Value Creation: Designing Effective Customer Value Propositions in IoT-orientated Business Models, a Qualitative Approach.

DANE POTGIETER

04358422

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration

11 November 2019

ABSTRACT

Many entrepreneurial ventures fail because of unprofitable business models that may be due to ineffective customer value propositions (CVP). However, little is known about designing CVPs that are effective in creating and capturing value for a successful business model. Moreover, designing CVPs is a challenge in the Internet of Things (IoT) industry that faces tremendous uncertainty in proving customer value. The literature suggests that a formal process to design CVPs may have several positive consequences for venture performance. Thus, in this study, the CVP design activities were explored to gain insights into the process, content, characteristics and business model alignment activities of an effective CVP.

Through this multiple-case study, six semi-structured interviews were conducted with five IoT-orientated ventures, and their perspectives, together with observations and archival records, were analysed inductively to explore the design of effective CVPs. The study found that the design process is dynamic, iterative, and interactive that revolve around value creation processes, supported by CVP enablers, where the emphasised value dimensions evolve towards effectiveness and business model alignment.

This study contributes to the literature by providing a better understanding of the process and content of effective CVPs in IoT-orientated business models. As a result, a broad framework is proposed to enable the design of effective CVPs.

KEYWORDS

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

_____

Dane Potgieter

11 November 2019

CONTENT

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

AI	Artificial Intelligence
AWS	Amazon Web Services
B2B	Business-to-business
B2C	Business-to-consumer
CAPEX	Capital Expenditure
CVP	Customer Value Proposition
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
IoT	Internet of Things
MES	Manufacturing Execution Systems
NDA	Non-disclosure Agreement
OEE	Overall Equipment Efficiency
OPEX	Operating Expenditure
PCB	Printed Circuit Board
POC	Proof of Concept
QVP	Quantified Value Proposition
SME	Small- and medium-sized enterprises
SEDA	Small Enterprise Development Agency
VRIO	Valuable, Rare, Inimitable, and Organised to Capture Value

1. INTRODUCTION TO THE RESEARCH PROBLEM

1.1. Background: The Importance of Customer Value Propositions

More entrepreneurial activity is required in South Africa. Since 2013, the South African economy failed to grow by more than 2% a year with a declining Gross Domestic Product (GDP) per capita, and an official unemployment rate of 27% (Cotterill, 2019). Reducing unemployment to 10% would require the South African economy to grow at a rate of 5-6% over 20 years (Cotterill, 2019). This illustrates that economic growth is important for job creation, which in turn may reduce unemployment, inequality, and poverty that is pervasive in South Africa (Pilling, 2019).

Growing the economy by 5-6% would require a significant effort, and entrepreneurs can drive this growth. Small and medium-sized enterprises (SMEs) in South Africa currently contributes 36% of the country's GDP (Herrington, Kew, & Mwanga, 2017). However, there is significant upside potential to contribute to the national GDP considering that up to 70% of SMEs fail in South Africa (George, Corbishley, Khayesi, Haas, & Tihanyi, 2016), together with low early-stage entrepreneurial activity for efficiency-driven economies (Herrington et al., 2017).

Entrepreneurs in South Africa exit their ventures for several reasons besides resource constraints. Herrington et al. (2017) report that just over a quarter of entrepreneurs discontinued their ventures due to limited access to finance. However, over 40% of entrepreneurs in South Africa exit their ventures due to an unprofitable business model (Herrington et al., 2017). Herrington et al. (2017) suggest that a lack of profitability may be due to low business skills, poor marketable ideas, inability to access markets, lack of appropriate infrastructure, or that many entrepreneurs enter saturated and traditional industries with low margins and high competition.

A business model is primarily concerned with the way in which a venture creates and captures value (Demil, Lecocq, Ricart, & Zott, 2015). Wirtz, Pistoia, Ullrich, and Vincent (2016) suggests that ventures that emphasise the business model, and management thereof, tend to be more successful. The business model itself can be a source of innovation (Foss & Saebi, 2017), and competitive advantage (Demil et al., 2015). Moreover, a business model consists of various components that collectively explain the value creation and value capturing activities of the venture (Wirtz et al., 2016). However, a central component of the business model is the

customer value proposition (CVP), which aims to explain and communicate the value that will be created for the customer that could have significant performance implications (Payne, Frow, & Eggert, 2017).

Furthermore, increased connectivity and technological advancement are changing the global context. This landscape is creating incredible opportunities for entrepreneurs to innovate and create value for consumption in different ways (Amit & Zott, 2015; Kohler, 2015). However, entrepreneurs need to develop opportunities that provide customers with improved or different benefits that create value for customers and enable the venture to capture value to be successful (Priem, Wenzel, & Koch, 2018).

Priem et al. (2018) suggests that by creating value for customers, first and foremost, through enhanced or different benefits, the venture will attract the necessary resources, which is a key constraint for many entrepreneurs (De Massis, Audretsch, Uhlaner, & Kammerlander, 2018; Herrington et al., 2017). To create profitable ventures that attract resources, an entrepreneur needs to develop marketable and innovative ideas for customers. It is therefore argued that entrepreneurs in South Africa have ineffective CVPs that would enable the venture to create and capture value through a coherent business model to be successful (Priem et al., 2018).

A CVP is multidimensional and can have many benefits for an entrepreneurial venture. By organising information about customers jobs-to-be-done, pains, and gains, in a simple way, the value creation possibilities would become easily visible for an entrepreneur, which could result in a CVP becoming effective that leads to a profitable business model (Osterwalder, Pigneur, Bernarda, & Smith, 2014). A clear CVP may also create strategic direction internally that may lead to increased motivation and focus on creating value for customers and the venture (Osterwalder et al., 2014; Payne et al., 2017). Also, by understanding and having a process of designing a CVP, entrepreneurs would be able to experiment with and test their value propositions and underlying assumptions, which could reduce the risk of failure (Osterwalder et al., 2014). More importantly, by deliberately designing a CVP, an entrepreneur is forced to understand their customers, their problems, and needs, which may result in products and services customers need and value, and as a consequence, a profitable business model (Osterwalder et al., 2014), and competitive advantage (Payne et al., 2017).

The process of developing a CVP can be characterised as a dynamic, iterative and interactive process (Frow et al., 2014). Entrepreneurs need to continually deepen their knowledge about customers while designing and testing new CVPs to remain relevant to customers (Osterwalder et al., 2014; Payne et al., 2017). Also, knowledge of competitors is essential to ensure that the few points of differences important to the customer are emphasised, which may also lead to a competitive advantage for the venture (Anderson, Narus, & van Rossum, 2006; Payne et al., 2017). Therefore, to design a CVP that is effective demands the understanding and application of a systematic process (Osterwalder et al., 2014; Priem et al., 2018).

However, the process and content of designing effective CVPs in relation to a ventures' business model are not well understood. Payne et al. (2017) found that few organisations have formal CVP design processes, and those that do, have varying processes to design a CVP. Priem et al. (2018) suggest, from both a business model perspective that the focus has been on inter-firm processes to design innovative business models with a limited understanding of the process and content of designing effective CVPs. Furthermore, Frow et al. (2014) posit that an explicit process to design a CVP could facilitate achieving venture goals. However few substantive studies exist to explain the design process. This research study thus focuses on these gaps in the literature to understand and address the problem of ineffective CVPs.

1.2. Research Problem

The research problem is concerned with ineffective CVPs of entrepreneurs to create and capture value for a profitable business model. A business model explains who the customer is, what the CVP is, how the resources and capabilities will create the CVP, and finally, how value will be captured from the CVP (Massa, Tucci, & Afuah, 2017). Zott, Amit, and Massa (2011) suggest that a ventures' "business model revolves around customer-focused value creation" (p.1031). Furthermore, Priem et al. (2018) argue that customer value creation is a prerequisite for venture success, where a ventures' business model and value creation process is highly dependent on effective CVPs (Payne et al., 2017). A CVP that creates value for the customer through enhanced or different benefits will draw the necessary resources that entrepreneurs need to be successful (Priem et al., 2018). The activities of a business model are thus fundamentally concerned with developing, communicating and

delivering a CVP to customers that would enable value creation and capture (Payne et al., 2017). However, both the business model and CVP concepts are not well understood, especially the process and content of an effective CVP in relation to the business model (Payne et al., 2017; Priem et al., 2018).

A CVP would, in particular, be an essential component in a digitally enabled world with rapid technological advancements (Amit & Han, 2017). Substantial advances in technology have created significant opportunities for entrepreneurs to access and reconfigure resources that allow them to do business in new ways, and create new value for customers (Amit & Han, 2017). These trends have given rise to technology-enabled business models that have become some of the most valuable start-ups in the world (Amit & Han, 2017), where technologies such as the Internet of Things (IoT), 3D printing, and Blockchain could significantly upend existing industries with new business models (Viswanadham, 2018). However, technology-enabled start-ups are faced with tremendous uncertainty about the CVP to be designed and communicated, because of insufficient information to support the claims made by the CVP (Dattée, Alexy, & Autio, 2018; Wouters, Anderson, & Kirchberger, 2018). This is especially relevant in IoT-orientated business models, where it has been identified that the CVP is a critical factor to the success of the business model (Metallo, Agrifoglio, Schiavone, & Mueller, 2018).

The CVP concept is not well understood or well defined (Payne et al., 2017; Skålén, Gummerus, von Koskull, & Magnusson, 2015). Many entrepreneurs do not know how to design and communicate an effective CVP that would allow customers and stakeholders to assess its benefits and value effectively (Priem et al., 2018; Wouters et al., 2018). Also, entrepreneurs find it challenging to identify which value dimensions of the product or services customers value the most (Wouters & Kirchberger, 2015). Moreover, our understanding of how entrepreneurs ensure that there is a fit between the CVP and business model is lacking (Payne et al., 2017; Wirtz et al., 2016). Therefore, in addressing these gaps in the literature, this research study seeks to gain an understanding of how entrepreneurs design effective CVP in IoT-orientated business models under conditions of risk and uncertainty.

According to the research and several authors (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018), limited research has been done on the topic of designing effective CVPs. Furthermore, a deeper exploration of critical business model building blocks, such as the CVP is called for in the context of IoT-orientated ventures to understand

the processes of value creation and capture (Metallo et al., 2018). Moreover, considering that value is assessed and perceived by customers in a specific context (Kuehnl, Fürst, Homburg, & Staritz, 2017), while business models may also be context-specific (Demil et al., 2015), it is imperative to further our understanding of the CVP phenomenon in the South African context. The South African context is especially relevant as entrepreneurial ventures that aim to create value under conditions of uncertainty (Dattée et al., 2018; Demil et al., 2015) are faced with many environmental and resources challenges to overcome when starting a new venture (Herrington et al., 2017). Similarly, the nature and impact of new technology are uncertain as insufficient information may exist to support any claims about customer value (Wouters et al., 2018). Therefore, the perspectives of entrepreneurial ventures in the South African context are essential to deepening our understanding of CVPs for IoT-orientated business models.

As discussed in the sections above, entrepreneurial activity is a key driver for economic growth and job creation. However, many ventures in South Africa fail because of unprofitable business models. These unprofitable business models may be due to various factors that point to ineffective CVPs to create value for customers that enables the venture to capture value. Ineffective CVPs may be due to entrepreneurs not understanding how to design a CVP that is aligned to a business model to be effective. It is thus imperative to improve our understanding of the process to design effective CVPs, the content and characteristics thereof, and aligning with a business model in the context of risk and uncertainty. Business model theory provided the lens through which CVPs were explored to deepen the knowledge and understanding into the research gaps highlighted.

1.3. Research Purpose

The purpose of this exploratory research is to address the problem of ineffective CVPs by gaining insights and an understanding of how entrepreneurs design effective CVPs for IoT-orientated business models in the South African context. The purpose will thus be to answer the following overarching research question:

How do entrepreneurs design effective customer value propositions (CVP) in IoT-orientated business models?

To achieve this purpose, this research study aims to build on CVPs and business models within strategic entrepreneurship by exploring several gaps highlighted in the literature (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018). Firstly, this study will explore and understand the process of designing a CVP. Secondly, the content and characteristics of an effective CVP will be explored. Finally, this study will explore how entrepreneurs create alignment and fit between the CVP and business model to communicate and deliver the CVP.

1.4. Significance of Research for Business

Entrepreneurs operate under high uncertainty and risk, and although the focus of entrepreneurs is to create value to bring about sustainable and durable change (Demil et al., 2015), they need to develop effective CVPs enabled through a business model to create and capture value (Priem et al., 2018). Given the high SME failure rates in South Africa (George et al., 2016) and low entrepreneurial activity (Herrington et al., 2017). There is a need to better understand the design of effective CVPs and business models (Priem et al., 2018). This study will, therefore, aim to provide a better understanding of how entrepreneurs design effective CVPs through their business model to create and capture value, which may lead to improved customer value perceptions, internal strategic alignment, and as a consequence venture performance and success (Payne et al., 2017). This research will provide entrepreneurs with insights into the process of designing an effective CVP, which is an underdeveloped research area (Payne et al., 2017). Managers may also gain valuable insights from this research as they are required to think more like entrepreneurs to create new value for their firms (Demil et al., 2015). However, this study will focus on the entrepreneurial perspective in the South African context.

1.5. Significance of Research for Theory

This research study will aim to contribute to the body of knowledge on CVPs and business models in several ways that provide a better understanding of developing effective CVPs. Firstly, this study will aim to provide insights into the process of designing a CVP. The literature suggests that a formal process to develop a CVP can impact the business model (Payne & Frow, 2014; Priem et al., 2018), facilitate the achievement of business objectives (Frow et al., 2014), and moderate the impact of the CVP on the venture and business model alignment (Payne et al., 2017).

However, few substantive studies explore the formal processes to develop a CVP and require a deeper understanding (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018). Secondly, this study aims to provide a deeper understanding of the underlying processes, resources, and activities involved in designing and deliver an effective CVP through a business model. Important contributions have been made to understand the common practices (Skålén et al., 2015), and market-based and firm-based resources (Payne et al., 2017) to develop and deliver a CVP. However, these practices may be broad and context-specific, while the market- and firm-based resources require more research to develop a better understanding of their influence on designing and delivering effective CVPs aligned to a business model (Payne et al., 2017). Finally, this study aims to provide a better understanding of the content and characteristics of effective CVPs. The literature identifies and discusses various design characteristics (Anderson et al., 2006; Payne et al., 2017), and strategic demand characteristics (Priem et al., 2018) that would determine and influence the content and effectiveness of a CVP. However, these design and demand characteristics are limited in scope and detail and do not explain how to determine the effectiveness of a CVP, which requires further research (Payne et al., 2017; Priem et al., 2018).

The research study paper will proceed as follows:

- Chapter 2 presents an overview of the relevant literature as it relates to business models and value propositions;
- Chapter 3 provides a summary of the pertinent research questions that form the basis of the study;
- Chapter 4 describes the research methodology and design to be followed;
- Chapter 5 presents and describes the results from the data analysis;
- Chapter 6 provides a discussion of the results;
- Chapter 7 concludes with the relevant business and academic insights followed by recommendations for future research

Table 1 below provides for the key definitions and terms relating to literature review to follow in Chapter 2.

Table 1: Key Definitions

Key Term	Definition
Business Models	Business models can be defined as "the logic of the firm, the way it operates, and how it creates and captures value for its stakeholders" (Demil et al., 2015, p. 3).
Resources and Activities	"An activity in a focal firm's business model can be viewed as the engagement of human, physical and/or capital resources of any party to the business model (the focal firm, end customers, vendors, etc.) to serve a specific purpose toward the fulfilment of the overall objective." (Zott & Amit, 2010, p.217).
Value Capture	Value capture can be defined as the exchange value in terms of the price paid for the value created at the point of sales (Bowman & Ambrosini, 2000).
Value Creation	A customer's willingness-to-pay less a suppliers opportunity cost (Brandenburger & Stuart, 1996). Put differently, the perceived use-value that is subjectively assessed by a consumer to increase consumer surplus amongst alternatives (Bowman & Ambrosini, 2000).
Customer Value Proposition	"A customer value proposition (CVP) is a strategic tool facilitating communication of an organisation's ability to share resources and offer a superior value package to targeted customers."(Payne et al., 2017, p. 472)

2. LITERATURE REVIEW

2.1. Introduction

The importance of understanding the design of effective CVPs, aligned to the business model, was discussed in the previous section. Entrepreneurs with IoT-orientated business model in the South African context faces significant risk and uncertainty in designing CVPs to be communicated and delivered through their business models. However, limited research exists to provide insights into the design of effective CVPs.

In this chapter, the existing literature on business models is discussed to establish the link to value propositions. After that, the literature on the value proposition concept is discussed to understand the evolution of the concept, and the designing of an effective CVP, including the content and characteristics of a CVP. Furthermore, pertinent research questions to expand existing knowledge on these concepts are identified throughout.

2.2. Business Models

2.2.1. Background

The internet boom in the 1990s opened up vast opportunities for ventures to find new ways of doing business while achieving their desired objectives (Demil et al., 2015; Massa et al., 2017). This resulted in the steady rise of business models for internet ventures to explain how their venture would generate value (Demil et al., 2015). It is believed that by emphasising the business model, and the management thereof, firms tend to be more successful than those that do not (Wirtz, Pistoia, Ullrich, & Vincent, 2016).

The business model construct has been a popular topic of debate. Business models have been reviewed to understand the different interpretations and meanings attached to the term business model (Massa et al., 2017), its relation to strategy (Massa et al., 2017; Priem et al., 2018), exploring its origins, relevance and development over time (Wirtz et al., 2016), its wider implications (Ritter & Lettl, 2018), and business model innovation (Foss & Saebi, 2017). However, the business model concept is ambiguous, which have led to three different overarching interpretations emerging, which are 1) the attributes of a real firm, 2) cognitive schemas, and 3) formal representations of organisational activities, which would have implications for

the appropriate unit of analysis, construct clarity, and subsequently theory development (Massa et al., 2017).

2.2.2. Definition

It is recognised that business models are not fixed attributes of a firm, but reside in the minds of the individuals with bounded rationality (Massa et al., 2017, p. 83). However, in defining the business model the researcher followed Demil et al. (2015) who described it as "the logic of the firm, the way it operates, and how it creates and captures value for its stakeholders" (p. 3). Moreover, Teece (2010) argued that a business model is more than the logic of the firm; it must meet the customer's needs and must be difficult to imitate. This requires that the business model itself be viewed as the unit of analysis to integrate and link value creation and value capture within a business model (Demil et al., 2015).

2.2.3. Business Model Theory

Traditional strategy theories emphasise value capture and argue that competitive advantage is single-sourced and reside in either a venture's resources or activities on the supply-side (Massa et al., 2017). In contrast, Priem et al. (2018) strongly argue that value creation for consumers is a prerequisite for value capture and that the demand-side can be a source of competitive advantage even without superior resources (p. 24). The business model perspective balances these views and suggests that value creation can occur on both the supply- and demand-side, while competitive advantage can be based in both resources and activities on both sides (Massa et al., 2017).

Furthermore, Demil et al. (2015) argue that the business model itself can be a source of competitive advantage beyond its resources and activities. However, the authors also suggested that the business model is less concerned with competitive advantage and more focused on mechanisms to create and capture value and that environmental conditions are a choice and not a constraint (Demil et al., 2015). In contrast, Teece (2010) argues that if a business model is designed to be sufficiently differentiated and difficult to imitate it may lead to competitive advantage. Therefore, the design and configuration of a business model are of strategic relevance (Demil et al., 2015).

Through business model analysis entrepreneurs could gain a more meaningful understanding of competitive advantage and why competitiveness declines (McGrath, 2010). This is because the business model underpins a venture's competitive advantage (Osiyevskyy & Dewald, 2015). Furthermore, different business model design themes may also affect venture performance (Amit & Zott, 2015). These design themes are novelty, lock-in, complementarities, and efficiency, which describe the sources of value creation (Zott & Amit, 2010). In building on these design themes, Amit and Zott (2015) conceptually developed four antecedents of business model design as illustrated in Figure 1 below.
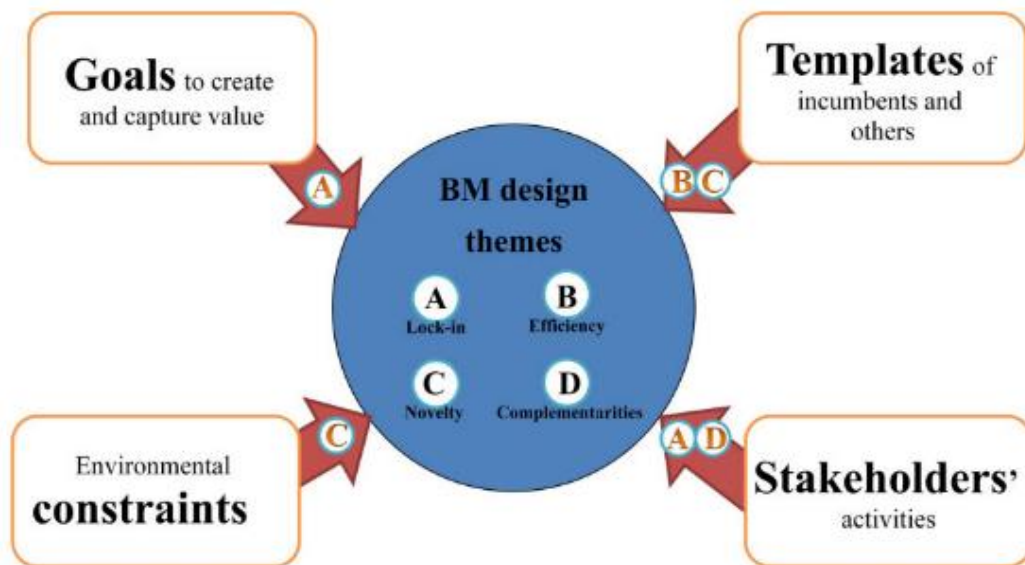
Figure 1: Antecedents of Business Model Design

Source: Amit and Zott (2015)

Product market strategies are essential complements in designing a business model. Zott and Amit (2008) found that novelty-centred business models might enhance venture performance when coupled with product-market strategies. Product market strategies that focus on differentiated offerings, cost leadership, or early market entry would complement a novelty-centred business model to create value (Zott & Amit, 2008). Therefore, aligning the business model with a product-market strategy is essential for venture performance.

Extant literature has largely taken a static view of the business model (Wirtz et al., 2016). However, business models are dynamic, as changes in the environment over time will affect the business model (Gerasymenko, De Clercq, & Sapienza, 2015).

Through a dynamic lens on business models, McGrath (2010) suggested that constraints that are competitively important are not known when resource allocations decisions are required, and advocates for experimentation in the market, and time to discover more effective business models (p. 253).

Changes to a business model would also be more profound in the early stages of a new venture as initial assumptions on which the business model was designed may have been mistaken or due to external environmental changes (Gerasymenko et al., 2015). Substantial change to a business model could involve concurrent adjustments of several components within the business model (Gerasymenko et al., 2015). This would be particularly profound in terms of the business model components related to resources, activities, stakeholders, and the nature of its value proposition (Gerasymenko et al., 2015). Therefore, an effective business model can only be found through experimentation, time and discovery (McGrath, 2010).

2.2.4. Business Model Components

The components and function of a business model vary considerably amongst scholars (Massa et al., 2017; Wirtz et al., 2016). In their review, Wirtz et al. (2016) consolidated the various components found in the business model literature into three broad categories. First, strategic components consist of the strategy, resources and network model (Wirtz et al., 2016). Second, customer and market components consist of the customer, market offer and revenue model (Wirtz et al., 2016). Third, value creation components consist of the manufacturing, procurement and financial model (Wirtz et al., 2016). An entrepreneur would need to be mindful of all these components in designing a business model to create and capture value.

Furthermore, Wirtz et al. (2016) identified areas for further research most relevant to furthering business model research. The interactions within the business model are the area ranked as the most pertinent (Wirtz et al., 2016). Change and evolution, innovation, and design are most relevant from a process perspective (Wirtz et al., 2016). Furthermore, the individual partial models that were found to be of significant interest for future research are the network, customer, strategy, revenue and resources model (Wirtz et al., 2016). However, the value proposition is the most consistently identified component of the business model, followed by resources, and then activities. It is therefore suggested that the relationship between the business model and value proposition concept is essential to understanding business models.

The success of a business model is highly dependent on effective CVPs to create and capture value (Priem et al., 2018). The revenue model is a vital component of the business model to enable value-capturing activities from the CVP especially for technology ventures. The revenue model is similar to the pricing strategy where the revenue model enables revenue generation and complements the design of a business model (Zott & Amit, 2010). Furthermore, Zott and Amit (2010) found, in the case of a technology venture, that even though the business model was in place to communicate and deliver a CVP, the revenue model remained uncertain. Moreover, Metallo et al. (2018) found that IoT-orientated ventures' path to profit is to focus on enabling recurring revenue. Moreover, understanding the revenue models of ecosystem partners is a necessary capability to develop an effective revenue model (Metallo et al., 2018). Suggesting that capturing value from a CVP will depend on developing effective revenue models through experimentation and ecosystem knowledge.

2.2.5. Technology-enabled Business Models

The advancement of technology in a digitally enabled world has changed the way business is conducted (Amit & Han, 2017; Viswanadham, 2018). Innovations in technology are the means through which ventures can derive a competitive advantage as these technologies open up new ways to create and capture value through innovative resource configurations and business models (Amit & Han, 2017; Dattée et al., 2018; Metallo et al., 2018; Viswanadham, 2018). Technologies such as the IoT, 3D printing, and Blockchain could significantly upend existing industries with new business models (Viswanadham, 2018).

New technologies may also lead to more compelling, measurable, and effective CVPs. Through IoT technology, for example, the healthcare industry can create networked medical devices that reduce costs, expand reach, and improve patient recovery (Viswanadham, 2018). The manufacturing industry could improve supply chains, improve quality, improve product development time, and create customised products that customers want (Viswanadham, 2018). Furthermore, Dattée et al. (2018) argue that IoT technology is a generative technology that could enable an infinite range of possible value propositions.

IoT could enable a digital makeover through computerisation and connection to the internet (Amit & Han, 2017). The use of IoT devices is rapidly increasing, and these

devices are used in all sorts of physical things for various purposes (Amit & Han, 2017; Metallo et al., 2018). IoT devices also open up opportunities to co-create mutually determined CVPs and provide access to resources, such as data, that never existed before that may lead to novel resource configurations and business models (Amit & Han, 2017). Metallo, Agrifoglio, Schiavone, and Mueller (2018), conducted a multiple-case research study that explored business models in the IoT industry. The authors found that the most critical factors that enable an entrepreneur to create and capture value are the value proposition, key activities, and key resources (Metallo et al., 2018). The authors concluded that the value proposition has a central role in IoT-orientated business models to be successful, and requires more in-depth exploration to understand the value proposition, as well as, the related critical factors in creating and capturing value in IoT-orientated ventures (Metallo et al., 2018).

In conclusion, this section identifies the importance of a CVP in the design of a business model. However, the question of how entrepreneurs create a fit and alignment between its CVP and business model are essential considerations in designing an effective CVP, which leads to the following research question:

RQ: How do entrepreneurs create alignment and fit between a CVP and its business model?

2.3. Value Proposition Concept

2.3.1. Value Creation and Value Capture

The concept of value has a long and enduring history in economic theory (Beinhocker, 2006; Menger, 1976). However, value is an evolving concept, and Beinhocker (2006) defined it as "the value of something depends on what someone else is willing to pay for it at a particular point in time" (p. 4). Furthermore, value has two dimensions that are encapsulated in the term value creation and value captured. On the one hand, Bowman and Ambrosini (2000) defined value creation as the use-value, or value-in-use, that is subjectively assessed by customers, while value capture is defined as the exchange value, or value-in-exchange, that is extracted when a customer makes a purchase at the point of sale. On the other hand, Brandenburger and Stuart (1996) defined value creation as the customers' willingness-to-pay (WTP) less the suppliers' opportunity cost, and value capture is defined as the price received from the customer less the cost paid to the supplier.

Therefore, creating value for customers while capturing value for the venture is critical for a successful venture (Priem et al., 2018). The design of a CVP is an essential part of the value creation process to influence customer perceptions, while the CVP fit and alignment with the business model is essential to deliver and capture value (Payne et al., 2017; Priem et al., 2018). The section to follow will explore the literature on the value proposition concept as it relates to the design of CVPs.

2.3.2. Background and Evolution

The proposition concept evolved to become strategically relevant to organisations. During the 1910s-1930s, the proposition concept was used mostly in an advertising context to influence customers' behaviours towards acting on the proposition (Payne et al., 2017). The unique selling proposition (USP) emerged during the 1940s-1960s, which focussed on communicating the functional, and unique benefits that may be valued by customers while highlighting the favourable points of difference to competitors (Anderson et al., 2006; Payne et al., 2017). Since the 1970s-1980s, the emotional selling proposition (ESP) focussed on making emotional appeals to customers through advertising (Payne et al., 2017). This was followed by the core benefits proposition in the 1980s, which focused on the core benefits the product design promised to deliver to customers (Payne et al., 2017). The CVP concept originated from problems faced by product-oriented organisations during the 1980s, where the CVP was developed to concisely explain why customers should purchase a venture's products and services in increasingly competitive environments (Lanning & Michaels, 1988; Payne et al., 2017).

However, due to the fragmented nature and development of the concept, it is often confused with other concepts that may appear to be related (Payne et al., 2017). The CVP is distinct from other concepts, such as the positioning statement, business models, value disciplines, unique selling proposition, and core benefits statement (Payne et al., 2017). It is distinct in that it seeks to be an all-encompassing concept to communicate and create value while being a central component of a business model (Payne et al., 2017; Wirtz et al., 2016). Given its distinctive nature and importance, the CVPs definition remains ambiguous and poorly understood (Payne et al., 2017; Skålén et al., 2015).

2.3.3. Definition

Despite its importance and widespread use, the definition of a value proposition is poorly understood (Skålén et al., 2015). In the goods-dominant logic, the value proposition can be understood as the offering to the market, the inherent value delivered to customers, developed without the direct involvement of customers (Skålén et al., 2015). In service-dominant logic, the value proposition concept has not conclusively been defined, as most literature equates promises to value propositions (Skålén et al., 2015). However, what distinguishes the value propositions in the service-dominant logic is that it is co-created and relies on resource integration (Skålén et al., 2015).

In contrast, the business model literature distinguishes between a manufacturing-centric business model and user-centric business model in defining the value proposition component (Hienerth, Keinz, & Lettl, 2011). In a manufacturing-centric business model, the customer derives value from using the product or service. In a customer-centric business model, the customer derives value from using the product or services, as well as direct involvement in the ventures business processes of new products development, production, and marketing (Hienerth et al., 2011). A CVP can also be thought of as bundles of benefits to customers (Töytäri & Rajala, 2015).

According to Payne et al. (2017), the original definition of the CVP evolved from, the precise benefits that will be offered at a certain price and cost to a specific customer (Lanning & Michaels, 1988), to the holistic set of experiences a customer might gain when engaging with a ventures' products or services (Payne et al., 2017). This perspective focused on a one-sided determination of a CVP, where the venture determined the CVP to be offered to customers (Payne et al., 2017). However, the CVP has developed into a two-sided concept where customers and other stakeholders actively participate in the development of a CVP to be offered and may go well beyond benefits to customers to include benefits to a broader set of stakeholders (Frow & Payne, 2011; Payne et al., 2017). These customers and stakeholders are commonly referred to as value co-creators (Amit & Han, 2017).

To this end, Payne et al. (2017) posited the following working definition of a CVP, "A customer value proposition is a strategic tool facilitating communication of an organisation's ability to share resources and offer a superior value package to target customers" (p.472). This definition highlights the CVPs strategic role in

communicating value, the role of resources and resource sharing, and the role of offering a value package that is differentiated from competitors (Payne et al., 2017). Therefore, designing and developing a CVP would involve various strategic considerations.

2.4. Customer Value Proposition Design

2.4.1. Perspectives

Anderson et al. (2006) categorised CVPs into three categories which focus on all benefits, favourable points of difference, and resonating focus (p.3). First, the most common approach to developing a CVP is to focus on all the benefits the product or service is to deliver to customers, which requires the least market knowledge about customers and competitors to develop (Anderson et al., 2006). The second approach, favourable points of difference, recognise that competitors exist and that the CVP should emphasise the points of difference relative to competitors. However, this approach still ignores the customer and assumes that the points of difference the CVP communicates are valued by the customer (Anderson et al., 2006). The final approach, resonating focus, acknowledges both the customer and competitors, and focuses on co-creating a CVP, which would provide superior value to the target customer based on the knowledge of what is most important to the customer, and knowledge of what the competitors are able to offer, and then to emphasise, not all, but the few points of difference that would generate the greatest value for the customer now and in the future (Anderson et al., 2006).

Similarly, Payne et al. (2017) categorised and formulated three CVP perspectives relevant to the design of a CVP. These three perspectives are supplier-determined, transitional, and mutually determined (Payne et al., 2017). Firstly, a supplier-determined CVP perspective emphasises value-in-exchange and takes an "inside-out" approach (Day, 2011), where the design of CVPs is entirely driven and formulated by the venture (Payne et al., 2017). Secondly, a transitional CVP perspective extends the former view by engaging the customer to identify the value dimensions important to the customer (Payne et al., 2017). Finally, a mutually determined CVP perspective emphasises value-in-use to co-create with the customer (Payne et al., 2017), where the approach is "outside-in" (Day, 2011). The mutually determined CVP emphasises value creation across the customer relationship by considering the value that would flow "before, during, and after the

usage experience" (Payne et al., 2017, p.472). The value-in-use aspect of value focuses on the point at which the customer subjectively assesses or perceives the value on offer, where the customers' objective is to increase their consumer surplus (Bowman & Ambrosini, 2000). Therefore, a mutually determined CVP is essential in a ventures' value creation process as it places the customer, their perceptions of value, and what they desire as the focal point in designing a CVP.

Quero and Ventura (2019) illustrated the importance of a mutually determined CVP by exploring how crowdfunding business models create value (Quero & Ventura, 2019). The authors show how the value proposition approach may aid entrepreneurs in improving value co-creation planning with several stakeholders that may lead to the creation of relational- and economic value (Quero & Ventura, 2019). However, to design, develop, and implement a mutually determined CVP would require resources to design effective CVPs (Payne et al., 2017).

2.4.2. Resources and Activities

Resources are at the heart of any business model as it enables value creating and value capturing activities, and gain a competitive advantage (Demil et al., 2015; Massa et al., 2017). Resources can broadly be thought of as any resources that are a strength or a weakness of a venture (Barney, 1991; Wernerfelt, 1984). Barney (1991) defined resources as "all assets, capabilities, organisational processes, firm attributes, information, knowledge etc. that are controlled by the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (p. 101). However, Alexy, West, Klapper, and Reitzig (2018) extended the traditional view on resources, to argue that through strategic openness resources do not have to be owned or controlled to confer a competitive advantage. Ventures consist of a bundle of resources, and advantages lie within these bundles of resources that are complementary (Alexy et al., 2018). Moreover, Priem et al. (2018) challenged the supply-side view, to argue that a focus downstream to customers may also be a source of competitive advantage. In contrast, the business model perspective takes a broader view of resources to include activities. Zott and Amit (2010) suggested that "an activity in a focal firm's business model can be viewed as the engagement of human, physical and/or capital resources of any party to the business model to serve a specific purpose toward the fulfilment of the overall objective" (p. 217). Therefore suggesting that to create and capture value to gain a competitive advantage, the

venture does not need to control or own the resources as they may reside with partners, customers or other stakeholders. The expanded view on resources and activities opens up various sources for ventures to create and capture value in novel ways that may lead to multiple sources of competitive advantage (Massa et al., 2017).

Furthermore, a change in a ventures' business model to exploit opportunities does not necessarily require a resource move, as the same resources can be combined in novel ways to enable new CVPs and business models (Demil et al., 2015). In a recent study in Germany, De Massis et al. (2018) showed how small Mittelstand firms are able to create disproportionate value globally despite resource constraints. These firms overcame their resource constraints by addressing customers specific needs, while also relying on close customer interaction as a source of co-creation and innovation (De Massis et al., 2018, p. 130)

On both the supply-side and demand-side to create and capture value, resources are essential antecedents in designing and developing mutually determined CVP that may lead to a competitive advantage (Payne et al., 2017; Skålén et al., 2015). The resources most important for developing a CVP would require both firm-based and market-based resources (Payne et al., 2017). The firm-based resources that directly influence the development of the CVP would include product knowledge about the technical specifications and potential application, whereas leadership support and CVP formalisation structure and processes are moderating resources that influence the impact of the CVP on the venture (Payne et al., 2017). The market-based resources that directly influence the development of the CVP would include market knowledge where knowledge about the customer and competitors are fundamental, and innovation processes and culture that finds new ways to solve customers problems (Payne et al., 2017). Furthermore, the market-based resources that moderate the impact of the CVP on customers perception of value would include customer relationships and brand reputation (Payne et al., 2017). Taken together, an effective CVP can have a positive impact on the ventures' market orientation, its employees behaviours, resource configurations, and importantly on customers perceptions of value which are fundamental to the value creation process (Payne et al., 2017). However, the resources identified predominantly identifies the venture-specific resources, whereas the resources that reside with customers and partners are not explicitly recognised in the design and development of a CVP.

Through direct interaction, ventures and customers integrate resources to co-create value, where the customer creates value for themselves or others during the use of the product or service (Skålén et al., 2015). Resource integration also occurs in the CVP configurations the venture offers to the market, while the integration of resources can also occur between various stakeholders in an ecosystem (Frow et al., 2014; Skålén et al., 2015).

In a digitally enabled world, the role of resources is even more profound, where opportunities to discover and exploit new opportunities have expanded significantly (Amit & Han, 2017). This has increased the scope of resources and means available to entrepreneurs in holistically addressing customer and partner needs (Amit & Han, 2017). The value creation potential for entrepreneurs and manager are virtually limitless in a digitally enabled world, however this requires a firm understanding of how resources, which may be firm-based, customer-based, or partner-based, are configured and connected to solve customers and partners problems holistically and in novel ways that would create new value (Amit & Han, 2017).

Skålén et al., (2015) suggested that value propositions are configurations of various practices and resources, and reconfiguring these may lead to new CVPs. Furthermore, the authors argued that CVPs should be evaluated from the customer's perspective (Skålén et al., 2015). The internet and social software empower customers to become a part of ideation and design of new products and services, which enables entrepreneurs, especially start-up ventures and other flexible organisations, to develop new CVPs that may be highly profitable (Hienerth et al., 2011). However, this is dependent on how the entrepreneur integrate users into their business model and leverage resources outside of the venture (Hienerth et al., 2011).

There are mainly four broad resource configurations, viewed from a system-based and value-creation-centric perspective (Amit & Han, 2017). These configurations could define a venture as an integrator, collaborator, transaction enabler or bridge provider while the combinations between these configurations could be limitless (Amit & Han, 2017). Firstly, as an integrator, the venture creates value in a traditional 'brick and mortar' way, for example, manufacturers, where resources are configured to create value for customers (Amit & Han, 2017). Secondly, a collaborator would collaborate with partners, for example, alliances, who own complementary resources to create value for customers (Amit & Han, 2017). Thirdly, a transaction enabler, commonly known as multisided platforms, connects two groups of value co-creators

by facilitating transactions between the groups, where the resources controlled by the value co-creators are utilised to address each other's needs (Amit & Han, 2017). Finally, a bridge provider is similar to a transaction enabler but differs in that a bridge provider would utilise the resources of one group of value co-creators to address the needs of another group and capture value from the latter group (Amit & Han, 2017). Therefore, in a digitally enabled world, the resources, activities, and configuration entrepreneurs adopt to address the needs, not just of customers, but of all value co-creators, would be a critical consideration in the process of designing effective CVPs.

2.4.3. Process and Practices

As described in previous sections, the value proposition concept has evolved from its initial conceptualisation of being supplier-determined, to be mutually determined, and co-created by various stakeholders including customers, where resources play a critical role both inside and outside the venture. The section to follow will describe and interpret the available CVP literature on processes, practices, and frameworks that provide insight into the process of designing effective CVPs.

The literature on the process of designing a CVP is sparse. Frow and Payne (2011) make some progress toward developing an iterative planning process. However, the impetus for the process is to use the value proposition to gain alignment and to co-create value propositions, with all stakeholder (Frow & Payne, 2011). The iterative planning framework consists of five steps to identify relevant stakeholders, determine core values, facilitate knowledge sharing, identify value co-creation opportunities, and then to co-create stakeholder value propositions (Frow & Payne, 2011).

Another approach, by the same authors in 2014, developed a process through which entrepreneurs can deconstruct successful value propositions (Payne & Frow, 2014). This process enables entrepreneurs to use successful value propositions as a template, to gain an understanding of the content, differentiators, value dimensions, and characteristics, that make a value proposition superior (Payne & Frow, 2014). The deconstruction process can also be used by the entrepreneur to understand their current, underperforming, value propositions (Payne & Frow, 2014). Payne and Frow (2014) suggested that by following a process of deconstructing a "best-in-class" value proposition, entrepreneurs can develop innovative value propositions that may lead to venture performance (Payne & Frow, 2014). The deconstruction process entails separating the source of competitive advantage into cost drivers and

differentiation drivers to understand the business system and activities that drive the value proposition (Payne & Frow, 2014).

In Contrast, Skålén et al. (2015) posited ten common practices, categorised into three broad practices, namely, provisional, representational, and management and organisational practices, that are relevant to the design of a CVP. The provisional practices ensure that the CVP is delivered (Skålén et al., 2015). The representational practices enable the communication of the CVP internally and externally (Skålén et al., 2015). The management and organisational practices support and enable the provisional and representational practices with a focus on aligning and integrating (Skålén et al., 2015). Taken together, as summarised in Table 2, these practices make up "the anatomy of value propositions" (Skålén et al., 2015). However, these practices could be too general and context-specific (Payne et al., 2017).

Table 2: Practices and their Integration of Resources

Practice	Type of Practice	Description of Practice
Provisional practices	Operating practices	Integration of resources to support customer value creation.
	Problem-finding practices	Identification of problems to create value for the customer.
	Problem-solving practices	Solving customers' problems.
Representational practices	Naming and labelling practices	Describing CVP activities and their delivery.
	Modelling practices	Creating a CVP structure.
	Interaction practices	Focuses on enabling CVP communication to customer or CVP co-creation with the customer.
Management and organisational practices	Organisational practices	Organising and facilitating the activities of providing and representing CVPs.
	Staffing and team-building practices	Recruitment of staff and building teams that can deliver and communicate CVP.
	Networking practices	Process of involving networks and partners to create, deliver and/or negotiate CVPs.
	Knowledge-sharing practices	Practices to share knowledge and skills to realise CVPs.

Source: Adapted from Skålén et al. (2015)

In contrast to the practices developed by Skålén et al. (2015), Payne et al. (2017) continues to theoretical root the CVP in resource-based theory and broadly categorises the process to design CVPs into antecedents, consequences, and moderators as illustrated in the conceptual framework in Figure 2. In this conceptual framework, firm-based resources and market-based resources form the foundation that either enables or moderates the design of a CVP, while design characteristics moderate the CVP impact on the venture and customers (Payne et al., 2017). Moreover, Payne et al. (2017) provided insights to processes and practices within each category that could facilitate the design of a CVP, these are summarised in Table 3.
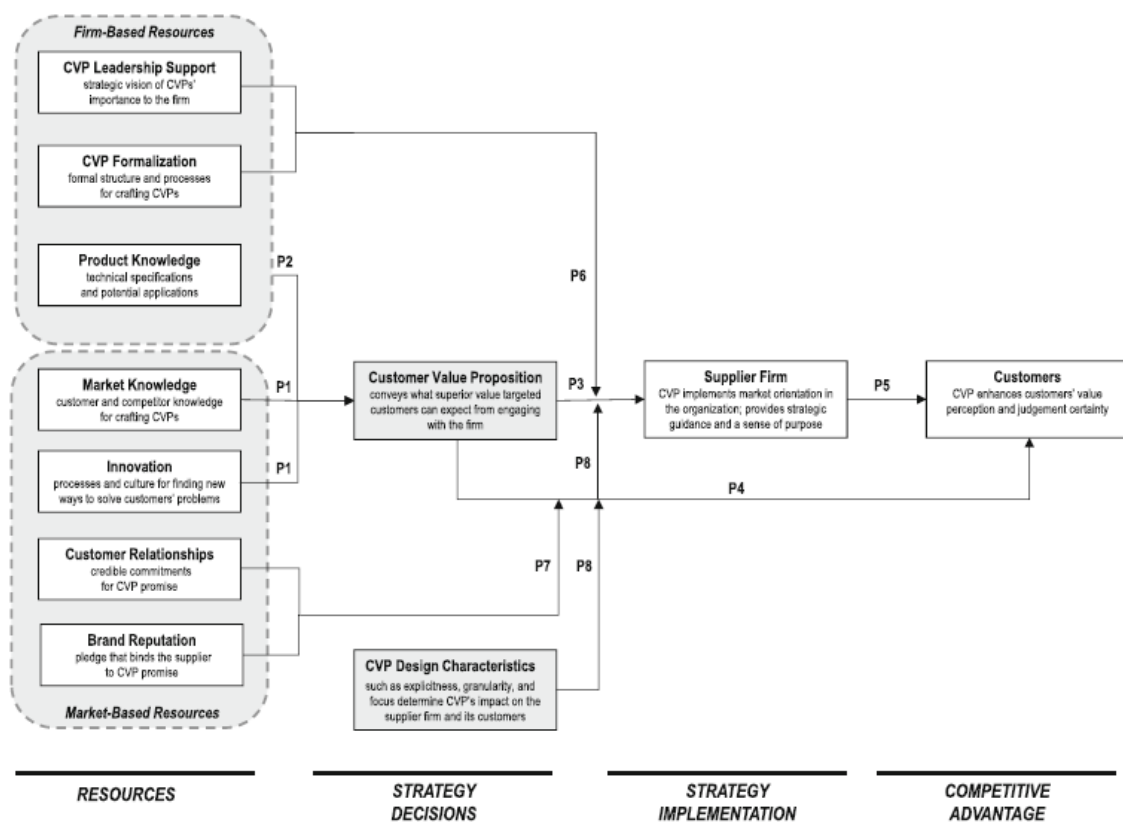
Figure 2: Antecedents, Consequences and Moderators of the CVP

Source: Extracted from Payne et al. (2017)

Table 3: CVP Design Practices and Processes

Category	Elements	Practices / Processes
Firm-based resources	CVP leadership support	Leadership support to signal strategic priority of designing CVPs, and activates necessary firm- and market-based resources.
	CVP formalisation	Formalise organisational structures and process to design and communicate CVPs.
	Product knowledge	Understanding the technical specifications and alternative applications of solution offered. Match product knowledge to market knowledge to design effective CVPs.
Market-based resources	Market knowledge	Source of competitive advantage and basis for designing a CVP. • Customer knowledge is essential to gain customer insights to understand and solve important problems. • Competitor knowledge is essential to gain insights to understand whether and how superior solutions can be offered to customers.
	Innovation	Novel ways of solving customer problems. • Innovation processes determine the way in which a venture would develop, shape, and integrate its current and new resources. • Culture determines the way in which innovation activities are carried out.
	Customer relationships	Strong customer relationships enhance credibility and brand reputation. • Develop and build trusted customer relationships.
	Brand reputation	Brands are pledges of credibility and influence customer perceptions of ability to deliver on CVP. • Develop a trusted brand and create awareness around the brand.
CVP design characteristics	Perspective adopted	Identify and select a design perspective from either, supplier-determined, transitional, or mutually determined. Consider various factors in the perspective adopted, such as context, external environment, customer, products/services etc.

| | Explicitness | Decide whether CVP should be communicated explicitly or implicitly to internal and external stakeholders.

Explicit communication of CVP offers the ability to reduce ambiguity, and ensure consistent messages to the market and customers, and aligns internal resources on CVP. |
| | Granularity | Decide whether the CVP will be designed at either the firm, customer segment or individual customer level. The more granular the CVP, the more market knowledge is required. |
| | Focus | Decide on the number and scope of value dimensions to be emphasised that would have the biggest impact on the customer. |

Source: Payne et al. (2017)

Several broadly applicable processes and approaches have been suggested in the literature (Frow & Payne, 2011; Payne & Frow, 2014). Some progress has been made to develop practices that would inform the design and delivery of CVPs (Skålén et al., 2015). Moreover, Payne et al., (2017) advanced the literature on CVPs by theoretically rooting CVPs in resource-based theory and continued to formulate a conceptual framework that described the key enablers and moderators to designing effective CVPs. However, these practices and processes are broad, context-specific, and no clear process is discernible from the literature to design an effective CVP.

In conclusion, both Frow et al. (2014) and Payne et al. (2017) recognises that our understanding of the process of designing a CVP is lacking and requires further investigation. This is supported by scholars in the business model literature who calls for more empirical and conceptual research into the process and content of effective CVPs (Priem et al., 2018). By understanding, how the design process unfolds entrepreneurs would be better positioned to formalise design processes to develop superior CVP (Payne et al., 2017), and gain a deeper understanding into the value creation side of business models (Priem et al., 2018). In addressing these gaps the following research question arises:

RQ: How do entrepreneurs perceive the process of designing a customer value propositions?

The section to follow will review the literature on the content and characteristics of CVPs as it relates to the types of value, sources of value, characteristics of effective CVPs, and design characteristics.

2.5. CVP Content and Characteristics

2.5.1. Value Dimensions

Designing and developing an effective CVP requires an understanding of the types of value, or value dimensions to be emphasised. Payne et al. (2017) proposed that the CVP design characteristics would moderate the impact of the CVP on both the venture and its customers. Focus is a crucial CVP design characteristic that focuses on the number and breadth of value dimensions to be emphasised as points of differences (Payne et al., 2017). However, there is disagreement in the literature as to how many value dimensions should be emphasised and highlighted to design an effective CVP, with views ranging from, emphasising a single point of difference not offered by competitors (Payne et al., 2017), to emphasising the few points of differences relative to competitors (Anderson et al., 2006).

Value dimensions can be multidimensional with various types of value that could form the content of a CVP. Smith and Colgate (2007) developed a comprehensive framework in which the value dimensions are categorised into four types of value – functional or instrumental value, experiential or hedonic value, symbolic or expressive value, and cost or sacrifice value (p.20). The types of value would aim to describe the value to be created for customers.

The characteristics of the four types of value emphasise different elements desired and prioritised by the customer. Firstly, functional value fulfils the customers' needs in terms of product or service characteristics that could emphasise different dimensions, such as the functions, attributes, features, usefulness, performance, and outcomes (Smith & Colgate, 2007). Secondly, experiential value seeks to create value through experiences, feelings, and emotions, from which various other value dimensions could arise, such as sensory, emotional, relational, and epistemic value (Smith & Colgate, 2007). Thirdly, symbolic value refers to the meaning a customer associates with the product or service through aligning the value with their self-concept or self-worth, which could have personal meaning or self-expression value for the customer (Smith & Colgate, 2007). Finally, since customers seek to maximise

their consumer surplus (Bowman & Ambrosini, 2000), the cost value is essential as this is concerned with the transaction costs associated with the product or service (Smith & Colgate, 2007). Cost value could include various value dimensions, such as reducing psychological costs, relational costs, economic costs, personal investments, and risk (Smith & Colgate, 2007). In considering the four types of value and the multitude of possible value dimensions within each type, it should be clear that to create customer value would require in-depth knowledge of the customers' needs and desires to design an effective CVP.

Furthermore, five significant sources of value are essential in the value creation process. The sources of value include information, products, interactions, environment, and ownership (Smith & Colgate, 2007). In addition, the sources of value can further be categorised from a cost driver and differentiator perspective, where the cost drivers may emphasise the pricing value, while the differentiators emphasise performance value, relationship value, and co-creation value (Payne & Frow, 2014).

A combination of processes and activities make up the sources of value where the output of processes and activities directly drive the types of value to be created (Smith & Colgate, 2007). Firstly, information as a source of value would be created by a range of activities, such as advertising, public relations, and brand management (Smith & Colgate, 2007). Secondly, products would be created by activities that may include product development, marketing research, research and development, and production (Smith & Colgate, 2007). Thirdly, the interactions between customers and the venture will be created through activities related to human resource management, quality management, and operations (Smith & Colgate, 2007). Fourthly, the environment in which purchasing and consumption take place will be created through activities concerning infrastructure and facility design and merchandising (Smith & Colgate, 2007). Finally, the transfer of ownership will be facilitated through a range of activities, such as payments and billing, distribution, contracts etc. (Smith & Colgate, 2007). Therefore, the activities, sources of value, and types of value are important elements to consider and understand when designing the content of a CVP. However, the link between value dimensions and effectiveness characteristics is not clear.

2.5.2. Effectiveness Characteristics

Various dimensions and characteristics determine the effectiveness of a CVP. The value offering should emphasise both the benefits and costs that are important to customers, in a way that is differentiated from alternative offerings (Payne et al., 2017). This offering should strongly resonate with customers by addressing all the types of value dimensions that are important to the customer, while delivering value before, during, and after consumption (Anderson et al., 2006; Payne et al., 2017). Therefore, the effectiveness of a CVP needs to be measured across the customer value creation journey.

However, several strategic demand characteristics could moderate the effectiveness of a CVP. Priem et al. (2018) described the key strategic characteristics on the demand-side that could be broadly applicable to all other stakeholders the venture engages with to determine the effectiveness of a CVP. These characteristics are customer heterogeneity, industry dynamics, and latency of customer needs (Priem et al., 2018). Customer heterogeneity describes the extent to which customer preferences and financial constraints differ that would determine the effectiveness of an offering (Adner & Snow, 2010). Industry dynamics involve the introduction of novel solutions in an industry, which could result in an exponential shift in demand away from incumbent firms without notice (Argyres, Bigelow, & Nickerson, 2015). The latency of customer needs cannot be articulated with ease, which requires a market-orientation and learning capabilities to gain an understanding of both the articulated and latent needs of customers to develop effective CVPs (Slater & Narver, 1998). These strategic characteristics provided insight into the dynamics to design effective CVPs. However, they do not describe specific characteristics that would make a CVP effective.

Furthermore, the CVP design characteristics provided a more granular approach to designing effective CVPs. Payne et al. (2017) proposed that the CVP design characteristics would determine the effect of the CVP on both the venture and its customers (Payne et al., 2017). However, the authors acknowledged that there are many relevant design characteristics of which only four design characteristics were emphasised as described in Table 3 earlier. Therefore, the CVP content to understand the effectiveness of a CVP is not well understood. This gap was acknowledged in the literature where Payne et al. (2017) highlighted the need for further research to understand the content of CVPs that make them effective, as well

as, the characteristics that determine their effectiveness. This was supported by Priem et al. (2018) who called for further research to understand the content of effective CVP. This leads to the following research question:

RQ: How do entrepreneurs perceive the content and characteristics of an effective CVP?

In conclusion, the CVP concept is an essential consideration for entrepreneurs to strategically communicate how the venture intends to create value while delivering and capturing value through a business model to address customers needs. The CVP concept may serve many purposes for an entrepreneur, however the effectiveness of a CVP would depend on many dynamics, such as the resource and activity configuration of the venture, the perspective it adopts, whether it is explicitly communicated, at what level of granularity it is developed at, and the number and breadth of value dimensions it focusses on. Also, in a technology-enabled world, the efficient use of resources may lead to innovative and novel CVPs. Moreover, an effective CVP may serve as one of the most important organising mechanisms in an entrepreneurs business model to create value for all of its value co-creators, while allowing it to organise to capture value. However, there is much that remains to be understood of the process and content of designing effective CVPs, and to create a fit with a business model to enable value creation and value capture (Payne et al., 2017; Priem et al., 2018).

3. RESEARCH QUESTIONS

The overarching research question this study aimed to explore is how entrepreneurs design effective CVPs in IoT-orientated business models in the context of risk and uncertainty. In answering this question, the study focused on answering the three sub-questions formulated in the literature review section. Moreover, the value proposition component is a central element of a business model where "the business model revolves around customer-focused value creation" (Zott, Amit, & Massa, 2011, p.1031). Therefore, to understand and gain insights into the research problem, the research questions were structured to flow from a focus on the CVP to the business model. *Figure 3* below visually depicts the research questions and their flow in order.
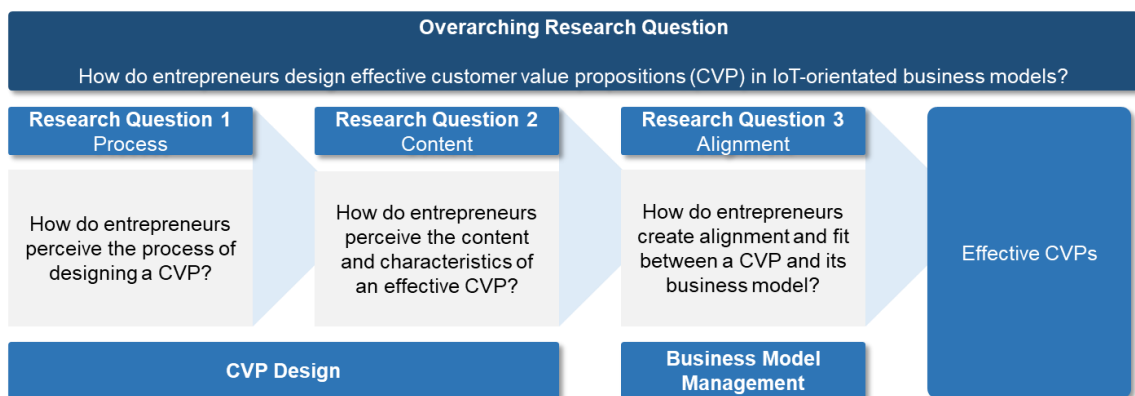
Figure 3: Research Questions to Research Problem

Research Question 1

The literature on CVPs has focused on describing its importance, what it is, and what it is not, yet it remains poorly understood (Payne et al., 2017; Skålén et al., 2015). Several approaches and perspectives were described that might lead to an effective CVP and venture performance (Anderson et al., 2006; Payne et al., 2017). However, to date, limited substantive research is available that provides an understanding of the process of designing a CVP from the perspectives of entrepreneurs. The formalising of CVP design and implementation processes may lead to a number of positive outcomes for an entrepreneur especially as an internal strategic alignment mechanism towards creating customer value (Payne et al., 2017). Several authors, (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018), have called for more empirical research to understand the process of designing effective CVPs, which led to research question 1:

> *RQ1: How do entrepreneurs perceive the process of designing a CVP?*

Research Question 2

The value dimensions and characteristics of a CVP influence the content of effective CVPs, which in turn affects the venture and its customers. Smith and Colgate (2007) developed a comprehensive framework on the types of value and the sources of that value. However, does not establish a relationship between the content and effectiveness characteristics. Priem et al. (2018) describe important strategic characteristics to consider that would determine the effectiveness of a CVP. However, these lack specific effectiveness criteria. In contrast, Payne et al. (2017) provide a more granular understanding to design effective CVPs with four CVP design characteristics. However, these characteristics are limited in scope and do not describe effectiveness criteria. Therefore, the CVP content to understand the effectiveness of a CVP is not well understood. This gap was acknowledged in the literature where Payne et al. (2017) highlighted the need for further research to understand the content of CVPs that make them effective, as well as, the characteristics that determine their effectiveness. This was supported by Priem et al. (2018) who called for further research to understand the content of effective CVP. This led to the following research question to be explored:

RQ2: How do entrepreneurs perceive the content and characteristics of an effective CVP?

Research Question 3

In developing theory for the CVP concept, Payne et al. (2017) identified several moderating variables in the design of effective CVPs, of which CVP leadership and formalisation is one (Payne et al., 2017). The authors suggested that CVP leadership and formalisation processes would moderate the design of a CVP (Payne et al., 2017), and specifically called for more research on the relationship between the business model design and the CVP design, which led to the third, and final, research question to be explored:

RQ3: How do entrepreneurs create alignment and fit between a CVP and its business model?

4. RESEARCH METHODOLOGY

4.1. Choice of Methodology

The research philosophy for this study was interpretivism as the researcher prescribed to the notion that reality is subjective and could be multiple from different perspectives in their natural environment (Myres, 2018; Saunders & Lewis, 2018). Value creation, value propositions, and business models are context-specific, and thus required a more in-depth understanding within the South African context (Demil et al., 2015; Kuehnl et al., 2017). Furthermore, a technology that creates disruptive change and vast potential future uses are called generative technologies, of which the Internet of Things (IoT) is one such technology (Dattée et al., 2018). IoT technologies may enable unbounded opportunities for entrepreneurs to create value with a range of possible CVPs (Dattée et al., 2018). In this context, the researchers' focus was on technology-enabled business models that are IoT-orientated to create value for customers. Moreover, entrepreneurs are primarily concerned with creating value under conditions of high uncertainty (Dattée et al., 2018; Demil et al., 2015). Therefore, understanding and describing how entrepreneurs design effective CVPs, and align these with an IoT-orientated business model would provide deep and rich insights from an entrepreneurs perspective (Saunders & Lewis, 2018).

The approach to theorising was inductive (Saunders & Lewis, 2018). In reviewing the prevailing literature, research questions were developed that allowed the exploration of effective CVPs design to understand the process from the entrepreneur's perspectives (Saunders & Lewis, 2018). The research questions were designed to allow insights to emerge inductively from the observed data through in-depth interviews and observations from multiple perspectives (Creswell, Hanson, Clark Plano, & Morales, 2007; Saunders & Lewis, 2018). This approach was the most appropriate as both business models and value propositions lack construct clarity (Massa et al., 2017; Skålén et al., 2015).

The purpose of this study was thus an exploratory qualitative research design as the researcher was concerned with providing new insights on how CVPs are designed and aligned to IoT-orientated business models from different perspectives (Saunders & Lewis, 2018). The researcher followed a multiple-case research strategy to explore the activity from different perspectives (Creswell et al., 2007; Saunders & Lewis, 2018). This research strategy is particularly relevant when research questions are

intended to provide an in-depth understanding of an issue or activity within a particular context (Creswell et al., 2007). Moreover, the case study strategy is a popular research strategy employed by scholars exploring the value proposition and business model concepts (Corvellec & Hultman, 2014; Kin-man To et al., 2018; Metallo et al., 2018; Payne & Frow, 2014; Quero & Ventura, 2019; Töytäri & Rajala, 2015). In addition, Payne et al. (2017) specifically recommended a case study strategy to explore the process entrepreneurs use to design and develop effective CVPs (Payne et al., 2017).

Due to limited time, this study consisted of semi-structured interviews with multiple entrepreneurs, in their natural environment, once over the course of 2019 to gain insights and an understanding from their perspectives on the research questions. Therefore, this study was conducted on a cross-sectional timeframe as data was collected over a short period at a particular point in time (Saunders & Lewis, 2018).

4.2. Population

Herrington et al. (2017) defined entrepreneurial activity across different stages. In considering the low entrepreneurial activity in South Africa in the conception and firm-birth stages, while high failure rates that prevail in the persistence stage, it was therefore proposed to study the CVP design process from both an established and start-up perspective to gain a deep understanding of the CVP design process. The population of the study thus consisted of all entrepreneurs or owner-managers with an established or start-up venture in the IoT industry.

4.3. Unit of Analysis

The unit of analysis for the research was the venture from the perspective of the individual that enable the value creation and value capturing processes as it related to the design of a CVP. This research was conducted through semi-structured interviews. Lepak et al. (2007) illustrated that value creation and value capture is different for an individual, firm, and society. However, the main concern of this research was the value creation and value capturing processes of the venture, and on how the individual performs the process. Thus, deep understanding and rich insights were gained from interviewing entrepreneurs and owner-managers in addressing the research questions and understanding the research problem of not designing effective CVP (Creswell et al., 2007; Saunders & Lewis, 2018).

4.4. Sampling Method and Size

According to Herrington et al. (2017), only 2.5% of the South African adult population in 2017, aged between 18 to 64, owned established businesses (p.26). Given an estimated population of 32,213,037 for this age group (Statistics South Africa, 2017), it would translate into approximately 805,000 established businesses in South Africa. Thus, the population is known, however, as posited by Saunders and Lewis (2018) a sampling frame is a complete list of the population from which the researcher would select a sample using probability sampling. However, the researcher did not believe that such a list existed, and if it had, it would have been hard to come by. To identify a suitable population, the researcher narrowed the population down to the IoT industry in South Africa, as IoT-orientated business models required more in-depth exploration of the CVP concept (Metallo et al., 2018). The IoT industry has only just emerged in South Africa, with the IoT Industry Council (IOTIC) becoming a formally recognised industry body in March 2019 (Vermeulen, 2019). Given the narrowed scope, the researcher was still of the belief that no complete list existed for IoT-orientated ventures in South Africa, however, it did provide initial criteria for sampling.

Therefore, the proposed study utilised a non-probability purposive sampling technique since no sampling frame existed for the population (Saunders & Lewis, 2018). Saunders and Lewis (2018) suggested that a non-probability purposive sampling technique relies on the researchers' judgement in selecting a sample where no list is available. This judgement can be based on various reasons that would ensure that participants in the study will yield the necessary insights and understanding into the research problem (Saunders & Lewis, 2018).

Based on the researcher's judgement (Saunders & Lewis, 2018), certain criteria were identified through the literature as specified in an earlier section. In addition, the researcher focused on IoT-orientated ventures, an emerging industry, to gain an in-depth understanding of the nature of CVPs and business models within the South African context. The age of the industry was relevant as represented ventures that had successfully launched and become established in an emerging industry compared to those ventures that have yet to become established (Herrington et al., 2017). The IoT industry is an emerging industry in South Africa (Vermeulen, 2019), and are thus faced with high uncertainty and risk in designing effective CVPs to create and capture value (Dattée et al., 2018). Entrepreneurs are in particular concerned with creating value under these conditions, and if the entrepreneur is

unable to perceive an opportunity to capture value from the CVP they might refrain from pursuing the opportunity (Demil et al., 2015). Therefore, IoT-orientated ventures, as a sub-set of the total population, represented an interesting situation within the South African context. This was, therefore, a homogenous sample that allowed for the research questions to be explored in greater depth (Saunders & Lewis, 2018).

The cases were identified through a variety of primary and secondary sources (Saunders & Lewis, 2018). The primary source for cases was through the researchers' informal network, for example, LinkedIn – a social media platform. While internet searches, through web sites such as VentureBurn - an online media site reporting on ventures in emerging markets, served as a secondary source to identify the sample cases. Once the samples were identified, the researcher sought to obtain contact information for potential cases. The researcher first attempted to contact an appropriate individual within the venture, and if the individual was willing to participate, a written request was then made (Saunders & Lewis, 2018). A written request provides the opportunity to communicate the purpose of the research professionally, how the participant could contribute, clear conditions of taking part in the research, guaranteeing anonymity, and how information collected will be used (Saunders & Lewis, 2018). The researcher followed up once after one week of the written request either through email or telephonically to request feedback on the initial request. If unsuccessful or declined, the researcher then continued to identify alternative research cases to be contacted, so not to coerce the individuals representing the venture in any way to participate in the research (Saunders & Lewis, 2018).

There were few concrete guidelines on the appropriate number of cases to select in a multiple case study design. Scholars researching the CVP concept with a multiple case research design have utilised varying samples, however, these ranged between two to four cases (Patala et al., 2016; Payne et al., 2017; Quero & Ventura, 2019; Wouters & Kirchberger, 2015). Therefore, the researcher did not set an initial sample case size, and the number of cases was determined by when code saturation had been achieved, and whether the research questions could be answered (Bowen, 2008; Reilly & Parker, 2012). Saturation is the point where no new information or insights are being gained from any additional interviews (Guest, Bunce, & Johnson, 2006), or when there is sufficient information to answer the research questions (Reilly

& Parker, 2012). In a multiple case study design, the objective is not to make generalisations, but to explore and gain an in-depth understanding of the research problem within a particular context (Creswell et al., 2007). However, it was important to reach saturation to ensure a deep and rich understanding of the research problem.

Overall, five cases were selected for the research study. Although the researcher attempted to interview more than one individual in each case, this was only possible for one case. A total of 97 unique codes were developed after several iterations. The initial code count was 177 codes. Through revision and merging of codes, this was reduced to 97 codes across all the data sources and cases. Figure 4 below illustrates the pre-merge and post-merge of all unique codes by case. This demonstrated that saturation was achieved over the five cases where few new codes were developed from the last two cases.
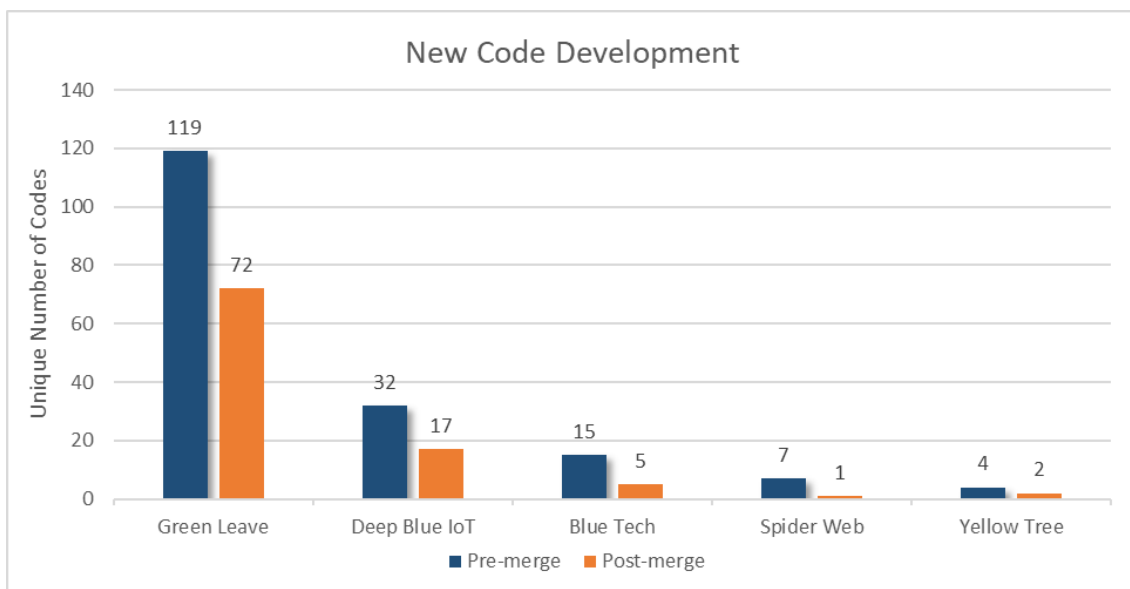
Figure 4: Code Development by Case

4.5.   Measurement Instrument

Exploratory case study research aims to provide insights into an issue through an in-depth understanding of a case through multiple forms of data (Creswell, 2012; Saunders & Lewis, 2018). Collecting data through multiple sources is also a major strength of a case study strategy to develop "converging lines of inquiry" to allow for data triangulation (Yin, 2018, p. 127), and an in-depth understanding of the research

problem (Creswell, 2012). Therefore, data were collected through semi-structured interviews, observations, and archival records related to each case (Yin, 2018).

In-depth interviews were conducted with individuals supported with an interview schedule that was semi-structured as the measurement instrument (Saunders & Lewis, 2018). Semi-structured interviews are useful in gathering information about a particular topic that may enable inductive theory development by allowing participants to describe the event from their perspectives (Saunders & Lewis, 2018). In a semi-structured interview, a list of questions should be prepared to ask participants, however, it allows for flexibility and additional questions to gain a deeper understanding of the particular experience the respondent is conveying (Saunders & Lewis, 2018). The interview schedule was developed based on the research questions, which in turn were developed from the literature reviewed, to gain an understanding of the research problem. The resulting interview questions aimed to gain deeper insights, and understanding of the design of effective CVPs from the perspective of entrepreneurs or owner-managers to answer the research questions and address the research problem.

Observations are frequently used in qualitative research to collect data as it occurs in a setting, which requires careful attention by the researcher to visual detail (Creswell, 2012). The role of the researcher was primarily to be that of a nonparticipant observer (Creswell, 2012). To gather data effectively from the observations, the researcher recorded field notes before, during, and after the interviews (Creswell, 2012; Yin, 2018). The researcher specifically observed the setting, the participants emotions and body language, interruptions, and finally, any reflections shared by the participants (Creswell, 2012; Yin, 2018). To make sense of the observations, the researcher recorded a description of the observation made followed by a reflective note on what it might mean (Creswell, 2012).

Furthermore, archival records, that consist of both public and private records, can be a valuable source of information in qualitative research (Creswell, 2012; Yin, 2018). The advantage of documents is that they represent the participants' thoughtful attention in their language and words, and are also ready for analysis, unlike interview and observation data that require transcription (Creswell, 2012). There are various types of documents that can be collected; however, the researcher focused on collecting information from publicly available sources, such as websites, newspaper articles, and social media postings (Creswell, 2012). In addition, the

researcher requested access to internal documents, such as product brochures, and any other information that might provide insights into the research questions (Creswell, 2012).

Furthermore, Saunders and Lewis (2018) suggested that conducting pilot interviews are important to determine whether the questions and concepts are understood correctly, to determine the flow of questions, and the timing of the interview, and identifying any important topics that might have been missed previously. In addition, a pilot interview will assist to indicate whether the researcher will be able to answer the research questions and objectives of the study (Saunders & Lewis, 2018). Therefore, a pilot interview, using the interview schedule, was conducted with an owner-manager of a Fintech start-up that was faced with similar conditions of uncertainty and risk as an IoT-orientated venture. The pilot interview revealed a few insights to improve the flow of questioning; to clarify ambiguous questions in the schedule, and allowed for the testing of recording equipment.

4.6. Data Gathering Process

The researcher collected data over six weeks through semi-structured face-to-face interviews (Saunders & Lewis, 2018). The interviews were guided by the interview schedule developed from the research questions. The number of cases and interviews were determined by whether the information gathered from each case is sufficient and adequate to answer the research questions (Reilly & Parker, 2012).

To ensure data could be analysed accurately, all interviews were recorded with two audio recorders. These recordings were then uploaded to a cloud storage account as a backup. The audio recordings, together with observation notes made during the interview, were transcribed after the interviews. This, along with relevant archival records, enabled the researcher to early on code, analyse, and identify any gaps in the interview schedule, and observation structure that can be addressed in subsequent interviews (Saunders & Lewis, 2018). During the first case interview, the researcher realised that an important question was omitted from the interview schedule that provided valuable insights into the research problem. Yin (2018) suggested that remaining adaptive when collecting data could lead to invaluable results and insights. Therefore, this particular question was asked during the first interview as the interview evolved, which was then also posed to all subsequent cases as well.

Prior to every interview, the researcher gathered as much information about the respondent and the case as possible. All necessary documents were printed, which included the interview guide, consent form, and additional supporting material. The interview locations were selected based on what was convenient for the participant. The researcher ensured that appropriate body language and appearances were observed during the interviews (Saunders & Lewis, 2018).

Moreover, as each interview commenced the researcher made sure to thank the participant for their time to conduct the interview. The purpose of the research and interview was clearly communicated, and permission to record the interview was asked for and granted by all the participants. Observational notes were made before every interview with information specific to each case, during the interview to record key thoughts, and after the interview to capture additional thoughts and observations (Saunders & Lewis, 2018).

4.7. Data Analysis Approach

To analyse data qualitatively, all audio recordings and field notes were transcribed to analyse the text (Saunders & Lewis, 2018). Throughout the data gathering process, the researcher transcribed the audio recordings and field notes. The transcribed documents were then loaded on to Atlas TI - a qualitative data analysis software package, provided by the Gordon Institute of Business Science (GIBS). Also, during the data gathering process, the researcher reflected on the completed interviews to identify initial insights and gaps. This reflection allowed the researcher to make changes to the interview schedule for the interviews that followed (Saunders & Lewis, 2018). In addition, after each interview, transcribing, and initial coding of the text data commenced to allowed the researcher to become familiar with the data, establish when saturation had been reached, and identify themes that might arise (Saunders & Lewis, 2018). Yin (2018) also suggested making reflective notes throughout the analytical process as a helpful practice to understand the data, while providing hints and clues to interpret the data.

The data analysis approach that was followed throughout the process consisted of the following steps (Saldana, 2013; Saunders & Lewis, 2018; Yin, 2018):

1. Become familiarised with the data;
2. Identify initial insights and themes;

3. Develop and assign initial codes to a piece of the interview data;
4. Develop categories and sub-categories ;
5. Systematically reorder, relink, and regroup codes into the developed categories to develop meaning and explanation;
6. Review codes and categories and recode if necessary;
7. Assign categories into themes/concepts; and
8. Develop patterns/propositions/theory.

The researcher followed the above steps systematically and iteratively throughout the data analysis approach. The researcher went through a number of iterations where initially the collected data, including observations and archival records, were coded quite broadly, which is a method of coding called lumping (Saldana, 2013). However, after coding the first interview it became apparent that a more rigorous coding process, i.e. splitting, was required to allow for a nuanced analysis of the data from the start (Saldana, 2013). This meant the researcher spent a prolonged period coding and recoding the data line-by-line that could further promote trustworthiness of the analysis (Saldana, 2013). Once all the data were coded, the researcher started searching for relationships and meaning between the codes to develop categories and sub-categories, after which themes and patterns emerged across the cases.

In a multiple-case design, although generalising from qualitative data is not the objective, a cross-case analysis provides some ability to identify the insights and themes that are common across the cases while strengthening the robustness and validity of the research study (Creswell, 2012; Gibbert & Ruigrok, 2010). The initial cross-case analysis was conducted, prepared, and structured followed by the drafting of the results section by research question and theme, which included describing the context of each case (Creswell, 2012). However, once the first draft of the results section was completed it became apparent that the codes and categories needed to be reviewed and restructured to better answer the research questions and improve the robustness of the analysis.

The second cycle of coding allowed the researcher to merge the number of codes and categories into a more nuanced set for analysis (Saldana, 2013). The researcher systematically went through each code to understand its meaning better. This review process resulted in the number of codes reducing from 177 to 97 codes for a set of codes that were mutually exclusive and exhaustive (Myres, 2018). Based on the reviewed codes, it became simpler to redevelop categories, themes, and conducting

a cross-case analysis that allowed for meaning and explanation to emerge to answer the research questions.

A cross-case analysis could consist of various general strategies and analytical techniques (Yin, 2018). However, in line with the inductive approach adopted, the researcher employed a strategy to work the data from the ground up, inductively, to search for, and identify, themes, patterns and relationships within and across the five cases (Yin, 2018). The case analysis approach may consist of three broadly defined steps that consist of 1) identifying within-case patterns, 2) drawing initial conclusions, and 3) identify replicative relationships across the cases (Yin, 2018). However, Yin (2018) suggested that the analytical techniques for "case study evidence is one of the least developed aspects of doing case studies" (p.165). Thus, to start the analysis of the data, the researcher manipulated the data across the cases by structuring the data in various table arrays to reflect the categories, codes, and cases in different ways while reflecting their frequency of occurrences (Yin, 2018). In addition, several mind-maps and visual displays were created, augmented with analytical notes, to make sense of the data and draw conclusions (Yin, 2018). Through this process, and several iterations, the researcher developed themes and patterns that were synthesised across the cases while recognising similarities and differences between them to retain the integrity of every case (Yin, 2018).

4.8.   Quality Controls

Ensuring trustworthiness in a qualitative inquiry is important to achieve scientific rigour (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Trustworthiness consists of credibility, transferability, dependability and conformability (Morse et al., 2002). Through several strategies, the researcher demonstrated trustworthiness throughout the process that would also reduce researcher bias.

Firstly, to ensure methodological coherence (Morse et al., 2002), the researcher ensured that there is congruence between the research questions and the subsequent research methodology and design. The case study design included collecting data through multiple sources which is a strength of this methodology to allow for data triangulation that further improves trustworthiness (Creswell, 2012; Yin, 2018). Secondly, informed by the literature, the researcher selected entrepreneurs for the study, and by specifying additional criteria, such as the industry, the

researcher ensured that the sample is appropriate to gain the necessary data to answer the research questions (Morse et al., 2002). Thirdly, as part of the researchers' data analysis strategy, collected data were transcribed, reviewed, and coded line-by-line as soon as possible to identify any insights that might require adjustments to the interview schedule but also to demonstrate that saturation was achieved (Creswell, 2012), through this the credibility and dependability was improved (Creswell, 2012; Morse et al., 2002; Saldana, 2013). Fourthly, also part of the researchers' data analysis strategy was to review codes and categories frequently and iteratively to make sense of the data while ensuring rigorous analysis (Saldana, 2013). This way the researcher was able to confirm themes that emerged with existing themes while gradually building towards an abstract/conceptual level, which enabled the researcher to think more theoretically (Morse et al., 2002). Throughout the research process, the researcher kept a journal to record any reflective notes, ideas, and analysis to augment and improve the robustness and trustworthiness of the research (Saldana, 2013; Yin, 2018). Finally, inherent in the data analysis strategy, gradual steps were made between the data and the conceptual level (Morse et al., 2002). Furthermore, in drawing conclusions, the researcher ensured that it was comprehensive, logical, parsimonious, and consistent (Morse et al., 2002). The researcher presented textual evidence from the interview data, triangulated with observation and archival records, to demonstrate consistency and improve the credibility of data and conclusions (Creswell, 2012; Hsieh & Shannon, 2005).

4.9.   Limitations

Qualitative research designs inherently have several limitations. Firstly, the sample selection of cases with specific criteria and the small number of cases was a limitation to generalise the findings to the IoT industry and to other settings. Secondly, as demonstrated throughout the literature review, value is an evolving concept that is subjectively assessed, which further limits the generalisability of the findings. However, the objective was to gain insights into the research problem and develop theory that would require testing on a larger scale to allow for theory validation and generalisation (Saunders & Lewis, 2018).

Another limitation pertains to the cross-sectional timescale and unit of analysis of the study (Saunders & Lewis, 2018). The collection of case data at a single point in time

limits the generalisability of the findings as it may not be sufficient to establish trends and comparisons (Gibbert & Ruigrok, 2010). In addition, to conduct an in-depth multiple-case study was beyond the researcher's ability and available resources (Saunders & Lewis, 2018). Thus, the study had to be limited in size and time to complete the research within the required timeframe. To overcome this limitation, future research with a longitudinal design in different settings could be employed (Saunders & Lewis, 2018).

5. RESULTS

5.1. Introduction

This section serves to provide a summary of the findings from the data collected for each of the businesses, hereafter referred to as cases, in this study for further analysis and synthesis in the discussion chapter to follow. This section also introduces the specific cases and relevant results from the data analysis conducted. In line with the ethical requirements of this research study, the anonymity of the respondents and cases are assured with all names being replaced with pseudonyms.

A challenge in analysing case study evidence is that the analytical strategies are the least developed aspects of doing case studies (Yin, 2018). An experienced case study researcher will thus have great advantages over a novice researcher (Yin, 2018). Since the researcher is a novice in analysing case studies, the researcher allowed for a great deal of experimentation and iterations with the data and results for themes and patterns to emerge. The primary strategy that emerged for the researcher was to work the data from the ground up (Yin, 2018), which is in line with the inductive approach adopted in the methodology section.

5.2. Data Types Gathered

This research study consisted of five cases. The researcher attempted to conduct two interviews within each case, however, only one case provided access to a second participant. Therefore, six interviews were conducted across five cases. To supplement the interview data, archival and observational data were collected. In addition, the researcher made notes before, during, and after the interview, which were included for data analysis. However, the main data source for data analysis came from the interviews that were conducted.

5.3. Description of Cases

The data collection spanned five separate cases of which two were established companies, two were in the start-up phase, and one is a start-up within an established company. Table 4 presents a description of each case and the participants.

Table 4: Description of Cases

Company Pseudonym	Type of Service	Description	Company Stage	Participant & Position
Deep Blue IoT	Broad IT Solutions provider	Provide a wide variety of IT services, including holistic IoT solutions; bespoke hardware development and manufacturing; and bespoke software services.	Established	Jack – Partner / CEO
Blue Tech	IoT Solutions provider	Provides high quality electronic and hardware designs; complete turnkey solutions from design to manufacturing to implementation.	Established	John – Co-founder / CEO
Green Leave	IoT Solutions providers	Provide holistic IoT solutions; bespoke consulting services in industrial and electronic engineering.	Start-up	Ben – Partner / CEO Nico – Investment Partner
Yellow Tree	IoT Solutions provider	Provide holistic and bespoke IoT solutions based on the latest technology available.	Start-up	Mark – Co-founder / Marketing Director
Spider Web	IoT Network provider	Provides connectivity to enable IoT solutions	Start-up from Established	Pete – Sales Director

5.4. Introduction to Cases

The IoT industry and market in South Africa is still emerging. Ventures in this industry, as well as customers, faces high uncertainty and risk. All five of the cases in this research study provided an opportunity to gain valuable insights into the design of effective CVPs in this context. As defined in the Global Entrepreneurship Monitor report (Herrington et al., 2017), three of the cases are established business or businesses formed out of established companies that have been in operation for more than 3.5 years, while the other two cases, Green Leave and Yellow Tree, are start-ups in the IoT industry. Interviews were conducted with either the owners, executives, directors or partners. An introduction to each case along with relevant contextual information is presented in the section to follow.

5.4.1. Blue Tech

Blue Tech was established around 15 years ago with a focus on developing electronic solutions. Over the last five years, based on industry and market trends, the focus had shifted towards developing end-to-end IoT product and software solutions that are relevant for the African market and requirements.

> *"So about 15 years ago, we started with developing electronic solutions. Ultimately, as time progressed, about five years ago, we started focusing on machine-to-machine or IoT technologies, and remote monitoring solutions, because that was what was going to be the next big thing."* (John – Blue Tech; 2019/08/22; 2019/08/22)

> *"We often found that the building blocks of devices you can buy from China, or wherever else does not necessarily fit into the African model market or requirements. So, in a nutshell, we do bespoke IT or remote monitoring solutions from concept to the whole thing, you know, start to finish."* (John – Blue Tech; 2019/08/22)

Blue Tech has a diverse set of capabilities that enables them to develop bespoke and end-to-end solutions for customers.

> *"We develop the hardware, the electronics, the firmware that goes on there, the analytics, the communication protocol. We do the final assembly and manufacturing of these devices as well, on the hardware level. Then we've got a platform or communication protocol we use together with our portal and platform that makes it very easy for us to develop a solution that talks to the cloud and the information is available then for the customer. So sort of jack-of-all-trades."* (John – Blue Tech; 2019/08/22)

Blue Tech is a business-to-business solutions provider and focuses on building partnerships and developing solutions for the customers that would enable them to sell more of their services to the end-user.

> *"We've worked very long and hard on building relationships with certain people in certain areas to get to a point where we've got better access and exposure. Your telecom operators are a very nice way to get into the market because there's a lot of push from their side because they want to sell connectivity, and if you can supply them with a solution they can sell it to their*

customer, and everybody makes money in the circle." (John – Blue Tech; 2019/08/22)

Blue Tech has good relationships with customers and retains around half of its customers over the long-term. However, Blue Tech is facing challenges to scale, due to limited access to resources. In addition, due to local economic and market constraints, Blue Tech has continued to search for markets that are more attractive for growth by moving into other African markets where there is a need for IoT solutions. The African market makes up between 70 to 80% of Blue Tech's current projects based on the number and scope of these projects.

> *"We have one product we've been building for nine years I think, and it's probably 15,000 or 20,000 units we've built over that period of time. So yes, there are long-term relationships, and some are not that long. It's about a 50/50."* (John – Blue Tech; 2019/08/22)

> *"Our biggest issue has been funding…If we had lots of money to work with, we could probably push out ten times more viable products and solutions than we are currently."* (John – Blue Tech; 2019/08/22)

> *"Our focus has subsequently been more on the African market rather than the South African market. Because there's a lot more growth in certain African countries than there is in South Africa."* (John – Blue Tech; 2019/08/22)

Blue Tech is an established business that focuses on developing and delivering business-to-business solutions. This case provided good insights into the design of an effective CVP because Blue Tech has shown an ability to search for and find alternative growth markets with limited resources, and build long-term, mutually beneficial customer relationships.

5.4.2. Deep Blue

Deep Blue was formed out of an existing international company with a large global network across 38 countries. The company has grown into a group of companies that provides a variety of services that focuses on software development and electronics development. Deep Blue itself was created as a brand around three years ago to group the various companies under an umbrella name. Within this brand, the larger organisation is looking to grow its IoT business through Deep Blue IoT while leveraging the groups' resources.

"So, the first thing is that Deep Blue is just a brand. It's an organisation, it's not a company…We are an international company with branches, I think, in 38 countries and so forth." (Jack – Deep Blue; 2019/08/21)

"What we did over time, and it's just a matter of focus, is that we've said, okay, Deep Blue at this point in time, have two focuses, and that's our traditional business of software development for clients, and then we have [Deep Blue IoT]*, whereas right now, we've got a very strategic focus on IoT and IoT related projects. "* (Jack – Deep Blue; 2019/08/21)

Deep Blue is not new to the IoT industry. They have been doing connected devices under different guises for the last 12 years, and to take advantage of the market trends and awareness the focus had shifted using Deep Blue IoT as the vehicle and brand.

"So we have been doing IoT for the last, I don't know, 12 years. We didn't call it IoT. We called it revenue protection. We called it data collection automation, or whatever. It's only in the latter part of the century, of this decade where this term of IoT became so popular, and so on. Now, to capitalise on that, let's call it awareness in the market. That's when we then grouped all this stuff together and we said, this is now [Deep Blue IoT]*. So it's only been, the brand itself, it's only been in existence for about three years or so. But we've been doing this for a very long time. "* (Jack – Deep Blue; 2019/08/21)

Deep Blue is a business-to-business solutions provider and appears to be relatively successful in gaining and retaining large customers, which is a key focus for the case.

"Once we bring a customer on board, we can keep them. I mean, I look at it on the software side of things, not the IoT side. There we've got clients, and not insignificant clients, [Telco A]*, has been a client for 12 years.* [Telco B] *has been a client for the last 10 years.* [OGC]*, which is an oil and gas company, they've been a client of ours for 10 years.* [JJS] *has been a client for 10 years.* [Motion] *has been a client for 12 years; I can go through them, there are plenty."* (Jack – Deep Blue; 2019/08/21)

Deep Blue has very few resource constraints, and a large part of their growth and customer success comes from having access to resources in terms of finances and capabilities.

"We are our own VC…So, how can I say, having that kind of financial muscle behind us helps a lot." (Jack – Deep Blue; 2019/08/21)

"So it's not just the hardware, it's not just the software, we've got UX services, you know, usability. So we can design you nicer screens, mobile apps, you name it, we do that. We have data science. So we do full-blown AI machine learning to the most extreme levels, you know what I mean. We've got all of these horses in our stable, and that allows us to do this stuff. So that definitely helps as well." (Jack – Deep Blue; 2019/08/21)

Deep Blue IoT, although the brand only existed for the last three years, is an established business, and provided an excellent case for the study of designing effective CVPs, because of their ability to continue growing, delivering new products and services, and building lasting customer relationships in the business-to-business context.

5.4.3. Green Leave

Green Leave was established with an underlying philosophy and vision to digitise, optimise and transform their customers' businesses by providing an end-to-end solution using IoT technology. Green Leave is very much in the start-up phase where the venture has had to pivot several times and shift focus over the last two years with two broad offerings, hardware solutions and software platform, to deliver value to customers.

"The environment that we are operating in is, we want to provide an end-to-end solution, using IoT technology, but also have an approach and an underlying philosophy." (Ben – Green Leave; 2019/08/13)

"So the one pivot was that we realised that the calling of all pockets approach didn't work. The second one is that because of this relatively new approach, and this new technology of IoT, we had to shorten our cycle times in order to deliver a proof of concept for the customer to see what tangible value there will be." (Ben – Green Leave; 2019/08/13)

"So we have to now, once again, pivot to say but we've got two very distinct things now, we've got hardware solutions, and we've got a software platform, and both of these things we can sell." (Ben – Green Leave; 2019/08/13)

Green Leave is a business-to-business solutions provider focused on SMEs. Once Green Leave has managed some level of growth, the venture will seek to develop solutions for larger enterprise customers. However, Green Leave is currently constrained by their limited resources and finding a fit between its business model and the market.

> *"We actually want to target a certain sector, more certain size company. So we only want to, for now, want to target small and medium enterprises…So our software might not currently be 100% enterprise-ready. That will be in the growth phase when we can afford to employ three or four developers to make that enterprise-ready we will go to enterprise customers. But for now, our value proposition is to small and medium enterprises that want to have a taste of digital transformation and lean transformation using IoT Technologies."* (Ben – Green Leave; 2019/08/13)

Green Leave's underlying philosophy and approach to creating solutions are to create long-term and lasting relationships with their customers. To be part of the overall journey to create value for the customer and ultimately their customers, i.e. end-users.

> *"Once you've already partnered with this customer and you formed a special relationship with this customer, what we want to do then is, we want to build solutions that will make them money because they also have to digitise their proposition to their customers."* (Ben – Green Leave; 2019/08/13)

Green Leave is also in the process of searching for attractive markets to develop scalable solutions to leverage their limited resources and enable the venture to grow towards its overall vision.

> *"So we're trying to now package our solutions into a way that people can really slot into their organisation without our help. So that we can create more sales, without having to spend more time with customers."* (Ben – Green Leave; 2019/08/13)

Green Leave provided an interesting case of a start-up looking to gain market share in an emerging industry as a business-to-business solutions provider. This case demonstrated the iterative and dynamic nature of designing an effective CVP when constrained with limited resources in an industry faced with uncertainty and risk.

5.4.4. Spider Web

Spider Web was formed out of an international company focusing on global connectivity for mobile operators. To take advantage of the group's resources and capabilities, Spider Web was established as a separate company, with access to resources, to provide connectivity solutions into the IoT industry. Spider Web started taking off around January 2018 as demand for mobile connectivity solutions grew.

> *"So they looked at what other services they could leverage off their knowledge of USSD and mobile operators."* (Pete – Spider Web; 2019/08/27)

> *"It's kind of really started, I would say at the beginning of last year* [January 2018]*, where it was throwing the leads over the fence."* (Pete – Spider Web; 2019/08/27)

> *"The nice thing with* [Spider Web] *now is that it has now completely spun out of the group. Although there's still some common shareholding and funds that are accessed if needed."* (Pete – Spider Web; 2019/08/27)

Spider Web focuses purely on being an enabler for the IoT industry through their connectivity solutions. Spider Web's customers are the IoT hardware and software solution providers in the industry, who in turn provides solutions to their customers.

> *"We are not end-customer facing really, because we don't have hardware, and we don't have dashboards."* (Pete – Spider Web; 2019/08/27)

Spider Web relies on its network of hardware and software partners to enable end-to-end solutions by connecting the right partners to address the customer's need. A key activity is to build long-term relationships by solving customers' problems.

> *"We see this all the time in the business world. A sales guy will go in and try and push something down on a customer, and if they buy it, and it wasn't the right solution, it normally gets kicked out, or they don't have a long-lasting relationship. So what we do is we kind of go in, understand the needs, and then put our partners together, because we've got hardware partners, and we've got software partners, and we are the connectivity layer."* (Pete – Spider Web; 2019/08/27)

Spider Web relies on a network of partners to enable their value proposition and focuses on building strong ties with their partners to ensure that IoT projects are

successful. Spider Web brings a unique value proposition to the IoT industry, which made it an interesting case to understand the design of an effective CVP.

5.4.5. Yellow Tree

Yellow Tree was established two years ago as a start-up by a team that specialised in industrial automation and process plant control. Based on the industry and market trends, the team established Yellow Tree to integrate devices through IoT. Yellow Tree then moved into electronic design and enclosure design to be able to provide competitive solutions to customers.

> *"We saw two years ago. We saw the change in the IoT side, especially the industrial side, and the impact it will have…So we started Yellow Tree as a start-up, and we started looking at how to integrate devices on the industrial side."* (Mark – Yellow Tree; 2019/08/28)

> *"So you get to this catch situation where people expect IoT to be, I don't want to say cheap, but feasible, right. We can't make it feasible because of the prices of devices and the import price. So we thought it would be a good idea to make our own devices, and we started the journey into the electronic design and enclosure design and all that right."* (Mark – Yellow Tree; 2019/08/28)

To gain a foothold in the market, Yellow Tree constantly shifted and narrowed their focus towards specific market needs that would enable the venture to grow, which have led the venture becoming an end-to-end solutions provider able to manufacture and design complete solutions for industrial customers.

> *"So I think we had a list of about 45 different devices we wanted to make* [laughter]. *At one stage, we had to stop and say, okay, focus on something in the market, where there is a need for something, and we hit it off on two areas where we basically made satisfaction buttons for the retail sector, right. From there on, we started dabbling in electricity monitoring and warts and all that right."* (Mark – Yellow Tree; 2019/08/28)

> *"So we started off with automation. We started the company looking at devices, and then we moved on to more of a solutions company where we don't just make the devices, but we give the end-customer the best solution at the end of the day."* (Mark – Yellow Tree; 2019/08/28)

Yellow Tree focuses on the market, what customers need, and building long-term relationships to ensure successful IoT project implementation in a business-to-business context. This focus ensures successful customer relationships for Yellow Tree, which creates more demand for their solutions and services despite limited resources.

> *"We take on the correct problems our clients have, not to waste their time and ours."* (Mark – Yellow Tree; 2019/08/28)

> *"So from day one, you got to build a relationship with the customer and walk with them, through whatever they want to do, and you have to be agile enough to change whatever you need to change when they want to change, right."* (Mark – Yellow Tree; 2019/08/28)

> *"What we found though, on one or two successful implementations, is that once you've added that* [solution]*, right, and they see the value of what you brought to them from a digitisation point of view, it's just like they've taken the red pill, right. So now they can digitise this and that and it just, it keeps going, and it doesn't stop."* (Mark – Yellow Tree; 2019/08/28)

In the context of being a start-up in the IoT industry, the Yellow Tree case provided another interesting case to understand the process of designing an effective CVP. Yellow Tree has been in existence for two years, and, it would appear, that this venture is already making good progress towards establishing a position within the industry and market developing business-to-business solutions.

5.5. Introduction to Research Questions

The aim of this research study was to explore and understand how entrepreneurs in IoT-orientated business design effective CVPs in the context of risk and uncertainty. To achieve this aim, the five cases were selected to provide an understanding and insights into the process of designing a CVP, the content of a CVP, and how entrepreneurs create a fit between their CVP and business model to communicate and deliver value to customers. The results from the data collected across the five cases will be structured and presented in order of the research questions. *Table 5* provides a summary of occurrences by research question, theme, and case.

Table 5: Summary of Occurrences

Summary of Occurrences by Theme	Research Question 1		Research Question 2	Research Question 3
	CVP Enablers	Value Creation Process	Value Dimensions	Business Model Management
Blue Tech	43	25	22	38
Deep Blue IoT	67	42	41	60
Green Leave	60	116	51	203
Spider Web	58	31	28	56
Yellow Tree	31	46	25	90
Overall	259	260	167	447

Table 6 below provides a detailed summary of the theme and category frequencies that emerged from the data analysis. Four salient themes emerged with 15 categories developed from 97 codes. The initial code count was 177 unique codes. Through revision and merging of codes, the code count reduced to 97 codes across all the data sources and cases.

Table 6: Summary of Theme and Category Frequencies

Summary of Occurrences	Research Question 1					Research Question 2					Research Question 3				
	Value Creation Process		CVP Enablers			Value Dimensions					Business Model Management				
	Process: Design	Process: Delivery	Enablers: Resources & Capabilities	Enablers: Partnerships & Ecosystem	Enablers: Communicating Value	Content: Information Value	Content: Economic Value	Content: Latent Value	Content: Tangible Value	Content: Effectiveness Characteristics	BM Management: Market Alignment & Growth	BM Management: Competitiveness	BM Management: Challenges	BM Management: Organisational Learning	BM Management: Customer Management
Total	171	89	100	93	66	47	34	34	27	25	149	96	96	71	35
By Case															
Blue Tech	18	7	18	17	8	9	3	4	3	3	13	11	3	6	5
Deep Blue IoT	34	8	20	22	25	9	5	9	15	3	13	21	9	10	7
Green Leave	69	47	35	14	11	11	19	15		6	86	15	65	28	9
Spider Web	19	12	13	30	15	11	3	4	6	4	16	16	10	13	1
Yellow Tree	31	15	14	10	7	7	4	2	3	9	21	33	9	14	13

5.6. Results - Research Question 1

How do entrepreneurs perceive the process of designing a CVP?

This research question was formulated to explore and gain insights into the process of designing a CVP in the context of uncertainty and risk. Through an inductive analytical approach, several categories and themes emerged from the cases related to the process of designing a CVP. The value creation process and CVP enablers emerged as themes in response to research question 1, which will be described in the section to follow in order of overall occurrences.

5.6.1. Value Creation Process

The value creation process consists of two processes. The design process and the delivery process, which taken together drive the process of designing a CVP. The design process describes the key activities to designing an initial CVP, while the delivery process describes the key activities to initiate implementation of the CVP that will naturally evolve over the delivery process.

5.6.1.1. Design Process

The design process is a core process of designing a CVP across all the cases. Collectively it was the most observed category with 171 occurrences. This design process emphasises the creation of novel solutions underpinned by a holistic problem-solving process that focuses on a problem-solution fit to develop end-to-end solutions for the customer. Green Leave provides an overview of the role of technology that leads to novel solutions, which is also demonstrated through brochures and content to visualise the digital transformation.

> *"We can use IoT sensors and technology to simplify that whole process [digital transformation]."* (Ben – Green Leave; 2019/08/13)

Yellow Tree supports this by adding, in an expressive tone of voice, that there are three domains of technology driving novel solutions, which requires a firm understanding of the technology.

> *"It revolves around devices, networks, and platforms, right. And I think once you understand how those three pillars are put together; you can give the*

customer the best solution to what they need." (Mark – Yellow Tree; 2019/08/28)

Deep Blue continues to add that every solution will be novel in the sense that every customers' needs will be different based on their context. Archival records that communicate and suggest tailored services across the IoT spectrum also support that every solution will be novel to the customers' needs.

"Every industrial IoT use case is going to be different. You're not going to buy them off the shelf, not for a very long time." (Jack – Deep Blue; 2019/08/21)

In a simplified example, Yellow Tree describes with excitement how the industry and technology have evolved, and how it can lead to novel solutions to customer's problems. These solutions have also become much more accessible and affordable.

"So, MES has been a thing, buzzword, before IoT was a buzzword, its manufacturing execution systems, right. So that's when you start looking at your OEE [overall equipment efficiency] *and your efficiency on a line, for instance, right. Now, the problem with that 10 years ago, was that the software was expensive and most of your lines are not networked, right. So it'll be a little island, the problem is getting the data out of that, to build that network becomes like a 2-3 million rand operation. So the guys look at it and go, the return for this is so little. I am not going to do it. Wherewith IoT now, we can literally just slap a gateway into the, on the PLC side, pull the data out and say, well your OEE is this right."* (Mark – Yellow Tree; 2019/08/28)

A key activity in the design process is the problem-solving process. Deep Blue indicates that context and understanding is an essential first step in the process to design a solution that is fit for purpose.

"We need context. We need to understand the problem. So we can give you the right solution." (Jack – Deep Blue; 2019/08/21)

Green Leave and Yellow Tree describe how this problem-solving process is a very focused and iterative approach to identifying and understanding the key problems that will create the most value for the customer in the long-term.

"So by using a very iterative approach to say, let's first identify the 20% of things that are causing 80% of the problems, or the 20% of machines, that

are creating 80% of the value in terms of finances, or in terms of customer value." (Ben – Green Leave; 2019/08/13)

"Start with something small, right. So we can see this is the major issue. This is the bottleneck. But just by changing this little thing in the process, it will already start making a difference." (Mark – Yellow Tree; 2019/08/28)

A key activity that goes hand-in-hand with the problem-solving process is to understand whether there is a problem-solution fit. Green Leave describes the essential elements of gaining a problem-solution fit that revolves around understanding the problem, the technology, the costs, and then whether the customers is willing to pay for the solution.

"So to build a value proposition, you must first, understand the problem very well, and then see how you can fix it with what technology and how expensive that technology is…and then the problem should be so that the client is willing to pay for it." (Nico – Green Leave; 2019/08/15)

Yellow Tree provides an example that describes the importance of understanding the problem and the technologies available to provide a solution that fits the problem.

"So if, if it's, for instance, measuring a cooler box, and there are 3,000 cooler boxes that you want to measure, and there is whatever in it, blood, for instance, that's a battery-operated unit, right. So that's a totally different solution to one where you measure a field contactor or a generator, right." (Mark – Yellow Tree; 2019/08/28)

A final activity in the design process is to focus on developing holistic solutions. Blue Tech describes it simply by focusing on the bigger picture.

"We have to look at the full picture. We have to sell a solution, we can't sell a product." (John – Blue Tech; 2019/08/22)

Yellow Tree further elaborates the dimensions of what an end-to-end solution includes, and it essentially revolves around hardware and software solutions. This corresponds with archival records that communicate the specifications and functionality of an end-to-end solution.

"So we do the whole thing, right, we sell a full solution where you buy the button, you press it, you get analytics, we give the customer analytical reports

and notifications if there are unhappy customers, and so forth." (Mark – Yellow Tree; 2019/08/28)

5.6.1.2. Delivery Process

The delivery process is an integral part of the design process and observed 89 times across all the cases. The delivery process focuses on the efficient implementation of the initial CVP while using resources effectively. Blue Tech describes how elevating their internal resources to reduce turnaround times leads to efficient implementation. This is supported through company documents, which communicate that with specialised equipment they are able to produce prototypes in-house with little delays.

> *"We've built our core of the business around the building blocks principle, which allows us to do new product development in a very short time period. And we've done it a couple of times before, if a customer has a certain requirement, four weeks later, we can do a demonstration on what he wants."* (John – Blue Tech; 2019/08/22)

Green Leave also describes how efficient resource use improves their ability to demonstrate an initial CVP. This corresponds with solution brochures that depict examples of common problems, the solution, and the expected outcome of the solution that revolve around enabling the customer.

> *"So now it's a matter of in the same day, I can go and install our device and on-board them* [customer] *onto our platform. And by the end of that day, that manager, or business owner can go home and he can log on to his computer and see exactly what's happening in his plant."* (Ben – Green Leave; 2019/08/13)

Yellow Tree continues to add that by focusing on their core capabilities they are able to use their resources effectively. This focus is evident on their website, which specifies and communicates their offerings simply.

> *"We're not a massive team, so we keep it, we try and keep it quite lean at the moment, which we are able to do. And we only take, I would say, we only take on opportunities, which is in our scope as well, right."* (Mark – Yellow Tree; 2019/08/28)

The delivery process is dynamic and driven by customer problem and context. Deep Blue emphasises this point through an example illustrating the dynamic nature of a CVP that depends on the customers' problem, objectives and context.

"The engagement with our clients or potential clients are much more driven by a specific need that they have. So I'll give an example, you've got the [Carton] diamond mine out here, they would come to us and say we have a need, which is - diamonds get stolen. So the sorting of the diamonds is in a huge, big, three-story, like a warehouse, it's like a three-story safe, nobody goes in there. But I need technology to identify a diamond, and then to, you know, somehow collect that diamond. So again, that's a very specific problem that needs to be solved…So there the value proposition was very much risk mitigation. You know, security, all those kind of things, okay, and automation and accuracy, and all those things." (Jack – Deep Blue; 2019/08/21)

Green Leave also describes how the initial delivery process is dynamic and evolves with a focus on continuously moving from one problem to the next.

 "We approach this very differently to say that our scope and our timeline is one month. Then we move on to the next one, the next problem that is, and then we move on to the next problem." (Ben – Green Leave; 2019/08/13)

Fundamental to the delivery process is to engage, empower, and integrate the customer and their resources into the process in an interactive manner. Green Leave describes the dynamics and importance of the customer and their resources in the delivery process that leads to important feedback loops. This process is also visible in their company brochures that describe a four-step process that revolve around the customer.

 "So one of the fundamental principles of a lean transformation is respect for people. It's one of the main pillars we do in transformations and respect for people is to engage with them, empower them, and to challenge them. " (Ben – Green Leave; 2019/08/13)

"It's a collaborative problem-solving environment, where even the operators have a feedback loop back to their manager. And that feedback loops come to us to say, can you modify the screen? Can you add another sensor, even though we're not ready to move on to the next iteration, but we want to have that input or that parameter as well." – (Ben – Green Leave; 2019/08/13)

Yellow Tree supports this by providing an example of an interactive relationship with the customer to design and deliver the CVP.

> *"So if it's an asset tracking thing, for instance, right. You got to have the logistics guy involved from the start. So what is the problem? What are you experiencing? And why is it you want to track these assets in this specific way. It's imperative that they be part of the journey as you go along"* (Mark – Yellow Tree; 2019/08/28)

Throughout the delivery process, insight might be gained that would result in the CVP evolving. Blue Tech describes how the CVP evolves in the delivery process and the importance of the implicit activity of being able to effectively identify and recognise the value opportunities throughout the delivery process.

> *"As it evolves* [solution] *you kind of have that extra. That's what makes IoT very interesting is that very often you find the true value after you've started with it. You find extra value after you've been able to analyse the information because the information might not have been readily available beforehand for you to make those discernments."* (John – Blue Tech; 2019/08/22)

A key underlying trend throughout the value creation process is the role and importance of the customer. Deep Blue provides a crisp explanation of the importance of the customer and customer-centricity.

> *"When I talk value proposition that for me is purely from a client's perspective. And if you can't articulate or if they can't articulate what it is they want to solve, then you can have all of the differentiating factors that I discussed just now, which is us, that means nothing."* (Jack – Deep Blue; 2019/08/21)

Blue Tech elaborates by describing the dynamic, iterative and interactive nature of the delivery process where value is co-created with the customer. Communication is a key activity throughout the process.

> *"It's interactive, we have to find out from the customer, are you addressing his needs, are you adding value, what extra stuff is there, and what's their real problem because sometimes, the problem statement isn't the real problem. So it is a bit of an iterative process, and it is interactive. You can't just do it on your own and expect it to come out alright on the other side… it becomes a sort of co-partnership type of principle because the customer knows their*

business better than I do. So I need to communicate with them" (John – Blue Tech; 2019/08/22)

5.6.2. CVP Enablers

The value creation process emphasises the processes involved in designing a CVP. However, these processes need to be enabled through various activities and resources to become effective and realise a CVP. The CVP enablers theme focuses on three key enablers that consist of resources and capabilities, partnerships and ecosystem, and communicating value. These enablers will be described in the section to follow in order of occurrences from the data analysis.

5.6.2.1. Resources and Capabilities

Organisational resources and capabilities is a core enabler for all the cases in the CVP design process with 100 occurrences observed. These resources and capabilities are dynamic as they enable the cases to combine and leverage resources to solve problems and develop new capabilities.

Deep Blue illustrates by describing how their resources and capabilities allow them to solve customer problems they have no experience with, which creates an opportunity to develop new capabilities to enable and enhance a CVP for other customers.

> *"So the point is, now we get these sensors that they* [customer] *use, something we've never worked with before, have never got experience with. So they bring it here, they give us the protocol information. Then we start to program this* [cube] *device to be able to talk to those sensors. In this case, we will make up the cables as well to connect all these things. And then we'll test it, we will take you through a test cycle. And then, we normally, on this side now* [solution ecosystem]*, we'll do like a simple dashboard, so just to show the results of all of this. So this team is very key. It's somewhere between the product and the services. We productised the protocols that are translated. So the next client that has the same requirement, we can use it. So it's a very strong reuse capability."* (Jack – Deep Blue; 2019/08/21)

Green Leave implicitly describes the dynamic nature of their resources and capabilities in solving customers' problems. These dynamic abilities are

demonstrated in company brochures that isolate key problems customers might have together with the resource and capability set Green Leave would utilise to solve those problems.

> *"Wherever you* [customer] *are in your [digitisation] journey we can just slot in and assist you with that."* (Ben – Green Leave; 2019/08/13)

Blue Tech further describes the range and nature of its resources and capabilities, which flows from its core capability to solve problems. Resources and capabilities are also communicated through company documents that are categorised around eight key service offerings.

> *"We have quite a diverse team in the sense that we try and look at, I think our focus is mainly problem-solving if I can put it that way. So when it comes to doing research and understanding a problem and getting solutions for the problem, between myself and my partner, and one or two other guys, we can sort of cover the whole bases. But yeah, that's the initial stage, especially with sort of determining or giving them the value proposition."* (John – Blue Tech; 2019/08/22)

Yellow Tree also describes the range and nature of its resources and capabilities that enable the value creation process.

> *"Then there are other areas where we might just give the devices, or we might just look at the analytics, but we do have the ability to give the full solution, from device through connectivity through to the back."* (Mark – Yellow Tree; 2019/08/28)

The individuals and teams, with their knowledge and experience, makes it possible to create and build organisational capabilities that enable the design of a CVP. Yellow Tree, Deep Blue, and Blue Tech describe the impact and importance of knowledge and experience to enable the overall value creation process.

> *"So all of us in* [Yellow Tree] *has a background in automation, especially industrial automation."* (Mark – Yellow Tree; 2019/08/28)

> *"What we do is very, you know, we have a very strong background, 17-year background in the aerospace and defence industry. So you can imagine the kind of discipline that our electronics development comes from to be able to*

compete in that space. So those are the kind of principles we apply to this."
(Jack – Deep Blue; 2019/08/21)

"We have the benefit of having worked on a lot of projects. We've probably done about 180 to 190 product developments. That helps a lot. So experience is quite, quite important in our situation… So the depth of our experience helps us to solve problems quicker and easier." (John –Blue Tech)

5.6.2.2. Partnerships and Ecosystem

The partnerships and ecosystem category is observed across all the cases with 93 occurrences. The core focus is on establishing and developing strategic partnerships that would enable a CVP. Partnerships make it possible to design and deliver CVPs that create value. These partnerships are also a means to fill key resource and capability gaps that may exist.

Deep Blue describes the strategic nature of partners with an example of partners enabling role.

> *"It's very strategic for us to go to market with partners. Because the partner is a very efficient way of translating the clients' problem into a language that we understand. We've got amazing technology, but if you say to me, I've got to build a solution around let's say, oil quality monitoring, okay. I know nothing about oil, you know what I'm saying, and we use partners to be able to translate that for us."* (Jack – Deep Blue; 2019/08/21)

Yellow Tree also describes how they use partners to complement their capabilities, and reflects on the collaborative spirit observed amongst partners in the industry. The importance of partners is also evident in company documents where partners and their roles are explicitly communicated as part of the offering.

> *"If it's not in our toolbox, we need to be able to go to someone else and say, you've got this, it might be worth much so let's do it. And what we've seen so far is that most guys all willing to play."* (Mark – Yellow Tree; 2019/08/28)

Green Leave further describes how partners are a critical part of their CVP to fill internal resource and capability gaps.

> *"We do need to interface with or interact with hardware companies. That is the reality of it…We do not have the internal skills and capacity just yet to do some of these things."* (Ben – Green Leave; 2019/08/13)

Partnerships not only enable the design and delivery of a CVP but also serves as an effective channel through which to deliver a CVP and grow the business. This requires an understanding of who the key partners are, and what opportunity may exist for them. It needs to be mutually beneficial. Blue Tech describes how certain partners are a key channel for reaching customers, and further provides an example that illustrates the importance of understanding the partners' CVP and context to develop a mutually beneficial relationship.

> *"Your telecoms operators are a very nice way to get into the market because there's a lot of push from their side because they want to sell connectivity, and IoT devices typically use this connectivity from those guys, from your* [Telco 1]*,* [Telco 2]*,* [Telco 3]*, and* [Telco 4]. *And if you can supply them with a solution they can sell it to their customer, everybody makes money in the circle. Like a, typically your Samsung cell phone, for instance. That's an enabler for them to sell services. And so an IoT solution becomes an enabler for them to sell services. That's why they are a very good entry point. So aligning with Telco's, it's been our focus."* (John – Blue Tech; 2019/08/22)

Spider Web continues to describe the ecosystem and how certain partners are more effective channel partners to enabler their CVP. This emphasises the need to understand the partner ecosystem.

> *"So* [Braveheart] *is an end-to-end solutions provider from hardware to platform, and they do B2B. So they also don't really sell into* [end-customers]*, they'll partner with* [partners]*. And then you get the real end-to-end guys like* [Yoko]*. They will build stuff and prototype it, and deploy it at the end-user. And then you get hardware manufacturers that build things, and they just sell things. They don't care about, you know, platforms and customers, you want to buy 10,000 devices, I will build you 10,000 devices. So those are the three types of tiers, and I try and chase the guys building things, that's where I try to focus on."* (Pete – Spider Web; 2019/08/27)

Blue Tech adds by describing the need to understand the partners' CVP to determine how they can contribute and enable their CVP.

"Everybody specialises in a certain field because IoT is not as simple as just a device and it works. There are aspects, obviously, like, you know, the hardware, the firmware, the communications stack, which could be GSM, Bluetooth, [Network - Classic]*,* [Network – Jane]*, or whatever,* [Network – Narrow]*. So there are so many variations, and each one has a benefit or an advantage for a specific application. So you can't cover all the bases, and that's where your associations and partnerships become key, I think."* (John – Blue Tech; 2019/08/22)

Spider Web provides an example from a customers' perspective that describes the process of identifying partners to enable the design of a CVP.

"Understanding your technology. I think it's also a very critical step, so what I am saying is, you know, if you, outside of things. So if I was going to deploy an IoT solution, and I go, ok I'm going to go [Network - Classic]*. And then I go, okay, now I have got 1,000 branches in Africa, my solution will fail, because it will only work in South Africa. It'll only work in Kenya. But what about my other, you know, regional offices? So you need to, you know, when you building a VP, is to say, okay, if I'm, if you say this is a true IoT device and go anywhere in the world, how do you deliver that service, and it's, it's then working with the mobile operators to make sure that their network coverage is good, and therefore, the agreements are good. So you've covered the pricing, we've covered the connectivity, and then you need to go to the hardware guys."* (Pete – Spider Web; 2019/08/27)

A key activity to enable the design of a CVP is to develop, contribute, and collaborate within the ecosystem. Spider Web provides an example of developing the ecosystem by engaging and developing partners outside of the immediate ecosystem.

"So in SA, the first step was identifying who are the big manufacturing guys and going to them. And the guys kind of go, you know, well, you know, we don't do this thing. And then you show them, okay, these are the customers that are interested. This is how we're going to build the story for them. This is where you guys are going to play. Ok great, get the hardware guys on board. Then you've kind of close that loop. And then, last step in the puzzle is the AI and platform side, of which there are millions, and it's probably the easiest bit to get right. So it was also understanding, which are the best guys in building

IoT customs, and then from there it's putting the last pieces of the puzzle together." (Pete – Spider Web; 2019/08/27)

Yellow Tree continues by describing the essential role of all partners in the ecosystem, and the need to be collaborative. This collaboration is evident in social media postings on attending partner and industry events.

"So I mean, we see a place for all of those different networks and connectivity partners, and there are different areas and roles that they play. But without them, the ecosystem is vital, right, in this sense, especially in IoT I think it's not just one company doing everything, you got to be able to play, and be a team player." (Mark – Yellow Tree; 2019/08/28)

5.6.2.3. Communicating Value

The communication of value is a key enabler to the value creation process. This category is observed across all the cases with 66 occurrences. The communication of value focuses on educating the customer to enhance their understanding of the CVP and to perceive the value that may be realised. Blue Tech describes this by highlighting the need to communicate directly with customers in an interactive way that not only communicates the CVP but also tests it, which allows customers to envision the CVP.

"So I need to communicate with them and say, Okay, well, this is what you have. If I can do this, and this, can that save you money? And they often will say yes, and I can see how that saves money. So they have to sort of buy into it and envision it." (John – Blue Tech; 2019/08/22)

Spider Web simply states the need to demystify the CVP for the customer by creating awareness and knowledge of the value it could bring.

"So it's demystifying that lack of knowledge." (Pete – Spider Web; 2019/08/27)

Green Leave and Deep Blue add by describing the need to communicate the multidimensional nature of the CVP in the most effective way possible.

"So everyone is aware what a standalone IoT, you know, a sensor can do for you. But in the broader things, what can we actually derive, what value can we derive out of the information and out of the patterns and trends that we get

out of the things, that [value] *we need to prove at a very low level* [cost and uncertainty] *to the customer."* (Ben – Green Leave; 2019/08/13)

"I go to a client with, this is the realities or whatever. Often a client will look at this and say, I've got somebody else here, that will do it for half the price. But they don't understand this [complexity and failure rate]*."* (Jack – Deep Blue; 2019/08/21)

An enabler to communicating value effectively to customers is to create solution evidence through physical concept solutions, features and benefits, and real customer use-cases. Spider Web and Blue Tech describe the essential need to create and communicate solution evidence that lowers the perception barriers for customers and increases their understanding of the CVP.

"So we built that [IoT enabled button]*, and we give it to them* [customers]. *So we've got what it is, the key features, the use case and the customer because we're trying to paint a picture. So if I go to an end customer, they say but who is using it? Well, there's an end customer because that's normally the biggest question, Who else is using it? You need that because no one wants to be the guinea pig."* – (Spider Web)

"So part of the process is when we've done the analysis, we typically do like a functional block diagram so that it's easy for the customer to understand the functionality of the system, and how everything fits together." (John – Blue Tech; 2019/08/22)

5.6.3. Conclusion - Research Question 1

In concluding the results for this section, it is important to highlight the underlying trends from the results. The customer has a central role in the overall value creation process. The value creation process is a process that can be characterised as being dynamic, iterative, and interactive. Moreover, there are several factors that enable a CVP to be designed and delivered, all of which are key to the process of designing a CVP.

5.7. Results - Research Question 2

How do entrepreneurs perceive the content and characteristics of an effective CVP?

This research question was formulated to explore and understand the content of a CVP and the characteristics that make a CVP effective. The value dimensions theme emerged from the data analysis and will be described in the section to follow.

5.7.1. Value Dimensions

The value dimensions theme was observed across all the cases with 167 occurrences. This theme consists of five dimensions that describe the content and characteristics of an effective CVP. These dimensions are information value, economic value, latent value, tangible value, and effectiveness characteristics. Each dimension will be described in order of occurrences next.

5.7.1.1. Information Value

The information value dimension was observed across all the cases with 47 occurrences. The information value category emphasises what an IoT solution may do for the customer. Green Leave describes the essential content and characteristics of a CVP by emphasising how it could enable the customer with information to make better decisions. This customer enablement factor forms a key part of company brochures on the impact of Green Leave's solution can have for the customer.

> *"So with the SMEs specifically, what we've seen is its owners are not on site all the time. So with the IoT space, it makes it easy for them. When did they start? When did they finish? Is the manufacturing facility running, and all of that? The owners can see that offsite while managing all of the other things…So for me, the value in one sentence is to make intelligent decisions."*
> (Nico – Green Leave; 2019/08/15)

Blue Tech supports that information leads to better decision-making, and elaborates that informed decision-making, in turn, can lead to reduced costs, reduced risk, increased sales, and increased operational efficiencies, which makes the CVP content multidimensional and layered.

"So we also look at it from the perspective where the hardware is not really the value of the system, it's only an enabler. The true value lies in the data and how the data that you collect can be analysed and help the customer to make informed decisions, which, in turn, could save them money, or recoup or reduce losses, or make their operations more efficient. So the value really lies in the information and how you process and present it, not so much the hardware and the rest of the system. So that's the value proposition. The customer wants to know, am I saving money? Am I making money? Is it reducing my risk? That's the primary objective." (John – Blue Tech; 2019/08/22)

Viewing the potential value from the perspective of the customer is a key activity to communicate information that would differentiate the CVP from competitors. Deep Blue describes how understanding the value and opportunity cost from the customers' perspective allows them to differentiate their CVP.

"So when we talk about the value proposition. The way I translate that is what makes us different from the next guy [competitor]*. Because that obviously, ultimately, this is like an opportunity cost model comparison, you know. I'm going to spend money here or there, what is my opportunity costs* [from customer perspective]*? So and this for me is, how can I say, the clearest way to articulate that, is what our differentiators are."* (Jack – Deep Blue; 2019/08/21)

Yellow Tree continues by describing how their core capabilities create an opportunity to differentiate their CVP.

"So we do feel that is one of the key roles that differentiates us, being able to make devices, right." (Mark – Yellow Tree; 2019/08/28)

5.7.1.2. Economic Value

The economic value dimension was observed across all the cases with 34 occurrences. Economic value focuses on two additional dimensions. This first is to reduce the cost, risk, uncertainty and financial exposure for customers. The second is to increase money, time and convenience through novel industry solutions and technology.

Green Leave and Deep Blue describe the multidimensional nature of the CVP as it relates to economic value.

> *"When we then approach a new client is to minimise the risk, minimise the capital expenditure. So they can really pay for this out of OPEX, not CAPEX…Because we can give them a much lower cost solution* [compared to traditional solutions].*"* (Ben – Green Leave; 2019/08/13)

> *"So for me, to sell it you have to say, Okay, am I going to save money or time for that person* [customer]. *That's for me the value that you can create."* (Nico – Green Leave; 2019/08/15)

> *"So again, what we are aiming to do is to, you know, is to position the question of risk on these projects. I mean, you've, it's not what I say, there is this statistic that so many of these projects fail. So obviously, we help you de-risk the project so that you have success. So you know, then at least your chances of then wasting your money is limited."* (Jack – Deep Blue; 2019/08/21)

5.7.1.3.   Latent Value

The latent value dimension was observed across all the cases with 34 occurrences. This dimension specifically focuses on identifying and revealing value to customers that might have been unknown. In revealing latent value to customers, the objective is to grow their business, enable them to develop new CVPs to their customers and gain a competitive advantage. Deep Blue described the latent value dimension by emphasising pivoting opportunities for its customers. This relates closely to company brochures that communicate how Deep Blue can assist customers to achieve their strategic objectives and broaden their competitive advantage.

> *"If you really leverage your data as an asset, you can pivot your business in amazing ways. So the value we bring is for the client to achieve that vision of pivoting their business. We help them achieve that, but take the risk out of it."* (Jack – Deep Blue; 2019/08/21)

Green Leave continues by adding that the focus is on creating a more profitable customer, and helping the customer grow into new markets, which corresponds to company brochures on the typical problems Greene Leave aims to solve for customers.

"Well, a more profitable business. And so that they can grow in terms of that. So they don't get stuck in a rut and don't stay in this one market the whole time. So they can adapt and change and all those things. So profitable is one thing, but then change over time to keep up with the market." (Nico – Green Leave; 2019/08/15)

Spider Web and Blue Tech provide examples of how an IoT solution could reveal new opportunities for customers to grow their business or better manage their resources by looking beyond the immediate CVP.

"So for them, it was about understanding their asset base and where those assets are. So that the [Ducktail]*, which is the unit that goes into the connected cooler, gives GPS, door open and close, compressor temperature, ambient temperature etc. So this also starts to be able to now look at marketing. So is that beer sold at the right temperature? And one day, maybe the fridges could even run a special."* (Pete – Spider Web; 2019/08/27)

"So you look at a bit of a broader spectrum. It's difficult. I am trying to get an example. But you sometimes have situations where a customer wants to do maybe asset tracking. But asset tracking has other benefits, like maybe usage tracking as well, which you can use for routine maintenance…That might not be the immediate value proposition the customer sees, but looking at the broader spectrum, you can present added value to them." (John – Blue Tech; 2019/08/22)

5.7.1.4. Tangible Value

The tangible value dimension was observed with 27 occurrences across four of the five cases. Tangible value focuses on the solutions' features, benefits, and functionality that are broadly required, but also specific to the customer and their context. The communication of tangible value is also evident in archival records for all the cases. Deep Blue, in a differentiating manner, provides an example of a solution that describes the various possible benefits and features the customer might value.

"It also means that when I've got sufficient power still, or with all this sufficiency, it takes a [cube]*, two seconds to boot up. Now imagine how long it takes your laptop. Plus, when you disconnect the power, the power supply*

gives me 500 milliseconds of let's say usable power before the [cube] dies. But that's enough time because it's so efficient to take everything in the memory database, puts it to non-volatile memory and it still has time to send the message to the backend system. We call it the last will and testament, it says, ooh, I'm dying, I'm dying, be aware, okay. And then when the power is restored, it takes two seconds to boot up, animates all this data again, and it just goes on, like nothing's happened. Now that plays towards the industrialised or the industrial-strength stuff we're doing." (Jack – Deep Blue; 2019/08/21)

Spider Web, also in a differentiating manner, continues by describing their CVPs core features and benefits.

"It's a true two-way global service. So I'm able to push the device anywhere in the world. I'm able to get information from that device, and I am able to send information to the device." (Pete – Spider Web; 2019/08/27)

Furthermore, Blue Tech describes a need to understand and emphasise the features and functionality from the customers' perspective but also looking beyond their initial needs.

"So we try and, so you have to do research and figure, okay, if he wants one thing, is that really what he wants? What extra features or functionality is there? What issues might he have that he hasn't noticed, or seen." (John – Blue Tech; 2019/08/22)

5.7.1.5. Effectiveness Characteristics

The effectiveness characteristics dimension was observed across all the cases with 25 occurrences. To determine whether a CVP is effective is a vital part of the process. The characteristics that make a CVP effective is essential feedback to the value creation process. Green Leave describes that a CVP is effective when customers have follow-on request.

"So, this might sound funny, but the one thing to test the value of our, our system, and our value proposition, is the amount of phone calls from existing customers. So that's the amount that this guy picks up the phone and tells me, you know, I'm thinking of something else now." (Ben – Green Leave; 2019/08/13)

Spider Web supports that follow-on requests is a key characteristic, and provides an example on determining an effective CVP.

> *"If one of their* [partner] *devices go in, it's kind of like, it's switched on and it's working. And the guys go, okay, and then you start to see the orders go from one, which is two from a POC, and then you'll see the 10s the 500s and 1000s, and then you know that the value proposition is right, it's effective. And then if it doesn't grow then you know, the guy hasn't bought into your story. It's that simple."* (Pete – Spider Web; 2019/08/27)

Yellow Tree also supports that an effective CVP is characterised by follow-on request from customers.

> *"And what we found though, on one or two successful implementations, is that once you've added that, right, and they see the value of what you brought to them from a digitisation point of view, it's just like they've taken the red pill, right. So now they can digitise this and that and it just, it keeps going. And it doesn't stop."* (Mark – Yellow Tree; 2019/08/28)

Green Leave continues by describing that a customers' willing-to-pay is a key characteristic, but that the effectiveness of an implemented CVP can mostly be determined from the data and information.

> *"There are two aspects to it* [CVP effectiveness]. *The one is internal for me. I will know or will feel good about the changes that I've made in the factory and so forth. Well, there are actually three things. The second thing is the client will pay. They will see the value and then they will pay for us. And if they don't pay, we know there is a misunderstanding, or they don't see the value. And you'll actually see it in the data. You can see that, ok, of the first month we recorded it as X and then two months later, we made the changes, and now it's X plus 10% or whatever. So you will see it in the data most of the time."* (Nico – Green Leave; 2019/08/15)

Blue Tech continues by merely describing that the effectiveness of a CVP is determined by whether the customer is saving money.

> *"So at the end of the day, if the customer is saving money, then it's done its job."* (John – Blue Tech; 2019/08/22)

The ultimate characteristic that defines whether a CVP is effective or not, is determined through customer word-of-mouth. Green Leave, Spider Web, and Yellow Tree describe the word-of-mouth characteristic.

> *"So up to now, we haven't done any real marketing ourselves. That's kind of word-of-mouth. And it was you know, we busy at this customer. And they told another guy that's kind of interested...So there's a whole pipeline."* (Ben – Green Leave; 2019/08/13)

> *"So we get most of our stuff that has come in, has either been word-of-mouth, or referral."* (Pete – Spider Web; 2019/08/27)

> *"When you have the customer, once you've added a successful implementation, right. We have seen word-of-mouth spread quite a lot. We get people who phone us saying, well, I got your number from so and so. I think that's one of the other key things right."* (Mark – Yellow Tree; 2019/08/28)

Across all the cases, a key activity in the overall value creation process is to go into a proof of concept (POC) phase. This activity aims to reduce risk and uncertainty while demonstrating the CVP efficiently and effectively to customers. Spider Web explains the context and need for conducting a POC phase.

> *"Customers normally don't believe you can get that information* [data] *from the field or that you can actually do it. So in IoT, the buzzword is POC. So everybody wants a POC because I think so many customers have been burned."* (Pete – Spider Web; 2019/08/27)

Yellow Tree continues by frustration describing the dynamics around the POC phase, and the need to actively manage the POC phase to ensure that the overall CVP is effective.

> *"So yes, POC, we hate the word, but it is a vital part of IoT. But if you do it correctly, it's not. Because we've been in some POCs for a year as well, right. It just drags out forever. And when we started the company, we saw that you stay in the POC phase, right. It's up to you as the technology partner to make sure you get out of that phase, right. And help them* [customer] *go into the next phase so that you can convert that into successful return on investment."* (Mark – Yellow Tree; 2019/08/28)

"The POC has got to have specific tick boxes, right. So you are going to go into the POC, know what you're going to fix and change, right. Make sure it lasts for only the amount of time it's specified. And then go and say, was it successful? Was it not? Why not? What can we change to make it successful, and then go into the POC phase right? After the POC phase, then we move into rollout. Once again, trying not to do a big bang, right. Do a section, start with that, roll out slowly, and then phase it as you go. And I would say that is typically, obviously, there's some more stuff that happens in between, but that is your general scope." (Mark – Yellow Tree; 2019/08/28)

5.7.2. Conclusion – Research Question 2

In concluding the results section for research question 2, it is important to highlight the key findings and insights. The results for research question 2 further emphasises the dynamic and interactive nature of the CVP design process, the importance of understanding that the content of a CVP is dynamic and multidimensional and that ultimately the effectiveness of a CVP can be characterised by whether the customer requests additional solutions or spreads positive word-of-mouth.

5.8. Results - Research Question 3

How do entrepreneurs create alignment and fit between a CVP and its business model?

This research question was formulated to better understand how alignment and fit are achieved between a CVP and the business model. The theme that emerged from the data is business model management and observed as the most dominant theme with 447 occurrences from the data analysis. This theme and its categories will be described in the section to follow.

5.8.1. Business Model Management

The business model management theme is a prevalent theme across all the cases. This theme consists of five categories, namely market alignment and growth, competitiveness, challenges, organisational learning, and customer management. Each of these categories will be described in order of occurrences in the section to follow.

5.8.1.1. Market Alignment and Growth

The market alignment and growth category was observed across all the cases with 149 occurrences. This category places a particular emphasis on the revenue model dynamics, and how revenue will be generated from the CVP. Green Leave provides insights into the revenue model dynamics while highlighting the need for experimentation. The revenue model is also positioned in company brochures as a flexible and a benefit to customers.

> *"We've got two models. They can rent the device from us. So we'll then do a six-month plan where they can, or 12-month plan, where they can rent it, and after the 12 months they can own it, or they can go for a full 36 months rental if they want to get the cost down even more. So it's a combination of the two. We are still trying to find the sweet spot in the market."* (Ben – Green Leave; 2019/08/13)

Deep Blue continuous by discussing the revenue model dynamics for a particular product offering with a focus on gaining market share.

> *"So these* [cube] *devices, physical devices, you buy them, and the use of all of this is subscription-based. So it's very similar to AWS and Google and Azure, and so on. Ours is just, obviously because we're trying to break the market, it's a lot cheaper."* (Jack – Deep Blue; 2019/08/21)

Blue Tech continues by discussing how one element of a solution is only an enabler to capture value from another part of the solution, and how there are various dynamics at play depending on the CVP.

> *"Because we understand that the value lies in the data, not the device. We don't necessarily try and make money on the hardware. It's just an enabler for us to charge for services, which is your hosted information and analytics on that. So yes, there is a subscription. Typically, it's a two-year type contract depending on the device. Working with Telco's, they try and do an OPEX model with the customer, which means there is a dependency on the application. Once again, there is a contract period."* (John – Blue Tech; 2019/08/22)

There is also emphasises on gaining a product-to-market fit, which is a contributing factor to the revenue model dynamics. Green Leave and Spider Web explains that

in essence a fit is achieved by ensuring that a specific customer problem is solved for which the customer is willing and able to pay for the solution.

> *"What problems are there in the world? But what problems are there in a world that the client is willing to pay for, to fix them? If you can't get a client that is willing to pay for that, you don't have a product even, and then even the value proposition gets a lot harder."* (Nico – Green Leave; 2019/08/15)

> *"You got to meet the customers' pain points, you know. So if you don't, if you're not solving a problem, the guy* [customer] *is not going to buy from you, and that for me is the most important part."* (Pete – Spider Web; 2019/08/27)

Yellow Tree explains that the size of the opportunity is a characteristic of product-market fit, an essential characteristic to ensure effective resources use.

> *"There's a lot of development that needs to go into the device, and it's something we don't, nowadays, take lightly to make a device. The opportunity really needs to be there, because it takes us up to anything between three to six months to get a device from being a bunch of wires to an actual enclosed, IP rated, and an approved device."* (Mark – Yellow Tree; 2019/08/28)

Blue Tech adds that the revenue model is a key part of gaining access to the market to determine whether there is a product-market fit.

> *"Yah, in a nutshell, like I said before, you can have the best idea, the best solution. If you are not priced in the market, you don't have access to your end customer to know that you are in the right price bracket, your supplying the right solution for the right need, you don't have a product!"* (John – Blue Tech; 2019/08/22)

Spider Web further adds that a product-market fit can be determined through an understanding of whether a CVP makes sense economically for the customer.

> *"I don't know if you can quote me on it, but they say, you know, to track a device it needs to be 1% of the value of the assets over its lifetime. So if it's more than that, it's costing you money. Then it is not worth tracking."* (Pete – Spider Web; 2019/08/27)

A key activity to managing and aligning the business model is the search for resources to create new or enhanced CVPs, or to develop new CVPs from existing

resources and capabilities. Green Leave explains how external partner resources and capabilities can influence the CVP.

> *"So I think that's where the value proposition differs a lot of time with external parties having a specific skill to bring that in and change the value proposition and so forth."* (Nico – Green Leave; 2019/08/15)

Green Leave and Spider Web explaining how existing resources and capabilities can be combined in different ways to develop new CVPs aligned to the market.

> *"Although we use the same back end, the same sensors, the same everything. We just package it in a sense to say, okay this is going to monitor a mobile fridge, and the problem is they can't monitor the mobile fridges or whatever. And we package that to say this is the industry we are going to target."* (Nico – Green Leave; 2019/08/15)

> *"You know, because we can say well, you want HTTP, HTTPS, you want emailed, you want it, you know, Microsoft Azure, Google, pick it, and we've got the node for that. And that's the value, that's actually the power of the offering. I mean, as I said, we could take a SIM card, we could do* [Network – Jane]*, we could do* [Network - Classic] *if we wanted, but the power of that platform is where the gold sits."* (Pete – Spider Web; 2019/08/27)

To enable growth and market alignment requires focus and understanding of how to enter the market, reaching customers, and where opportunities may be. Blue Tech explains the importance of partnerships, as a channel, to gain access to markets, and adds that communication is essential to enable channel partners.

> *"Access to the market is also paramount. Once again, I can have the best solution, but if the customer that wants to buy it doesn't have access to buy it, then we don't have a business. Once again, partnerships play a role there. If we are focusing on technology, which we are, technology and solutions, somebody needs to sell the solution and promote the solution and market it at the same time, because I know I need all of those aspects, and even maintenance and installation. It's also important for me to enable them [partners] to do their job. So even if I have a great value proposition, if my distribution channel doesn't know exactly what that is, they not empowered to go and sell the products and we all make money. So I think the golden thread*

for something like that is communication. None of that works without communication." (John – Blue Tech; 2019/08/22)

Deep Blue also emphasises the importance of partners and adds that digital marketing and events are activities to align with the market and grow.

"So from here, it's obviously, you know, there are different initiatives we have, our partnerships are key. If we can't market it and sell it, then at least we want our partners to do that. The second thing is, is also you know, we've started with a social media campaign. So that's, it's still very much new. And then obviously, you know, we do events, as well. We showcase stuff, and so on.

Finding markets and growth is multidimensional in a sense that recognising opportunities, may lead to new CVPs for both the venture and the customer. Green Leave explains through an example of how new CVPs, triggered by the customer, arise that are aligned to the market.

"So we had a call from a company the other day that manufactures trailers for trucks, truck trailers. And they said so, you know, they now at a stage where they've stabilised their operations, because they get a lot of feedback from the customer saying, you know, the frame cracked or this one wheel. It has a vibration on the wheel. So they now at a point where they say, can we put one of your devices, that's on a network, can we put one of those devices on the truck? As we sell that trailer to the customer, there will always be a device that's connected to our plant. So we can always see where the truck is driving, what the vibration is, what the load is, what the speed is, that information will give us feedback on how we need to improve our product. So that's the real end goal for us, and then you're moving into real IoT solutions, in our opinion."
(Ben – Green Leave; 2019/08/13)

Deep Blue continues with an example of how new CVPs can be triggered by the venture for customers.

"You know, I was talking about this bus company, where we want to put in this platform and everything. And I said to the guys, think of it now, now that you can collect all this data, you've got ticketing, route information, driver information, video, everything, the engine dynamics, consumption, you've got everything, Everything that you could possibly want to measure, and track, you've got it down in a database. Think of now that now you can pivot your

business, you now become an Uber, for a seat, you understand what I'm saying? As opposed to a bus manufacturer. So the point I'm making is that those kinds of opportunities, I think you're going to see more and more of that transpire as a result of IoT because IoT is ultimately a data project." (Jack – Deep Blue; 2019/08/21)

5.8.1.2. Competitiveness

This competitiveness category is observed across all the cases with 96 occurrences. Competitiveness centres on differentiation, which requires being aware of, and understanding who the competitors are in the market, and what the competitors are doing. Deep Blue explains that market differentiation is a key part of the CVP, and those differentiating factors revolve around core capabilities and advantages gained over time. The focus on differentiation is evident throughout Deep Blue's digital content and documents.

> *"If somebody says to us, why would you want to use the* [Deep Blue] *IoT solution? Let's just call it* [Cube]*, okay. As opposed to all the others* [competitors]*, I mean, you've got* [Player 1]*, you've got, there's a whole bunch of players in the market. Why us? Ok, so what we are saying is, there are five reasons, so the first reason is that what we do, and what we build is, is really industry grade…The second thing is…we focus on providing a solution. And that I think, is probably our biggest differentiator… the third value proposition or the differentiator is that we, we build solutions, which are fit for purpose…I forget now the fourth one, but in any case, the last one also, because we are taking a solution approach, more often than not, we have to do a retrofit."* (Jack – Deep Blue; 2019/08/21)

Spider Web explains through an example of how their core capabilities differentiate them over competitors. This core capability is also emphasised throughout Spider Web's digital content and documents.

> *"So it's global connectivity* [Core capability]*. So what we mean by that is the device again, like the* [Ducktail]*, like I told you, can be built in South Africa, boxed here, shipped anywhere in the world, turned on and it's going to work. And that's our value prop.* [Network – Classic] *can't do that.* [Network – Jane] *can't do that."* (Pete – Spider Web; 2019/08/27)

Key to competitiveness is understanding where a competitive advantage may be gained or developed. Blue Tech explains how pursuing attractive markets with an understanding of what these markets need could drive their competitiveness.

> *"You know because South Africa is very saturated to a certain degree and there are certain, working with Africa, the need and the, I almost want to say, the hunger is more in Africa than it is in South Africa. Some countries are better educated than in South Africa in that respect. If you take Kenya, for instance, Kenya is more advanced with IoT in many cases than South Africa. Tanzania is not far behind in that respect either. Nigeria is doing well. What's the other one, Rwanda is also picking up quite a bit. So there's a big hunger for technology…So Africa seems to innovate quicker than South Africa."* (John – Blue Tech; 2019/08/22)

Spider Web continues to explain that understanding the market and competitors, and exploiting a core capability is key to competitiveness.

> *"I think that moving assets is good for us because of the SIM card story, you know. It's not something that's fixed in the ground. So like, for example, where* [Network – Classic] *is good, is a parking sensor. So if you drive over the parking sensor it knows that there is a vehicle when you drive off the parking, the sensor knows the parking is open again. It's a static thing in the ground, it doesn't move. If they want ten-year battery life, that's the solution I'll go for. So for us, it's about a moving asset, and it's about also creating the controlling of that asset, and that's where GSM with two-way control works great."* (Pete – Spider Web; 2019/08/27)

Yellow Tree adds that being close to the market and customers' needs can be a key driver to being competitive.

> *"We never set out to make, I'm going to call this, we all say it, the stupid button, but it's not a stupid button, right. So I think when we started IoT, we wanted to do the cool stuff. We wanted to get the facial recognition, analytics, and all that, and funny enough, the market wanted the buttons, so we went for the button right. And we are doing a few POCs at big clients, and it's looking good."* (Mark – Yellow Tree; 2019/08/28)

Team dynamics and organisational culture are also key drivers of competitiveness. Deep Blue explains with sincerity how organisational culture is fundamental to building trusted, long-term customer relationships and competitiveness.

"One thing I can tell you is that our clients love us. And I'm, I know, everybody wants to say that, and everybody claims, oohhh the client engagement and everything. But the thing is, is that if you work inside of our organisation, you will find that this is a very close-knit family. That's the fundamental values of our business. We're trying to establish an environment where our colleagues are not just friends of ours, but our best friends, okay. So it's very innovative, little control, safe environment all that kind of stuff. Now the reason I'm saying that, is that that translates to our clients as well. Our clients deal with us because they trust us." (Jack – Deep Blue; 2019/08/21)

Yellow Tree continues by explaining with passion the importance of organisational culture to be competitive and adds how internal dynamics could have a positive influence on customer relationships.

"Having my team that's able to learn and learn quickly, right. And that's a big thing…We are a very agile team, like it's, without that I would say we would probably battle a lot more, right." (Mark – Yellow Tree; 2019/08/28)

"So we work in our office, as well it's a workshop because it's all industrial. So we grind, and we cut valves and install flow meters, and so it's grimy. And we try, and we like it, you know, it's a bit of who we are, and we are sticking to that. We play right. That's what we got to do. That's part of our job as well…There's a lot of passion from them [team]*…So we go to clients with this passion and vibe, and we get them all excited...And I think it's also a big part of our company, if you're passionate about it, you will be successful, and I think that's a cool thing."* (Mark – Yellow Tree; 2019/08/28)

5.8.1.3. Challenges

The constraints and challenges theme considers both internal and external elements that may hinder the ability to design effective CVPs and gaining alignment to the business model. This category is especially prevalent for the Green Leave case, with some occurrences across the other cases that will be described next.

Market/Customer Challenges

The key constraints to designing a CVP is around the customer themselves in getting the customer to understand where the real problems might be. Green Leave explain how the customer can be a challenge to enable an effective CVP.

> *"I can see improvements, but I can't justify it because I don't have the data. So now I have to tell the owners, okay, let me bring in this* [solution] *to collect the data to show you where the issues are...And normally they have their own set ideas of where they think the problem is and normally their idea and my idea is different."* (Nico – Green Leave; 2019/08/15)

> *"Sometimes it's out of our control. Once we've implemented the solution, and we do have the capability to help that customer and create value or solve problems…but sometimes it is out of our control."* (Ben – Green Leave; 2019/08/13)

Yellow Tree continues to describe how external factors related to risk and uncertainty could influence the customer.

> *"We've got a lot of external factors and the political side, but there's also some uncertainty. So, some guys* [customers] *don't want to invest after they've seen it because all of a sudden the rand-dollar has gone, you know. So there is a risk for them and there is uncertainty and all that."* (Mark – Yellow Tree; 2019/08/28)

Yellow Tree also adds by explaining how internal customer bureaucracy could be a challenge.

> *"It's sometimes tricky with a client. So you might have a successful POC, and they come and say, well, geez, this whole thing's going to cost us 10 bar in the next three, four months, maybe a year or two, right. We just can't see spending that right now…So you got to go through all the red tape for people to sign off and that is definitely an issue sometimes for us."* (Mark – Yellow Tree; 2019/08/28)

Internal Challenges

The internal constraints are challenges that might threaten the viability or sustainability of the CVP and overall business model. Spider Web provides an example explaining how their CVP is constrained by external factors.

> *"So in this wonderful story, that I'm pitching, it's not all roses, right. I mean it's, there are, it's got its challenges. So there's, I mean, you know, with your phone you driving into certain areas, and there's just GSM dead spots. So some of these devices that go in, and then there's no connectivity…So, GSM connectivity is a major threat to our offering. If there's no connectivity, it's not going to work."* (Pete – Spider Web; 2019/08/27)

Green Leave and Deep Blue explains the internal challenges related to reaching their customers and creating awareness of their CVP in the market.

> *"There is a lot of factories in Gauteng. It's actually crazy. But to get to them, where are they, they are in industrial parts but ok, how do you get in there?"* (Nico – Green Leave; 2019/08/15)

> *"Our single biggest Achilles' heel is that nobody knows about us. We do absolutely amazing things here, and there are just too few people who know that."* (Jack – Deep Blue; 2019/08/21)

Industry/Ecosystem Challenges

The industry and ecosystem are collectively constrained by the perceptions and a lack of understanding that may exist in the industry and the market. Deep Blue, with visible frustration, explains the challenges that exist because many stakeholders underestimate the complexity of the projects, and as a result, the industry experiences extremely high failure rates that may negatively influence customers' perceptions of the cost and the associated risk and uncertainty.

> *"I think the single biggest hurdle in the IoT space is, and I have to say that very carefully, there is a misunderstanding around what it takes to do it successfully. So we look at IoT, as really, all of this is a very complex data project, right."* (Jack – Deep Blue; 2019/08/21)

> *"Look at this, ok so all of this, we get all this information in five-second intervals, everything works beautifully, okay. But you look at these values,*

okay. How is it possible, this is humidity okay, how is it possible that I can have at 10:16 a humanity of 1%, and then at 10:17 it's 34%? Now, believe me, this is the reality of projects, you get anomalies in the data…So the first thing is that you've got to understand, this is part of the reality. And the second thing is you have to actively plan and address this, because if you think about it, I can say no, just ignore those. But if I ignore them, it might be an indication that my sensor is busy failing. So I can't just ignore it. But I can't just include it because I might have some alerts on there, and now I get all these false positives, and people lose trust in the system. So it's, people underestimate the complexity of IoT significantly." (Jack – Deep Blue; 2019/08/21)

"There's a statistic right now, 84% of IoT projects fail. 84%! That's not what I said. Some study was done by, I think, by Siemens it was. It is significant. Not in the history of, let's call it IT, and I use that word very widely, okay, but in the history of IT, have we had such high failure rates of projects, not even ERP projects. We have never had such a high failure rate on projects. It's massive and expensive. We're talking about value creation, not value destruction." (Jack – Deep Blue; 2019/08/21)

5.8.1.4.   Organisational Learning

Learning is an essential part of the process and observed across all the cases with 71 occurrences. This category represents the feedback and learning processes and activities from which the cases learn to better design and enable their CVPs.

A key activity is to focus on continuous organisational learning activities. Green Leave, Yellow Tree and Spider Web explain how through experimentation and reflecting, they can shift their business or change their internal activities to improve their CVPs.

"So in a certain way, we decided, listen, I think we need to step out of that mentality to say, calling all pockets, we need to have a very straightforward and phased approach." (Ben – Green Leave; 2019/08/13)

 "So I think in the first year, we learned that just tagging and measuring everything doesn't always make sense." (Mark – Yellow Tree; 2019/08/28)

"So when I first started, I was like, cool okay, I got these cool sim cards, and then, I saw all these platform guys coming in, and went chasing after all the

platform guys. And then quickly realised, but no one's got the hardware thing, so I had to then change my focus, and learn about hardware." (Pete – Spider Web; 2019/08/27)

Organisational learning also involves learning about opportunities by recognising and understanding trends in the market and industry. Yellow Tree and Blue Tech explains how understanding the market, together with their resources and capabilities, allows them to see opportunities.

"So that whole MES thing, on the industrial side, is what we see, think is major value coming in over the next two, three years on that side. Because of what we have, we can now easily extract the data. And then start putting analytics together and there is a lot of value in that." (Mark – Yellow Tree; 2019/08/28)

"We've got a good feeling of which areas in Africa has what type of requirements. IoT is not limited to certain areas. It's all over the world. And each country has their own take on what they need and what they don't need. Some countries have issues with theft of gas canisters, that might not be a problem in other countries, but that's just an example." (John – Blue Tech; 2019/08/22)

5.8.1.5.   Customer Management

The customer is a central theme throughout all the cases. Customer management is thus an important category, and it is was observed across all the cases with 35 occurrences. Across all the cases, the customer is central in all company brochures that aim to communicate the CVP. It was also observed that all participants spoke with excitement and passion when it came to customers and what they can do for them. Green Leave explains how they see the customer as a partner with a long-term focus.

 "Once you've already partnered with this customer and you formed a special relationship with this customer, what we want to do then is, we want to build solutions that will make them money because they also have to digitise their proposition to their customers. So this whole thing is this value proposition to their customers." (Ben – Green Leave; 2019/08/13)

Blue Tech and Yellow Tree further explain that customer management involves providing the customer with assurances that solutions will be effective over the long-term, and that support will be available when it is needed.

> *"Even if you have all of those things* [market fit] *right, is how do you support the solution further on in the life cycle, because the customer wants to know that if I buy this today is it going to work for me tomorrow. So that's critical as well, you need partnerships to address that."* (John – Blue Tech; 2019/08/22)

> *"Look, obviously, you get to a stage where you can hand over the system to them, and they look after it, but you always need to be there, to be on call and help where help is needed."* (Mark – Yellow Tree; 2019/08/28)

Trust is a fundamental requirement in building long-term customer relationships. Deep Blue explains how the trust-building process involves various dimensions, and that customer trust is the key to sustainable long-term relationships.

> *"They trust us because they know they can always count on us no matter what. I think for me, ultimately, that is, the true characteristic. The fact that the client can trust you. You know, and trust is a very dimensional thing, they trust your skill, they trust your integrity, they trust your advice, you are all those things…If I think of the alternative, would you do business with somebody you don't trust?"* (Jack – Deep Blue; 2019/08/21)

Blue Tech explains how the initial customer engagement is critical to building the customer relationship and trust, and it needs to be direct interaction.

> *"I communicate with customers directly, and customer relationships are paramount. You know that's why whenever I see a customer, I have to meet them face-to-face, I don't do emails, and whatever. First impression, first discussion, we have to sit down and talk."* (John – Blue Tech; 2019/08/22)

Yellow Tree continues to explain elements that could negatively influence the customer relationship, and how trust is developed through a willingness to engage transparently and honestly.

> *"I think that entering a meeting with two things, an NDA and a cost is kind of negative, right. So before you start looking at the actual, you know* [problem]*, we want to build the relationship. So starting that up with a non-disclosure, and a lot of these guys do that right, before you start anything, sign an NDA,*

which we feel, you can still discuss a lot with the customer without giving away trade secrets, which nowadays, it's electronics right, measuring temperature is not rocket science." (Mark – Yellow Tree; 2019/08/28)

5.8.2. Conclusion – Research Question 3

The process to align and achieve a fit between the CVP and business model is influenced by various factors and dimensions that are dynamic in nature. Feedback and learning are thus key activities in the process to recognise opportunities from the market and customers to achieve a better fit between the CVP and business model.

5.9. Results - Conclusion

The results from the data analysis have provided ample evidence and insights to address the research questions. Several salient themes emerged from the research study. The value creation process is particularly important to design an effective CVP, which includes the content and characteristics of an effective CVP. Furthermore, the business model alignment and management theme is a key theme to gain alignment and fit between the CVP and business model. The results demonstrated that although there are core principles followed by most of the cases, the process of designing an effective CVP varies between the cases and it is a dynamic process influenced by various dimensions of the business model and the context of the venture.

6. DISCUSSION

6.1. Introduction

In this chapter, the results and findings are discussed that were presented in the previous chapter. This discussion moves towards answering the research questions. The discussion proceeds in the sequence of the research questions that collectively provide insights into the overarching research question of how entrepreneurs design effective CVPs in IoT-orientated businesses. The results are compared and contrasted to the existing literature as presented in chapter two. This is done to contribute to the body of knowledge by extending our understanding into the design of effective CVPs in the context of risk and uncertainty.

6.2. Discussion - Research Question 1

How do entrepreneurs perceive the process of designing a CVP?

Across the five cases, 260 occurrences of the value creation process were observed, and 259 occurrences of the CVP enablers theme was observed. Together these two themes describe the process of designing a CVP.

The impetus for this research question is to understand the process of designing a CVP. Anderson et al. (2006) described three broad approached to a CVP. In contrast, Skålén et al. (2015) suggested ten common practices in the development of a CVP, while Payne et al. (2017) developed a conceptual model to describe the antecedents, consequences and moderators to develop effective CVPs. However, few substantive research studies are available on the process of designing a CVP, which is also a finding by Frow et al. (2014). The formalising of CVP design and implementation processes may lead to several positive outcomes for an entrepreneur especially as an internal strategic alignment mechanism towards creating customer value (Payne et al., 2017). Several authors, (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018), have called for more empirical research to understand the process of designing effective CVPs. Therefore, the results of each theme are discussed toward answering this research question to improve the understanding of designing a CVP.

6.2.1. Value Creation Process

6.2.1.1. Design Process

The results from the research study found that, across all the cases, the design process is a core process for designing a CVP. Collectively it was the most observed category in this theme with 171 occurrences. Four key elements make up the design process, which are, novel solutions, holistic problem solving, problem-solution fit, and end-to-end solution. Together, these four elements drive the initial design process of a CVP.

Novel Solutions

The central focus in the design process is on novel solutions for customers. The focus is on understanding three domains of technology that collectively enable the development of novel solutions through combinations of the technology domains. This finding resonates with the problem-solving practices that focus on solving customers' problems through integrating and combining resources differently (Skålén et al., 2015). This is also supported by Payne et al. (2017), who suggested that "the way a firm develops, shapes, and integrates resources" make up the innovation processes to solve customers' important problems (p. 476). Novel solutions are thus supported by the literature, in the form of problem-solving practices, and innovation processes that are core market-based resources in designing effective CVPs (Payne et al., 2017).

Problem-solving Process

The problem-solving process is found to be a core activity in the design process, with a particular emphasis on the customer, understanding their problems, and designing solutions that are fit for purpose. Skålén et al. (2015) found that problem-finding practices identify customer value creating problems, or customer needs to create new value. Problem-solving practices, in addition to problem-finding practices, "help to solve customer problems" (Skålén et al., 2015, p.144). Payne et al. (2017) also support this finding by stating, "firms must gain deep customer insights to understand how they can help solve their important problems" (p. 476). The findings are similar to the literature but differ where it was found that the problem-solving process is a very focused and iterative approach to identifying and understanding the key problems that will create the most value for the customer now and over the long-term.

Problem-solution fit

An activity that goes hand-in-hand with the problem-solving process is to understand whether there is a problem-solution fit. The essential elements of gaining a problem-solution fit revolve around understanding the problem, available technology, costs, and whether customers are willing and able to pay for the solution. The literature broadly supports this finding through the problem-finding and problem-solving practices discussed previously. However, this finding differs in that there is a focus on solving problems where the customer is willing and able to pay for the solution.

End-to-end solutions

In designing a CVP, the focus is on developing holistic solutions by focusing on the bigger picture from the customers' perspective. This finding, once again, is broadly supported in the literature on the problem-finding and problem-solving practices where the focus is on understanding the customer, their important problems, and solving the customers' problems to create value (Skålén et al., 2015). This finding differs in that the focus is not only on the immediate problems of the customer but to understand how value can be created for the customer over the long-term based on their overall strategy. However, the focus on end-to-end solutions could also be due to the nature of the IoT industry that is still emerging and growing.

6.2.1.2. Delivery Process

Following the initial design process, the study found that the delivery process is a core part of the overall process to design an effective CVP. Across all the cases, the design process was observed 89 times. The delivery process focuses on effective implementation, co-creation, and feedback processes that either enhance the design of a CVP or enables the design of new CVPs for the customer.

Effective Implementation

A key finding is that the delivery process revolves around the efficient implementation of an initial CVP with limited resources. A proof of concept (POC) phase was common across the cases where the role of the POC phase is critical in not only designing and delivering the CVP but to also reduce risk and uncertainty for customers. Skålén et al. (2015) posited that operating practices support the core value to be created in the CVP. The literature thus supports the findings that effective implementation is an operating activity to support the core value stated in the CVP. However, the findings provide a more detailed view in that effective implementation

is a strategy through which to overcome possible resource constraints or to reduce risk and uncertainty for customers while delivering the CVP through a focused and iterative process.

Co-creation and Feedback Processes

The research found that co-creating value with the customer and implementing effective feedback loops are essential in the delivery process. Co-creation involves integrating and interacting with the customer and their resources to design effective CVPs. Also, feedback loops enable the enhancement of a CVP or the identification of new CVPs that would address valuable problems the customer might have. Skålén et al. (2015) suggested that interaction practices enable CVPs to be co-created with customers. Furthermore, Frow et al. (2014) suggested that CVPs are "co-created, reciprocal and dynamic". In addition, Payne et al. (2017) suggested that co-created, or mutually determined, CVPs proposes value "to the customer before, during, and after the usage experience" (p.472). The literature supports the findings that co-creating CVPs occur through integrating and interacting activities with the customer that are classified as interaction practices by Skålén et al. (2015). In addition, feedback loops would also be a form of interaction practices to co-create enhanced CVPs or new CVPs or to design CVPs that proposes value across the customer journey.

Dynamic Problem-solving

In addition to the problem-solving process, the results show that there is a dynamic problem-solving process that unfolds with the delivery process. This finding indicates that dynamic problem-solving is aimed at identifying and recognising value-adding opportunities that emerge during the delivery process. This finding is largely supported by the problem-finding practices suggested by Skålén et al. (2015).

6.2.2. CVP Enablers

The findings indicate CVP enablers are required to enable the process to design effective CVPs. Three categories of CVP enablers enable the value creation process, which consists of resources and capabilities, partnerships and ecosystem, and communicating value.

6.2.2.1. Resources and Capabilities

The findings indicate that resources and capabilities enable activities to create and deliver the CVP. Throughout the process, new resources or capabilities can also be developed and leveraged towards new customers. In addition, it was found that individuals and teams with knowledge and experience within the industry are important to enable resources and capabilities that solve customers' problems more effectively. This knowledge is found to be specialist knowledge and experience in the industry or across industries. Demil et al. (2015) suggested that to create and capture value, does not necessarily require a resource move, as the same resources can be combined in novel ways to enable new value propositions and business models. Payne et al. (2017) posited that firm-based resources and market-based resources are essential antecedents in designing and developing mutually determined CVP. The findings corroborate the role of resources and capabilities as an enabler in the value creation process to design and deliver effective CVPs.

6.2.2.2. Partnerships and Ecosystem

Partnerships have dual roles in the value creation process. On the one hand, the findings show that strategic partnerships are a means to understand and translate a customers' problem where organisational knowledge to the problem might be lacking. On the other hand, strategic partnerships create an opportunity to address internal resource deficiencies or complement existing resources and capabilities to enable the design and delivery of an effective CVP. Furthermore, ecosystems were found to be a critical enabler to the value creation process. The results indicate that identifying, engaging and developing partners outside of the immediate ecosystem are key activities that enhance the value creation process where collaboration is essential for a sustainable ecosystem. Moreover, a key finding to develop strategic partnerships within the ecosystem is to develop sufficient partner knowledge. The results indicate that partner knowledge revolves around understanding the ecosystem, the partners and their CVPs, and identifying where synergies may exist to design effective CVPs that creates value for the customer. Amit and Han (2017) posited that ventures with a collaborator resource configuration would collaborate with partners who own complementary resources to create value for customers. In addition, Skålén et al. (2015) suggested that networking practices focus on involving networks and partners to create, deliver and/or negotiate CVPs. The literature largely

supports the findings on the role and importance of partnerships within the ecosystem. In addition, a finding that builds on the market-based resources is partner and ecosystem knowledge. Payne et al. (2017) posited that market-based resources consist of customer and competitor knowledge to enable the design process. However, partner and ecosystem knowledge is also a key enabler in the design process, and thus expands the view on market-based resources.

6.2.2.3. Communicating Value

Customer education and interaction were found to be crucial to the value creation process. The results indicate that educating and interacting with customers on the CVP are necessary activities to influence customers perception of value that would allow the customer to understand and envision the CVP. It also offers an opportunity to test the CVP that may lead to an enhanced CVP. Furthermore, the findings indicate that reducing perceptions of risk and uncertainty to the CVP, solution evidence needs to be produced. Solution evidence could include either physical concept solutions or real use-cases that would enable the customer to perceive the CVP in practical terms. Skålén et al. (2015) posited that interaction practices are activities that enable the communication of the CVP to the customer. In addition, organisational practices involve activities to provide and represent the CVP to the customer (Skålén et al., 2015). The literature supports the finding that communicating value is an enabler to design effective CVPs. However, the findings indicate a more nuanced view on activities to communicate the CVP effectively. In the context of risk and uncertainty, actively educating customers and developing solution evidence would be enablers to design effective CVPs.

6.2.3. Conclusion – Research Question 1

The overall value creation process to design an effective CVP can be described as dynamic, interactive and iterative, with a focus on creating customer value. It starts by holistically understanding the customers' requirements, needs and context. Then through a focused problem-solving approach identifies and understand the customer problems that would create the most value now and over the long-term. Once the problem to be solved is understood, the process continues to understand how resources (e.g. technology, internal resources, partnerships, customer resources etc.) will be combined and integrated to develop a novel and holistic solution specific

to the customers' needs, which they are willing and able to pay for. However, this process is not necessarily sequential, and the design and delivery processes may occur concurrently towards designing effective CVPs.

CVP enablers are essential throughout the value creation process. Resources and capabilities, with a focus on organisation knowledge, are at the heart of creating value. Partnerships also have an essential multidimensional role in creating value, and the key to strategic partnerships and the ecosystem is to develop partner and ecosystem knowledge. Moreover, communicating value is probably one of the most essential activities that enable the design of effective CVPs. The enabling role of communicating value is on educating customers to influence their value perceptions of the CVP, while also gathering valuable feedback that could influence the design of the CVP.

6.3. Discussion - Research Question 2

How do entrepreneurs perceive the content and characteristics of an effective CVP?

Across the five cases, 167 occurrences of the value dimensions theme were observed. This theme describes the content and characteristics of an effective CVP.

This research question was formulated to understand the content and characteristics of an effective CVP. Smith and Colgate (2007) developed a comprehensive framework on the types of value and the sources of that value. Furthermore, Priem et al. (2018) described important strategic characteristics from a demand-side perspective to consider that could determine the effectiveness of a CVP. In contrast, Payne et al. (2017) provided a more granular understanding with four CVP design characteristics. However, these studies are limited in scope and do not fully describe the effectiveness characteristics. This gap is acknowledged in the literature where Payne et al. (2017) highlighted the need for further research to understand the content of CVPs that make them effective, as well as, the characteristics that determine their effectiveness. This is supported by Priem et al. (2018) who called for further research to understand the content of effective CVP. The results from the data analysis of this theme will thus aim to answer this research question to understand the content and characteristics of effective CVPs.

6.3.1. Value Dimensions

The value dimensions theme consist of five core dimensions. These dimensions are information value, economic value, latent value, tangible value, and effectiveness characteristics. Collectively, these dimensions describe the content and characteristics of effective CVPs.

6.3.1.1. Information Value

The results indicate that an effective CVP would include information value that communicates how customers will be enabled to make better and informed decisions, which may lead to other value dimensions, such as economic and latent value, to realise. In addition, it was found that information value, from the customers' perspective, aims to communicate information effectively that would differentiate the CVP. Smith and Colgate (2007) posited that functional value aims to fulfil customers' desires across a broad range of possible dimensions, which includes outcomes and usefulness. Furthermore, experiential value aims to create value through experiences, feelings and emotions (Smith & Colgate, 2007). In addition, information is a source of value that can emphasise either cost drivers or differentiators (Smith & Colgate, 2007). The finding on the information value dimension is supported in the literature where the focus is on emphasising customer objectives towards useful experiences while emphasising both costs driver and differentiators.

6.3.1.2. Economic Value

The results indicate that economic value is multidimensional. On the hand, the focus is to reduce cost, risk and uncertainty. On the other hand, the focus is on increasing profits, time and convenience. The cost value is concerned with overall transaction costs that could include reducing economic costs, psychological costs, and risk (Smith & Colgate, 2007). In addition, functional value includes performance and attributes (Smith & Colgate, 2007). The findings are supported by the literature where the economic value dimension emphasises various value dimensions with a focus on both cost drivers and differentiators.

6.3.1.3.   Latent Value

The results indicate that the latent value dimension aims to identify and reveal latent value from a customer's problems. Latent value is an evolving dimension that focuses specifically on identifying growth opportunities, competitive advantage, and develop new CVPs for the customer to create value. Slater and Narver (1998) suggested that the latency of customer needs cannot be articulated. In contrast, Priem et al. (2018) suggested that a focus on customers dynamic, diverse and latent needs may result in a competitive advantage on the demand-side. The literature broadly supports the findings but provides a more in-depth understanding of where latent value can be articulated throughout the value creation process to emphasise new opportunities and competitive advantage for the customer.

6.3.1.4.   Tangible Value

The results indicate that the tangible value dimension aims to communicate the product and service benefits, functions, and features that are valued by the customer but also differentiates the CVP in the market. Smith and Colgate (2007) posited that functional value emphasises functional, attributes, and features related to the product or service. The findings are thus supported by the literature where the CVP would seek to communicate tangible value dimensions related to the product or service. Furthermore, the findings indicate that tangible value is aimed at the customers' needs, which could be both cost drivers and differentiators. However, from a CVP perspective, the emphasis is on market differentiation.

6.3.1.5.   Effectiveness Characteristics

The results indicate that effective CVPs are characterised by increasing demand from either the customer themselves or positive word-of-mouth where the customer is willing and able to pay for the CVP. It was also found that if the customers' objectives (e.g. efficiencies, saving costs, increasing sales etc.) were met then the CVP is effective. Progress on customer objectives is generally observable from the data, which is a key indicator that the CVP is effective. Furthermore, throughout the process to design an effective CVP, the results indicate that all the cases conducted activities that would reduce risk and uncertainty for the customer. It was found that a key activity in this process is the delivery process, which includes a POC phase. The

results indicated that the POC is a mechanism to determine whether a CVP is effective in creating value for the customer.

The literature on effectiveness characteristics is limited. Priem et al. (2018) proposed that the effectiveness of a CVP should consider heterogeneous and latent customer needs, as well as industry dynamics. Furthermore, Payne et al. (2017) proposed that design characteristics, such as perspective adopted, explicitness, granularity and focus, could moderate the effectiveness of a CVP. The findings indicate that all four design characteristics are relevant to effective CVPs. The perspective adopted is to design mutually determined CVPs with the customer taking into consideration the customers' context, environment and needs. The CVP is explicitly communicated through activities, such as the POC phase. The granularity of the CVP is at the individual customer level. Finally, the focus of the CVP focuses on several value dimensions that would have the biggest impact on the customer. However, the findings provide a nuanced view on measuring effectiveness characteristics, which builds on the literature to determine the effectiveness of a CVP.

6.3.2. Conclusion – Research Question 2

The content and characteristics of effective CVPs can be described as multidimensional and dynamic. Various value dimensions aim to communicate value through the CVP. These value dimensions are embedded in a CVP where some dimensions, such as information value and latent value, are implicit while others, such as economic value and tangible value, are more explicit. However, these value dimensions can evolve over time depending on the customers' objectives, and implementation stages. In addition, the types of value emphasised are mostly functional value and cost value while further emphasising both cost drivers and differentiators (Smith & Colgate, 2007).

Determining the effectiveness of a CVP is interactive and dynamic. Creating and delivering CVPs that deliver on the customer's objectives is a key characteristic that a CVP is effective. Moreover, increasing demand through either existing customers or positive word-of-mouth is a key effectiveness characteristic. However, customers that are willing and able to pay for a CVP is probably the most fundamental characteristic of an effective CVP. These findings are broadly explained in the literature. However, these findings provide a more nuanced view on the content of CVP and the characteristics that make CVPs effective.

6.4. Discussion - Research Question 3

How do entrepreneurs create alignment and fit between a CVP and its business model?

Across the five cases, 447 occurrences of the business management theme were observed. This theme describes how alignment and fit between a CVP and a business model are achieved.

This research question was formulated to understand how alignment and fit between the CVP and business model are achieved. Payne et al. (2017) identified several moderating variables in the design of effective CVPs, of which CVP leadership and formalisation is a moderating variable (Payne et al., 2017). The authors suggested that CVP leadership and formalisation processes would moderate the design of a CVP (Payne et al., 2017), and specifically called for more research on the relationship between the business model design and the CVP design. The results from the data analysis on this theme will thus aim to answer the research question to understand the alignment and fit activities between a CVP and business model.

6.4.1. Business Model Management

The business model management theme consists of five core dimensions. These dimensions are market alignment and growth, competitiveness, challenges, organisational learning, and customer management. Collectively, these dimensions describe how the CVP and business model are aligned to create a fit.

6.4.1.1. Market Alignment and Growth

The market alignment and growth dimension explore five key categories that enable CVP and business model alignment. These key categories are revenue model, product-to-market fit, resource alignment, market entry, and opportunity recognition.

Revenue Model
The findings indicate that revenue model dynamics and experimentation are core activities to align the CVP and the business model. It was found that revenue model dynamics considers the options customers have to pay for the CVP, how market share will be gained, and how value will be captured from the CVP that revolves around products and services. The findings indicate that experimentation is

necessary to determine the most effective revenue model. However, across all the cases there is a focus on a subscription-based revenue model. Zott and Amit (2010) suggested that the revenue model is akin to the pricing strategy where the revenue model enables revenue generation and complements the design of a business model. In addition, Metallo et al. (2018) found that IoT-orientated ventures aim to capture value through recurring revenue streams. The literature supports the role of the revenue model in aligning the CVP and business model where the extent of value capture from the CVP will be determined by the revenue model or pricing strategy through experimentation with a focus on recurring revenue streams.

Product-to-Market Fit

Identifying and finding a product-to-market fit was found to be essential. The results indicate that a product-to-market fit is gained by ensuring a large enough market opportunity exist, or simply to ensure a customer's problems are solved where they are willing and able to pay. In addition, it was found that the revenue model is a key factor to determine whether there is a product-to-market fit. Zott and Amit (2008) posited that product market strategies complement novelty-centred business models to achieve a fit and venture performance. The product market strategies focus on differentiation, cost leadership, or market entry (Zott & Amit, 2008). The literature supports the need for product-to-market fit through product-market strategies. However, the findings indicate that to enable these strategies for a product-to-market fit requires a focus on understanding the market size and whether value can be captured from the market.

Resource Alignment

Resource alignment involves activities to search for resources that create new or enhanced CVPs or to align and combine existing resources to develop new CVPs. These are activities that revolve around constant experimentation to gain alignment between the CVP and business model. McGrath (2010) suggested that experimentation in the market and time to discover more effective business models is an essential activity to make resource allocation decisions that are competitively important. The findings are supported by the literature where experimentation is necessary to make effective resource decisions to create an alignment between the CVP and business model.

Market Entry

A key alignment and fit activity is the process through which the market is entered. Developing and enabling key partners were found to be an essential channel through which access to markets is gained. To enable partners requires effective communicating for them to understand and communicate the CVP to the market effectively. Zott and Amit (2008) highlighted the important complementary role of product market strategies for business model alignment. Early market entry is highlighted as a particular strategy for novelty-centred business models to gain a competitive advantage (Zott & Amit, 2008). In addition, Skålén et al. (2015) suggested that a key practice in the process of developing effective CVPs are networking practices. Networking practices are practices that involve networks and partners to create, deliver and/or negotiate CVPs (Skålén et al., 2015). The findings for the market entry category is in contrast with the literature on early market entry but supported by the importance of networks and partnerships to create, deliver and negotiate CVPs.

Opportunity Recognition

It was found that opportunity recognition is a key alignment and growth mechanism. Either the customer or the supplier may trigger value-creating opportunities that would enable the design of new CVPs aligned to the business model and the market. Skålén et al. (2015) suggested that through interaction practices, CVP communication or co-creation activities are enabled. The literature broadly supports the finding of the relevance of opportunity recognition activities to communicate or co-create CVPs. However, the findings provide a better understanding of interaction practices to include opportunity recognition capabilities.

6.4.1.2. Competitiveness

The competitiveness dimension was observed across all the cases with 96 occurrences. This dimension further explores four categories that aim to improve overall competitiveness towards aligning the CVP with the business model. These four categories are competitor knowledge, core capabilities, market-orientation, and organisational culture.

Competitor Knowledge

Identifying, understanding and developing knowledge on competitors and their CVPs were found to be essential to differentiate a CVP in the market. These essential

activities enable aligning and configuring the CVP and business model towards market differentiation. Payne et al. (2017) posited that competitor knowledge is a market-based resource that enables the design of effective CVPs by understanding how superior a CVP is, relative to competitors, in addressing customer's needs. Developing competitor knowledge is also found to be relevant to a business model in relation to the revenue model (Metallo et al., 2018). The finding on the importance of competitor knowledge is supported in the literature, especially in terms of differentiation and revenue model dynamics.

Core Capabilities

The results indicate that differentiation typically centres on a core capability unique in the market. The CVP and business model is configured and aligned to leverage a core capability that would differentiate the CVP in the market. However, the findings indicate that core capabilities are developed through a combination of internal and external resources and activities, and depends on competitor knowledge to effectively differentiate. Zott and Amit (2010) suggested that activities in a business model involve both internal and external resources towards the fulfilment of the overall objective. The findings on the importance of a core capability are supported in the literature, especially on the role of resources and activities that go beyond firm-boundaries (Zott & Amit, 2010), and the need for competitor knowledge to effectively differentiate the CVP (Payne et al., 2017).

Market-Orientated

An orientation towards the market and customer needs was found to be essential in identifying potential advantages over competitors. By understanding the market, competitors, and customer needs, attractive markets can be identified and pursued that would drive competitiveness. These activities would aim to, not only align the CVP and business model but to align with the market overall. Slater and Narver (1998) posited that a market-orientation and developing learning capabilities would enable the identification and understanding of both articulated and latent needs of customers. The literature supports the importance of a market-orientation towards understanding needs, but the finding contributes towards a better understanding of the impact of a market-orientation in improving competitiveness that aligns the CVP and business model.

Organisational Culture

It was found the organisational culture is a fundamental driver of competitiveness. The results indicated that organisational culture is essential to building trusted, long-term customer relationships. To create alignment between the CVP and business model requires an organisational culture orientated towards solving the customers' problems and building trusted relationships. Payne et al. (2017) posited that culture is part of innovation, which is a market-based resource. Culture determines the way in which innovation activities are performed (Payne et al., 2017). The literature thus supports the finding of the important role of culture to align the CVP and business model. The finding also provides a better understanding of the role of culture as it relates to customer relationships.

6.4.1.3. Challenges

The challenges dimension reveals that there are three categories of challenges that need to be managed to align the CVP and business model. These three categories are market/customer challenges, internal challenges, and industry/ecosystem challenges.

The results indicate that several challenges, or environmental conditions, could moderate the influence of the CVP. It was found that understanding the internal and external challenges customers are facings is an essential activity to configure and align the CVP and business model effectively towards enabling the customer to adopt the CVP while lowering the risk and uncertainty customers might face. Furthermore, the results indicate that CVP shortcomings are challenges that need to be managed. Moreover, the industry is plagued with high failure rates. Failure rates can be attributed to underestimating the complexity involved in delivering a CVP successfully, which influences a customer's perception of risk and uncertainty. It was found that understanding the industry challenges is an essential activity to configure and align the CVP and the business model to reduce risk and uncertainty for customers. Demil et al. (2015) argued that the business model is less concerned with a competitive advantage and more focused on mechanisms to create and capture value and that environmental conditions are a choice and not a constraint. In contrast, the findings indicate that environmental conditions, or challenges, do have an impact on the business model that would have implications for aligning the CVP and business model to be effective. Therefore, identifying and understanding the

challenges that might influence the business model is a key activity to align the CVP and business model.

6.4.1.4.   Organisational Learning

The organisational learning dimension encompasses several areas to enable designing and delivering effective CVPs and aligning the CVP and business model. The results indicate that through internal reflection, experimentation, and analysing the market and industry, learning takes place that enables a change in the CVP or business model to create alignment. Slater and Narver (1998) posited that learning capabilities are required to understand articulated and latent customer needs. Furthermore, McGrath (2010) suggested that experimentation and time are essential to developing more effective business models. In addition, Skålén et al. (2015) posited that knowledge-sharing practices enable the realisation of a CVP. The literature thus supports the role and importance of the finding on organisational learning activities and further provides an understanding of the types of learning activities that enable better alignment of the CVP and business model.

6.4.1.5.   Customer Management

Customer management is found to be a core activity throughout the results. The results indicate that customer management is a key activity for CVPs to be effective. Customer management involves building trusted relationships through direct, honest, and transparent engagements. Payne et al. (2017) posited that customer relationships are a market-based resource that enhances credibility and brand reputation. Moreover, trusted customer relationships are found to moderate the influence of a CVP (Payne et al., 2017). The literature supports the finding of the importance of building trusted relationships for effective CVPs. These relationships will also enable better alignment between the CVP and the business model.

6.4.2. Conclusion – Research Question 3

Various business model dimensions and activities need to be considered and managed on an ongoing basis. The market alignment and growth dimension emphasise the importance of an effective revenue model enabled by a product-to-market fit, resource alignment, market entry strategies, and opportunity recognition. The competitiveness dimension emphasises the importance of developing

competitor knowledge, an orientation towards the market, leveraging core capabilities, and organisational culture. Furthermore, various market, internal and industry challenges need to be understood and managed.

Essential to managing and aligning the CVP and business model across all the dimensions is knowledge. This knowledge consists of the market, customers, competitors, partners, and industry, and is enabled through organisational learning capabilities and customer relationships. Aligning and achieving a fit between the CVP and business model is thus a complex, dynamic and evolving process, which resonates with a view held in business model literature (Gerasymenko, De Clercq, & Sapienza, 2015; McGrath, 2010).

7. CONCLUSION AND RECOMMENDATIONS

7.1. Introduction

A concern for low entrepreneurial activity and high failure rates, due primarily to unprofitable business models, initiated this study (George et al., 2016; Herrington et al., 2017). Unprofitable business models can be due to various factors. However, the researcher identified ineffective CVPs as an area to explore further (Payne et al., 2017; Priem et al., 2018). This research study, thus, set out to explore and understand the process of designing effective CVPs in the context of risk and uncertainty. The study did this in two ways, by focusing on the emerging IoT industry and entrepreneurial cases that included both start-ups and established ventures that are embracing and pursuing a market position in the IoT industry.

This study explored how entrepreneurs design effective CVPs in IoT-orientated business models as the overarching research questions. As presented in chapter one, CVPs aim to communicate, create and deliver value to customers that may have significant performance implications for a venture (Payne et al., 2017). A CVP is also a mechanism through which to effectively differentiate a venture in the market to gain a competitive advantage (Eggert, Ulaga, Frow, & Payne, 2018). However, many entrepreneurs do know how to design and communicate a CVP that would allow customers to assess its benefits and value effectively (Priem et al., 2018; Wouters et al., 2018). Also, the process of design effective CVPs lack empirical research, and several authors have called for a better understanding (Frow et al., 2014; Payne et al., 2017; Priem et al., 2018). There is also a lack of research on the content and characteristics of effective CVPs (Payne et al., 2017; Priem et al., 2018). Finally, CVPs are a core component in a ventures business model (Zott & Amit, 2010). However, there is a need to understand the relationship between the business model and designing effective CVPs, as CVP leadership and formalisation processes moderate the impact of the CVP on the venture and its customers (Payne et al., 2017). These three areas formed the research questions that collectively answer the overarching research question.

This chapter presents the conclusions to this research study through summarising the significant research findings, presenting their implications for theory and business, highlighting the limitations, and then suggesting future research areas.

7.2. Research Findings

This exploratory research study has successfully answered the research question set out in chapter one, namely to explore and understand how entrepreneurs design effective CVPs in IoT-orientated business models. The key findings of this study can be summarised into three areas. Firstly, there is an overall dynamic value creation process with several essential enablers. Secondly, the content and effectiveness of a CVP evolve throughout the value creation process. Finally, business management is a dynamic and iterative process to enable the design of effective CVPs aligned to the business model.

7.2.1. Dynamic Value Creation Process

The process of designing a CVP is dynamic, iterative, and interactive. The process focuses on value creation consisting of the design and delivery process that encompasses several critical provisional, representational, and organisational practices (Skålén et al., 2015). Designing a CVP does not occur in isolation, there may be an initial CVP at a solution level, but once an initial CVP is adopted the design and delivery of an effective CVP coincide to create value for customers. Across the entire process, the ability to effectively identify and solve important customers' problems is essential, and this problem-solving process (Skålén et al., 2015) is interactive and iterative to co-create effective CVPs with the customer focusing on long-term value (Payne et al., 2017; Skålén et al., 2015). Furthermore, the ability to configure and combine resources, including technology resources, is essential to develop novel solutions (Payne et al., 2017; Skålén et al., 2015).

Two key activities are required to demonstrate and communicate the CVP and enable the value creation process. Several design characteristics may be applicable to communicate a CVP effectively (Payne et al., 2017). However, a key challenge to designing and delivering an effective CVP is educating customers on the CVP. This need for customer education may be due to the risk and uncertainty over the technology and solutions, high implementation failure rates and legacy issues. Thus, value-communicating activities that educate customers on the CVP is a necessary first step. This involves communicating value through real use-cases, developing and demonstrating physical concept solutions, or visually presenting and illustrating the CVP. The objective of this activity is to influence the value perceptions of the customer, to enable them to envision the CVP, and show customers how the CVP

could solve their important problems (Payne et al., 2017; Skålén et al., 2015). Once a customer has perceived the value and adopted an initial CVP, a proof of concept (POC) phase is a necessary second activity. A proof of concept phase is part of the delivery process where through a focused and iterative approach important and high-impact customer problems are solved. The POC phase is also a strategic activity that enables ventures to overcome potential resource limitation because of the narrow and focused scope of a POC. However, the onus is on the venture to define and establish the success metrics of a POC, and then to manage the POC to ensure it converts into a project to implement holistic solutions that would lead to an effective CVP.

Knowledge is a fundamental enabler to the value creation process. The importance and role of customer and competitor knowledge in designing effective CVPs are well established (Payne et al., 2017). However, knowledge of partners and the ecosystem is also a key enabler to designing and delivering effective CVPs. Partner and ecosystem knowledge is the knowledge that aims to identify and understand the CVPs of the partners inside and outside of the immediate ecosystem. Through partner knowledge, a venture can identify strategic partners that could enable the creation, communication and delivery of a CVP (Skålén et al., 2015).

To develop knowledge requires effective organisational learning processes. Learning capabilities are necessary to effectively identify customers' needs that may be articulated or latent (Slater & Narver, 1998). For organisation learning to take place, it is necessary to implement and integrate feedback loops throughout the value creation process across relevant stakeholders. Also, organisational learning occurs through reflection, market experimentation and time (McGrath, 2010), which enables the design of both the CVP and business model to evolve and become effective.

7.2.2. CVP Content and Effectiveness

The nature of a CVP is dynamic and evolves throughout the value creation process, which flows through to the content and effectiveness characteristics of a CVP. Throughout the value creation process, to design and deliver a CVP, there are varying value dimensions and types of value (Smith & Colgate, 2007) that can be emphasised in the CVP. An initial CVP would emphasise tangible and economic value to influence a customer's value perceptions. These value dimensions would aim to communicate, through the CVP, the essential functions, features, attributes

and cost of the product or service. As the CVP evolves through the value creation process, other value dimensions may be emphasised, such as information and latent value. Information and latent value dimensions aim to communicate outcomes, performance, usefulness, and importantly, strategic possibilities for the customer. These value dimensions may only emerge in the delivery process as solution implementation occurs. However, it is essential to understand that they may emerge, to then identify and emphasise it in the CVP to become more effective. Throughout the process, the sources of value (Payne et al., 2017; Smith & Colgate, 2007) would aim to emphasise both costs drivers and differentiators. Costs drivers in the CVP emphasise, from a customer's perspective, how the solution could reduce costs, risk and uncertainty. Differentiators in the CVP emphasise both supplier differentiators, relative to competitors, and customer differentiators to create value for the customer.

The effectiveness of a CVP is determined through various characteristics that also evolve. Initially, the effectiveness of a CVP can be determined by a customer's willingness and ability to pay for a solution. As the value creation process occurs, the effectiveness of the CVP can be determined through whether the customers' objectives are being achieved that are objectively observable from data and information, i.e. data-driven. Once a solution has been implemented and the customers' objectives achieved, the effectiveness of a CVP is determined by whether demand increases either from follow-on needs and requests from the customer, or positive word-of-mouth.

7.2.3. Business Model Management

The relationship between a CVP and business model is integrated and complementary. The design of the CVP could influence the design of the business model and vice versa. Thus, continued management of the business model is necessary to ensure alignment to the CVP to enable value creation. The revenue model is an essential business model component (Wirtz et al., 2016) that requires careful consideration and management because of its impact on the effectiveness of the CVP and the consequences for market alignment, growth and performance. The revenue model determines the level of value that can be captured from the CVP, which, in the case of IoT-orientated business models, revolve around pricing strategies for hardware, software and services to generate recurring revenues, i.e. subscription-based (Metallo et al., 2018). Knowledge of customers, competitors and

partners could influence the revenue model (Metallo et al., 2018; Payne et al., 2017). However, learning through market experimentation (McGrath, 2010), especially in conditions of uncertainty, may lead to an effective revenue model to capture value from the CVP.

Improving competitiveness is an essential business model management activity. Competitiveness would influence both the effectiveness of a CVP and business model. Once again, knowledge of competitors (Payne et al., 2017), their CVPs, and business model has an influence on improving competitiveness. However, organisational culture is also a driver of competitiveness. Organisational culture determines how value-creating activities are performed (Payne et al., 2017), but more importantly, organisational culture drives and enables the building of trusted customer relationships. Building trust with customers is essential and a priority in the IoT industry due to the risk and uncertainty that is prevalent. Therefore, developing and managing an organisational culture could drive competitiveness that could have consequences for the effectiveness of the CVP and business model.

7.3. Proposed Framework

Qualitative research is generally rich and subjective with the objective of developing theory (Saunders & Lewis, 2018). This research study consisted of a small sample size and was exploratory, which limits the generalisability of the findings and insights derived (Saunders & Lewis, 2018). Also, the value communicated through a CVP and business model is subjectively assessed and thus context-specific (Demil et al., 2015; Kuehnl et al., 2017), further limiting generalisability. However, with the objective of contributing to the body of knowledge with a better understanding of designing effective CVPs, the conceptual framework in Figure 5 aims to illustrate and describe the key insights and findings from this research study.
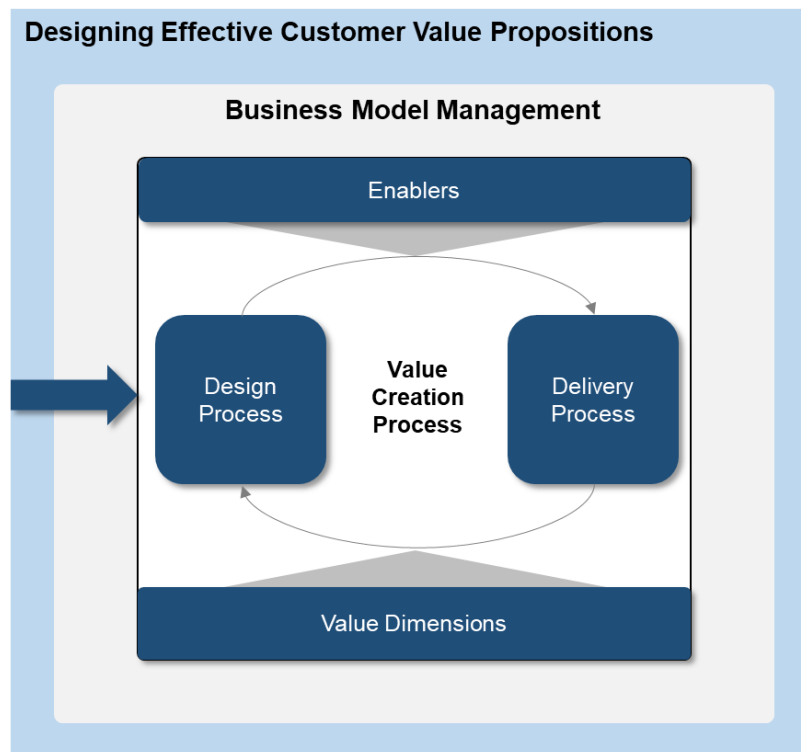
Figure 5: Effective CVP Design Framework

The Effective CVP Design Framework in Figure 5 conceptually illustrates the core elements of designing a CVP. The framework aims to illustrate that the overall process is dynamic, iterative and interactive, and represents the key insight and findings from this research study.

Value Creation Process

At the centre of the framework is the value creation process. The overall objective of designing CVPs and business models is to create value (Demil et al., 2015; Payne et al., 2017). Specifically to the CVP, the value creation process encompasses two processes, the design and delivery process. These two processes together determine how value will be created for the customer and can occur separately or concurrently. The design process emphasises problem-solving capabilities and developing novel solutions to customer's important problems. The delivery process emphasises focused and efficient implementation to overcome resource limitation and co-creation with the customer towards effective CVPs. The value creation process is summarised by the following propositions:

P1: A design and delivery process that is dynamic, iterative and interactive are core value creation processes to designing effective CVPs.

P2: Problem-solving capabilities will moderate the effectiveness of a CVP to create value for customers.

Value Dimensions

Throughout the design and delivery processes, several value dimensions would influence the effectiveness of a CVP. Four types of value, tangible, economic, information, and latent value will be emphasised at different phases of the value creation process, focusing broadly on a combination of cost drivers and differentiators from the customers' perspective. Furthermore, various dimensions would determine the effectiveness of a CVP that requires continuous measurement and monitoring. These dimensions include a customer's willingness and ability to pay, achieving customer objectives, and increased demand from existing customer or new customers due to word-of-mouth. Value dimensions are summarised by the following propositions:

P3: Value dimensions will evolve throughout the process of designing effective CVPs with a focus on cost drivers and differentiators.

P4: An effective CVP can be characterised by a customer's willingness and ability to pay, achieving the customer's objectives, or increased demand from existing or new customers.

Enablers

To enable the design and delivery of an effective CVP requires three key enablers. Firstly, resources and capabilities are at the heart of creating value. Finding, combining, integrating and developing resources and capabilities are essential activities that enable the design of a CVP. Secondly, partnerships and ecosystem are essential in the process, not only to enable the process but also to enhance the CVP. Developing knowledge of partners and their CVPs is a key activity to the process. Finally, communicating value aims to influence the perceptions of customers on the CVP where educating customers is a key activity. Educating customers through conceptual or practical solution evidence is essential to create perceived value. The CVP enablers are summarised by the following propositions:

P5: Resources and capabilities, partnerships and ecosystems, and communicating value are enablers to designing effective CVPs.

P6: Knowledge of partners will influence the development of partnerships that enable the design of an effective CVP.

P7: Educating customers will positively influence customer's perceptions of the CVP.

Business Model Management

The CVP is a central part of the business model, where the business model enables the CVP. Business model management, thus, aims to align the business model and CVP throughout the process to create value and broadly involves four main activities. Firstly, revenue model development is a core value capturing activity in managing the business model. Effective revenue models are vital to enable value capture from the CVP. Secondly, managing and improving the competitiveness of the venture is essential. Thirdly, organisation learning activities ensures that the CVP and business model evolves with the market and customer. Finally, customer management ensures that trust is built and maintained with the customer. Business model management is summarised by the following propositions:

P8: Revenue model development, improving competitiveness, organisational learning, and customer management are key business model activities that ensure alignment between the business model and the CVP to be effective.

P9: The revenue model will moderate the effectiveness of a CVP.

In summary, the framework and propositions developed put the design of effective CVPs at the centre of business models. Business models are concerned with value creation and value capturing activities for its stakeholders (Demil et al., 2015), and the design of an effective CVP is, in particular, concerned with the value creation process for customers (Payne et al., 2017). In addition, the framework identifies the evolutionary nature of various value dimensions and essential enablers to the value creation process. However, business model management and value capturing activities, that revolve around the revenue model, are essential to the design of an effective CVP that would determine venture performance (Priem et al., 2018). The framework, thus, illustrates the mutual and co-dependent relationship between value creation and value capturing activities of a business model and CVP that evolve to become effective.

7.4. Implications for Theory and Business

This research study provides practical insights for managers and entrepreneurs to conceptualise the design of an effective CVP in the IoT industry and the context of risk and uncertainty. In addition to the proposed conceptual framework and propositions above, the research study provides several additional insights for entrepreneurs and business practitioners with theoretical implications.

Developing Knowledge

Knowledge development of customers and competitors is essential to designing effective CVPs (Payne et al., 2017). However, developing partner knowledge is also vital to the design of an effective CVP, as well as the business model. This knowledge entails understanding the partners within, and beyond the immediate ecosystem, their CVPs, and business models. This insight contributes to a better understanding of the market knowledge required for designing a CVPs to gain a competitive advantage (Payne et al., 2017).

Implementation Strategies

A focused and narrow scope and implementation strategy, such as a proof of concept phase, could yield several benefits while creating value for the customer. Firstly, it enables start-ups to overcome resource constraints and be competitive. Secondly, it reduces risk and uncertainty for the customer. Thirdly, it creates an environment to experiment with novel solutions. Moreover, these insights provide a better understanding of the operating practices (Skålén et al., 2015), and innovation resources (Payne et al., 2017) to designing and delivering a CVP.

Educating Stakeholders

Educating customers on the potential value that can be created is a vital activity. General awareness and understanding of a novel solution and industry would moderate the impact of a CVP. This challenge can be averted by educating customers through direct interaction with evidence of what value can be created. Solution evidence could include real use-cases, conceptual material, and physical concept solutions, which would enable the customer to envision the potential value in their context. Educating partners on the CVP is also essential to enable them to create value. These insights are important contributions to the literature on the

positive impact a CVP can have on customers' perception of value (Payne et al., 2017), especially with novelty-centred business models (Zott & Amit, 2008).

Measuring and Determining Effectiveness

Determining the effectiveness of a CVP may be ambiguous and subjective. However, it is an essential activity to enable organisational learning. The effectiveness characteristics of a CVP could evolve. Initially, it may be characterised by a customer's willingness and ability to pay for a solution. Throughout value creation, it may be assessed through data-driven insight directly related to the customer's objectives. Then, as a customer's objectives have been achieved, it may be characterised by an increase in demand from the customer or positive word-of-mouth. This insight contributes to the literature on CVPs and business models to extend the design characteristics of a CVP (Payne et al., 2017) and provides a better understanding to determine the effectiveness of a CVP and business model (Priem et al., 2018).

Revenue Model Development

The revenue model can have a significant impact on whether a CVP is effective or not. As highlighted above, the willingness and ability to pay for a solution is a key characteristic of an effective CVP. If the revenue model is not aligned to the extent that customers are willing and able to pay for the CVP, then it may not be effective and could have consequences for venture performance. To find an effective revenue model could occur through experimentation in the market, and knowledge of what competitors are doing (Metallo et al., 2018). However, the overall objective for a revenue model is to generate recurring revenue, especially in the IoT industry (Metallo et al., 2018). These insights contribute to a better understanding of the nature of revenue models (Wirtz et al., 2016), and the impact it can have on a business model and the effectiveness of a CVP (Priem et al., 2018).

7.5. Limitations of Research

This research study was exploratory in nature, which limits the generalisability of the results to other contexts. In addition, several other limitations are relevant to this study related to researcher bias, available data, time-scale, and sample. Firstly, researcher bias and assumptions is a risk in qualitative research that could influence the findings. To overcome and reduce researcher bias, several strategies were

implemented (section 4.8). Secondly, archival data and potentially related documentation were limited to publically available data. The study, thus, relied primarily on interview data, which in itself was limited to one interview per case, except for one, where two interviews were conducted. In recognising these limitations, the researcher extended the number of cases from an initial four to five cases to ensure code saturation was achieved. Furthermore, observational and archival data were used as secondary sources to triangulate findings from the interview data. Thirdly, the cross-sectional timescale is a limitation. Due to time constraints, the data was collected once at a point in time during 2019. In addition, value and related constructs are also subjectively assessed and evolve, which limits the findings to a specific context and time. Finally, this study was limited to a small number of cases, which further limits the generalisability of the findings to the IoT industry and to other contexts.

7.6. Suggestions for Future Research

Based on insights and findings derived from this research study, the following potential areas for future research are suggested. First, a longitudinal qualitative research study to explore and understand how the design of a CVP evolves over time and in different contexts. Second, the Effective CVP Design Framework and propositions can be tested quantitatively to understand whether the process to design an effective CVP occurs as suggested. Third, the role of entrepreneurial opportunity recognition can be explored to understand its impact on designing effective CVPs. Fourth, an exploration into the value capture mechanisms used in similar conditions of risk and uncertainty to better understand the dynamics of an effective revenue model. Finally, an exploration of strategies and mechanisms used to communicate value and to determine the effectiveness of a CVP over time.

REFERENCES

Adner, R., & Snow, D. (2010). Old technology responses to new technology threats: Demand heterogeneity and technology retreats. *Industrial and Corporate Change*, *19*(5), 1655–1675. https://doi.org/10.1093/icc/dtq046

Alexy, O., West, J., Klapper, H., & Reitzig, M. (2018). Surrendering control to gain advantage: Reconciling openness and the resource-based view of the firm. *Strategic Management Journal*, *39*(6), 1704–1727. https://doi.org/10.1002/smj.2706

Amit, R., & Han, X. (2017). Value Creation through Novel Resource Configurations in a Digitally Enabled World. *Strategic Entrepreneurship Journal*, *11*(3), 228–242. https://doi.org/10.1002/sej.1256

Amit, R., & Zott, C. (2015). Crafting Business Architecture: The Antecedents of Business Model Design. *Strategic Entrepreneurship Journal*, *9*(1), 331–350. https://doi.org/10.1002/sej

Anderson, J. C., Narus, J. A., & van Rossum, W. (2006). Customer Value Propositions in Business Markets. *Harvard Business Review*, *84*(3), 90–99. Retrieved from https://hbsp.harvard.edu/tu/46774a8a

Argyres, N., Bigelow, L., & Nickerson, J. A. (2015). Dominant Designs, Innovation Shocks, and the Follower's Dilemma. *Strategic Management Journal*, *36*(2), 216–234. https://doi.org/10.1002/smj

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: a research note. *Qualitative Research*, *8*(1), 137–152.

Bowman, C., & Ambrosini, V. (2000). Value Creation Versus Value Capture: Towards a Coherent Definition of Value in Strategy. *British Journal of Management*, *11*, 1–15.

Brandenburger, A., & Stuart, H. J. (1996). Value-Based Business Strategy. *Journal of Economics & Management Strategy*, *5*(1), 5–24.

Corvellec, H., & Hultman, J. (2014). Managing the politics of value propositions. *Marketing Theory*, *14*(4), 355–375. https://doi.org/10.1177/1470593114523445

Cotterill, J. (2019). South Africa's economic growth stutters. Retrieved May 10, 2019, from www.ft.com/content/1688aa70-3f53-11e9-b896-fe36ec32aece

Creswell, J. W. (2012). *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research* (4th Ed). Boston: Pearson Education.

Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative Research Designs: Selection and Implementation. *The Counseling Psychologist*, *35*(2), 236–264. https://doi.org/10.1177/0011000006287390

Dattée, B., Alexy, O., & Autio, E. (2018). Maneuvering in Poor Visibility: How Firms Play the Ecosystem Game When Uncertainty is High. *Academy of Management Journal*, *61*(2), 466–498.

Day, G. S. (2011). Closing the marketing capabilities gap. *Journal of Marketing*, *75*(4), 183–195.

De Massis, A., Audretsch, D., Uhlaner, L., & Kammerlander, N. (2018). Innovation with Limited Resources: Management Lessons from the German Mittelstand. *Journal of Product Innovation Management*, *35*(1), 125–146. https://doi.org/10.1111/jpim.12373

Demil, B., Lecocq, X., Ricart, J., & Zott, C. (2015). Introduction to the SEJ Special Issue on Business Models: Business Models within the Domain of Strategic Entrepreneurship. *Strategic Entrepreneurship Journal*, *9*(1), 1–11. https://doi.org/10.1002/sej

Eggert, A., Ulaga, W., Frow, P., & Payne, A. (2018). Conceptualizing and communicating value in business markets: From value in exchange to value in use. *Industrial Marketing Management*, *69*, 80–90. https://doi.org/10.1016/j.indmarman.2018.01.018

Foss, N. J., & Saebi, T. (2017). Fifteen Years of Research on Business Model Innovation: How Far Have We Come, and Where Should We Go? *Journal of Management*, *43*(1), 200–227. https://doi.org/10.1177/0149206316675927

Frow, P., McColl-Kennedy, J. R., Hilton, T., Davidson, A., Payne, A., & Brozovic, D. (2014). Value propositions: A service ecosystems perspective. *Marketing Theory*, *14*(3), 327–351. https://doi.org/10.1177/1470593114534346

Frow, P., & Payne, A. (2011). A stakeholder perspective of the value proposition concept. *European Journal of Marketing*, *45*(1), 223–240. https://doi.org/10.1108/03090561111095676

George, G., Corbishley, C., Khayesi, J. N. O., Haas, M. R., & Tihanyi, L. (2016). Bringing Africa in: Promising Directions for Management Research. *Academy of Management Journal*, *59*(2), 377–393. https://doi.org/10.5465/amj.2016.4002

Gerasymenko, V., De Clercq, D., & Sapienza, H. (2015). Changing The Business Model: Effects of Venture Capital Firms and Outside CEOs on Portfolio Company Performance. *Strategic Entrepreneurship Journal*, *9*(1), 79–98. https://doi.org/10.1002/sej

Gibbert, M., & Ruigrok, W. (2010). The "What" and "How" of Case Study Rigor: Three Strategies Based on Published Work. *Organizational Research Methods*, *13*(4), 710–737. https://doi.org/10.1177/1094428109351319

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. https://doi.org/10.1177/1525822X05279903

Herrington, M., Kew, P., & Mwanga, A. (2017). *GEM South Africa Report - 2016-2017*. Retrieved from https://www.gemconsortium.org/country-profile/108

Hienerth, C., Keinz, P., & Lettl, C. (2011). Exploring the nature and implementation process of user-centric business models. *Long Range Planning*, *44*(5–6), 344–374. https://doi.org/10.1016/j.lrp.2011.09.009

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Kin-man To, C., W.Y. Yee, R., Mok, P., Chau, K., Chong Wong, M., & Cheung, N. (2018). Collaboration reasoning or social heuristics? Value proposition validity in omnium-gatherum business models. *Journal of Business Research*, *88*(1), 550–559. https://doi.org/10.1016/j.jbusres.2018.01.062

Kohler, T. (2015). Crowdsourcing-Based Business Models: How to Create and Capture Value. *California Management Review*, *57*(4), 63–84. https://doi.org/10.1525/cmr.2015.57.4.63

Kuehnl, C., Fürst, A., Homburg, C., & Staritz, M. (2017). Toward a Differentiated Understanding of the Value-Creation Chain. *British Journal of Management*, *28*(3), 444–463. https://doi.org/10.1111/1467-8551.12206

Lanning, M., & Michaels, E. (1988). A business is a value delivery system. McKinsey Staff Paper No. 41, July.

Lepak, D. P., Smith, K. G., & Taylor, M. S. (2007). Value creation and value capture: A multilevel perspective. *Academy of Management Review*, *32*(1), 180–194. https://doi.org/10.5465/AMR.2007.23464011

Massa, L., Tucci, C. L., & Afuah, A. (2017). A Critical Assessment of Business Model Research. *Academy of Management Annals*, *11*(1), 73–104.

McGrath, R. G. (2010). Business models: A discovery driven approach. *Long Range Planning*, *43*(2–3), 247–261. https://doi.org/10.1016/j.lrp.2009.07.005

Metallo, C., Agrifoglio, R., Schiavone, F., & Mueller, J. (2018). Understanding business model in the Internet of Things industry. *Technological Forecasting & Social Change*, *136*(1), 298–306. https://doi.org/10.1016/j.techfore.2018.01.020

Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification Strategies for Establishing Reliability and Validity in Qualitative Research. *International Journal of Qualitative Methods*, *1*(2), 13–22. https://doi.org/10.1177/160940690200100202

Myres, K. (2018). Qualitative Research Skills [PowerPoint Slides]. Retrieved from https://gibs.blackboard.com

Osiyevskyy, O., & Dewald, J. (2015). Explorative versus Exploitative Business Model Change: The Cognitive Antecedents of Firm-Level Responses to Disruptive Innovation. *Strategic Entrepreneurship Journal*, *9*(1), 58078. https://doi.org/10.1002/sej

Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. (2014). *Value Proposition Design: How to Create Products and Services Customers Want*. New Jersey: John Wiley & Sons Inc.

Patala, S., Jalkala, A., Keränen, J., Väisänen, S., Tuominen, V., & Soukka, R. (2016). Sustainable value propositions: Framework and implications for technology suppliers. *Industrial Marketing Management*, *59*, 144–156. https://doi.org/10.1016/j.indmarman.2016.03.001

Payne, A., & Frow, P. (2014). Deconstructing the value proposition of an innovation exemplar. *European Journal of Marketing*, *48*(1), 237–270. https://doi.org/10.1108/EJM-09-2011-0504

Payne, A., Frow, P., & Eggert, A. (2017). The customer value proposition: evolution, development, and application in marketing. *Journal of the Academy of Marketing Science*, *45*, 467–489. https://doi.org/10.1007/s11747-017-0523-z

Pilling, D. (2019). Cyril Ramaphosa must find a way to make South Africa fairer. Retrieved May 25, 2019, from www.ft.com/content/e63103a0-7caa-11e9-81d2-f785092ab560

Priem, R. L., Wenzel, M., & Koch, J. (2018). Demand-side strategy and business models: Putting value creation for consumers center stage. *Long Range Planning*, *51*(1), 22–31. https://doi.org/10.1016/j.lrp.2017.07.007

Quero, M., & Ventura, R. (2019). Value proposition as a framework for value cocreation in crowdfunding ecosystems. *Marketing Theory*, *19*(1), 47–63. https://doi.org/10.1177/1470593118772213

Reilly, M. O., & Parker, N. (2012). 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. https://doi.org/10.1177/1468794112446106

Ritter, T., & Lettl, C. (2018). The wider implications of business-model research. *Long Range Planning*, *51*(1), 1–8. https://doi.org/10.1016/j.lrp.2017.07.005

Saldana, J. (2013). *The Coding Manual for Qualitative Researchers* (2nd Ed.). London: SAGE Publications. https://doi.org/10.1017/CBO9781107415324.004

Saunders, M., & Lewis, P. (2018). *Doing research in business and management: An essential guide to planning your project.* (2nd Ed.). Harlow: Pearson.

Skålén, P., Gummerus, J., von Koskull, C., & Magnusson, P. R. (2015). Exploring value propositions and service innovation: a service-dominant logic study. *Journal of the Academy of Marketing Science*, *43*(2), 137–158. https://doi.org/10.1007/s11747-013-0365-2

Slater, S. F., & Narver, J. C. (1998). Customer-led and market-oriented: Let's not confuse the two. *Strategic Management Journal*, *19*(10), 1001–1006.

Smith, J. B., & Colgate, M. (2007). Customer Value Creation: A Practical Framework. *Journal of Marketing Theory and Practice*, *15*(1), 7–23. https://doi.org/10.2753/MTP1069-6679150101

Statistics South Africa. (2017). *Mid-year population estimates 2017*. Retrieved from http://www.statssa.gov.za

Teece, D. J. (2010). Business Models, Business Strategy and Innovation. *Long Range Planning*, *43*(2), 172–194. https://doi.org/10.1016/j.lrp.2009.07.003

Töytäri, P., & Rajala, R. (2015). Value-based Selling: An Organizational Capability Perspective. *Industrial Marketing Management*, *45*(1), 101–112. https://doi.org/10.1016/j.indmarman.2015.02.009

Vermeulen, J. (2019). IoT Industry Council of South Africa – The details. Retrieved July 2, 2019, from https://mybroadband.co.za/news/internet-of-things/300436-iot-industry-council-of-south-africa-the-details.html

Viswanadham, N. (2018). Performance analysis and design of competitive business models. *International Journal of Production Research*, *56*(1), 983–999.

Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal*, *5*(2), 171–180. https://doi.org/10.1002/smj.4250050207

Wirtz, B. W., Pistoia, A., Ullrich, S., & Vincent, G. (2016). Business Models: Origin, Development and Future Research Perspectives. *Longe Range Planning*, *49*(1), 36–54. https://doi.org/10.1016/j.lrp.2015.04.001

Wouters, M., Anderson, J., & Kirchberger, M. (2018). New-Technology Startups Seeking Pilot Customers: Crafting a Pair of Value Propositions. *California Management Review*, *60*(4), 101–125.

Wouters, M., & Kirchberger, M. A. (2015). Customer value propositions as interorganizational management accounting to support customer collaboration. *Industrial Marketing Management*, *46*(1), 54–67.

Yin, R. (2018). *Case Study Research and Applications: Design and Methods* (6th Ed). Thousand Oaks: SAGE Publications.

Zott, C., & Amit, R. (2008). The fit between product market strategy and business model: implications for firm performance. *Strategic Management Journal*, *29*(1), 1–26.

Zott, C., & Amit, R. (2010). Business Model Design: An Activity System Perspective. *Long Range Planning*, *43*(2), 216–226.

Zott, C., Amit, R., & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management*, *37*(4), 1019–1042.

APPENDIX 1: CONSISTENCY MATRIX

Research Questions	Literature Review	Data Collection Tools	Analysis Technique
1. How do entrepreneurs perceive the process of designing a CVP?	Section 2.3. to 2.4	Interview schedule: questions 1 – 3	Inductive data coding, cross-case synthesis (Saldana, 2013; Yin, 2018)
2. How do entrepreneurs perceive the content and characteristics of an effective CVP?	Section 2.5	Interview schedule: questions 4 – 6	Inductive data coding, cross-case synthesis (Saldana, 2013; Yin, 2018)
3. How do entrepreneurs create alignment and fit between a CVP and its business model?	Section 2.1	Interview schedule: questions 7 - 9	Inductive data coding, cross-case synthesis (Saldana, 2013; Yin, 2018)

APPENDIX 2: ETHICAL CLEARANCE

Gordon Institute of Business Science
University of Pretoria

18 July 2019

Potgieter Dane

Dear Dane

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

APPENDIX 3: CONSENT LETTER

Informed Consent Letter

Hi, my name is Dane Potgieter and I am currently a student at the University of Pretoria's Gordon Institute of Business Science (GIBS) and completing my research in partial fulfilment of an MBA.

I am conducting research on the design of effective customer value propositions in IoT-orientated business models. I am trying to find out more about the process and content of designing effective customer value propositions and creating a fit with the business model. Our interview is expected to last between 45 minutes to one hour, preferably at the premises of the business. This will help us better understand how entrepreneurs in South Africa design effective customer value propositions in a given context. **Your participation is voluntary and you can withdraw at any time without penalty**.

A third party, who will be required to sign a nondisclosed agreement with me, will transcribe the data collected. All data will be reported anonymously, without identifiers, using fictitious names in place of you and your organisation's name. This data will be stored securely, with no identifiers, on a google cloud account for a period of 10 years. In order for me to analyse your responses accurately later, I would need to record our interview, will you allow me to record our conversation?

Consent to Voice Record:

Yes	No

If you have any concerns, please contact my supervisor or me. Our details are provided below.

Researcher:	Dane Potgieter	Supervisor:	André van der Walt
Email:	dane.potgieter@hotmail.com	Email:	vdwalta9@gmail.com
Phone:	081 551 0129	Phone:	082 497 6176

Signature of participant: _____ Date: _____2019

Signature of researcher: _____ Date: _____2019

APPENDIX 4: SEMI-STRUCTURE INTERVIEW GUIDE

The table below indicates the proposed interview questions as they relate to the research questions.

#	Interview Question Guide
Research Question 1	
1	What is your current understanding of a customer value proposition (CVP)? a. How would you describe your CVP?

2	How would you describe the process of designing a CVP?
	   a. Do you have formalised processes for developing a CVP? If not, how have the processes unfolded in developing a CVP?
	   b. What are the key steps in the development process?
	   c. What are the key activities required throughout the development process?
	   d. What resources are required in the development process? E.g. data, knowledge, key staff etc.
	   e. What role do customers and other stakeholders have in the development process?
	   f. What other internal and external factors influence the development process?

3	What are the challenges you have faced in designing and communicating a CVP?
	   a. How have you overcome these challenges?
	   b. What opportunities exist to improve the process of designing a CVP?

Research Question 2	
4	What type (s) of value are you trying to communicate through your value proposition?
5	What are the sources (i.e. activities/resources) that create the type of value your CVP communicates?
6	What are the characteristics that make a CVP effective? a. How do you measure the effectiveness of a CVP?
Research Question 3	
7	How would you describe your current business model? (Note: Present business model canvas as a guide)
8	How would you describe the relationship between a CVP and the Business Model?

9	How do you align your CVP with your business model to communicate and deliver value?
	   a. What message/value is your CVP communicating, and how does your business deliver that message?
	   b. What are the core BM components that need to align with the CVP for consistency?
	   c. How do you know there is a fit between the CVP and BM? What are the characteristics?
	   d. How do you capture value from your CVP?

APPENDIX 5: CODES

Independent Code List

Alternative markets segments

Challenging industry

Challenging market

Company history/constraints

Company vision/mission focused

Competitiveness through technology

Competitor awareness/knowledge

Complexity unawareness

Connect ecosystem partners

Continuous Holistic Feedback Loops

Continuous optimisation

Continuous organisational learning

Create customer growth options

Create growth & competitive advantage

Creating solution evidence

Customer conversion challenges

Customer knowledge/education

Customer relationship dynamics

Customer solution objectives

Customer trends

Customer word-of-mouth marketing

Customer-centricity and Co-creation

Develop & manage supplier partnerships

Develop internal partners

Develop key resources/capabilities

Develop scalable market solutions

Diverse experience and knowledge

Dynamic business model management

Dynamic design process

Economic constraints

Ecosystem constraints

Ecosystem development

Effective problem identification

Effectively communicate value & benefits

Efficient resource use & implementation

Enable management/visibility

End-to-end solution

End-user value creation

Engage & empower key customer staff

Evolution of partnerships

Financial constraints

Focus on differentiation

Focus on key benefits

Focus on quality offerings

Focused problem-solving

Fundamentals for growth

Gaining customer commitment

Holistic requirements gathering

Honest internal feedback

Importance of organisational culture

Importance of Value Proposition

Important of customer trust

Industry norms

Industry positioning

Industry trends

Integrate customer resources

Internal agility

Internal conflict/constraints

Internal customer processes

Internal focus and clarity

Key individual traits

Key solution partners

Lack of stakeholder involvement

Latent value realisation

Leadership constraints

Leverage internal resources

Limited customer resources

Limited resources

Long-term customer focus

Market channel development

Market entry strategy

Market gaps

Multidimensional value creation

Novel solutions

Opportunity recognition

Organisational capabilities

Organising through brand

Partner communication / enablement

Personal history/constraints

Problem-solution fit

Problem-solving constraints

Product functionality

Product-Market fit

Reduce customer exposure & uncertainty

Research and development

Resource solution possibilities

Revenue model dynamics

Sales and marketing constraints

Solution phases & evolution

Strategic partnerships

Strong internal structures

Success feedback metrics_data/efficiency

Success feedback metrics_follow-on projects

Success feedback metrics_save money & time

Time constraints

Understanding markets

Value realisation: Money/Convenience/Time

Code Families

Theme	Categories
CVP Enablers	Enablers: Communicating Value
	Enablers: Partnerships & Ecosystem
	Enablers: Resources & Capabilities
Value Creation Process	Process: Delivery
	Process: Design
Value Dimensions	Content: Economic Value
	Content: Effectiveness Characteristics
	Content: Information Value
	Content: Latent Value
	Content: Tangible Value
Business Model Management	BM Management: Challenges
	BM Management: Competitiveness
	BM Management: Customer Management
	BM Management: Market Alignment & Growth
	BM Management: Organisational Learning