of facilitators (e.g. customers who manage their children’s Snapper cards), participants did not proactively check their card balance, instead relying on the balance displayed on the bus validator or estimating their balance based on the number of “Please check your balance” warnings they’d received on the bus. *“With me, I would probably say, in my head I know I've got two more rides, because it's ten bucks, I think, is the cutoff. Then I'm like two more rides and I'll be done.”*

These participants went further than avoiding self-service, and described choosing not to engage with Snapper customer service at all, in order to avoid the cognitive effort of finding out how to resolve an issue. While this theme was initially described as “trust”, in later interviews it became clear that this hands-off approach to their Snapper cards was motivated by an attempt to reduce cognitive effort, rather than by a conviction that the Snapper system would get it right. *“I wouldn't have a clue how much it costs, so I just wave it in front of the machine and carry on, so yeah. I've got no idea how much. Is it like three dollars to get into town, or something. Is that how much it costs?”*

Rather than seeking out Snapper customer support, whether through self-service or traditional channels, these customers were more likely to rely on the contextual help offered by the Snapper system - support that appears in the context it’s needed. These customers expressed no desire to actively monitor their balance through Snapper’s web or mobile applications or traditional support channels. Instead, they relied on the visual or audio notifications on the bus in order to know when their Snapper card balance was running low. “*Until I get that reminder, I'm like Pavlov's dog. Until I get a reminder, I'm like, "Ha ha, sweet,"...I don't even really think about it. It's so instinctual just to get on and swipe it.”*

These findings indicate that customers prefer support to be available in the context of trying to achieve a task. Customers want the support to come to them, rather than having to seek out or evaluate support options, e.g. rather than being expected to actively check their Snapper card balance or monitor their transaction history, customers want to be told their balance when they are traveling.

Avoiding logistical effort

Avoiding logistical effort by managing Snapper card(s) en route

Interview participants identified both location and time as logistical considerations when evaluating support options, but location appeared to be of greater concern. *“Location is important because it's convenient, time is not always important but sometimes it is. So location is more important most of the time.”*

Customers were extremely eager to avoid going out of their way to manage their Snapper card. While location was specifically mentioned by several participants, it’s worth noting that these customers mentioned proximity to their bus commute, indicating an unwillingness to think about Snapper outside of the context of travel, demonstrating an avoidance of both cognitive and logistical effort: *“Basically I just am a creature of habit, so I go just about to the same place every time, because it's really close.”*

Most participants described relying on the visual and audio alerts on the bus readers, allowing them to monitor their balance as part of their commute, rather than going out of their way to access Snapper's other channels which provide a card balance and transaction history. Customers who had access to Snapper's Android application viewed this more favourable than topping up via a self-service kiosk, and highlighted the convenience of being able to top up in the context of their commute. *"It's really easy. You can do it mid-trip. You can do it on the bus. If it's told me it's low, then I'll top up."*

Avoiding logistical effort by managing Snapper card(s) online

Most participants described a preference for managing their Snapper cards and accounts for other essential services online. *"Online is just easier".* Several interviewees specifically emphasised mobile as their preferred channel, stating *"I do just about everything on my phone"* and *"Ideally, you'd just have an app, wouldn't you?"*

Interview participants were more likely to identify mobile rather than web as their preferred channel. This was true for both Android users (active users of Snapper's mobile app at the time of interviews) and iPhone users (who did not yet have a Snapper app available at the time of interviews. *"Just an app really is all I want. No, seriously. That's all I want."*

Two participants went further, describing a desire to use their phone to tag on and off the bus, rather than having to manage a physical card. This strong preference for a mobile-based channel reinforces that being able to manage their Snapper cards contextually and on-the-go requires the least cognitive and logistical effort from Snapper customers.

When it’s urgent - high involvement support issues

Although participants described avoidance of effort in relation to most aspects of managing their Snapper cards and resolving any associated issues, several themes emerged that had a clear relationship with the amount of effort customers were willing to exert in order to resolve an issue. While interviewees demonstrated a general apathy around identifying optimal support channels, consistent with low-involvement decision-making, antecedent factors were identified that were likely to motivate customers to reach out to Snapper support and deviate from their preferred channels and self-described hands-off approach, e.g. by using the call centre, or by reaching out over multiple channels until the issue was resolved.

As above, if the participant lacked confidence (in themselves, in the support staff, or in the support channels and processes), they were even more likely to exert greater effort when seeking to resolve these urgent issues.

Urgency because a customer’s ability to travel is impacted

Customers considered support issues impacting their ability to travel to be the most urgent or time-sensitive, and these issues were most likely to result in the customer initiating a real-time interaction with customer service staff, by calling the call centre or visiting a service site. Even participants who had previously described an aversion to engaging with the call centre and a preference for online or digital support channels immediately identified the call centre as their first port of call for urgent issues. *“If it was really urgent...I’m not certain if people would understand the gravity of it, if I’m not talking to them.”*

Recurring issues

Another factor likely to motivate participants to engage with support channels was the frequency of the issue in question. Customers who had been overcharged on the bus (e.g. due to driver error when configuring the Snapper equipment) described reaching out after noticing the issue multiple times. *"I did remember, by memory this had happened before."* While all participants identified that they had been impacted by this issue, only one participant described getting in touch the first time the issue occurred.

Similarly, although interview participants described being willing to purchase a new card if their Snapper card was faulty, rather than seeking a free replacement, they were more likely to reach out to customer support if the issue recurred. "*I've actually had that happen twice with two cards, I only went back and got one of them redone."*

Issues with financial impact

Participants also described a willingness to exert greater effort when an issue was financially impacting them. Although customers were willing to ignore issues with minimal financial impact rather than exert effort to get the issue resolved, this was only true up to a threshold. *"I thought it would be quite cumbersome to try and get the funds off the registered one….I don't think I had a lot of money on it anyway."*

Several interviewees indicated a financial threshold that would spur action to resolve issues resulting in a cost of more than a few dollars. *"If it comes up as fourteen, fifteen dollars, then I would be concerned."*

This financial threshold appeared to be calculated cumulatively, reinforcing the idea that a financial loss of a dollar or two might not spur the customer to seek support the first time it occurred, but repetition of the same issue would drive them to seek customer support. *"I thought twenty dollars is too much to spend now. I didn't do anything [the first time this happened] because I didn't know what to do and I thought for the ten dollars and the balance I had left on it, it probably wasn't worth it."*

Channel responsiveness

Participants who described a lower threshold for financial impact were more likely to reach out through traditional support channels, and indicated a greater sense of urgency when trying to resolve these issues. Although avoidance of effort was strongly shown, this was at odds with the behaviour customers described, where they chose to call or email Snapper rather than using self-service. *"I do prefer phone because the feedback loop's shorter."* Several interview participants made it clear that while the call centre was not their preferred channel, it was the one they were most likely to use due to perceived responsiveness. *"I prefer to get stuff solved instantly, so calling is easier."*

When explaining why they chose a particular support channel over another, in reference to Snapper or other companies, research participants identified perceived responsiveness as a key evaluating factor. A lack of responsiveness was enough for participants to discontinue using a channel: *"I guess over email, they can just ignore you, so I'd call."*

Conversely, a quick response over a channel resulted in strong loyalty to that channel, with customers unlikely to evaluate other options. Two research participants identified Twitter as having quicker response times than other channels, and explained that this was why they used Twitter to engage with Snapper and other companies, rather than other digital channels or the call centre. If customers had a single issue resolved over Twitter, they expressed an intention to continue using that channel on an ongoing basis.

The importance of perceived responsiveness helps to explain the seeming contradiction of customers describing themselves as preferring digital or self-service channels, accessible from their mobile, while also describing the call centre as their default channel for resolving issues they've experienced in the past. *"Depending on the urgency of my inquiry, it would either be a phone call or an email. If it was something I needed to know immediately, I might've got on the phone."*

Research participants expressed frustration at the variation in responsiveness across companies' multi-channel offerings, and the lack of clarity over the best channel to resolve a particular issue. *"You might offer five different channels. They should all provide me with the same result or the same outcome or the same level of service. Some companies it's like, 'Okay, I've rung them, got no response. Emailed, nothing. I'll tweet it, and someone responds straight away.' It's like 'Okay, why can't I get that response when I ring you up?'...at the end of the day, you guys should be managing those things consistently."* Customers seemed to value consistency of experience over having a range of channels on offer, with one participant saying *"if you want people to go to a certain place, just point them in that direction and say 'that's where you go.'"*

When considering chat-based support channels they might have tried in the past, participants either described them as highly responsive, or extremely unresponsive (when the chatbot failed to understand their query and provided no helpful information). *"Because I'm a creature of habit, I'd ring the 0800 number. I have done web chat and it can be clanky or it can be like you're talking to a machine...for the minute, it [the customer's preferred channel] would be the stupid phone, I'm afraid."*

Even tech-savvy customers expressed skepticism around automated web chat, and a reluctance to engage with virtual agents. *"Not unless the technology gets a lot better. They tend to just put you through to the wrong place. Unless you're going for some vanilla option that they provide, you don't get anywhere. So I'm very skeptical of that working well."*

Reinforcing the idea of channel loyalty as a way of reducing the effort associated with seeking support, a single interaction with a channel appeared to be sufficient for participants to form an opinion about the responsiveness of that channel, and therefore whether they would use that channel again. *"Eventually I'll just go online, but they're not always good at getting back to you quickly."*

Table 4.8: Themes and subthemes identified in in-depth interviews with Snapper cardholders

Theme	Subtheme	Count	Quotes
Avoiding social effort	Avoiding human interaction	13	*I liked the kiosk because I didn't have to talk to anybody. Not that I mind talking to people, but I didn't have to gauge whether or not someone's in a good mood.* *I try and avoid the dairies.* *I hate talking on the phone.*
	Avoiding explanations	6	*Currently I use an email to solve any issues that come up because I found that using the telephone was too difficult...If you're trying to explain it over the phone they're challenging you as you go and they don't listen to the whole story.*
Avoiding cognitive effort	Avoiding cognitive effort when evaluating channels	15	*I haven't used that [the Android app] yet because I haven't needed to, so I haven't really explored that, so I don't know enough about the Android app yet to use it.* *The weird thing is I do just about everything on my phone, and I don't even know if you can top them up using your phone.*
	Avoiding cognitive effort through channel loyalty	6	*I used it once, and then I got such a good response, that I was like, 'Why would I ever do anything again?' I was like, 'Well, that was so easy, I'll just do it again.'*
	Avoiding cognitive effort when finding out how to resolve an issue	16	*It's not priority enough to sort it out or work out who to talk to about that.* *I don't know what the outcomes are if you ask for help, I don't know that they actually send you one [a Snapper card].*
	Avoiding cognitive effort by trusting the Snapper system	18	*Until I get that reminder, I'm like Pavlov's dog. Until I get a reminder, I'm like, "Ha ha, sweet,"...I don't even really think about it. It's so instinctual just to get on and swipe it.* *I wouldn't have a clue how much it costs, so I just wave it in front of the machine and carry on, so yeah. I've got no idea how much.*
Avoiding logistical effort	Avoiding logistical effort by managing Snapper card(s) en route	8	*I've used the kiosk as well because it was convenient, because it's now convenient because it's right there. There's one just across the road now.* *Basically I just am a creature of habit, so I go just about to the same place every time, because it's really close.*
	Avoiding logistical effort by managing Snapper card(s) online	19	*I'd love to be able to just top it up on my phone.* *I'd just rather it was on my phone.* *The app is my primary source for Snapper.* *No, just an app really is all I want. No, seriously. That's all I want.*

These findings clearly demonstrate the importance of “ease of use” identified in the Technology Acceptance Model (TAM) (Davis et al., 1989), providing richer insights into the types of effort that determine whether a self-service technology is perceived as easy or difficult to use. This more detailed model addresses earlier criticisms of the TAM, where it has been suggested that the model lacks practical implications for the implementation of self-service technologies. The existing TAM has been critiqued as “highly abstract and conceptual” and offering “limited opportunities to generate practical ideas that can assist...in designing easily adoptable SSTs.” (Oh et al., 2016). In contrast to this, the proposed extension to TAM provides more prescriptive guidance for the design of an SST (see Figure 4.3.

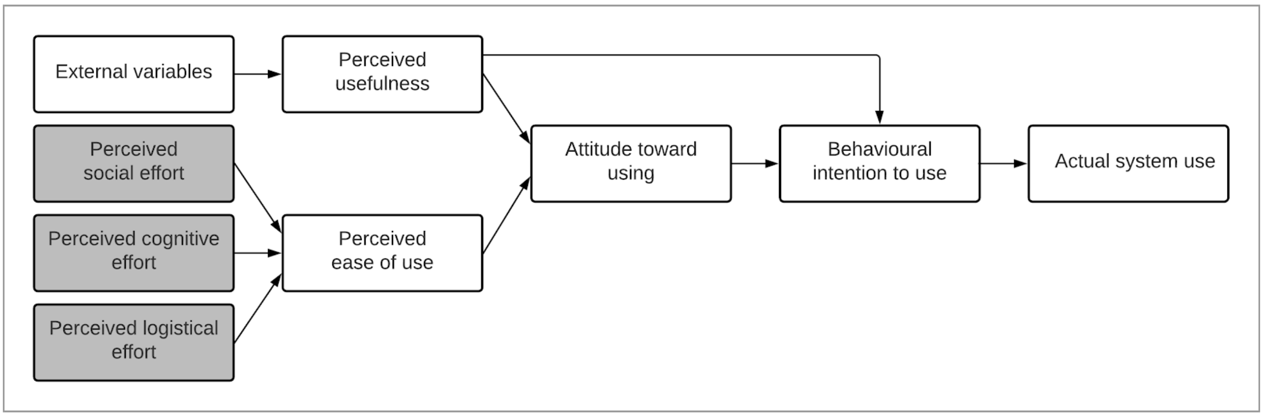

External variables
Perceived usefulness
Perceived social effort
Perceived cognitive effort
Perceived logistical effort
Perceived ease of use
Attitude toward using
Behavioural intention to use
Actual system use

Figure 4.3: Proposed extension to Technology Acceptance Model

These research findings provide further context around the determinants of “perceived ease of use”. By recognising the cognitive, social and logistical aspects of “ease of use” in shaping positive perceptions of self-service technologies, there are clear managerial implications for the design and implementation of an enhanced self-service offering (see Chapter 6.0).

4.2.4 Research objective 4: To understand customer attitudes to automated customer service

In order to understand perceptions of the proposed offering, and attitudes towards automated customer service, a market analysis was conducted. This analysis explored the uptake of chatbot technology in the New Zealand context; looking at how receptive New Zealand consumers (and businesses) have been to this technology, as well as the industries or use cases where this technology has been most rapidly accepted. This included a competitor analysis of companies from other essential industries, incorporating information shared with Snapper by other customer-centric companies using self-service technologies.

Adoption of chatbot technology

Market research demonstrated that conversational AI is moving at an extremely rapid pace, both in terms of the technology available, and the adoption of this technology by businesses and consumers. This technology is beginning to see widespread adoption across essential service industries, including public transport providers. In the words of Transport for NSW Deputy Secretary, Customer Services, Tony Braxton-Smith, “We recognise that the information landscape is shifting towards voice services, which is why we have been so quick to adopt and innovate in this space...In NSW, we know transport is no longer just about building infrastructure and running services, but embracing new technology to provide the best services for our customers. RITA began as an interactive Chatbot on Facebook Messenger. Now RITA has evolved to become an essential component of digital assistant products like Alexa.” (Railway Technology, 2018). Prefer, a Wellington-based AI consultancy, describes the rapid increase in AI capability as increasing the attractiveness of this technology to customer service managers (Prefer, 2018).

Discussions between Snapper staff and technology consultancy Theta provided insight into the adoption rates of chatbots in the New Zealand context, highlighting the rapid increase in business demand over the last 18 months. “It took some time for the New Zealand market to pick up bots. Since late 2017, it’s all about bots...businesses are far more open to this technology.” (S. Baliti, personal communication, October 2018). Martijn Verhoeven, CEO of Prefer corroborated this, describing high levels of interest in chatbot technology, to meet growing consumer demand for highly responsive service (M. Verhoeven, personal communication, November 2018).

Business cases for chatbot technology

Despite the growing interest in chatbots, some businesses experience difficulty developing a business case for this technology, as chatbots are designed to address an “indirect, rather than a direct, pain point” (M. Verhoeven, personal communication, November 2018); namely, businesses struggling to meet consumer demand for highly responsive service, via traditional service channels that do not scale without additional cost and resource (such as call centres).

Customer service has been widely identified as the primary use case for early adopters of chatbot technology. “The most popular use case is call centres or similar. For customer service, the return on investment is really easy to prove.” (S. Baliti, personal communication, October 2018). This use case was recognised by Dave Lynch, CIO for the Bus Division at First Group PLC, when he reflected on innovation within the public transport space, saying, “Another area where I see great utilisation is the use of ‘bots’, particularly for customer service. With the growing proliferation of voice-activated products, bots will have a key role in providing answers and services to our customers quickly and naturally. The ability to check when your next bus is, buy your regular ticket again and have it appear in your mobile app by interacting with Alexa or Siri, will make customers’ lives easier.” (Lynch, 21 September, 2018).

Theta described early adopters of this technology as seeking, not to replace their customer service teams, but to free up valuable CSR resource to handle more complex queries. “The majority of customer service questions are repetitive and simple. Our experience is that a chatbot can handle 80% of questions.” (S. Baliti, personal communication, October 2018). In this way, chatbots are seen as a complement to people, able to handle routine tasks and first level problem resolutions, or augmenting human conversations by helping with initial triaging. In the words of Westpac’s director of omni-channel transformation, Daniel Bergan, "Bots have a very important role to play in the future of customer service as they are an efficient way to deliver a consistent outcome for repetitive tasks" (Smith, 2017).

This approach moves beyond cost-cutting, to equip businesses with “a pool of talent they can deploy to focus on things that were previously getting less attention” (Prefer, 2018). Fiona Smith, Trustpower’s General Manager for customer operations, echoed this mindset, saying “Staffed channels focus on the moments that matter, the complex and the emotional” (Evans, 2018).

Implementation of chatbot technology

When describing how businesses have successfully implemented chatbot technology, Theta identified the ability to iterate rapidly as a critical success factor, rather than investing significant time or resources up front. To ensure minimal resource investment up-front, Theta offers a whitelabel product, their “FAQ Bot” (www.faqbot.nz), which allows businesses to quickly implement a chatbot answering informational queries for their customers. The Theta FAQ Bot uses Microsoft cognitive services to understand intent, and match the domain question with a question in the knowledge base, managed by the business’s internal staff. The FAQ Bot is currently used by 12 businesses, ranging from small retail stores to large international technology companies. It offers multi-language support, comprehensive insights and analytics, and can be further enhanced with more complex integrations, allowing customers to self-serve for both informational and transactional queries. In contrast to the simplistic FAQ Bot, Prefer offers open-source products such as Zwerm.io, allowing companies to quickly implement and manage chatbots with much more technical flexibility, utilising a range of natural language processors and front-end implementations as required. In addition to these local offerings, a wide range of chatbot platforms are available in an increasingly saturated market, to facilitate a rapid implementation of conversational AI (Phillips, 2018). These offerings range from simplistic decision-tree logic, to more complex implementations involving one or more natural language processors.

When exploring the recommended process for developing a chatbot and the associated knowledge base, a common recommendation was that the business “soft launch” the bot, and enhance the knowledge base based on real customer interactions, rather than seeking to develop a comprehensive knowledge base prior to launching. “It’s a misconception that you need lots of data prior to development - the bulk of the issues over any channel will be identified in the first few weeks. It’s no different to training a new staff member.” (M. Verhoeven, personal communication, November 2018).

To support this iterative learning, chatbots are commonly rolled out as a beta or trial offering, prior to launching a more fully fledged offering. This approach was demonstrated by Air New Zealand's roll out of Oscar Bravo, with Air New Zealand Chief Digital Officer Avi Golan describing the beta as “a new approach for us, getting Oscar out fast and in the early-development stages so that we can build and co-create with our customers. Given Oscar learns natural language it makes sense he learns directly from our customers the types of information they want to know and the language they use, rather than airline jargon.” (Air New Zealand, 2017a).

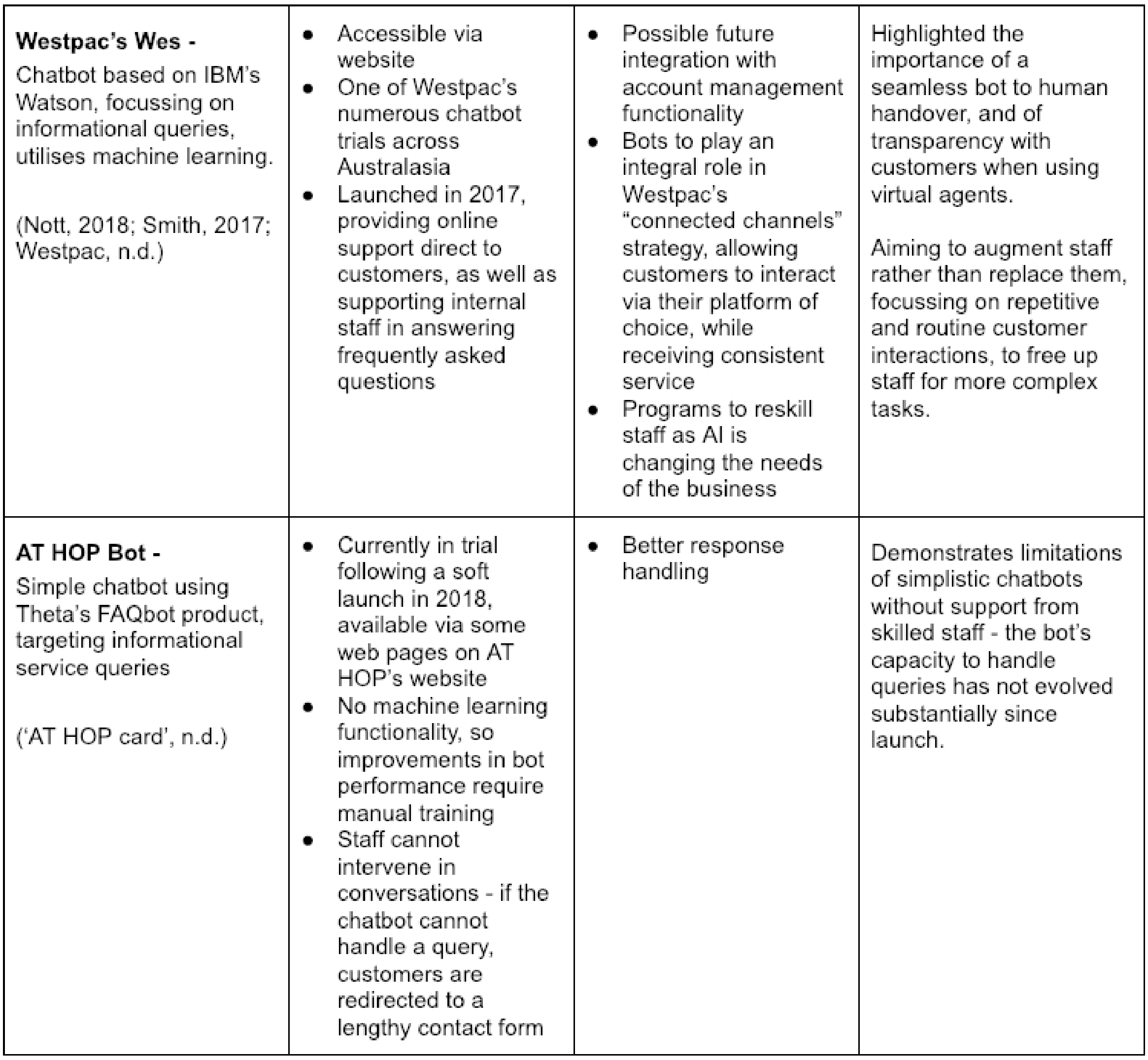
Aligning with findings from the in-depth interviews, assessment of successful chatbot implementations reinforced the importance of having clear escalation paths within self-service channels. Leading chatbot platforms ensure that customers are able to reach human support when required. Chatbots may prompt the customer to reach out to customer service representatives (CSRs), if the bot cannot satisfactorily answer a question. CSRs are able to supervise chatbot conversations, particularly during trial or training phases, allowing them to take over the conversation if required. More advanced platforms such as Zwerm.io conduct sentiment analysis on the customer's responses, alerting CSRs if the customer is demonstrating dissatisfaction with the interaction, so a live agent can intervene.

Comparison to industry

To explore successful chatbot implementations in the New Zealand market, a number of case studies were identified. Although these organisations are not direct competitors to Snapper, the competitor analysis focussed on essential service providers with a significant customer service component to their service offering (see Table 4.9).

Table 4.9: Competitor analysis of conversational AI products in New Zealand market

Product (Source)	Implementation	Future roadmap	Insights
Air New Zealand's Bravo Oscar Tango - chatbot targeting informational service queries and utilising machine learning to learn based on customer interactions. (Air New Zealand, 2017a, 2017b, 2018)	• Launched in February 2017 as a beta product in the New Zealand market, and was introduced to Australian market 9 months later • Within a year from launch, went from answering 7% of queries successfully, to handling 75% of queries across more than 380 topics. • Accessible via web and mobile application • Integrated with in-home digital assistants (Google Home and Amazon Alexa)	• Planned integration with booking system to further facilitate self-service • Planned integration with other chat platforms	Importance of early feedback and an iterative approach to allow for co-creation with customers.
Trustpower - Web bots targeting functional service queries, e.g. account enquiries and actions. Encompasses both informational and functional queries, through embedded forms to reduce channel-switching. (Evans, 2018; Trustpower Ltd., 6 April, 2017, 2018)	• Planned integration with other chat platforms • By 2018, over 45% of customer queries were being handled by virtual agents	• Increased personalisation • Focus on increasing uptake of automated, self-service channels	High levels of customer satisfaction demonstrate consumer willingness to engage with virtual agents. Highlighted the popularity of this technology for service on the go.
ANZ's Jamie - Digital assistant accessible from ANZ's website, designed to handle informational queries based on 30 most frequently searched topics. (ANZ, 2018, n.d.)	• Accessible via website • Developed by NZ-based Soul Machines Ltd, Jamie does not incorporate machine learning, instead focussing on voice interaction • Handled 12,000 conversations in first 100 days after launch, and was able to answer around 60% of these queries	• Improved response handling and sentiment analysis • Greater range of topics • Multi-lingual support for Te Reo Maori • Integration with account management to facilitate personal banking tasks	Importance of iterative approach, improving the service based on actual customer interactions with the tool.



Westpac's Wes - Chatbot based on IBM's Watson, focussing on informational queries, utilises machine learning. (Nott, 2018; Smith, 2017; Westpac, n.d.)	• Accessible via website • One of Westpac's numerous chatbot trials across Australasia • Launched in 2017, providing online support direct to customers, as well as supporting internal staff in answering frequently asked questions	• Possible future integration with account management functionality • Bots to play an integral role in Westpac's "connected channels" strategy, allowing customers to interact via their platform of choice, while receiving consistent service • Programs to reskill staff as AI is changing the needs of the business	Highlighted the importance of a seamless bot to human handover, and of transparency with customers when using virtual agents. Aiming to augment staff rather than replace them, focussing on repetitive and routine customer interactions, to free up staff for more complex tasks.
AT HOP Bot - Simple chatbot using Theta's FAQbot product, targeting informational service queries ('AT HOP card', n.d.)	• Currently in trial following a soft launch in 2018, available via some web pages on AT HOP's website • No machine learning functionality, so improvements in bot performance require manual training • Staff cannot intervene in conversations - if the chatbot cannot handle a query, customers are redirected to a lengthy contact form	• Better response handling	Demonstrates limitations of simplistic chatbots without support from skilled staff - the bot's capacity to handle queries has not evolved substantially since launch.

4.3 Conclusion

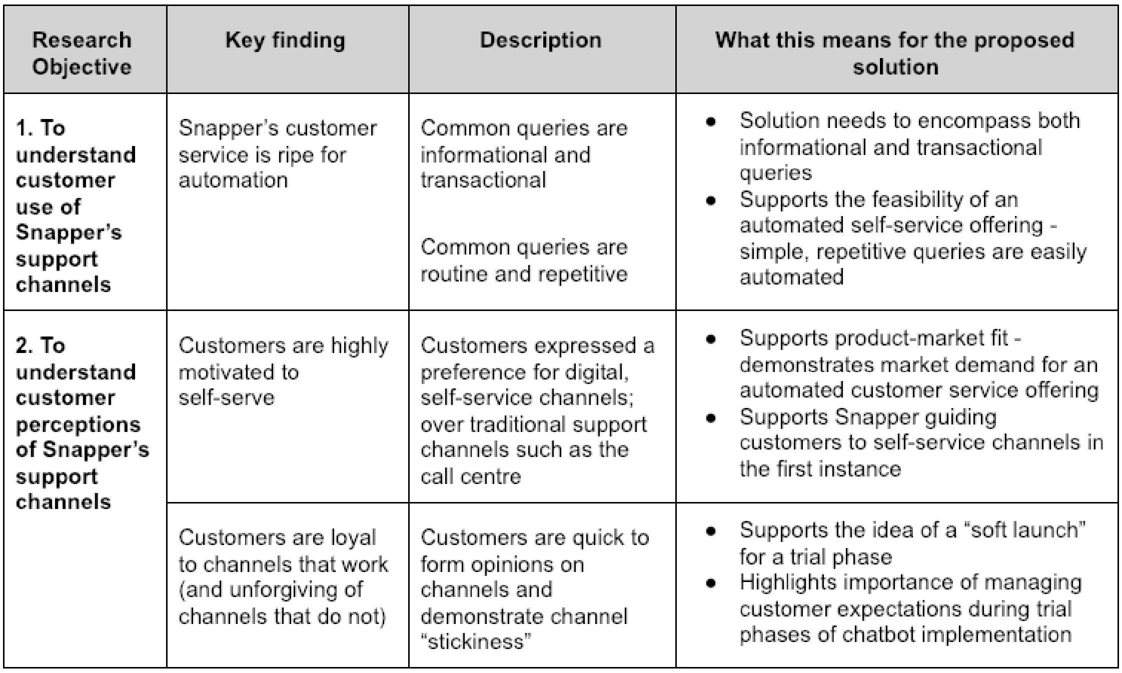
The research findings provide context into customer use and perceptions of Snapper's support channels, reinforcing the market demand for improved self-service options, and demonstrating that Snapper customer service is ripe for increased automation. By recognising the types of effort customers seek to avoid when accessing support, the findings offer clear implications for the design and development of a Snapper customer service chatbot, to ensure perceived "ease of use" drives uptake of the new product. Finally, market analysis of chatbot providers in the New Zealand context reinforces these findings, highlighting key insights for the successful implementation of a conversational AI offering. The implications of these findings for the proposed solution are explored in more detail in the following chapter, providing context to the recommendations outlined in the business case (see Chapter 6.0).

5.0 Discussion

5.1 Introduction

This chapter reflects on the findings from the previous chapter and identifies major implications for the feasibility of an automated self-service offering. The research findings help to identify key barriers to the adoption of an enhanced self-service offering, and provides insight into what not to do when implementing automated customer service. Findings from the first phase of the research, where existing data across Snapper's customer service channels was analysed, showed a clear opportunity to deliver an enhanced self-service offering, giving insight into customer use and perceptions of Snapper's support channels. The findings identified during in-depth interviews, including a proposed extension to the Technology Acceptance Model, provide further insight into the pain points limiting the adoption of self-service, and provide greater clarity around the types of automated customer service likely to be well-received by Snapper's customers. To fully explore the project implications of these findings, iterations of the initial project assumptions are discussed, highlighting areas yet to be resolved. Previous research is considered, as well as comparison of the proposed automated service offering to similar concepts being explored by others in the industry.

Table 5.1: Implications of key research findings



Research Objective	Key finding	Description	What this means for the proposed solution
1. To understand customer use of Snapper's support channels	Snapper's customer service is ripe for automation	Common queries are informational and transactional Common queries are routine and repetitive	• Solution needs to encompass both informational and transactional queries • Supports the feasibility of an automated self-service offering - simple, repetitive queries are easily automated
2. To understand customer perceptions of Snapper's support channels	Customers are highly motivated to self-serve	Customers expressed a preference for digital, self-service channels; over traditional support channels such as the call centre	• Supports product-market fit - demonstrates market demand for an automated customer service offering • Supports Snapper guiding customers to self-service channels in the first instance
	Customers are loyal to channels that work (and unforgiving of channels that do not)	Customers are quick to form opinions on channels and demonstrate channel "stickiness"	• Supports the idea of a "soft launch" for a trial phase • Highlights importance of managing customer expectations during trial phases of chatbot implementation

3. To identify barriers to the adoption of self-service	Social effort is a barrier to using a channel	Customers seek out self-service options to reduce social effort	- Supports product-market fit - demonstrates market demand for an automated customer service offering
	Cognitive effort is a barrier to using a channel	Customers do not want to research channel options, or ways of resolving issues. Customers want highly contextual support	- Provides context on types of queries, e.g. “How do I…?” - Solution must be available on an existing, highly visible channel, and must not further fragment Snapper’s multi-channel support offering - Supports making chatbot available on channels where customers already interact, e.g. social media - Supports making chatbot proactive, rather than purely reactive (interactions need not be initiated by customer) - Solution must be contextual - accessible within the context of the daily commute
	Logistical effort is a barrier to using a channel	Customers seek out channels accessible via mobile or online to reduce logistical effort	- Supports product-market fit - demonstrates market demand for an automated customer service offering
	Self-service for urgent issues	Customers want highly responsive support, particularly with urgent queries (queries impacting ability to travel, queries with financial impact)	- Solution must be highly responsive - Solution must give customers confidence in the process of resolving urgent queries - Solution must be able to successfully address common queries, particularly queries customers view as urgent
4. Customer perceptions of automated customer service	Customers perceive automated service options as a way to to reduce effort	When avoiding social or logistical effort, customers favour digital and self-service options.	- As above, supports product-market fit
	In some scenarios, customers perceive avoiding automated service options as a way to reduce effort	When resolving urgent issues, or when dealing with uncertainty, customers reduce cognitive effort by relying on traditional channels (a “don’t tell me how to fix it, fix it for me” approach).	- As above, solution must demonstrate responsiveness equal to, or greater than, Snapper’s traditional channels

5.2 Implications of key findings

5.2.1 Customer use and perceptions of Snapper's customer service channels

Snapper's customer service is ripe for automation

Analysis of existing data across Snapper's customer service channels validated that increased service automation is a viable roadmap for Snapper. Snapper's customer service interactions were categorised into informational, transactional and collaborative queries. The majority of queries were identified as informational and transactional, with responses highly templated in nature. The data consistently showed 3-4 transactional queries driving the vast majority of traffic to Snapper's traditional customer service channels. As simple and repetitive queries are easily automated, the recurring nature of the majority of Snapper's customer service interactions indicates that these are ripe for digitisation and automation.

The lack of complexity in the majority of Snapper's customer service queries was reiterated during the in-depth interview phase, where customers described themselves as highly unlikely to reach out to Snapper for any reason other than these top query drivers (see Table 4.5), and expressed little motivation to contact Snapper for answers to informational queries. Despite the highly routine nature of these top queries, the majority of Snapper's customer service resource is devoted to responding to these queries.

Based on the analysis above, the key opportunity here is to introduce better alignment between the type of interaction initiated by a customer, and the resources allocated to address that interaction. While Snapper is not aiming to remove traditional customer service channels (such as the call centre) from their channel mix entirely, both Snapper and their customers will benefit if the majority of customers are able to resolve these routine queries through fully automated, self-service channels; freeing staff to handle more complex queries (see Section 4.2.4).

While Snapper has previously advocated an “omni-channel” approach (Cook, 2014), this is no longer reflected in their customer service roadmap. Snapper still offers a wide variety of customer service channels, which are managed by a variety of agent types, both internal and external (with a corresponding variation in Snapper expertise). Skilled customer service resources are consumed by repetitive transactional or informational queries. This increases the cost to serve, and significantly increases response time to customer queries. Conversely, many more collaborative/valuable interactions are directed to less experienced, outsourced customer service staff in the first instance (e.g. the call centre), resulting in necessary escalation to head office, and reducing Snapper’s ability to ensure first-contact resolution.

Snapper’s customer service staff and their expertise can be described as an operant resource (Constantin & Lusch, 1994), or one which produces impacts and outcomes on other resources. Service-dominant logic highlights the difference between these less tangible resources, and operand resources, which are tangible and static. Madhavaram and Hunt (2008) proposed a hierarchy for understanding the value delivered by operant resources. The greatest opportunity exists for transactional queries, which currently form the overwhelming majority of service requests through the call centre, service centres, in-app messaging and social media. The lack of self-service options for the key drivers of transactional queries represents a critical misalignment of operant resources.

Snapper’s customer service currently does not scale without compromising customer experience. Any increase in the volume of routine transactional or informational service requests means that Snapper’s customer service staff have less time to focus on higher-value, more collaborative interactions and to identify opportunities for improving the customer experience. The ideal future for Snapper customer service is to resolve these repetitive, routine customer service interactions at first contact, without requiring costly customer service resource. A chatbot self-service offering will allow more timely, cost-effective and accessible resolution of these issues than Snapper’s existing service channels (Xu, Liu, Guo, Sinha, & Akkiraju, 2017).

While the majority of Snapper's customer service queries are routine interactions, suitable for automation, the success of such an offering requires that high-value or highly collaborative customer service interactions are able to be escalated quickly and effectively to trained customer service staff. In this way, chatbot technology can augment Snapper's existing customer service resources for informational and transactional queries, ensuring that Snapper's customer service staff have the capacity to focus on high-value, collaborative interactions and continuous improvement.

Customers are highly motivated to self-serve

Findings from both secondary data analysis and in-depth interviews demonstrated a customer preference for digital, self-service channels, over traditional support channels such as the call centre or in-person support. Research findings showed positive customer perceptions of Snapper's existing self-service channels, validating that Snapper customers are highly motivated to self-serve, when equipped with suitable tools. AskNicely feedback addressed Snapper's customer service and was strongly positive in reference to self-service channels such as the Snapper Mobile Android app or Snapper Kiosks, although was mixed when referencing interactions with Snapper support staff. Recurring feature requests for an iPhone app or online top-up reinforced the customer preference for digital, self-service channels when managing their Snapper card(s). This preference for self-service is further reinforced by the in-depth interview findings; where participants identified digital, self-service channels as their preferred way of managing their Snapper cards, with a strong emphasis on mobile-based channels.

Based on these findings, customer reliance on Snapper's traditional channels is not founded in an unwillingness to use self-service channels; rather a resistance to channel-switching, or low awareness of channel alternatives. This highlights the importance of go-to-market strategy when implementing an enhanced self-service offering. The successful adoption of a customer service chatbot will require sufficient customer awareness of the channel, as well as a compelling value proposition to encourage customers to switch from traditional channels.

Customers are loyal to channels that work (and unforgiving of channels that don't)

With a highly fragmented customer service ecosystem, Snapper faces challenges reducing customer reliance on traditional service channels, which offer the highest cost-to-serve, and the greatest challenges in terms of delivering a timely and consistent service experience. Despite offering a range of self-service channels, Snapper has historically adopted a 'no wrong door' policy, seeking to deliver an equivalent service experience through self-service and traditional channels, rather than actively encouraging customer uptake of self-service channels. This 'pull' rather than 'push' approach has resulted in a slower uptake of self-service channels. While reloads (topping up Snapper cards) continue to trend steadily towards self-service, customer service traffic continues to rely heavily on traditional channels, such as the call centre as well as in-person, and email support. Despite customers continuing to request faster, easier ways of resolving common support issues; they still rely heavily on traditional channels.

Findings from in-depth interviews helped to explain how Snapper customers navigate the wealth of support channel options, and why they choose the channels they do. Research findings clearly demonstrated the channel 'stickiness' shown by Snapper customers, and help to explain their reluctance to engage in channel-switching behaviours. This is a way of avoiding the cognitive effort associated with researching and evaluating channel alternatives. This has two key implications for the successful implementation of a customer service chatbot for Snapper.

Firstly, Snapper will need to drive adoption of this new technology by proactively providing customers with information about the chatbot, and making it as accessible as possible from within the channels customers already access. The research findings show that customers are unlikely to investigate channel alternatives if they can avoid it, so the onus is on Snapper to demonstrate to customers that this new channel will provide greater value to customers, and will offer an easier path to resolving common support issues.

Secondly, research findings demonstrated that customers have long memories when it comes to initial evaluations of channel efficacy. This indicates that the successful implementation of a chatbot requires delivering sufficiently on customer expectations to ensure continued use. Customer perceptions of a channel were significantly shaped by perceived responsiveness, highlighting this as a critical success factor for the implementation of the Snapper customer service chatbot.

5.2.2 Driving self-service by addressing barriers

Reducing cognitive, social and logistical effort

Findings from the in-depth interviews identified perceived effort as the single biggest barrier to use of self-service channels, aligning with the Technology Acceptance Model (Davis et al., 1989). This motivating factor influences whether customers choose to engage with Snapper customer service at all, which channel they choose, how they engage, and whether they continue to engage with that channel in the future. This insight helps to explain why customers continue to use traditional channels for queries that are able to be resolved in real-time through Snapper's existing self-service channels, and the seeming contradiction in the channels customers claimed to prefer, versus the channels they actually used. The research findings make it clear that customers are engaging with Snapper as a low-involvement decision, and are only driven to high-engagement behaviours in very specific scenarios. In addition to the opportunities discussed above, the findings indicate additional barriers to self-service; namely, urgent scenarios where customers feel compelled to seek additional support from Snapper staff. Although an urgent issue may result in a customer being willing to exert more effort by engaging with support staff; on general issues, customers want nothing more than the tools to do what they need to, at that point in time.

The Technology Acceptance Model (Davis et al., 1989) suggests that reducing perceived effort to improve ease of use will improve customer perception of an automated self-service offering, and increase adoption. In seeking to reduce the perceived effort associated with a self-service channel, consideration must be given to the perceived cognitive, social, and logistical effort. This refers only to perceived effort, as customers are not sufficiently motivated to research which channels will require less effort in reality. Conversely, barriers to adoption of self-service can be understood as perceived effort across these categories.

The customer motivation to reduce social and logistical effort manifested as a preference for digital and self-service options, demonstrating market demand for an automated customer service offering, such as a chatbot. However, it became clear that customers are unlikely to research options or rationally evaluate channel options, and rather rely on their existing knowledge or heuristic cues for information about how to resolve a query. Information obtained from the interview participants demonstrated that the most obvious or accessible channel is the one that customers will use, regardless of whether Snapper offers alternative channels that align better with the customer's preferred ways of interacting with Snapper, and which require less cognitive, social or logistical effort. These findings show that uptake of new self-service technologies relies heavily on the visibility of the channel, and that the optimal channel for the proposed solution is likely to be the most obvious one. These findings support making a Snapper customer service chatbot available on channels where customers already interact, and making the chatbot proactive rather than purely reactive to interactions initiated by the customer.

Furthermore, research findings demonstrated that customers are highly loyal to a channel that works, and highly skeptical of a channel that has let them down even once. This behaviour reinforces the idea that customers will go to great lengths to avoid researching channel options, and do not engage in rational evaluation of channel options. Customers rely on quickly-formed opinions based on existing knowledge and past interactions. When it comes to customer perceptions of service channels, customer trust is fragile, although, easily gained. Participants who had used other companies' automated service offerings, such as chatbots, described high levels of skepticism that this technology could provide them the answers they needed, and an unwillingness to try this technology again.

These findings present an opportunity to enhance Snapper's self-service offering by providing a self-service option that helps customers solve common, recurring transactional queries. To ensure uptake of this offering, it's clear that it will need to be highly accessible through Snapper's existing self-service channels, rather than requiring customers to research options for support channels. The research findings also provide insight into the level of information customers require to feel confident when using a new self-service feature, indicating that when customers understand how the issue can be resolved up-front, they are more likely to self-serve.

Self-service for urgent issues

The research findings demonstrated that, consistent with their aims of reducing effort, customers are highly motivated to self-serve as this is less effort for them, particularly online and/or from their mobile device (in the context of their public transport commute). However, the in-depth interview findings highlighted some scenarios where this willingness to self-serve was reduced, and customers were willing to exert far greater effort in order to resolve their support issues. When the issue is impacting customers' ability to travel, or having a significant financial impact, customers are likely to seek greater reassurance during the support process. This effect was amplified when customers were unfamiliar with how to resolve the issue, or the channels by which the issue could be resolved, resulting in customer apathy, with a preference for traditional channels, where a support agent could resolve the issue on their behalf.

This behaviour has several implications for the successful implementation of a Snapper customer service chatbot. Firstly, it highlights that not all issues may be addressed by a chatbot in the first instance, and a critical success factor will be ensuring that chatbot users have a clear path to escalate to a live customer service agent when required. Secondly, this behaviour reinforces that feedback and reassurance for the customer around the process will be instrumental in ensuring the ongoing adoption of any new self-service channel. In more urgent support scenarios, customers want information up-front about what will be required to resolve the issue, particularly if they are embarking on self-service for that issue for the first time.

5.2.3 Customer perceptions of automated customer service

While the research findings show barriers, they also present an opportunity to increase uptake of self-service channels amongst Snapper customers by decreasing the effort associated with accessing and using these channels. Many of the effort-avoiding behaviours described during in-depth interviews manifested as a preference for self-service, digital channels.

Customers perceived automated service options positively, as a way to reduce effort. When seeking to avoid social effort, customers are likely to favour self-service options. When seeking to reduce logistical effort, customers are likely to view digital options more positively, and have a greater willingness to self-serve, if they are able to manage their Snapper card via the web or their mobile device (as opposed to having to travel to a Snapper self-service kiosk). Customers also viewed contextual automation as an opportunity to reduce the cognitive effort required to access support when researching channel options or how to resolve an issue, asking why the Snapper system could not proactively alert them when an action was required, rather than them having to seek out support.

While it was initially assumed that automated customer service would be particularly useful for informational queries, the low levels of engagement demonstrated by interview participants supported the idea that management of Snapper cards is a low-involvement decision for customers, and customer service interactions are more likely to be driven by transactional queries rather than informational queries. Customers were likely to tolerate confusion about how the Snapper system works, rather than actively seek information.

This customer avoidance of effort when researching channels results in a less-than-forgiving attitude to underperforming channels, which must be a key consideration when introducing a new SST to market. While companies describing their chatbot trials demonstrated a lean, iterative approach; it became clear that a minimum viable product for an automated customer service offering must be sufficiently effective to encourage customer uptake, as the research findings show that customer perceptions of a service channel are quickly formed and long held.

These findings also highlight some scenarios where customers are less likely to self-serve and conversely seek to reduce cognitive effort through avoidance of automated service options. In these urgent scenarios, perceived responsiveness becomes the most critical factor. Implementing a self-service offering that aims to address issues like this will require setting clear customer expectations around responsiveness that surpass the perceived responsiveness of traditional service channels (and then delivering on those expectations). Furthermore, the SST will need to incorporate easily accessible escalation to Snapper staff members when required, to ensure customers do not reach a “dead end”, meaning they are unlikely to choose to engage with that channel in future.

Based on the research analysis above, an opportunity exists to improve how customers navigate Snapper's multi-channel customer experience. The findings provide insight into potential pitfalls for an enhanced self-service offering, as well as how these might be addressed to ensure customer uptake of the product.

5.2.4 Evaluating the opportunities

The key research findings are outlined above, alongside implications for the project. While the project aimed to allow the solution to be emergent from the process, rather than predicting what an enhanced self-service solution might look like, several concepts were identified throughout the course of the project and are outlined below in greater detail. These possible solutions were evaluated against the research findings, to provide an evidence-based assessment of their feasibility, and to identify the preferred solution.

In-depth interview participants had already identified a range of behaviours designed to address their pain points with Snapper customer service, allowing them to reduce the cognitive, social or logistical effort associated with managing their Snapper card. Based on these findings, an enhanced self-service offering will further support customers in minimising the effort associated with managing their Snapper cards. Concepts discussed internally by Snapper include the use of conversational artificial intelligence (AI) to provide a chatbot that would answer informational queries and/or transactional queries. In addition to this solution, several alternatives were identified as ways to increase the ability and willingness of Snapper customers to manage their cards themselves through self-service channels.

Early in the research project, consideration was given to a chatbot that would be available over a third party platform, such as a bot on the Facebook Messenger Platform (Facebook, 2018). However, research findings made it clear that Snapper already struggles to deliver a consistent experience across its channels. Consultation with Snapper staff clarified that an omni-channel strategy (seeking to provide customers with a seamless experience across channels) is no longer core to their customer service roadmap. Snapper customer service has moved from the omni-channel approach to a more pragmatic multichannel approach, where development efforts are focussed on the highest impact channels.

In support of this, in-depth interview participants gave no indication of wanting a wealth of choices regarding which channels they could resolve issues through. Participants expressed a strong preference for digital, self-service channels; particularly those accessible from a mobile device. In contrast, they expressed frustration at the lack of clarity around the optimal channel through which common support issues could be resolved. This indicates that enhancements to Snapper's self-service offering should focus first on the most popular and obvious channels, i.e. their website and mobile offerings, rather than seeking to further expand their already varied channel offering, or to drive additional traffic to any of their less popular channels (i.e. social media).

The opportunities identified to enhance Snapper's self-service offering can be summarised as:

1. Implementing a cross-platform chatbot to handle informational queries
2. Implementing a cross-platform chatbot to handle informational and transactional queries
3. Enhancing Snapper's existing self-service web channel to better handle informational and transactional queries
4. Enhancing Snapper's existing self-service native mobile channels (iOS and Android) to better handle informational and transactional queries

As the research findings supported a range of alternative solutions, the value proposition of these opportunities was assessed using the criteria outlined in the LEAN Canvas (Maurya, 2010). Consideration was given to the unique value proposition of each of these solutions, and which customer problems or needs which would be addressed by these solutions. The resources required to deliver each solution were also considered, assessing the assumed benefits against the investment required.

Assessing the value proposition of Option 1 highlighted that while a chatbot platform presents a more substantial change to Snapper's customer service offering, it aligns with the idea of providing better customer service interactions, rather than preventing the need for a customer service interaction entirely. However, implementing a chatbot that would focus solely on informational queries would have limited impact on Snapper's customer service offering. Analysis of existing customer service traffic identified that the majority of Snapper customer service queries are transactional in nature (requiring that an action is taken against an account). The findings outlined above clearly indicate that an informational chatbot will not significantly improve the customer experience, as customers described themselves as unwilling to seek information, rather than having difficulty finding the information. Customers wanted information to come to them, in the context of their commute, rather than having to engage with yet another channel to find it. Unlike informational queries, which are low-volume and highly varied (see Section 4.2.1), transactional queries are ripe for automation due to their simple and repetitive nature. While an informational chatbot could be a viable first step towards an automated customer service offering; this would need to be augmented with transactional capability to have any significant impact on the percentage of Snapper queries currently being directed to costly, traditional channels.

Consideration of Options 3 and 4 (enhancing one or more of Snapper's existing self-service channels) identified that the key value proposition would be ensuring that Snapper customers could resolve common support issues (e.g. bus overcharges, lost/stolen cards, etc.) through their preferred channel. However, these solutions did not address the pain point of the cognitive effort required for customers to find out how to resolve an issue, or which channel the issue could be resolved by. Even significant enhancement of these products to ensure a full feature-set across the web, iOS and Android would require customers to conduct some element of research to identify how to resolve their common support issues. Furthermore, enhancement of these channels would require development across three platforms, meaning significantly greater resources would be required, with limited scope in terms of the types of issues that could be addressed.

In contrast, Option 2 (a chatbot capable of resolving both informational and transactional queries) would allow customers to both find out how to resolve common support issues, and allow them to resolve the issue within the chatbot, or direct them to the relevant web/app page for resolving the issue. If combined with clear escalation paths to reach a live customer support agent if required, this solution will most effectively address the barriers identified in the earlier research.

Having identified Option 2 (a customer service chatbot capable of handling both informational and transactional queries) as the preferred solution, further analysis was conducted to assess the feasibility of this proposed offering. The LEAN Canvas was revised to include detail of the unique value proposition, unfair advantage, customer segments, key metrics, and channels required to deliver such a customer service chatbot (see Section 6.2.2). This exercise identified several unknowns, including the cost of delivering such a solution, and additional expertise was sought from industry experts familiar with the delivery of customer service chatbot solutions (see Section 4.2.4).

5.3 Reflection on project assumptions

Early on in the project, the following assumptions were identified (see Section 3.1):

1. Snapper's self-service channels can deliver a better customer experience than traditional service channels.
2. Barriers affecting adoption of Snapper's self-service offering can be identified and addressed.
3. Addressing these barriers will improve customer experience and increase uptake of self-service.
4. Delivering such an enhanced self-service offering is commercially viable.

The research findings served to validate that self-service channels can deliver a better customer experience than traditional service channels, demonstrating positive customer perceptions of self-service and that these channels were perceived to require less customer effort in many scenarios (see Sections 4.2.2 and 4.2.3). Barriers affecting the adoption of Snapper's self-service offering were identified (see Section 4.2.3, and a solution was identified that addresses these barriers in order to increase uptake of self-service (see Section 5.2). Recommendations for further validating these assumptions via a trial implementation of a customer service chatbot are outlined in the business case (see Section 6.3.4).

Throughout the project, the LEAN Canvas (Maurya, 2012) was used to visualise how the project assumptions were evolving. Use of this template (see Figure 5.1) helped to identify key unknowns or areas requiring further validation, providing direction for the research as the proposed solution developed.

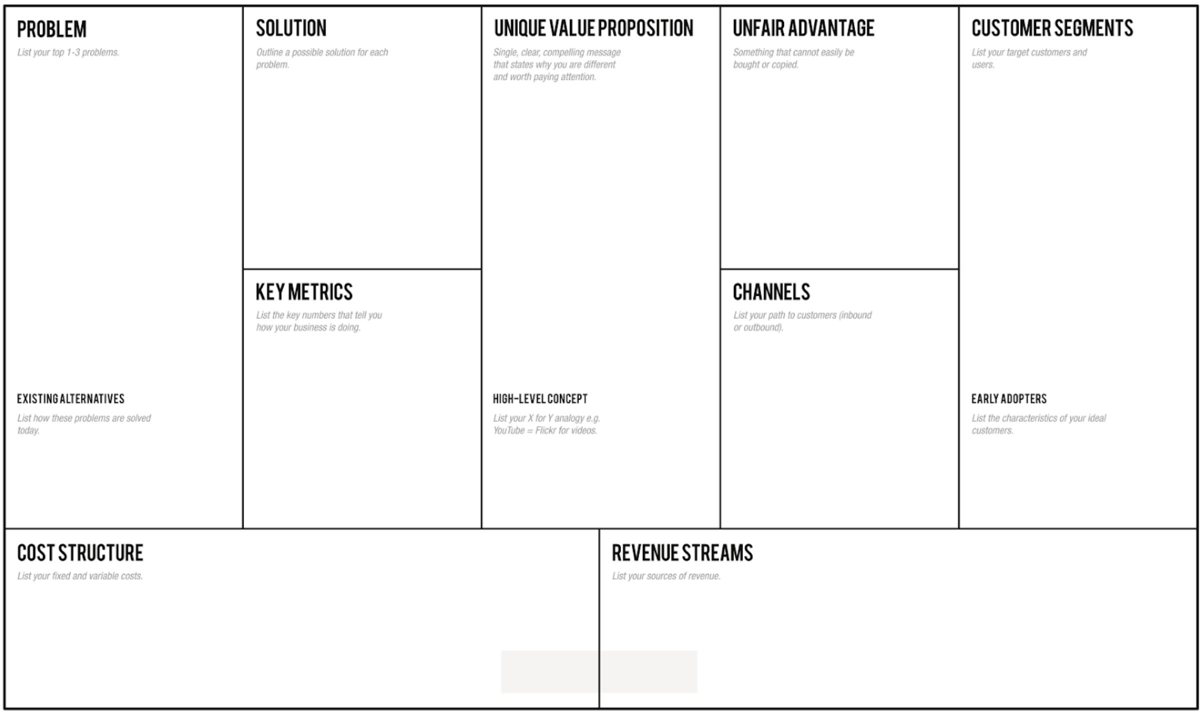

PROBLEM
List your top 1-3 problems.
EXISTING ALTERNATIVES
List how these problems are solved today.
SOLUTION
Outline a possible solution for each problem.
KEY METRICS
List the key numbers that tell you how your business is doing.
UNIQUE VALUE PROPOSITION
Single, clear, compelling message that states why you are different and worth paying attention.
HIGH-LEVEL CONCEPT
List your X for Y analogy e.g. YouTube = Flickr for videos.
UNFAIR ADVANTAGE
Something that cannot easily be bought or copied.
CHANNELS
List your path to customers (inbound or outbound).
CUSTOMER SEGMENTS
List your target customers and users.
EARLY ADOPTERS
List the characteristics of your ideal customers.
COST STRUCTURE
List your fixed and variable costs.
REVENUE STREAMS
List your sources of revenue.

Figure 5.1: LEAN Canvas template (Maurya, 2010, 2012)

Some aspects of the proposed business model remained fairly consistent through the course of this study; such as the problem being addressed, Snapper’s unique advantage and the customer segments (see Section 1.3 and Section 1.4). However; the nature of the solution, the unique value proposition, and the channels, were more emergent. These three areas were revised extensively following analysis of the research data, as the business opportunities were evaluated based on the research findings (see Section 5.2.4). The remaining elements of the business model; including key metrics, cost structure and revenue streams; are addressed in the completed LEAN Canvas included in the business case. The recommended cost structure and revenue streams discussed in Section 6.2.2 demonstrate the commercial viability of the proposed solution, validating the final project assumption.

5.4 Project unknowns

This project is centred on the New Zealand market, with research focussing on Snapper's Wellington customer base. Validation of how these research findings might apply to international clients is outside the scope of this project. However, while the project focuses on Wellington customers, previous Snapper projects have successfully demonstrated that their learnings from the domestic market can be applied for the benefit of overseas clients.

If seeking to apply these findings to a global market, further assessment of product-market fit (Andreessen, 2007) may be required. While regional authorities and public transport providers across the globe share the challenges of delivering on rapidly-changing customer expectations, this additional validation is recommended to determine how relevant this technology will be for overseas clients, as customer perceptions and uptake of conversational AI technology may vary significantly between markets.

5.5 Concluding comments

5.5.1 Comparison to previous research

Findings from the in-depth interviews highlight three motivating factors which influence how customers choose to engage with Snapper customer service channels: perceived cognitive effort, perceived social effort, and perceived logistical effort. These research findings reinforce the importance of "ease of use" in the adoption of new technologies, as shown in the widely accepted TAM (Davis et al., 1989). The proposed extension (see Figure 4.3) addresses earlier criticisms of the TAM, where it has been suggested that the model lacks practical implications for the implementation of self-service technologies.

In contrast to the TAM, the proposed extension recognises the mental, social and logistical aspects of *ease of use* in shaping positive perceptions of self-service technologies. While these factors were identified purely in the context of Snapper cardholders engaging with Snapper's customer service channels, they are likely to have relevance for other industries adopting SSTs, and seeking to drive greater uptake of these channels. The extended TAM provides clearer direction for the design and implementation of self-service technologies.

5.5.2 Avenues for future research

Although the research findings make it clear that mental, social and logistical factors help to determine perceived *ease of use*, the extent to which these factors impact customer willingness to self-serve remains unknown. While the addition of these factors to the TAM (see Section 4.2.3) goes some way to addressing the lack of practical application in the current model, future research could seek to further validate the role of these factors in determining "ease of use". Future quantitative research could seek to validate this proposed extension to the TAM, by validating that a reduction in perceived effort in one or more of these three areas will increase uptake of an SST, and explore to what extent these factors impact customer willingness to self-serve.

6.0 Recommendations (Business Case)

6.1 Introduction

The following business case summarises the recommendations for Snapper management to deliver an enhanced self-service experience for their customers, by adding conversational AI to their channel mix. Snapper has already established an improvement trajectory for their service offering, demonstrated by their steady roll-out of self-service features, improving their products based on dimensions historically valued by customers. This low-end disruption has allowed Snapper to continue to reduce their cost-to-serve by driving more customer service traffic to self-service channels. However, technologies such as conversational artificial intelligence (AI) and machine learning present an opportunity to introduce a greater step change in the scalability and quality of Snapper's service offering. Conversational AI technology is evolving at a rapid pace, and is beginning to see widespread adoption across essential service industries, including public transport. This disruptive technology presents an opportunity for Snapper to lead the way in meeting customer demand for a faster, more accessible way to resolve common customer support issues. Implementing conversational AI will assist Snapper in their efforts to increase uptake of self-service channels amongst Wellington cardholders, and further position Snapper as a market-leader in customer-centric innovation (see Project Objectives outlined in Section 1.3).

The following chapter provides an indicative business case for implementing a Snapper customer service chatbot, consolidating the research findings in order to provide data-driven recommendations for Snapper management to implement an enhanced self-service experience utilising conversational AI. This chapter is intended to be a stand-alone document for a Snapper management audience, providing a rationale for the recommended roadmap for the proposed product. The structure of this business case draws from best practices for business case development, as documented by the NZ Treasury in their Better Business case (BBC) framework (The Treasury New Zealand, n.d.), which aims "to give the information they need to invest with confidence." The BBC framework identifies five areas to be considered when developing a business case: the strategic, economic, commercial, financial and management cases ('BBC methods and tools | The Treasury New Zealand', n.d.).

The business case begins by addressing the management case, summarising the business model and delivery methodologies recommended for the project development (see Sections 3.4 and 6.2). The market validation phase (Section 6.3) then addresses the strategic business case, assessing the case for change. A PESTEL analysis is used to identify macro-environmental factors impacting Snapper and the proposed project, incorporating key findings from the customer and market research conducted earlier in the research (see Chapter 4).

Building on the opportunities identified in the PESTEL analysis, the product validation phase (Section 6.4) utilises a SWOT analysis, before providing clear recommendations around the required feature-set of the proposed solution, and a possible roadmap for implementing these features.

Finally, Section 6.5 outlines the economic, financial and commercial cases; including the recommended phases for development, alongside high-level resources and requirements required for implementation.

In addition to the analysis tools noted above, the business case draws from the Project Inception template, used internally by Snapper when seeking business sponsorship for a new project or initiative. When outlining the proposed feature-set and resources required to implement the project; the following business case has, where appropriate, followed the format used by Snapper in their Project Inception documentation; including clear prioritisation of features (MOSCOW analysis and MVP), and describing the resources required in hours (for internal resource, allocated per discipline) or dollars (for external resource or direct project costs).

The proposed solution for Snapper is a customer service chatbot, as a first step towards a conversational AI customer service offering. The feature set of this chatbot will include informational and transactional queries, in order to address the bulk of their customer service interactions. The recommendations provided include a simple initial implementation of such a chatbot, allowing for rapid feedback loops as Snapper staff and their customer base familiarise themselves with this technology. Following this initial phase, a draft roadmap is proposed for future enhancements of this technology, as the landscape matures, and the return on investment becomes clearer.

6.2 Business model design

6.2.1 Methodologies used for business model design

As outlined in Section 2.8, a range of frameworks for innovation was considered in relation to this project. In recognition of Snapper's service-dominant approach, the research design draws on design thinking and the associated service design methodologies (Beckman & Barry, 2007; T. Brown, 2009; T. Brown & Wyatt, 2010; Lockwood, 2010). As this project aims to explore how Snapper's customer service must evolve in response to a highly disruptive technology (conversational AI), Christensen's Theory of Disruptive Innovation was explored, providing a framework for understanding how disruptive technologies affect existing markets, and types of innovation for responding to disruptive technologies (Bower & Christensen, 1995).

Having explored leading innovation literature, including the writings of Drucker and Cristensen, a range of frameworks for business model design were considered (see Section 2.8.3), including the Business Model Canvas (Osterwalder, 2004; Osterwalder & Pigneur, 2010) and the later extension, the LEAN canvas (Maurya, 2012). LEAN startup methodology (Ries, 2011a) was identified as the business model framework best aligned with the ethos and practices of the project partner, Snapper. This was based on Snapper's lean organisational structure (Mamoli, 2018), and their highly iterative approach to projects, particularly internal projects for the Wellington market (Snapper Services Ltd., 2017a).

Within the LEAN startup community, the LEAN canvas is a widely accepted tool for communicating a business idea, and helping to identify key assumptions. For this project, the LEAN canvas was used as a critical step in the business model design process. This canvas was iterated on repeatedly, to record learnings as the project took shape, and to identify project unknowns in key areas.

6.2.2 LEAN canvas business model

Using the components of the LEAN canvas (see Figure 5.1), the following business model outlines recommendations for the proposed chatbot product, forming the basis for the development plan (see Section 6.4.3).

Problem

As advocated by Systematic Innovation (see Section 2.8), this project began with an identification of the problem area, before a solution had been identified (Drucker, 2011). This approach aligns with Snapper's Project Inception process, where the problem space is identified using the Job to be Done framework (Christensen, Hall, Dillon, & Duncan, 2016).

At the project outset, the "job to be done" was identified as helping Snapper customers manage their payment cards with minimal effort. Opportunity for improvement in Snapper's customer service was identified based on a combination of customers expressing frustration at the current support channels and processes, and customers requesting additional features and products to manage their Snapper cards via self-service channels (see Chapter 1).

More specifically, the problem was identified as Snapper customers relying heavily on traditional customer service channels, such as the call centre and in-person support (see Section 1.3), rather than self-service. This manifested as some customers perceiving their current support options as "a hassle" (customer feedback via Apptentive in-app messaging, 2017).

Snapper customers relying on traditional channels has been identified as an issue for two reasons. Firstly, these traditional channels don't scale effectively - higher traffic results in increased costs and greater challenges when seeking to maintain consistent service quality. Secondly, Snapper prioritises a self-service first approach, believing that self-service is the optimal channel to deliver on customer expectations of increasingly accessible and real-time service.

Solution

The project began by proposing automated customer service as an enhancement to Snapper's existing self-service channels. In order to understand the opportunities present for automated customer service, the research objectives focussed on first understanding and validating the problem, before a solution could be proposed and validated.

Based on the barriers to self-service identified in Section 4.2.3, a range of opportunities was identified and evaluated in Section 5.2.4. The possible solutions included enhancing Snapper's existing self-service channels (either web or mobile), or introducing a cross-platform customer service chatbot (focussing on either informational queries, or both informational and transactional queries). In order to most effectively address the customer pain points identified, a cross-platform customer service chatbot capable of handling both informational and transactional queries was identified as the preferred solution. This option was preferred for its flexibility, and was assessed as offering better product-market fit than a solution which excludes transactional queries, or focusses purely on Snapper's web or mobile channels. Possible features for this chatbot were identified and prioritised based on the research findings (see Section 6.4.2).

Key metrics

In order to access the performance of the proposed customer service chatbot, several key metrics were identified. These metrics aim to provide insight into whether the customer service chatbot is delivering on its objectives of reducing customer service traffic to costly traditional channels (such as the call centre and in-person support), and of delivering a better customer experience. Firstly, the number of customer interactions via the chatbot should be monitored (both unique visitors and total interactions). This data should be assessed against the overall number of customer service queries for that time period, and traffic to other channels (both traditional and self-service). These metrics will assist with understanding the customer uptake of this channel, and the resulting impact on customer service traffic to traditional channels. Cost savings resulting from reductions in customer service traffic to traditional channels should be calculated and compared to the cost of development, in order to forecast the return on investment over the lifetime of the product, validating the commercial viability of future development iterations.

Secondly, customer satisfaction with the chatbot should be monitored using the Customer Effort Score, which allows companies to quantify the ease of effort in the service experience (see Section 2.6), to validate whether the product is successfully offering an easier service experience for Snapper customers. Implementing Customer Effort Score surveys from the initial trial phase will provide a benchmark for Snapper to understand whether future chatbot enhancements have successfully reduced the perceived effort associated with the channel.

Finally, regular NPS surveys following interactions via the chatbot should be conducted. As NPS is a loyalty metric already in use by Snapper, comparison of this targeted NPS metric to Snapper's overall rating for the same time period will provide further insight into whether customer perceptions of Snapper's service offering are improved by the chatbot.

Unique value proposition

From the project inception, the proposed value proposition was identified as "delivering a better customer experience to Snapper cardholders". During the literature search, the Technology Acceptance Model (Davis et al., 1989) provided a framework for understanding what constitutes a "better customer experience", highlighting the role of "ease of use" or reduced effort. The initial assumption that Snapper's self-service channels can deliver a better customer experience than traditional service channels was validated during the research phases, highlighted by the "ease of use" identified in positive AskNicely feedback relating to Snapper's self-service channels (see Section 4.2.2).

Findings from the in-depth interviews provided greater clarity on what impacts customer perceptions of "ease of use" by identifying key barriers to the adoption of self-service as cognitive, social and logistical effort (see Section 4.2.3). Based on these findings, the value proposition for the proposed offering has been refined to "Delivering a better customer experience to Snapper cardholders by reducing the cognitive, social and logistical effort required to resolve common support issues". When considering how this value proposition is communicated to customers, in-depth interview findings highlighted that automated customer service needs to be done well from the start. Customers form opinions quickly about a channel, and a single interaction is enough to form a clear view on whether they will or will not engage with Snapper via that channel again.

Unfair advantage

An unfair advantage has been defined as “that which cannot be copied and cannot be bought” (Cohen, 2010). Snapper’s highly loyal customer base presents an unfair advantage, as demonstrated by their NPS ratings which show customer loyalty well above the expected range for the public transport industry (Snapper internal reporting, 2018). Snapper’s customers have demonstrated a willingness to engage in co-creation during product development; with high customer engagement during user testing, new product development research, and product trials. Snapper’s highly engaged customer base will play a critical role in the success of this project; given the necessity of approaching chatbot development as a highly iterative process (see Section 4.2.4), in order to learn from real-world interactions with customers. Snapper’s organisational agility (Mamoli, 2018), demonstrated by its rapid development cycles and ability to pivot quickly in response to market feedback, further contributes to this advantage, highlighting that they are ideally placed to respond to this disruptive technology (AI).

Channels

The project focussed on Snapper customer service channels for the Wellington market, and divided these channels into ‘traditional’ and ‘self-service’. A channel or channels for the proposed automated service offering was not identified at the project outset, meaning all of the following options were considered:

- Enhancing one or more of Snapper’s existing self-service channels (e.g. mobile applications, the website, the MySnapper desktop application, and kiosks)
- Automating one or more of Snapper’s existing digital service options which are currently staffed by live, rather than virtual, agents (e.g. in-app chat, email, social media chat)
- Introducing a new service channel not currently offered by Snapper

The project's initial assumptions were that customers selected their service channels based on what would be the least effort for them. This assumption was challenged by the research findings, as participants described continuing to use higher effort channels due to an avoidance of the effort required to research support channels and self-service options (see Section 5.2.2). Interview participants showed common behaviours around the avoidance of effort, and make it clear that even the greatest technological advancement in self-service will see little uptake if the channel is not readily available and immediately obvious to customers.

Based on the research findings above, it's clear that the chatbot will need to be highly accessible through one or more of Snapper's existing self-service channels, rather than requiring customers to research options for support channels. Furthermore, the findings make it clear that self-service which is accessible in the context of a customer's commute will have the greatest uptake. Given the difficulty of offering physical self-service kiosks in locations accessible for all Snapper cardholders, there's a clear impetus to focus on self-service channels accessible from mobile devices, allowing customers to address issues on the go.

In keeping with Drucker's framework for innovation (Drucker, 2011), the project has identified the Minimum Viable Product (MVP) for a first iteration of the Snapper chatbot. While Snapper has previously advocated an 'omni-channel' approach, they now favour a 'multi-channel' approach, focussing development efforts on the highest impact channels, meaning there is no requirement for the initial implementation of the chatbot to be available across multiple channels, and this can be addressed iteratively, beginning with the highest value channel. Based on this, the preferred channel for an initial implementation is the Snapper website (as the highest traffic self-service channel).

However, the research findings also support reducing the proactive effort required from customers, by making Snapper support available through the customer's preferred channels. It is suggested that future iterations of Snapper's customer service chatbot could be available via other third-party digital channels, such as social media (see Section 6.4.2).

Finally, regardless of the channel(s) chosen for the chatbot, it's clear that Snapper will need to drive adoption of this new technology by proactively providing customers with information about the chatbot, and making it as accessible as possible. Given customer reluctance to research channel alternatives, the onus is on Snapper to demonstrate to customers that this new channel will provide greater value to customers, and will offer an easier path to resolving common support issues. The successful adoption of a customer service chatbot will require sufficient customer awareness of the channel, as well as a compelling value proposition to encourage customers to switch from traditional channels.

Customer segments

The proposed solution impacts all three of Snapper's core customer segments described in Appendix A (facilitators, dependant and independent travellers). The primary audience being considered are Snapper cardholders who actively manage Snapper cards (i.e. this may not include some dependant travellers, such as children). The target audience for the product is Snapper customers who have access to a smartphone or internet-connected device. While this is the vast majority of Snapper customers, it should be noted that this is not true for all Snapper customers.

Cost structure and revenue streams

Consideration was given to Snapper's existing business model in the New Zealand market, as well as to industry trends to understand the commercial potential of such an offering in the overseas market. Two possible investment paths exist for the development of this solution in the Wellington market. Snapper could fund the development of this product itself, based on the anticipated cost savings in the Greater Wellington Region, and the potential for white-labelling the product for the overseas market. Alternatively, Snapper could seek additional investment from the Greater Wellington Regional Council to deliver an enhanced service. However, as Snapper offers "Ticketing-as-a-Service" in the Wellington region, and is responsible for the delivery of customer service across a wide range of channels, it is unlikely that Council funding will be available to further enhance these channels, given that the direct cost of delivering customer service via traditional channels is borne by Snapper.

The preferred commercialisation pathway, therefore, requires demonstrating that the costs of developing a customer service chatbot will be outweighed by the savings realised by reducing traffic to more costly, traditional support channels; allowing Snapper to finance this investment. While costs for the first phase of development have been estimated (see Section 6.5), the LEAN business model assumes an iterative development cycle. The return on investment can be assessed (see Key Metrics) following a trial phase, as input for a more detailed business case for future iterations of the product.

An approach for assessing the cost and returns of the Snapper customer service chatbot was presented to the project advisory board, and feedback was received around ways to validate the likely uptake of this technology. Industry expertise was sought from Theta and Prefer, to understand likely adoption of a customer service chatbot in the medium-term, and the number of queries likely to be directed away from traditional support channels as a result of this offering. Snapper has conducted a cost analysis of their current service offering, to baseline the cost-to-serve of their existing channels.

6.2.3 Summary of recommended business model

The key vision of this project is to overcome barriers to self-service, by introducing an enhanced self-service offering to address the bulk of Snapper's highly repetitive customer service queries. It is envisioned that the successful implementation of such a tool would both significantly reduce Snapper's cost-to-serve within the New Zealand market, and form an attractive proposition for transport authorities overseas, seeking to augment their existing ticketing systems to deliver on rapidly-changing customer expectations around their service offering.

On the basis of these findings, the recommendation is that Snapper invests in this technology themselves, rather than seeking external funding from the Greater Wellington Regional Council. The proposed iterative approach for developing the solution has been designed to allow for the return on investment to be demonstrated early on in the project. This will allow Snapper to make data-driven decisions about the benefits of further investment in the proposed roadmap for conversational AI.

6.3 Market validation and development

6.3.1 Market validation through customer research

Market demand for an enhanced self-service solution was validated during the research discussed in Chapter 4: Findings and Analysis. This research was conducted to better understand the target market, and where and how a chatbot could add value to Snapper's existing service offering. Firstly, secondary data from Snapper's customer service channels was analysed to understand how Snapper cardholders currently use Snapper customer service channels, and the types of queries driving traffic to these channels. Based on data from Snapper's internal monthly reporting (see Section 4.2.1), Snapper customers currently rely heavily on traditional channels, such as the call centre and in-person support, to resolve common support issues. This is at odds with the behaviour and preferences described during in-depth interviews with Snapper cardholders (see Section 5.2.1), where customers demonstrated that they are highly motivated to self-serve, as these channels are perceived as lower effort.

Analysis of AskNicely feedback reinforced that ease of use is a priority for Snapper customers, and greatly determines their satisfaction with the service. In addition to this insight, AskNicely feedback validated that there is customer demand for a better way to resolve common support issues, with customer comments highlighting the arduous nature of resolving issues via the Snapper call centre, and demonstrating customer demand for more ways to manage their Snapper cards from the web or their mobile devices (see Section 5.2.1).

Further validating customer demand for improved self-service options; interviews with Snapper cardholders gave insight into the ways customers seek to avoid logistical, social and cognitive effort when seeking support from Snapper. In-depth interview findings demonstrated customer appetite for more responsive support channels, reinforcing the product-market fit of chatbot technology (see Section 5.2.1).

6.3.2 Market validation through competitor research

Building on this understanding of how Snapper customers use and perceive Snapper's current customer service channels, market analysis explored the uptake of chatbot technology in the New Zealand context. This research explored how receptive New Zealand consumers (and businesses) have been to this technology, as well as the industries or use cases where this technology has been most rapidly accepted (see Section 4.2.4). This included a 'competitor' analysis of companies from other essential industries, examining successful chatbot implementations from leading New Zealand companies in essential service industries.

Based on this market analysis, it became clear that New Zealand companies are moving towards automated customer service at a rapid pace. Chatbot technology is becoming both more advanced and more accessible (Phillips, 2018), offering businesses a cost-effective way to handle repetitive and time-consuming queries (Smith, 2017). The receptiveness of NZ businesses to chatbot technology has changed substantially in the past 12-18 months, as corroborated by industry experts from service companies such as Theta and Prefer. "Everyone wants a bot now, everyone is looking at how they can use this technology." (S. Baliti, personal communication, October 2018).

Customer service was identified as the primary use case for this technology, given the ease of demonstrating return on investment, which further validates the product-market fit of the proposed solution. Martijn Verhoeven of Prefer described chatbots as appealing most strongly to companies with a B2C component to their service offering, particularly customer service, as "customer service is the one area of a business that adds significant cost but little value" (M. Verhoeven, personal communication, November 2018). Theta staff provided similar insights, highlighting that chatbot technology offers great potential to drive down the costs associated with customer service, and deliver a more consistent service experience.

The competitor analysis validated the development strategy assumptions (see Section 3.3), showing that an iterative product development process has been widely utilised in successful chatbot implementations. This allows for faster time to market and rapid feedback cycles as the product is enhanced. In particular, Air New Zealand demonstrated how this approach can facilitate co-creation with customers (Air New Zealand, 2017a, 2017b, 2018), allowing the product roadmap to be shaped by learnings following the initial product launch. This approach is reflected in the proposed development process (see Section 6.4.3).

6.3.3 PESTEL analysis

In order to better understand the macro-environment impacting Snapper's Ticketing-as-a-Service offering, a PESTEL analysis was conducted, summarising key project findings relating to the external marketing environment. The results of this PESTEL analysis were later used to identify strengths and weaknesses outlined in the SWOT analysis (see Section 6.4.1). Originally developed by Aguilar (1967) as the ETPS tool, later variations of the PESTEL analysis were expanded to include additional elements. This provided a framework for the consideration of political, economic, social, technological and environmental and risk factors in the market; as they relate to the organisation (Jurevicius, 2013).

Political factors

Few political factors impact Snapper's customer service offering. Any accessibility requirements which are driven by local government (e.g. the requirement to offer non-digital service channels) are reflected in Snapper's contractual obligations to the Greater Wellington Regional Council. At a national level, current and planned privacy legislation should be a consideration from the outset, for any new digital channels being developed by Snapper (see "Legal factors").

Economic factors

The primary economic trend impacting Snapper's customer service offering is the rise of automation, which is having a profound impact on the face of customer service (Naumov, 2018). Virtual agents are increasingly displacing traditional service channels, with some experts predicting that 85% of customer service interactions will be handled by automated systems by 2020 (Schneider, 2017). In the face of this rapid adoption of automated technologies, call centres and other traditional service providers are struggling to maintain relevance (Wood, 2018). In contrast, companies who have responded quickly to these disruptive technologies, such as Trustpower, have found a source of competitive advantage, through increased efficiencies in their service offering (Evans, 2018; Trustpower Ltd., 2018).

Social factors

Customer expectations are evolving at a similar pace to these technologies. Businesses must rapidly adapt to meet customer demand for highly accessible, ever available support (Schneider, 2017). While customers show a generally positive perception of Snapper, as demonstrated by Snapper's consistently high NPS rating (Snapper internal reporting, 2017-2018), they also demonstrate an ever-increasing expectation that self-service channels be made available (see Section 4.2.2), offering ever-easier ways to manage their Snapper cards and resolve common support issues. With the rapidly changing face of customer service across the board, customer expectations are being shaped by their interactions with a wide range of companies, not just Snapper.

Technology factors

The market analysis conducted throughout the project (see Section 4.2.4) clearly demonstrated the exponential growth of chatbot technology (see "Economic" factors). The impetus for Snapper to embrace this technology arises from the rapid rate at which the technology is evolving (and the increasing affordability and ease-of-implementation of this technology), as well as from the increasing customer expectation that customer service support be available when they need, where they need it (see "Social" factors).

This adoption is likely to continue at its current exponential trajectory, as the complexity of developing a chatbot reduces further. As conversational AI technology matures, several key changes are forecast. Natural Language Processors (NLPs) are becoming increasingly sophisticated (Zhang, 2018) while becoming easier to implement via a rapidly expanding range of third-party platforms (Phillips, 2018). Conversational AI is moving beyond a chatbot interface with companies exploring “digital assistants” (ANZ, n.d.), and voice services are becoming increasingly mainstream, as consumers interact via Alexa, Siri or Google Assistant (Lynch, 21 September, 2018).

Environmental factors

No environmental factors (e.g. environmental policies or climate change) were identified as impacting this project. While climate change concerns and resulting policies impact the public transport industry more broadly, as resulting policy provides greater support for sustainable transport; this has no immediate effect on Snapper or the proposed project.

Legal factors

As identified when considering political factors, legislation around security and privacy must be considered when developing or enhancing a product or service that deals with customer data. Snapper already has a strong focus on security, with regular internal and external reviews of their products.

In addition to following Snapper’s best practice for secure product development, this product will need to align with Snapper’s existing privacy commitments to their customers, outlined in the Terms of Use and Privacy Policy available on their site (Snapper Services Ltd., 2018a, 2018b). This privacy policy includes reference to the Privacy Act 1993 (New Zealand Parliamentary Counsel Office, 2019), which Snapper’s use of customer data must follow.

When identifying regulatory frameworks governing Snapper’s use of customer data, consideration must also be given to the Privacy Bill (Little, 20 March, 2018), now before Select Committee, which introduces reforms to the Privacy Act 1993. To reduce rework in the immediate future, Snapper should ensure that the planned use of customer data for this project aligns with these additional privacy requirements.

Although not directly relevant for Snapper's New Zealand offering, the GDPR legislation ('General Data Protection Regulation (GDPR) – Final text neatly arranged', n.d.) must also be a consideration for any products that may be leveraged for Snapper's EU-based clients in the future. Furthermore, legal experts suggest that these changes give insight into the direction that New Zealand privacy legislation is heading, and must, therefore, be considered by New Zealand businesses (Maasland, Mcmillan, & Allen, 2018). GDPR requirements not reflected in current New Zealand legislation or the planned reforms include the principles of data portability, the right of erasure, mandatory privacy impact assessments and explicit requirements around what constitutes consent.

6.3.4 Market validation through iterative development and deployment

Based on the competitor analysis, New Zealand businesses and consumers are increasingly receptive to conversational AI. Snapper can be confident that the market is growing for this technology, with demand increasing rapidly over the past 18 months, and new chatbots entering the market (see Section 4.2.4). Other essential industries are moving rapidly to offer chatbots as part of their channel mix, and there is increasing recognition within the transport industry that conversational AI is quickly becoming necessary to deliver on customer expectations of highly accessible, real-time customer service (Railway Technology, 2018). However, given the emerging nature of the technology, as well as the requirement for chatbots to be "taught" based on actual customer behaviour, early-stage customer feedback will be integral to the success of Snapper's chatbot.

Chatbots are commonly rolled out as a beta or trial, before launching a more fully fledged offering (see Section 4.2.4). In the words of Martijn Verhoeven, Founder of Prefer, "We encourage clients not to spend too much time puzzling over what might be, what could be, and instead to just get their chatbot out into the hands of customers, where they can respond to actual data about what people are asking, and improve the chatbot success rate very quickly." (personal communications with Snapper staff, November 2018). To leverage early-stage customer feedback, the recommendation is that Snapper release a Minimum Viable Product (MVP) as advocated by LEAN startup methodologies (Tokareva, 2018), clearly positioning this product as a trial, in order to manage customer expectations. The proposed feature set for this MVP is outlined in Section 6.4.2.

6.3.5 Market positioning

Historically, Snapper has introduced self-service channels as a supplement to their traditional service channels (Snapper Services Ltd, 2015), giving customers the choice of how they will manage their Snapper cards. Consistent with this approach, a Snapper chatbot should be positioned as an alternative to existing channels, rather than a replacement for the call centre and in-person support, at least in the short-term. Although virtual agent technology has the potential to eventually replace many of Snapper's customer service channels that require live agents (Schneider, 2017), Snapper has demonstrated a preference for allowing customers to migrate naturally towards their preferred channels. As discussed in Section 4.2.2, this approach has resulted in some customers continuing to rely on traditional channels out of habit, rather than because these channels align with their preferred ways of interacting with Snapper. To drive uptake of the chatbot, Snapper will require a go-to-market strategy (Friedman, 2002) that ensures that the product is highly visible to customers (see Section 6.5 for resources required for launch marketing and ongoing proactive customer communications).

When considering the positioning of the product during the early iterations, Snapper must consider how customer expectations will be managed, particularly during the trial phase. It will be critical to clearly position the trial phase as a “beta” product, with the aim of enhancing the product in future iterations based on learnings and customer feedback. Snapper has successfully used this approach previously, when trialling products such as Ridebank (Snapper Services Ltd., n.d.), to ensure that customer expectations are managed while making it clear that customer feedback is valued. Snapper staff described this approach as having been effective; resulting in highly engaged beta users who were understanding of product shortcomings or defects, and willing to provide give input on current and proposed product features.

6.4 Product validation and development

The market validation phase (see Section 6.3) demonstrated that there is unmet customer demand for better ways to manage their Snapper cards from self-service channels. Further work was then undertaken to assess product-market fit, or the degree to which the proposed product satisfies this strong market demand (Andreessen, 2007). An assessment of product-market fit commonly requires identifying the minimum viable product (MVP) that will address or solve a known problem or pain point (Tokareva, 2018). Following a SWOT analysis, core features required for an MVP were identified using the MoSCoW analysis prioritisation technique (Clegg & Barker, 1994)

6.4.1 SWOT Analysis

Building on the strengths and weaknesses identified in the PESTEL analysis conducted during the market validation phase, the following SWOT analysis was conducted to lay the foundation for product validation and development. The objective of this SWOT analysis was to determine whether a customer service chatbot should be developed, as Snapper’s first step towards conversational AI. Based on this objective; the SWOT analysis focussed on identifying strengths, weaknesses, opportunities and threats relating specifically to Snapper’s customer service offering; rather than the company more broadly.

Strengths

Snapper has a highly agile organisational structure (Mamoli, 2018), resulting in rapid time-to-market, even for complex or bespoke software development projects. As a small organisation, with a highly skilled development team, Snapper is able to respond quickly to project learnings and customer feedback (Snapper Services Ltd, 2015).

Snapper’s strengths also include their customer-centric culture, with a focus on delivering real value for their customers. Snapper has a demonstrated track record of working to understand their customers’ needs and wants (Snapper Services Ltd., 2017b). Continuously capturing ‘voice of customer’ insights is an embedded practice at Snapper, through the use of tools such as AskNicely to gather NPS data. This customer-centric culture means that Snapper is ideally positioned to benefit from iterative product releases, enabling customers to co-create value during the product development process.

Weaknesses

Having previously advocated an omni-channel service strategy (Cook, 2014), Snapper now offers a wide range of channels (see Section 4.2.1), including a call centre, in-person support centres, social media, email, and chat. Queries through these channels are handled by a range of support staff, ranging from external call centre employees or iSITE staff (for whom Snapper queries are a small part of their role), through to dedicated support staff based at Snapper head office. With such a wide range of channels and expertise levels, Snapper faces the challenge of delivering a consistent service experience across their channels (see Section 5.2.1).

Opportunities

Research findings also demonstrated that the majority of Snapper cardholder queries are simple and repetitive in nature, meaning they are ripe for automation (see Section 5.2.1). Only two query drivers were responsible for the vast majority of queries to traditional channels, accounting for 94% of service centre requests and 43% of call centre requests (see Section 4.2.1). A chatbot alternative does not need to be highly complex to be able to handle the majority of Snapper customer service queries, offering customers a better way of solving these same problems.

Threats

Unless Snapper continues to innovate, their current customer service offering will fail to deliver on evolving customer expectations (see “Social factors” identified in Section 6.3.3). Customer feedback received through AskNicely comments (see Section 4.2.2) and insights from in-depth interviews with Snapper cardholders (see Section 4.2.3) clearly highlight changing customer expectations in two areas. Firstly, customers expect highly accessible support, demanding that businesses offer the ability to do more from their mobile devices or online (Schneider, 2017). Secondly, regardless of which channel customers choose to access Snapper support through, they value responsiveness, and increasingly expect a real-time experience when seeking to resolve support issues (see Section 5.2.2).

6.4.2 Required feature-set for a chatbot MVP

In order to scope the MVP, possible features were noted based on the barriers to self-service identified during the customer research (see Section 6.3.1) and best practice for self-service identified during the competitor research (see Section 6.3.2). Using the insights gained from the customer research, features were then assessed against the Unique Value Proposition of “delivering a better customer experience to Snapper cardholders by reducing the cognitive, social and logistical effort required to resolve common support issues” (see Section 6.2.2). Feature priority was assigned using the MoSCoW analysis technique (Clegg & Barker, 1994) commonly used by Snapper during product scoping. In this way, it was possible to determine the smallest set of features required to deliver meaningful value to Snapper customers.

The “must have” features identified in this analysis (see Table 6.1) were considered to be the MVP, without which the product should not be launched. Based on Snapper’s agile approach to managing product roadmaps (Scrum.org, n.d.), the remaining features were allocated to the product backlog in order of priority, to be reviewed when scoping future iterations of the product.

To summarise the proposed core features, the recommendation is that a first iteration of this chatbot focuses simply on the most common informational queries from Snapper customers, meaning a shorter time-to-market. For the initial release, transactional queries (requiring that an action is taken against a Snapper card or account) can be addressed by including a deep link to the associated web or mobile application page, where these queries can be resolved through self-service. By excluding highly collaborative queries from the chatbot trial, and instead offering escalation pathways to live customer service agents, the chatbot can focus instead on effectively answering the repetitive queries currently placing Snapper’s traditional service channels under heavy load.

Implementing such a simple chatbot has several benefits. Firstly, it will reduce the upfront analysis required from Snapper to identify conversational flows for the bot, allowing them to focus on the known key areas driving the majority of customer service traffic (see Section 5.2.1). Secondly, this reduced time-to-market will allow Snapper to iterate based on actual customer feedback, rather than assumptions made prior to launch (see Section 6.3.4).

Table 6.1: MoSCoW prioritisation of proposed chatbot features

Priority	Feature	Detail
Must have	Available via web and mobile devices	Accessible from snapper.co.nz
Must have	Conversational maturity via appropriate natural language processor (NLP)	Able to understand context Able to identify user intent to provide accurate responses for high volume queries, and to suggest options to clarify user intent when required Able to respond in Snapper tone
Must have	Informational query handling	Able to provide accurate answers in response to frequently asked questions
Must have	Transactional query handling (deep links to web/app pages)	Directing users to existing self-service options for transactional queries
Must have	Escalation pathway to live agent	Customers can reach a customer service agent if the chatbot is unable to assist
Must have	Live agent takeover	Customer service agents can intervene via chat if the chatbot is not resolving the customer's query
Must have	Content Management System (CMS)	Snapper staff can review and update bot scripts via admin console
Must have	Customer feedback metrics	System captures key metrics required to measure customer satisfaction, such as Customer Effort Score
Must have	Monitoring and tracking	System tracks customer engagement with the tool, e.g. through Google Analytics
Should have	Accessible via Snapper's native mobile applications	Snapper's existing Android and iOS applications
Should have	Transactional query handling (integration with Snapper systems allowing for account management)	Allowing users to resolve transactional queries within the chat channel
Should have	Reporting dashboard	Snapper staff can view customer engagement and satisfaction metrics via admin console
Could have	Accessible via third party platforms	Deploying chatbot to social channels, e.g. Facebook Messenger
Could have	Sentiment analysis	Early identification of dissatisfied customers during a chatbot interaction, triggering live agent takeover (intervention by customer service staff)
Won't have	Machine learning	Based on discussion with Snapper staff, unable to justify the development costs based on the highly routine nature of the majority of Snapper's customer service traffic

6.4.3 Development and testing process

The development strategy assumes a highly iterative approach, drawing from LEAN startup methodologies (Ries, 2011a) and the agile practices used by Snapper development teams (Mamoli, 2018). This approach was further validated in the market analysis phase (see Section 6.3.2), based on competitor analysis of successful chatbot implementations, and recommendations from leading chatbot providers. The proposed development plan includes two product iterations scoped in detail, followed by a pause/pivot/persevere assessment, before reviewing the product backlog to scope future iterations.

Release 1: Chatbot trial (beta) - 4 weeks

The beta phase of chatbot trial requires the shortest possible path to market, with the least risk to Snapper's brand. In order to facilitate this, an off-the-shelf 'plug and play' solution can be utilised, allowing Snapper staff to familiarise themselves with the technology and the process of 'mentoring' a chatbot. For this beta phase, the chatbot will be 'soft launched' rather than promoted via proactive customer communications, and must be clearly identified as a trial or beta product. The bot will be accessible via snapper.co.nz subpages, to target a specific subset of users experiencing common informational queries, e.g. those using concessions (discount fares) or travel passes on their Snapper cards. By focussing on a subset of Snapper customers who frequently need to contact customer support, Snapper can validate the product while ensuring that the beta users are relatively contained. This will reduce any impact to the overall customer base and limit Snapper's reputational risk, if the trial is not an immediate success, or needs to be paused and modified in any way. A soft launch targeting a subset of users will help to ensure that query volumes via the chatbot remain low immediately following launch, allowing Snapper customer service staff to closely monitor the chatbot interactions and intervene if required. This monitoring will allow Snapper to iterate on the chatbot content quickly, updating conversational flows in response to chatbot failures.

While it has been proposed that this stage of the trial run for 4 weeks, this will need to be assessed based on the proportion of queries that the chatbot is able to answer correctly at the end of this timeframe. If there have not been enough chatbot interactions to provide sufficient feedback on the initial conversational flows (as indicated by a marked improvement in the chatbot's ability to successfully resolve queries), this phase may need to be extended.

Release 2: Chatbot trial (alpha) - 8 weeks

Following the beta phase, Snapper will be equipped with conversational flows for a subset of their customer base, be familiar with the process of managing chatbot content, and have greater confidence in the ability of the chatbot to resolve common queries for these customers. The chatbot alpha will then apply learnings from the beta phase to expand this query set to cover additional conversational flows, gathering structured data about how customers engage with Snapper customer service. This data will provide Snapper with much greater insight than their current customer care reporting, or website/mobile app analytics. In the words of Matthew Bartlett, co-founder of Citizen AI, “a key benefit of the chatbot model is that unlike with a website, where there’s quite a lot of guesswork with what people are wanting to do, with a chatbot, they ask for exactly what they want” (Webster, 2018).

The chatbot alpha will focus on the high-volume queries driving the majority of Snapper’s customer service traffic (see Section 5.2.1). The chatbot will be able to provide answers to common informational queries, and link users directly to the relevant self-service channels for transactional queries (or preferred digital channels, for transactional queries where a self-service channel is not yet available). Based on the repetitive nature of the query drivers identified for Snapper’s existing support channels, along with indicative timeframes for chatbot training provided by local chatbot providers Theta and Prefer in discussions with Snapper staff, it is expected that by the conclusion of the alpha phase, the chatbot will be able to successfully resolve a high proportion (>60%) of customer queries.

Future releases (product backlog)

Following the successful completion of the trial phase, a pause/pivot/persevere assessment should be conducted (Ries, 2011b). This LEAN methodology tool is currently used by Snapper during new product development to reflect on whether enough progress has been demonstrated to continue on the current trajectory. Alternatively, enough evidence may have been gathered to challenge project assumptions and justify a change in approach (a ‘pivot’), or to discontinue the project entirely. If the project is demonstrating high levels of customer satisfaction and engagement following this assessment, based on the Key Metrics identified in the LEAN Canvas business model (see Section 6.2.2), the product backlog will be reviewed to scope further iterations.

Future iterations of the chatbot may include integration with Snapper APIs to handle transactional queries, leveraging voice services for integration with Alexa and Siri, or the use of machine learning to reduce reliance on Snapper staff members to continue updating or mentoring the chatbot. The roadmap for conversational artificial intelligence at Snapper must also consider the channels over which this offering will be made available. While it is recommended that the first implementation of the Snapper customer service chatbot be available across a single channel, there is scope to make a more advanced version of the chatbot available across a range of Snapper products and channels; including social media, web and mobile applications.

6.4.4 Regulatory process

While the introduction of a chatbot offering does not substantially alter Snapper's legal and compliance obligations, a number of considerations were identified in the PESTEL analysis (see Section 6.3.3). Data privacy and security form the main risk around a digital service offering, and Snapper must continue to actively monitor their obligations in this area, by being aware of regulations impacting their New Zealand and off-shore customer base, as well as changing security requirements from third-party platform providers such as Google.

Intellectual property must also be considered, with the intellectual property for this innovation existing in two key areas. Firstly, Snapper's customer service knowledge base, which is managed across a range of knowledge base tools, including the call centre knowledge base (owned by the external call centre, and managed by Snapper customer service staff) and Snapper's internal wiki (hosted on Sharepoint). Snapper aims to take a “self-service first” approach to their knowledge management, aiming to equip customers with the same knowledge their customer service staff are armed with, wherever possible. As such, this intellectual property is already widely available (through information available on snapper.co.nz), and does not need protection. Secondly, the chatbot technology utilised for this service offering may require protection.

While the recommendation is that Snapper utilises an off-the-shelf solution for the initial trial phase, future iterations of the Snapper customer service chatbot may necessitate custom development, requiring Snapper to take steps to secure their intellectual property. While software cannot generally be patented in New Zealand (Ayyagari, 2017), Snapper's proprietary software can be protected by copyright (Ayyagari, 2017; Sumpter, 2015), and by continuing to follow best practice steps for protecting their code; such as through network security, access control, and obfuscation of source code (Grimes, 2014).

6.5 Resource requirements and returns

Based on the phased implementation recommended above, this section outlines the resources required for the development of the initial MVP (the alpha and beta trial phases), alongside the expected returns. The resources and skills required for the development of a chatbot, in order to provide cost estimates for the trial phases. The internal resources required for each phase have been identified by discipline, along with estimates for the time required. Estimates have been provided for external resource or direct project costs. In order to provide an indication of the return on investment, cost savings have been forecast for the first year of the chatbot. Assumptions used in this forecasting have been clearly identified, allowing these projections to be refined based on learnings from the beta phase before further investment is required.

6.5.1 Internal resources required for the product trial (hours per discipline)

Based on the scope identified for the MVP and the proposed development process, the skills required for the project team have been identified (see Table 6.2). Following the structure used by Snapper's project inception documentation, these internal costs have been estimated in hours, based on consultation with Snapper staff.

Table 6.2: Internal resources required for the product trial by phase

Skill	Detail	Hours required per phase
Data analysis	Identifying common queries	8 (prior to go-live)
Content writing	Drafting conversational flows based on common queries.	40 (prior to go-live)
Technical validation	Identifying preferred chatbot platform, based on required features and future roadmap. Prototyping / configuring preferred option to validate ease of integration with Snapper systems.	40 (prior to go-live)
Project management	Finalising project costs and scope following selection of preferred chatbot platform.	8 (prior to go-live)
Supervising chatbot (customer service)	Supervising chatbot conversations and live takeover as required	80 (15-25 hours per week during beta)
Mentoring chatbot during beta (data analysis and content writing)	Analysis of chatbot success/failure rates Monitoring customer satisfaction and engagement Updating conversational flows based on customer interactions	40 (10 hours per week during beta)
Mentoring chatbot during alpha (data analysis and content writing)	Analysis of chatbot success/failure rates Monitoring customer satisfaction and engagement Updating conversational flows based on customer interactions	90 (15 hours per week during alpha)
Marketing communications	Proactive customer communications to increase awareness of chatbot trial	25 (during alpha)
Ongoing chatbot support (data analysis and content writing)	Analysis of chatbot success/failure rates Monitoring customer satisfaction and engagement Updating conversational flows based on customer interactions	8 hours per week

6.5.2 External costs required for the product trial

As a key aim of this project is to ensure rapid time-to-market, the recommendation is to use third-party natural language processor and bot platform for the trial phase, such as the FAQbot offered by local provider Theta. If off-the-shelf solutions are not considered feasible following the technical validation phase, an alternative could be scoped. This would require exploring the development costs of building a bespoke chatbot utilising a third-party natural language processor, such as Amazon Lex (the NLP offered by Snapper's preferred hosting provider).

While external costs for this project depend on the complexity of the tool chosen, and in some cases, the uptake of the tool (with costs based on the number of API calls, or queries per month), the following costs have been provided as a guide for Snapper management, based on industry norms (see Table 6.3). As noted above, a technical validation phase is recommended, during which these options can be explored and prototyped, and projected costs can be validated.

Table 6.3: External costs required for the product trial

Resource	Detail	Cost
Chatbot platform	Options include local providers such as Theta's FAQbot (https://www.faqbot.nz/) or popular US-based platforms such as Twyllo (https://www.twyla.ai/)	\$50 - \$500 / month
Chatbot consulting	Training workshop and support for Snapper staff from Wellington-based industry experts such as Prefer (https://prefer.nz/), providing guidance on chatbot management and chatbot content-writing	\$1,800 (10 hours * \$180 / hr)
TOTAL COSTS	Projected cost range for first year	\$2,400 - \$7,800

6.5.3 Projected product returns

The projected product returns were calculated by multiplying the average cost-per-contact (Snapper internal reporting, 2018) for a query via a traditional service channel, by the number of queries expected to be directed to the chatbot (see Table 6.5). These projections make two assumptions, which are likely to be challenged during the chatbot beta, as there are still unknowns around which customers are most likely to switch to this new channel, and the speed with which this adoption will take place.

Firstly, the use of the average cost-per-contact assumes that customers interacting with the chatbot have been redirected from alternative channels in equal proportions. As the cost-per-contact varies significantly across Snapper's channels, the return on investment will be significantly higher if Snapper is able to direct more queries away from their call centre, as compared to channels with a lower cost-per-contact. This assumption can be validated during the trial phases using the Key Metrics; to understand what impact the chatbot product is having on query volumes via traditional channels and whether this impact is equally distributed across the channels. Secondly, these projections assume steadily increasing chatbot interactions. Both the volume of queries, and the rate at which these are forecast to increase, will be monitored during the trial, ensuring that the proactive communications are giving customers high awareness of this new channel offering.

The average cost-per-contact was estimated based on direct costs for external customer service, and approximate costs for internal staff based on their estimates of time required to resolve each query type (following discussions with Snapper customer service teams). This indicated an average cost-per-contact across Snapper's channels of $4 per contact (see Table 6.4), which was validated through comparison to industry standards (Curtis Barry, n.d.).

The forecast volume of chatbot queries was approximated based on query volumes received via Apptentive chat feedback. This channel was chosen as a conservative benchmark as it represents one of Snapper's lowest volume channels, and is the channel offering an experience most similar to a chatbot. These projects assume that channel uptake will increase by 20% per quarter (see Figure 6.1), but this assumption can be refined based on actual engagement data early on in the trial.

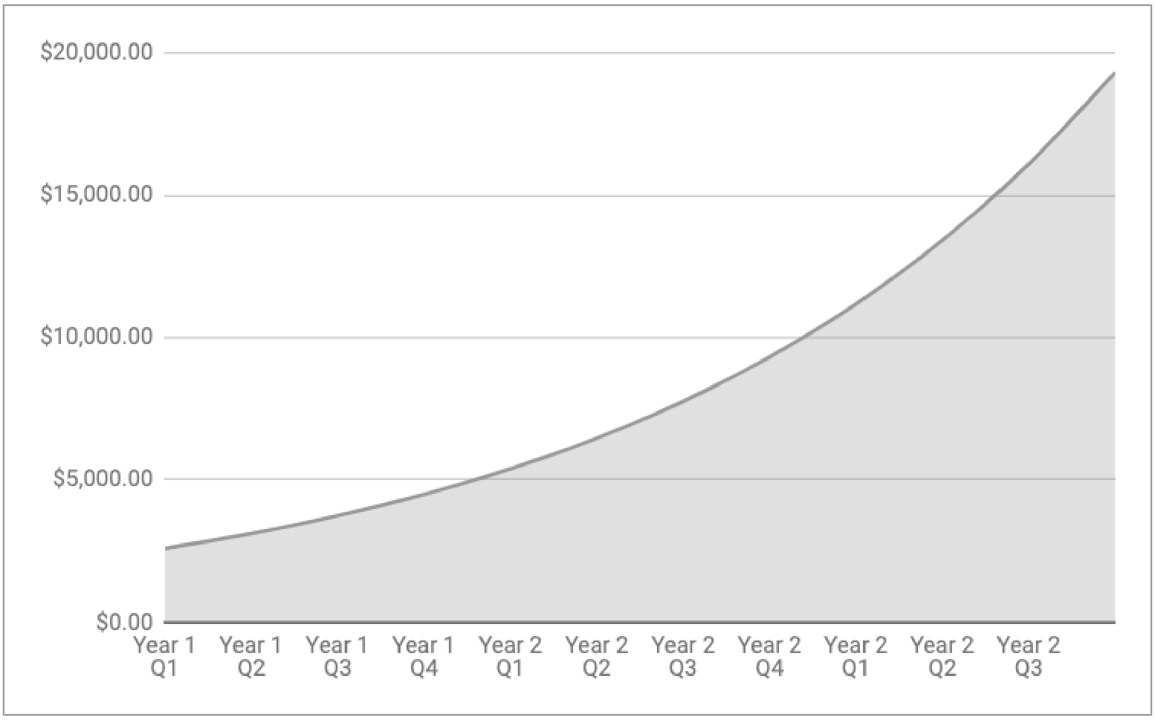
Table 6.4: Average cost-per-contact across existing support channels

Channel	Cost-per-contact (approximated)
Call centre - phone	$3
Call centre - email	$5
In-person support via head office	$6
Digital support via head office (social media, Apptentive, email)	$2
Average cost per contact	$4

Table 6.5: Projected project returns per quarter across first year

	Year 1 Q1	Year 1 Q2	Year 1 Q3	Year 1 Q4
Forecast no. of chatbot queries	$650.00	$780.00	$936.00	$1,123.20
Average cost-per-contact via current channels	$4.00	$4.00	$4.00	$4.00
Projected returns	$2,600.00	$3,120.00	$3,744.00	$4,492.80

Figure 6.1: Projected project returns across three years



6.6 Summary

This chapter presented a business case for the development of a customer service chatbot, drawing on the research findings discussed in the project report to outline the key decisions made during the market and product validation phases. Utilising PESTEL and SWOT analysis tools, the chapter provided clear recommendations for Snapper management to embrace the opportunity presented by disruptive AI technologies. To further validate product-market fit, and reduce the risk for Snapper, a highly iterative approach was recommended, allowing Snapper customers to co-create value during the product development. The business case outlined the proposed scope, timeframes, resources and requirements for a chatbot trial; clearly identifying the assumptions to be validated during this trial, before considering further investment in this technology. The proposed solution provides a rapid path-to-market, designed to give Snapper an opportunity to further validate the commercial viability of conversational AI to enhance their customers' service experience.

7.0 Conclusion

The following chapter provides a summary of the main takeaways from the research, and the project itself. The wider implications of the research findings are noted, including avenues for future research. Having discussed the broader relevance of the project findings, next steps for the project partner are identified, giving a view as to the future of the project.

7.1 Research implications

The research utilised a mixed methods approach, beginning with analysis of secondary data accessed from Snapper's internal customer service reporting. Findings validated customer demand for additional self-service options, as well as the repetitive nature of Snapper's customer service queries, indicating that these are ripe for automation. In-depth interviews conducted with Snapper cardholders gave further insight into how they select and interact with Snapper's customer service channels.

When explaining how customers navigate service channels, the avoidance of perceived effort was identified as a key theme, supporting the role of "ease of use" in explaining customer adoption of self-service technologies (Davis et al., 1989). Types of perceived effort were identified as social, cognitive and logistical effort. These categories were proposed as an extension to the Technology Acceptance Model (Davis et al., 1989), as antecedents of "perceived ease of use". While the addition of these factors to the TAM (see Section 4.2.3) goes some way to addressing the lack of practical application in the current model, future research could seek to further validate the role of these factors (see Section 5.5.2).

7.2 Project implications

Following the in-depth interviews, market analysis and discussions with AI and chatbot service providers explored best practice in automated customer service, to understand the adoption of conversational AI technology in the New Zealand context, as well as how other companies have successfully implemented a chatbot product. These findings highlighted the rapid growth of chatbot technology, with an increasing business interest in this technology. While natural language processors (NLPs) are becoming increasingly sophisticated, a growing range of chatbot platforms offers cost-effective options for implementing conversational AI with minimal development time.

The wider implications of this exponential technology have relevance far beyond the public transport industry. While conversational AI presents a significant opportunity to businesses facing challenges with delivering consistent customer service experiences at scale, the technology conversely presents a threat to these same businesses. As early movers find a source of competitive advantage in their rapid adoption of this technology, businesses who fail to adapt will struggle to compete.

While much remains unknown about the speed with which customers will adopt this technology, it is clear that conversational AI needs to have a place on Snapper's customer service roadmap, to ensure the business is positioned to adapt quickly to the changing face of customer service. As a first step towards a conversational AI offering, the business case provided alongside the project report proposes a chatbot trial, designed to provide valuable data and insights to the business. The development strategy assumes an iterative a rapid path-to-market, providing Snapper with an opportunity to further validate the commercial viability of using conversational AI to enhance their customers' service experience.

The proposed business case presents an opportunity for Snapper to lead the way in meeting customer demand for a faster, more accessible way to resolve common support issues. The successful development of a customer service chatbot will further position Snapper as a market-leader in customer-centric innovation.

References

Aarntzen, R. (2016). *The Use of Frameworks in Business Model Development*. University of Twente. Retrieved from http://essay.utwente.nl/70784/1/Aarntzen_MA_BMS.pdf

Adler, C., Goode, L., Newman, L. H., Marshall, A., Martineau, P., Crawford, S., & Allain, R. (2011, August 30). Ideas Are Overrated: Startup Guru Eric Ries' Radical New Theory. *Wired*. Retrieved from https://www.wired.com/2011/08/st-qareis/

Aguilar, F. J. (1967). *Scanning the business environment*. Macmillan.

Air New Zealand. (2017a, February 2). Meet Oscar, Air New Zealand's Artificial Intelligence–backed chatbot. Retrieved 10 December 2018, from https://www.airnewzealand.co.nz/press-release-2017-oscar-airnz-chatbot

Air New Zealand. (2017b, October 13). Air New Zealand's AI chatbot Oscar says g'day to Australia - Media releases. Retrieved October 2018, from https://www.airnewzealand.co.nz/press-release-2017-air-nz-chatbot-oscar-gday-australia

Air New Zealand. (2018, February 2). Air New Zealand's chatterbot Oscar turns one - Media releases. Retrieved October 2018, from https://www.airnewzealand.co.nz/press-release-2018-air-nz-chatterbot-oscar-turns-one

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

Altshuller, G., Al'tov, G., & Altov, H. (1996). *And Suddenly the Inventor Appeared: TRIZ, the Theory of Inventive Problem Solving*. Technical Innovation Center, Inc.

Andreessen, M. (2007). The Pmarca Guide to Startups, part 4: The Only Thing that Matters. Retrieved from http://blog.pmarca.com/2007/06/the-pmarca-gu-2.html

ANZ. (n.d.). Talk to Jamie, ANZ's Digital Assistant | ANZ. Retrieved 6 January 2019, from https://www.anz.co.nz/promo/digital-assistant/

Ayyagari, D. S. (2017, August 11). Securing software patents in New Zealand. Retrieved 11 January 2019, from https://www.baldwins.com/news/software-patents-in-new-zealand

Bagozzi, R. P., & Warshaw, P. R. (1990). Trying to Consume. *The Journal of Consumer Research*, *17*(2), 127–140.

Baig, E. C., Stepanek, M., & Gross, N. (1999). Privacy: The Internet wants your personal info. *What's in It for You*.

Bateson, J. E. (1985). Self-service consumer: An exploratory study. *Journal of Retailing*. Retrieved from http://psycnet.apa.org/record/1986-28840-001

BBC methods and tools | The Treasury New Zealand. (n.d.). Retrieved 7 December 2018, from https://treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/better-business-cases-bbc/bbc-methods-and-tools

Beckman, S. L., & Barry, M. (2007). Innovation as a Learning Process: Embedding Design Thinking. *California Management Review*, *50*(1), 25–56.

Berry, L. L., Seiders, K., & Grewal, D. (2002). Understanding Service Convenience. *Journal of Marketing*, *66*(3), 1–17.

Betz, F. (2002). Strategic Business Models. *Engineering Management Journal*, *14*(1), 21–28.

Bitner, M. J., Ostrom, A. L., & Morgan, F. N. (2008). Service Blueprinting: A Practical Technique for Service Innovation. *California Management Review*, *50*(3), 66–94.

Blank, S. (2005). The four steps to the epiphany: successful strategies for product that win. *Published by K & S Ranch*.

Bobbitt, L. M., & Dabholkar, P. A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service: The Internet as an illustration. *International Journal of Service Industry Management*, *12*(5), 423–450.

Bortolotti, T., & Romano, P. (2012). 'Lean first, then automate': a framework for process improvement in pure service companies. A case study. *Production Planning & Control*, *23*(7), 513–522.

Bower, J. L., & Christensen, C. M. (1995). Disruptive technologies: catching the wave. Retrieved from http://danieldalonzo.com/wp-content/uploads/2015/05/disruptive-technologies-catching-the-wave-christensen.pdf

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Brown, L. G. (1989). The Strategic and Tactical Implications of Convenience in Consumer Product Marketing. *Journal of Consumer Marketing*, *6*(3), 13–19.

Brown, T. (2009). Change by design. Retrieved from http://bsili.3csn.org/files/2013/06/change-by-design-brown-e.pdf

Brown, T., & Wyatt, J. (2010). Design thinking for social innovation. *Development Outreach*, *12*(1), 29–43.

Bryman, A., & Bell, E. (2015). *Business Research Methods*. Oxford University Press, USA.

Carline, M. (2007). Competitive advantage: consumers are more ready for kiosks than operators. *Executive Summary of Hospitality Industry Self-Service Technology Study*.

Chang, H.-L., & Yang, C.-H. (2008). Do airline self-service check-in kiosks meet the needs of passengers? *Tourism Management*, *29*(5), 980–993.

Chen, M., Chang, K., Hsu, C., & Yang, I. (2011). Understanding the relationship between service convenience and customer satisfaction in home delivery by Kano model. *Asia Pacific Journal of Marketing and Logistics*, *23*(3), 386–410.

Christensen, C. M., Anthony, S. D., & Roth, E. A. (2004). *Seeing What's Next: Using the Theories of Innovation to Predict Industry Change*. Harvard Business Press.

Christensen, C. M., Baumann, H., Ruggles, R., & Sadtler, T. M. (2006, December 1). Disruptive Innovation for Social Change. *Harvard Business Review*. Retrieved from https://hbr.org/2006/12/disruptive-innovation-for-social-change

Christensen, C. M., Hall, T., Dillon, K., & Duncan, D. S. (2016, September 1). Know Your Customers' 'Jobs to Be Done'. *Harvard Business Review*. Retrieved from https://hbr.org/2016/09/know-your-customers-jobs-to-be-done

Christensen, C. M., & Raynor, M. E. (2003). *The Innovator's Solution*. Harvard Business Press.

Clegg, D., & Barker, R. (1994). *Case Method Fast-Track: A Rad Approach*. Boston, MA, USA: Addison-Wesley Longman Publishing Co., Inc.

Clulow, V., & Reimers, V. (2009). How do consumers define retail centre convenience? *Australasian Marketing Journal (AMJ)*, *17*(3), 125–132.

Cohen, J. (2010, July 19). Real Unfair Advantages. Retrieved 10 January 2019, from https://blog.asmartbear.com/unfair-advantages.html

Collier, J. E., & Sherrell, D. L. (2010). Examining the influence of control and convenience in a self-service setting. *Journal of the Academy of Marketing Science*, *38*(4), 490–509.

Constantin, J. A., & Lusch, R. F. (1994). *Understanding resource management: How to deploy your people, products, and processes for maximum productivity*. Irwin Professional Pub.

Cook, G. (2014). Customer experience in the omni-channel world and the challenges and opportunities this presents. *Journal of Direct, Data and Digital Marketing Practice*, *15*(4), 262–266.

Corley, K. G., & Gioia, D. A. (2011). Building Theory about Theory Building: What Constitutes a Theoretical Contribution? *AMRO*, *36*(1), 12–32.

Cunningham, L. F., Young, C. E., & Gerlach, J. H. (2008). Consumer views of self-service technologies. *The Service Industries Journal*, *28*(6), 719–732.

Curtis Barry, F. (n.d.). Managing Your Cost Per Call. Retrieved 11 January 2019, from https://www.fcbco.com/articles-and-whitepapers/articles/bid/129578/managing-your-cost-per-call

Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing*, *13*(1), 29–51.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, *35*(8), 982–1003.

Demil, B., & Lecocq, X. (2010). Business Model Evolution: In Search of Dynamic Consistency. *Long Range Planning*, *43*(2), 227–246.

Desouza, K. C., Awazu, Y., Jha, S., Dombrowski, C., Papagari, S., Baloh, P., & Kim, J. Y. (2008). Customer-Driven Innovation. *Research-Technology Management*, *51*(3), 35–44.

Dixon, M., Freeman, K., & Toman, N. (2010, July 1). Stop Trying to Delight Your Customers. *Harvard Business Review*. Retrieved from https://hbr.org/2010/07/stop-trying-to-delight-your-customers

Drucker, P. F. (1985). The discipline of innovation. *Harvard Business Review*, *63*(3), 67–72.

Drucker, P. F. (2011). *Innovation and entrepreneurship*. New York, NY, United States: HarperCollins Publishers.

Drucker, P. F., & Noel, J. L. (1986). Innovation and Entrepreneurship: Practices and Principles. *The Journal of Continuing Higher Education*, *34*(1), 22–23.

Duarte, P., Costa e Silva, S., & Ferreira, M. B. (2018). How convenient is it? Delivering online shopping convenience to enhance customer satisfaction and encourage e-WOM. *Journal of Retailing and Consumer Services*, *44*, 161–169.

Evans, G. (2018, July 17). Trustpower plans further automation as it targets greater savings. *The New Zealand Herald*. Retrieved from https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12090618

Facebook. (2018). Messenger Platform - Documentation. Retrieved 4 December 2018, from https://developers.facebook.com/docs/messenger-platform/

Fielt, E. (2014). Conceptualising business models: definitions, frameworks and classifications. *Journal of Business Models*, *1*(1), 85–105.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Addison Wesley Publishing Company.

Forman, A. M., & Sriram, V. (1991). The Depersonalization of Retailing: Its Impact on The 'Lonely' Consumer. *Journal of Retailing*, *67*(2), 226–243.

Friedman, L. G. (2002). *Go-to-market Strategy: Advanced Techniques and Tools for Selling More Products, to More Customers, More Profitably*. Routledge.

García-Fernández, J., Gálvez-Ruíz, P., Fernández-Gavira, J., Vélez-Colón, L., Pitts, B., & Bernal-García, A. (2018). The effects of service convenience and perceived quality on perceived value, satisfaction and loyalty in low-cost fitness centers. *Sport Management Review*, *21*(3), 250–262.

Gardner, D. G., Dukes, R. L., & Discenza, R. (1993). Computer use, self-confidence, and attitudes: A causal analysis. *Computers in Human Behavior*, *9*(4), 427–440.

General Data Protection Regulation (GDPR) – Final text neatly arranged. (n.d.). Retrieved 10 January 2019, from https://gdpr-info.eu/

Gillett, P. L. (1976). In-Home Shoppers. An Overview. *Journal of Marketing*, *40*(4), 81–88.

Gould, S. J., Houston, F. S., & Mundt, J. N. (1997). Failing to try to consume: a reversal of the usual consumer research perspective. *ACR North American Advances*, *24*(1), 211–216.

Green, H. (2009, February 19). How Amazon Aims to Keep You Clicking. *Bloomberg News*. Retrieved from https://www.bloomberg.com/news/articles/2009-02-18/how-amazon-aims-to-keep-you-clicking

Grimes, R. A. (2014, April 1). Protect your source code before it's too late. Retrieved 11 January 2019, from https://www.csoonline.com/article/2610857/security/protect-your-source-code-before-it-s-too-late.html

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods*, *18*(1), 59–82.

Hackley, C. E. (1998). Social constructionism and research in marketing and advertising. *Qualitative Market Research: An International Journal*, *1*(3), 125–131.

Hamel, G. (2000). *Leading the revolution*. Boston, MA: Harvard Business School Press.

Heikkilä, S. (2014). *Mobility as a service-a proposal for action for the public administration, Case Helsinki* (Master of Science in Technology). (S. H. Ville Lehmuskoski, Ed.). Aalto University. Retrieved from https://aaltodoc.aalto.fi/handle/123456789/13133

Heinonen, K., & Strandvik, T. (2015). Customer-dominant logic: foundations and implications. *Journal of Professional Services Marketing*, *29*(6/7), 472–484.

Heinonen, K., Strandvik, T., Mickelsson, K.-J., Edvardsson, B., Sundström, E., & Andersson, P. (2009). Rethinking service companies' business logic: do we need a customer-dominant logic as a guideline? Retrieved from https://helda.helsinki.fi/dhanken/handle/10227/486

Heinonen, K., Strandvik, T., Mickelsson, K.-J., Edvardsson, B., Sundström, E., & Andersson, P. (2010). A customer-dominant logic of service. *Journal of Service Research*, *21*(4), 531–548.

Heinonen, K., Voima, P., & Strandvik, T. (2010). Exploring customer value formation: a customer dominant logic perspective. Retrieved from https://helda.helsinki.fi/dhanken/handle/10227/630

Hilton, T., & Hughes, T. (2013). Co-production and self-service: The application of Service-Dominant Logic. *Journal of Marketing Management*, *29*(7-8), 861–881.

Hoehle, H. (2011). *Consumer Intentions to Use Electronic Banking Channels: The Role of Task-Channel Fit* (Information Systems). Victoria University of Wellington. Retrieved from http://researcharchive.vuw.ac.nz/handle/10063/1643

Hoffmann, F. E. G. (2013). *Visual Business Model Ideation* (Management). University of St. Gallen.

Holmlid, S. (2009). Interaction design and service design: Expanding a comparison of design disciplines (Vol. 0). Stockholm: The Institute of Technology. Linköping University, Department of Computer and Information Science, MDI - Interaction and Service Design Research Group. Retrieved from http://nordes.org/opj/index.php/n13/article/view/157/0

Hoyer, W. D. (1984). An Examination of Consumer Decision Making for a Common Repeat Purchase Product. *The Journal of Consumer Research*, *11*(3), 822–829.

Jia, L., Xue, G., Fu, Y., & Xu, L. (2018). Factors affecting consumers' acceptance of e-commerce consumer credit service. *International Journal of Information Management*, *40*, 103–110.

Jones, J. M., & Vijayasarathy, L. R. (1998). Internet consumer catalog shopping: findings from an exploratory study and directions for future research. *Internet Research*, *8*(4), 322–330.

Jurevicius, O. (2013, February 13). Pest & pestel analysis. Retrieved October 2018, from https://www.strategicmanagementinsight.com/tools/pest-pestel-analysis.html

Kaura, V. (2013a). Antecedents of customer satisfaction: a study of Indian public and private sector banks. *International Journal of Bank Marketing*, *31*(3), 167–186.

Kaura, V. (2013b). Service Convenience, Customer Satisfaction, and Customer Loyalty: Study of Indian Commercial Banks. *Journal of Global Marketing*, *26*(1), 18–27.

Klobas, J. E. (1993). So why do people use online? An investigation of discretionary use of electronic information resources. Presented at the Online Information 93: 17th International Online Information Meeting, London, England. Retrieved from http://researchrepository.murdoch.edu.au/id/eprint/23387/

Langeard, E. (1981). *Services marketing: new insights from consumers and managers*. na.

Linder, J. (2000). *Changing business models: Surveying the landscape*.

Little, A. Privacy Bill 34-1 (2018), Pub. L. No. 34-1 (20 March, 2018). Retrieved from http://www.legislation.govt.nz/bill/government/2018/0034/latest/versions.aspx

Lockwood, T. (2010). *Design thinking: Integrating innovation, customer experience, and brand value*. Skyhorse Publishing, Inc.

Lynch, D. (21 September, 2018). Driving strategy change with a customer-centric approach to ticketing - Intelligent Transport. Retrieved 4 December 2018, from https://www.intelligenttransport.com/transport-articles/71936/driving-strategy-change-with-a-customer-centric-approach-to-ticketing/

Maasland, T., Mcmillan, S., & Allen, A. (2018, June 14). Privacy Law Reform and EU's General Data Protection Regulation. Retrieved 10 January 2019, from https://www.legalwiseseminars.co.nz/news/privacy-bill-and-data-protection/

Madhavaram, S., & Hunt, S. D. (2008). The service-dominant logic and a hierarchy of operant resources: developing masterful operant resources and implications for marketing strategy. *Journal of the Academy of Marketing Science*, *36*(1), 67–82.

Magretta, J. (2002). Why business models matter. *Harvard Business Review*, *80*(5), 86–92, 133.

Mamoli, S. (2018, March 3). Holacracy for Humans. Retrieved 7 December 2018, from https://www.infoq.com/articles/holacracy-humans

Maurya, A. (2010). How to document your Business Model on 1 page. *Saatavilla: Https://blog. Leanstack. Com/how-to-Document-Your-Business-Model-on-1-pagea6c91ab73efd. Viitattu*, *3*, 2017.

Maurya, A. (2012, February 27). Why Lean Canvas vs Business Model Canvas? – Love the Problem. Retrieved 5 December 2018, from https://blog.leanstack.com/why-lean-canvas-vs-business-model-canvas-af62c0f250f0

Meuter, M. L., & Bitner, M. J. (1998). Self-service technologies: extending service frameworks and identifying issues for research. In *American Marketing Association. Conference Proceedings* (Vol. 9, p. 12). American Marketing Association.

Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters. *Journal of Marketing*, *64*(3), 50–64.

Mick, D. G., & Fournier, S. (1998). Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies. *The Journal of Consumer Research*, *25*(2), 123–143.

Momani, A. M., & Jamous, M. (2017). *The Evolution of Technology Acceptance Theories*. Retrieved from https://papers.ssrn.com/abstract=2971454

Morelli, N. (2006). Developing new product service systems (PSS): methodologies and operational tools. *Journal of Cleaner Production*, *14*(17), 1495–1501.

Morgan, B. (2015, January 19). 5 Tips to Move From Transactional to Meaningful Customer Relationships. *Forbes Magazine*. Retrieved from https://www.forbes.com/sites/blakemorgan/2015/01/19/moving-from-transactional-to-meaningful-customer-relationships/

Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of Business Research*, *58*(6), 726–735.

Narteh, B. (2015). Perceived service quality and satisfaction of self-service technology: The case of automated teller machines. *International Journal of Quality & Reliability Management*, *32*(4), 361–380.

Naumov, M. (2018, April 23). 5 Predictions On The Future Of Customer Service. *Forbes Magazine*. Retrieved from https://www.forbes.com/sites/mikhailnaumov/2018/04/23/5-predictions-on-the-future-of-customer-service/

New Zealand Parliamentary Counsel Office. (2019, January 4). Privacy Act 1993 No 28 (as at 26 November 2018), Public Act Contents. Retrieved 10 January 2019, from http://www.legislation.govt.nz/act/public/1993/0028/latest/DLM296639.html

Nicereply.com. (2018, January 31). The Definitive 2018 Guide to Customer Effort Score. Retrieved 4 December 2018, from https://www.nicereply.com/blog/customer-effort-score-guide/

Oh, H., Jeong, M., & Baloglu, S. (2013). Tourists' adoption of self-service technologies at resort hotels. *Journal of Business Research*, *66*(6), 692–699.

Oh, H., Jeong, M., Lee, S., & Warnick, R. (2016). Attitudinal and situational determinants of self-service technology use. *Journal of Hospitality & Tourism Research*, *40*(2), 236–265.

Orsdemir, A., Deshpande, V., & Parlakturk, A. K. (2015). Is Servicization a Win-Win Strategy? Profitability and Environmental Implications of Servicization. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2679404

Osterwalder, A. (2004). The business model ontology: A proposition in a design science approach. Retrieved from http://www.academia.edu/download/30373644/thebusiness-model-ontology.pdf

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. John Wiley & Sons.

Patricio, L., & Fisk, R. P. (2011). Synthesizing service design and service science for service innovation. *Touchpoint: The Journal of Service Design*, *3*(2), 14–16.

Pavitt, D. (1997). Retailing and the super high street: the future of the electronic home shopping industry. *International Journal of Retail & Distribution Management*, *25*(1), 38–43.

Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, *36*(1), 83–96.

Peppers, D. (2013, January 15). 4 Types of Customer Interactions to Plan For. Retrieved 4 December 2018, from https://www.linkedin.com/pulse/20130114130809-17102372-4-types-of-customer-interactions-to-plan-for/

Phillips, C. (2018, June 21). Choosing the Best Chatbot Platform 101: A Beginner's Guide. Retrieved October 2018, from https://chatbotsmagazine.com/choosing-the-best-chatbot-platform-101-a-beginners-guide-e841b41192c7

Poppendieck, M., & Poppendieck, T. (2003). *Lean Software Development: An Agile Toolkit: An Agile Toolkit*. Addison-Wesley.

Prahalad, C. K., & Ramaswamy, V. (2004). Co−creating unique value with customers. *Strategy & Leadership*, *32*(3), 4–9.

Prefer. (2018, September 30). Welcome to your new call centre operator - a chatbot. Retrieved October 2018, from https://prefer.nz/welcome-to-your-new-call-centre-operator-a-chatbot/

Radnor, Z., Osborne, S. P., Kinder, T., & Mutton, J. (2014). Operationalizing Co-Production in Public Services Delivery: The contribution of service blueprinting. *Public Management Review*, *16*(3), 402–423.

Railway Technology. (2018, February 5). Transport for NSW selects Alexa to provide voice-activated info. Retrieved 4 December 2018, from https://www.railway-technology.com/news/transport-nsw-selects-alexa-provide-voice-activated-info/

Rappa, M. (2001). Business models on the web. Retrieved October 2018, from http://digitalenterprise.org/models/models.html

Reason, B., Løvlie, L., & Flu, M. B. (2015). *Service Design for Business: A Practical Guide to Optimizing the Customer Experience*. John Wiley & Sons.

Riebeck, M., Stark, A., Modsching, M., & Kawalek, J. (2008). Studying the User Acceptance of a Mobile Information System for Tourists in the Field. *Information Technology &*

Tourism, *10*(3), 189–199.

Ries, E. (2011a). *The Lean Startup: How Constant Innovation Creates Radically Successful Businesses*. Penguin UK.

Ries, E. (2011b, September 13). Pivot or Persevere? The Key to Startup Success. Retrieved 11 January 2019, from https://www.entrepreneur.com/article/220302

Roy, S. K., Shekhar, V., Lassar, W. M., & Chen, T. (2018). Customer engagement behaviors: The role of service convenience, fairness and quality. *Journal of Retailing and Consumer Services*, *44*, 293–304.

Schmitz, C., Bartsch, S., & Meyer, A. (2016). Mobile App Usage and its Implications for Service Management--Empirical Findings from German Public Transport. *Procedia-Social and Behavioral Sciences*, *224*, 230–237.

Schneider, C. (2017, October 16). 10 reasons why AI-powered, automated customer service is the future - Watson. Retrieved 10 January 2019, from https://www.ibm.com/blogs/watson/2017/10/10-reasons-ai-powered-automated-customer-service-future/

Schonfeld, E. (2011, July 30). Don’t Be Fooled By Vanity Metrics. *TechCrunch*. Retrieved from http://social.techcrunch.com/2011/07/30/vanity-metrics/

Scrum.org. (n.d.). What is a Product Backlog? Retrieved 11 January 2019, from https://www.scrum.org/resources/what-is-a-product-backlog

Selden, L., & MacMillan, I. C. (2006). Manage customer-centric innovation--systematically. *Harvard Business Review*, *84*(4), 108–116; 149.

Shahid Iqbal, M., Ul Hassan, M., & Habibah, U. (2018). Impact of self-service technology (SST) service quality on customer loyalty and behavioral intention: The mediating role of customer satisfaction. *Cogent Business & Management*, *5*(1), 1.

Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future

Research. *The Journal of Consumer Research*, *15*(3), 325–343.

Simon, F., & Usunier, J.-C. (2007). Cognitive, demographic, and situational determinants of service customer preference for personnel-in-contact over self-service technology. *International Journal of Research in Marketing*, *24*(2), 163–173.

Singh, J. (1990). Voice, exit, and negative word-of-mouth behaviors: An investigation across three service categories. *Journal of the Academy of Marketing Science*, *18*(1), 1–15.

Slifka, P. (2010). Self-service in the hospitality industry.

Smith, P. (2017, June 5). Westpac looks to bots after customer service upgrade. Retrieved 6 January 2019, from https://www.afr.com/technology/westpac-looks-to-bots-after-customer-service-upgrade-20170604-gwk977

Snapper Services Ltd. (2015, October 29). Adapt or Die, the Snapper guide to innovation. Retrieved 4 December 2018, from https://services.snapper.co.nz/adapt-or-die-the-snapper-guide-to-innovation/

Snapper Services Ltd. (2016, September 27). The big four: strategies for making your customer a priority. Retrieved 4 December 2018, from https://services.snapper.co.nz/the-big-four-strategies-for-making-your-customer-a-priority/

Snapper Services Ltd. (2017a). Adapt or Die: the Snapper guide to innovation. Retrieved 2017, from https://services.snapper.co.nz/adapt-or-die-the-snapper-guide-to-innovation/

Snapper Services Ltd. (2017b, December 2). You spoke, We heard, We listened. Retrieved 11 January 2019, from https://www.snapper.co.nz/you-spoke-we-heard-we-listened/

Snapper Services Ltd. (2018a, January 17). Privacy. Retrieved 10 January 2019, from https://www.snapper.co.nz/privacy/

Snapper Services Ltd. (2018b, September 11). Terms of use. Retrieved 10 January 2019, from https://www.snapper.co.nz/terms-of-use/

Snapper Services Ltd. (n.d.). Introducing RideBank^{TM}. Retrieved 10 December 2018, from https://www.snapper.co.nz/introducing-ridebank/

Souder, W. E., Buisson, D., & Garrett, T. (1997). Success through customer−driven new product development: a comparison of US and New Zealand small entrepreneurial high technology firms. *Journal of Product*. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-5885.1460459

Stockdale, R. (2007). Managing customer relationships in the self-service environment of e-tourism. *Journal of Vacation Marketing*, *13*(3), 205–219.

Sumpter, P. (2015). *Intellectual Property in New Zealand: A User's Guide to Copyright, Patents, Trade Marks and More*. Auckland University Press.

Sweeney, J. C., Danaher, T. S., & McColl-Kennedy, J. R. (2015). Customer effort in value cocreation activities: Improving quality of life and behavioral intentions of health care customers. *Journal of Service Research*, *18*(3), 318–335.

Tashakkori, A., & Teddlie, C. (2009). Integrating Qualitative and Quantitative Approaches to Research. In L. Bickman & D. Rog (Eds.), *The SAGE Handbook of Applied Social Research Methods* (pp. 283–317). 2455 Teller Road, Thousand Oaks California 91320 United States : SAGE Publications, Inc.

Taylor, S. J., Bogdan, R., & DeVault, M. (2015). *Introduction to Qualitative Research Methods: A Guidebook and Resource*. John Wiley & Sons.

Temkin, B. (2014, May 7). Five Questions That Drive Customer Journey Thinking - Customer Experience Matters®. Retrieved 4 December 2018, from https://experiencematters.blog/2014/05/07/five-questions-that-drive-customer-journey-thinking/

Terninko, J., Zusman, A., & Zlotin, B. (1998). *Systematic Innovation: An Introduction to TRIZ (Theory of Inventive Problem Solving)*. CRC Press.

The Lean Startup | Case Studies. (n.d.). Retrieved 5 December 2018, from http://theleanstartup.com/casestudies

The Treasury New Zealand. (n.d.). Plan: investment choices |. Retrieved 4 December 2018, from https://treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/plan-investment-choices

Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation*, *27*(2), 237–246.

Tokareva, J. (2018, February 27). What Is A Minimum Viable Product, And Why Do Companies Need Them? *Forbes Magazine*. Retrieved from https://www.forbes.com/sites/quora/2018/02/27/what-is-a-minimum-viable-product-and-why-do-companies-need-them/

Trustpower Ltd. (2018, September). Annual Reports - Financial Operating Performance - Trustpower. Retrieved 6 January 2019, from https://www.trustpower.co.nz/company-and-investor-information/reports

Tseng, M. M., & Piller, F. (2011). *The Customer Centric Enterprise: Advances in Mass Customization and Personalization*. Springer Science & Business Media.

Ulwick, A. W. (2002). Turn customer input into innovation. *Harvard Business Review*, *80*(1), 91–97, 126.

Vargo, S., & Akaka, M. A. (2009). Service-Dominant Logic as a Foundation for Service Science: Clarifications. *Service Science*, *1*(1), 32–41.

Vargo, S. L., & Lusch, R. F. (2014). *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions*. Routledge.

Vargo, S., & Lusch, R. F. (2006a). Service-dominant logic. *Service-Dominant Logic of Marketing: Dialog …*. Retrieved from https://books.google.com/books?hl=en&lr=&id=qTPfBQAAQBAJ&oi=fnd&pg=PT93&dq=service-dominant+logic+vargo&ots=YHauYgbMno&sig=uhgmREH8ZAs1Dzv47I-H83SM

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Vargo, S., & Lusch, R. F. (2006b). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory*, *6*(3), 281–288.

Vargo, S., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, *36*(1), 1–10.

Vargo, S., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, *44*(1), 5–23.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, *11*(4), 342–365.

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, *39*(2), 273–315.

Wasan, P. (2018). Predicting customer experience and discretionary behaviors of bank customers in India. *International Journal of Bank Marketing*, *36*(4), 701–725.

Webster, N. (2018, June 13). Emerging Tech: Artificial Intelligence and what feeds it. Retrieved 11 January 2019, from https://www.digital.govt.nz/blog/emerging-tech-artificial-intelligence-and-what-feeds-it/

Womack, J. P., Jones, D. T., & Roos, D. (1991). *The Machine That Changed the World: The Story of Lean Production*. HarperCollins.

Wood, Z. (2018, May 12). Rise of robots threatens to terminate the UK call-centre workforce. *The Guardian*. Retrieved from http://www.theguardian.com/business/2018/may/12/robot-technology-threat-terminist-uk-call-centre-workforce

Xu, A., Liu, Z., Guo, Y., Sinha, V., & Akkiraju, R. (2017). A New Chatbot for Customer Service on Social Media. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 3506–3510). ACM.

Yale, L., & Venkatesh, A. (1986). Toward the construct of convenience in consumer research. *ACR North American Advances*. Retrieved from http://acrwebsite.org/volumes/5956/volumes/v13/NA-13

Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The Behavioral Consequences of Service Quality. *Journal of Marketing*, *60*(2), 31–46.

Zeithaml, V. A., & Gilly, M. C. (1987). Characteristics affecting the acceptance of retailing technologies: A comparison of elderly and nonelderly consumers. *Journal of Retailing, 63(1), 49-68.*, *63*(1), 49–68.

Zhang, X. (2018, November 6). The Evolution Of Natural Language Processing And Its Impact On AI. *Forbes Magazine*. Retrieved from https://www.forbes.com/sites/forbestechcouncil/2018/11/06/the-evolution-of-natural-language-processing-and-its-impact-on-ai/

Zhu, Z., Nakata, C., Sivakumar, K., & Grewal, D. (2013). Fix It or Leave It? Customer Recovery from Self-service Technology Failures. *Journal of Retailing*, *89*(1), 15–29.

Appendix A - Snapper's customer segments

To better understand the differing needs of their customer base, Snapper has identified the following customer segments.

Dependant - A passenger requiring support from someone else to manage or use their Snapper card, e.g. a child passenger or an employee.

Facilitator - Someone who supports a dependent passenger to manage or use their Snapper card, e.g. a parent or business administrator.

Independant - A passenger who manages their own Snapper card.

Appendix B - In-depth interview guides

The following interview topic guide was provided for ethics application and used for the in-depth interviews conducted with Snapper cardholders.

Delivering better customer experiences through self-service for public transport payments

INTERVIEW GUIDE

Section	**Purpose**	**Prompts**
Introduction	Cover off house-keeping, consent	● Introduction / names ● Thanks for participating ● Purpose of research (reviewing information sheet) ● Duration of interview ● Opportunity for questions ● Signature of consent (cover confidentiality and withdrawing from the research)
Background	Ice-breaker questions for context, and understanding more about them as a customer Identifying which customer segment they fall into: ● Facilitator ● Dependant ● Independant	Gender, age range Can you tell me about how you use your Snapper card to travel? ● When / where / why / how often? ● Any examples?
Questions	Managing balance Managing travel Support from Snapper - when you did seek it out Support from Snapper - when you didn't seek it out	*Using a table of Snapper's customer service channels as a prompt if customer is unable to recall which channels they use to manage their card.* Do you keep track of your balance? **What do you do to track your balance?** **How do you feel about it?** **What would make it better for you?** Do you keep track of what you've been charged by Snapper? **What do you do to track your transaction history?** **How do you feel about it?** **What would make it better for you?** How do you top up? **What do you do to top up your Snapper card?**

		How do you feel about it? **What would make it better for you?** Have you ever wanted more info about your Snapper card? Have you ever been confused about what happened with your Snapper card? **What do you do to find more information?** **How do you feel about it?** **What would make it better for you? Have you had a similar service experience that was better/worse?** Can you tell me about a time you've needed help with your Snapper card? **What did you do?** **How did you feel?** **What would made it better for you?** Can you tell me about a time you've had to contact Snapper? **What did you do?** **How did you feel?** **What would made it better for you?** Have you ever lost your Snapper card? **What did you do?** **How did you feel?** **What would made it better for you?** Any other reason you've contacted Snapper? **What did you do?** **How did you feel?** **What would made it better for you?** Can you tell me about a time when something's gone wrong but you haven't reached out? **What did you do?** **How did you feel?** **What would made it better for you?**
Conclusion	Additional comments Next steps Thanks	Is there anything more you would like to add? Confirming timeframes for next steps (if participant has requested audio recording, etc.)

Appendix C - In-depth interview consent form

The following consent form was provided for ethics application and used for the in-depth interviews conducted with Snapper cardholders.

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Delivering better customer experiences through self-service for public transport payments

CONSENT TO INTERVIEW

This consent form will be held for 2 years.

Researcher: Charlie Gavey, School of Chemical and Physical Sciences, Victoria University of Wellington.

- I have read the Information Sheet and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.
- I agree to take part in an audio recorded interview.

I understand that:

- I may withdraw from this study at any point before 12 July, 2017 and any information that I have provided will be returned to me or destroyed.
- The information I have provided will be destroyed 3 years after the research is finished.
- Any information I provide will be kept confidential to the researcher and the supervisor.
- I understand that the results will be used for a Masters thesis.
- My name will not be used in reports, nor will any information that would identify me.

I would like a copy of the recording of my interview: Yes ☐ No ☐

I would like a copy of the transcript of my interview: Yes ☐ No ☐

I would like a summary of my interview: Yes ☐ No ☐

I would like to receive a copy of the final report and have added my email address below. Yes ☐ No ☐

Signature of participant: Name of participant: Date:

Contact details: