Title: A Case Study of Sustainable Business Model Innovation: Bridging the Ideation-Implementation Gap in the New Zealand Tertiary Education Sector

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A Case Study of Sustainable Business Model Innovation: Bridging the Ideation-Implementation Gap in the New Zealand Tertiary Education Sector

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Abstract

Sustainable Business Model Innovation (SBMI) is a nascent concept with few case studies, a paucity of research applied to some contexts and underexplored advantages and challenges. The purpose of this qualitative case study was to develop theory on how to accelerate SBMI and bridge the ideation-implementation gap by assessing the processes employed within the Tertiary Education Sector (TES) and Tertiary Education Organisations (TEOs) in New Zealand, and by exploring the associated barriers and drivers that enable and inhibit innovating the business model for sustainability. Senior managers and staff involved in implementing sustainability at their respective TEOs were interviewed, and secondary data sources were used. Using thematic and comparative analyses, six themes were identified: (1) existing knowledge and awareness, (2) innovating toward sustainability, (3) organisational structure and leadership, (4) resourcing sustainability, (5) measuring sustainability, and (6) external impacts on sustainability.

The six themes revealed several conditions, considerations, and influencing factors that affect the acceleration of SBMI and bridging the gap between ideation and implementation. These include a broadening and diverse understanding of sustainability, culture and individual values, TEO structure, strategic frameworks, planning and policies, locally driven development meeting regional needs, technological solutions, top-level management support, transparent and simple decision-making processes, investment in skills, sufficient and easily accessible resourcing tools to communicate, monitor and assess progress, legislation, government policies, market conditions, and the Sustainable Development Goals. Future research is required to provide more guidance on how organisations and decision-makers can leverage SBMI in the TES, on how to further conceptualise, design, and implement SBMI, and regarding the inclusion of more stakeholders and technologies.

Keywords: Sustainable Business Model Innovation; Tertiary Education Sector; Tertiary Education Organisations; New Zealand; Dynamic Capabilities.

Dedication

In loving memory of my grandmother Bet, who sparked my inquisitiveness, creativity and thirst for adventure, and who always provided unwavering support. It really is the best cup of tea. I will forever cherish our memories.

My grandfather Dr John, for your leadership and dedication to science, and for teaching me that there is only one way to do things, the right way, and to always persevere.

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Table of Contents

List of Tables

List of Figures

List of Acronyms

AI	Artificial Intelligence
BC	Blockchain
BDA	Big Data Analytics
BM	Business Model
CAG	Controller and Auditor-General
DCs	Dynamic Capabilities
DCT	Dynamic Capabilities Theory
ESG	Environmental, Social, and Governance
IoT	Internet of Things
ITP	Institutes of Technology and Polytechnics
LiFE	Learning in Future Environments Framework
MfE	Ministry for the Environment
MFAT	Ministry of Foreign Affairs
MNE	Multinational Enterprise
MoE	Ministry of Education
NZQA	New Zealand Qualifications Authority
OECD	Organisation for Economic Co-operation and Development
PESTELE	Political, Economic, Social, Technological, Environmental, Legal, and Ethical
QBL	Quadruple Bottom Line
RoVE	Reform of Vocational Education
SBM	Sustainable Business Model
SBMI	Sustainable Business Model Innovation
SDGs	Sustainable Development Goals
SMART	Self-Monitoring, Analysis, and Reporting Technology
TBL	Triple Bottom Line
TEC	Tertiary Education Commission
TEO	Tertiary Education Organisation
TES	Tertiary Education Sector
UN	United Nations

Glossary

Ideation-Implementation Gap	Challenges that hinder organisations' ability to innovate their business model for sustainability purposes. This includes the considerations, conditions and factors identified in this study that impacts the ideation of SBMI and the implementation of SBMI in the Tertiary Education Sector.
Sustainable Business Model Innovation	The value components, configurations, and frameworks identified in the literature, and the activities involved in the analysis, planning, design, development, and management of making transformations toward a sustainable business model.

Chapter 1. Introduction

The purpose of this qualitative case study is to explore the development of the nascent Sustainable Business Model Innovation (SBMI) concept. As illustrated in the literature review, some research has been conducted in some sector-specific businesses and organisational contexts. However, several factors remain underexplored, including the implementation and integration of SBMI, the application of SBMI in other contexts, and related topics that enable and hinder SBMI.

1.1. General Statement

SBMI is a multi-faceted concept and nascent research area that is becoming increasingly popular with researchers and practitioners (Csik et al., 2014; Evans et al., 2018; Gunaratne et al., 2021). Increased academic debate is creating more awareness of sustainably responsible management practices and the competencies and skills required to deliver strategic results that create shared value for a broader range of stakeholders (Bajo & Duran, 2014; Hill & Hult, 2018; Kramer & Porter, 2011; Porter, 2013). However, few in-depth qualitative case studies exist, subsequently impacting the ability of organisations to design, innovate, and assess SBMI, contributing to businesses' inability to move their business modelling toward SBMI.

A perceived role of Tertiary Education Organisations (TEOs) is to be agents of sustainable development and innovation (Cadarso et al., 2021; Ezza et al., 2021; Fitcher & Tiemann, 2018). Nevertheless, TEOs' sustainability developments are lagging behind other industry sectors, and TEOs are struggling to reorient themselves to support society in becoming more sustainable (Cadarso et al., 2021; Huisingh et al., 2013; Ezza et al., 2021). The strategic management and processes involved in conceptualising and implementing sustainability into TEOs' Business Models (BMs) remain underexplored (Abdelkafi et al., 2018; Abdelkafi & Täuscher, 2018; Ezza et al., 2021). The integration of sustainability at TEOs, and across sectors, is predominantly focused on environmental issues and using tools for optimisation. The literature indicates a lack of clear guidance and a comprehensive approach which contributes to business inertia. Clear strategies, well-structured sustainability initiatives, and effective management are needed (Contri et al., 2021).

Sustainable development has been recognised as important to TEOs; however, the literature highlights that it is not holistically embedded into the activities, policies, and strategies of TEOs (Contri et al., 2021; Ezza et al., 2021). Abdelkafi et al. (2018) and Abdelkafi and Täuscher (2018) analysed the strategies employed by TEOs aligned with the BM concept adapted to university contexts. Ezza et al. (2021) applied the sustainable business model (SBM) concept to TEOs. Cadarso et al. (2021) and Fitcher & Tiemann (2018) explored the elements of innovation through entrepreneurship and leadership in TEOs. As highlighted in the literature review, the SBMI concept was not found in the education sector or New Zealand contexts in the databases referenced.

Several identified components, archetypes, configurations, and tools support SBMI. SBMI components support the business in moving towards more comprehensive SBMI metrics by creating sustainable value propositions, sustainable value creation and delivery, and sustainable value capture innovation (Chofreh et al., 2020). More research is needed into the possible sub-components of SBMI and additional value types (Aldowaish et al., 2022; Barth et al., 2020). Archetypes and configurations support businesses toward SBMI (Bocken et al., 2014; Evans et al., 2018). However, the archetypes are harder to generalise in a broader context, and more archetypes are needed in response to changing market conditions, such as increasing environmental, social, and governance (ESG) reporting (Aldowaish et al., 2022; Chofreh et al., 2020). Drivers and barriers across levels of the organisation have been identified as have the core elements and competencies to facilitate the transformation toward sustainability for universities. Nevertheless, more assessment of the barriers and drivers concerning factors like organisational design, the link between conceptualisation and implementation, and performance metrics are needed (Bocken & Geradts, 2020; Geissdoerfer, 2019; McAloone et al., 2019). Research on the approaches, methods, and tools used and how universities implement sustainability strategies (including monitoring and reporting) and engage with sustainable development goals remains underexplored (Cadarso et al., 2021; Ezza et al., 2021; Fitcher & Tiemann, 2018).

Businesses or organisations, particularly those education-focused, struggle to integrate sustainability into their core business practices and actively innovate their BMs to embed sustainability. Extant research has yet fully to explore why. Further research is needed to explore the factors contributing to the ideation-implementation gap, including the drivers and barriers that facilitate SBMI, and to draw comparisons with other contexts.

1.2. Statement of the Problem

There is a paucity of research on implementing SBMI in different contexts. Similarly, a lack of qualitative case study analysis impacts businesses' ability to innovate, design, and assess SBMI. Moreover, the barriers and drivers in relation to the ideation-implementation gap and related failure modes remain underexplored. SBMI is still in its nascency. The concept has been generally examined through systemic literature reviews, applied to some organisational contexts and locations, and has focused on environmental improvements and tools used for optimisation. For example, Gunaratne et al. (2021) umbrella review on SBMI, and Bocken et al. (2014) research which predominantly focused on environmental improvements and was based around optimisation. References to the SBMI concept being applied to New Zealand or the education sector were not found in the literature referenced. This knowledge gap provides scope for further research, including exploring how businesses, particularly TEOs in New Zealand, can address the challenges that contribute to the ideation-implementation gap in order to accelerate SBMI.

Some extant literature offers SBMI components, configurations, frameworks, and contributing factors that enable and hinder SBMI. Recent research has applied strategic management and the BM perspective to TEOs, providing some insight into the development of sustainability and mapping SBMs. Ezza et al. (2021) claim to be the first to adopt the SBM concept contextualised to 61 Italian universities; they identified six SBMs that incorporated the three pillars of sustainability to varying degrees. Their quantitative study drew from secondary data, and they used that data to identify possible SBMs. The processes involved in how universities innovate their BMs remain unclear. This study draws from primary and secondary data to explore the innovation processes, and underlying challenges and advantages in the design and application of SBMI through in-depth qualitative case study analysis.

1.3. Purpose of Study

The purpose of this qualitative case study is to develop a theory on how to accelerate SBMI by exploring the phenomenon in the TES and assessing the effectiveness of processes employed at TEOs in New Zealand and exploring the associated barriers and drivers that enable and inhibit innovating the BM for sustainability. This study includes participants involved in sustainability strategy and related projects at their respective TEO. This research follows the

interpretivism philosophy and employs an inductive approach to case study analysis, using mono-method qualitative data collection from semi-structured interviews, and secondary data collection, including documentation and archival records. Interviewing individuals with experience and knowledge in implementing sustainability provides insight into how sustainability is integrated and implemented into the TEOs' BMs, the processes involved, and what enables and hinders progress towards SBMI.

1.4. Significance of the Research

Measuring business sustainability is increasingly mandated, demanded, and central to business competitiveness and long-term prosperity (Environmental Resources Management, 2020; Porter, 2013). SBMI is increasingly referenced as a critical driver for corporate sustainability and competitive advantage (Bocken & Geradts, 2020). The capability to innovate the BM proactively and successfully for sustainability is key in improving organisations' sustainability performance (Barlow et al., 2017; Bocken & Geradts, 2020; Evans et al., 2018).

Globally, governments have led low carbon initiatives and enacted regulatory changes to create more significant climate change action that is likely to increase sustainability action across sectors (ERM, 2021). For example, in 2020, the New Zealand government enacted a mandatory climate-related financial disclosure regime requiring reporting against External Reporting Board standards (Ministry for the Environment, 2021). Similarly, the government introduced New Zealand's 2050 net-zero target.

Another example is the collective global commitment to achieve the United Nations (UN) Sustainable Development Goals (SDGs) and protect the environment and society. The UN 2030 agenda for sustainable development aims for more inclusive, equitable, and quality education and the promotion of opportunities to foster lifelong learning for all (United Nations, 2015). New Zealand's statutory document, Tertiary Education Strategy, outlines the expectations and objectives of TEOs which include sustainability considerations. TEOs must convey how they intend to achieve these in their investment plans (Ministry of Education, 2020). Furthermore, as outlined in the Paris Climate Agreement adopted in 2015, countries are being called on to have more ambitious and actionable targets to achieve these goals, and businesses, including TEOs, play a critical role as enablers in driving these changes (Education New Zealand, 2021; United Nations Global Compact, 2021). Businesses need a decoupled economy for long-term success (UN Programme, 2019).

Several stakeholder groups could benefit from this study on how to innovate the BM for sustainability and strategic purposes, and better manage the barriers and enablers of SBMI. Using the results of this study could assist business managers and board members in making changes to the organisational culture and design factors that can hinder businesses' ability to transform their business modelling towards SBMI (Bocken et al., 2016; Bocken & Geradts, 2020). Adapting current processes, such as managerial incentives and governance structures, could incentivise and encourage proactive innovation that addresses the four pillars of sustainability throughout the organisation (Cortimiglia et al., 2022). Consequently, this would support employees and organisations in making better decisions towards achieving increased environmental balance and social equity.

A better understanding of the processes involved in SBMI could assist in the formulation of sustainability-focused policies and procedures to meet changing market expectations and increasing mandatory measures. Furthermore, a clearer understanding may support the improvement and implementation of the training of staff and other relevant stakeholders. This may lead to increased support for initiating and implementing sustainability initiatives and encouraging more active collaboration across different stakeholder groups—for example, government and communities. As a result, businesses including TEOs, may improve their sustainability impact rankings and future financing, attract more employees, create opportunities to raise funding for research, develop more partnerships, and increase customer numbers. Having clearer guidance can support businesses and decision-makers to be proactive in the changing needs of society and the environment, and accelerate the innovation process (Chofreh et al., 2020; Fissi et al., 2021; Franco et al., 2022).

Businesses struggling to innovate their BMs for sustainability may benefit the most from this research, as they will have working examples to support them in overcoming the barriers that hinder the innovation process. Including the perspectives of subject matter experts involved in sustainability innovations, who have knowledge and experience of overcoming barriers and successfully implementing SBMs, may provide organisations with potential solutions. For example, effective approaches and tools could encourage more organisations to innovate their BMs for sustainability, thus increasing the benefits to society and the environment, and contributing to the governments' sustainability initiatives.

1.5. Research Question, Aim, and Objectives

A case study supports in-depth inquiry and appropriately addresses the "*How"* research question.

The research question for this study is:

RQ1: How can organisations, specifically TEOs, accelerate SBMI and bridge the gap between ideation and implementation?

The development of the emerging SBMI concept is associated with the initial component of RQ1: *how to accelerate SBMI,* through exploring aspects of the concept in the TES. The second component of the question, *and bridge the gap between ideation and implementation* of SBMI, was explored through reference to TEOs' sustainability strategies and activities, from participant responses and secondary sources.

SBMI is a nascent research area with extant literature limited to some sector-specific industries and contexts. A qualitative case study strategy is used to explore how TEOs innovate their BMs for sustainability, uncover insights on the challenges and advantages of applying the SBMI concept in different organisational contexts, and develop theory to bridge the gap between ideation-implementation.

The aim of this research is to explore the SBMI concept in the TES and as modelled across TEOs in New Zealand. The research will improve the understanding of how businesses can actively integrate sustainability into their core operations and move their business modelling towards SBMI. It will expand on extant research and address research limitations to contribute to further research within the SBMI study area.

To achieve this aim involves the following four objectives:

OBJ1: To explore the challenges and advantages of applying the SBMI concept across the New Zealand TES,

OBJ2: To clarify the issues and reasons contributing to the ideation-implementation gap,

OBJ3: To assess TEOs' SBMI strategy processes and their effectiveness, and

OBJ4: To identify the tools and frameworks used to facilitate SBMI.

1.6. Overview of Research Design

A qualitative study will be undertaken using a case study strategy. Case study research is a robust approach to generate insights from intensive and in-depth inquiry into the SBMI process and draw comparisons within, and between, each TEO (Lewis et al., 2019). The in-depth research will support the aim and objectives of generating a clearer understanding of how sustainability is embedded into BMs in TEOs, exploring the advantages and challenges faced, clarifying issues and reasons, and assessing the SBMI process and its effectiveness.

The purpose of this research is exploratory. The research aim and objectives will be researched within the interpretivist paradigm, a mono-method qualitative methodology will be employed, and an inductive approach to data analysis will be followed. The interpretivism philosophy allows for the researcher to create richer understandings and interpretations of the SBMI process and investigate the organisational realities and contexts, and associated participants' perspectives. A mono-method qualitative methodology will investigate the associated processes and reasons, explore the participants' meanings, and examine these relationships interpreted through case study analysis. As the information needed is extensive, the study draws on multiple data sources including primary data collected from semi-structured interviews and secondary data sources.

Non-probability sampling techniques will be employed to select the sample purposively (Dawson, 2019). The study sample will be drawn from eight New Zealand universities and 16 Te Pūkenga Institutes of Technology and Polytechnics (ITP). The organisations chosen are self-defined and assessed as sustainable based on them publicly purporting to have SBMs. The researcher anticipates a sample of up to 12 participants. Participants selected will be staff involved in sustainability strategy and related projects at their respective TEO. Multiple semi-structured interviews will be conducted to ensure more reliable and comparable qualitative data. These interviews will be continued until the researcher reaches data saturation. Thematic and comparative analysis will be conducted to simultaneously analyse the data as it is collected while referencing additional sources to explain emerging themes (Collis & Hussey, 2014). More details about the specific design of the study are provided in Chapter 4 Research Methodology.

1.7. Definition of Terms

The following are specific, technical, and context-specific standard terms used in this research.

- **Business Model (BM)**: Represents an organisation's value proposition, value creation and delivery, value capture and the interactions between these elements (Bocken et al., 2014; Evans et al., 2018).
- **Sustainable Business Model (SBM)**: The integration of sustainability considerations into the BM to create, deliver, and capture value that increases the beneficial effects on, and decreases the adverse effects on, society and the environment (Cocklin & Stubbs, 2008; Evans et al., 2018). A SBM prioritises multi-stakeholder management to create shared value; non-monetary and monetary value for a broader range of stakeholders, and holds a long-term perspective (Albareda et al., 2018; Bocken et al., 2014; Evans et al., 2018).
- **Business Model Innovation (BMI)**: The conceptualisation and implementation of new business models, including the process of development, diversification, acquisition, and transformation from one model to another. This transformation can impact the individual value or collective components and the interrelations between value proposition, creation, delivery, and capture (Barlow et al., 2017; Evans et al., 2018).
- **Sustainable Business Model Innovation (SBMI)**: The analysis, planning, design, development, and management of making transformations toward a SBM (Barth et al., 2021; Bitzer et al., 2020; Chofreh et al., 2020; Evans et al., 2018). The components, organisational configurations, frameworks and other features of SBMI are discussed in section 3.4.
- **The Ideation-Implementation Gap**: Challenges that hinder organisations' ability to innovate their BM for sustainability purposes. Some challenges identified include several aspects of the overall management of the SBMI process, underlying organisational cultural dimensions, initiation of the ideation stage, follow-up, and implementation of ideas and SBMs, and market conditions (Baldassarre et al., 2017; Evans et al., 2018; Geissdoefer, 2019). Several considerations, conditions and factors are found in this study.

- **Triple Bottom Line (TBL):** Measuring business activities by their contribution to, and impact on, the three pillars of sustainability: profit, planet, and people (Elkington, 2018).
- **Quadruple Bottom Line (QBL):** An extension of the TBL, measuring business activities by their contribution to, and impact on, the four pillars of sustainability: profit, planet, people, and purpose (Hill & Hult, 2018).

1.8. Assumptions, Delimitations, and Limitations

This study assumes that data on the integration and implementation of sustainability, associated challenges, advantages, and reasons can be gleaned from semi-structured interviews and secondary data to develop a theory. Additionally, an assumption was made that the participants who consent to be interviewed possess appropriate sustainability knowledge and experience. Furthermore, it is assumed that the participants will be truthful in their responses. Research on the strategic management of universities and applying the SBM perspective to TEOs is limited. This study assumes that employing a mono-method data collection and incorporating the perspectives offered by those within TEOs in New Zealand would provide more information on the processes and associated drivers and barriers to expand on SBMI literature.

A delimitation of this study is that participants are high-level managers involved in sustainability projects and strategies at their respective TEO. Therefore, this may not be fully representative of individuals involved at different levels and positions in the organisation and external stakeholders. Including a more diversified and larger sample could provide valuable insights into the sustainability strategies, challenges and advantages, and the processes attributed to SBMI. For example, how the TEO collaborates with external stakeholders, such as industry partners.

Another delimitation is that perspectives are limited to individuals in research and sustainability, and from certain disciplines, for example, business and management, that are typically associated with sustainability for strategic purposes. Perceptions and contributions will likely differ between disciplines, for example, between medical and health sciences and business and management. Moreover, the data collected is restricted to TEOs. Sustainable developments, influences, and perspectives likely differ at other levels within the education sector, for example, early childhood and secondary schooling. Conducting a study on each level

within the education sector could provide additional insights into sustainable strategies and processes and unearth factors that influence SBMI.

Approaching the study from the role of an external researcher impacts the researcher's ability to gain access. Gaining physical access to multiple organisations requires ongoing and cognitive access (Lewis et al., 2019). To mitigate this risk, each potential TEO participant will be provided with a succinct, clear, and cohesive information sheet detailing the purpose of this study and the access required. The ethics approval will also be provided to build credibility. Ultimately, cognitive access will be determined by individual participants' willingness to participate in this research. This depends on several conditions, including the researcher's ability to convey research salience and relevance to engage participants' interest (Lewis et al., 2019).

Similarly, the researcher will make the process more personal and build credibility to mitigate internet-mediated limitations. The use of professional, commonly used, and accessible web-enabled software and recording software will be used to conduct interviews. Demonstrating these competencies can positively influence participants' perspectives to view the research project as objective and can increase the validity and reliability of the data collected (Dawson, 2019).

The researcher's negotiated access to data may hinder their ability to include relevant data and sample suitable participants. Therefore, this would impact the validity of the data collected and the researcher's ability to answer the research aim and objectives fully. The inclusion of relevant participants optimises the validity and accuracy of research (Heerkens, 2006).

As a business professional with over 11 years of experience working within the education, technology, and finance sectors, the researcher's professional work experience may lead to researcher bias. Similarly, the literature review provided in Chapter 3 may contribute to further researcher bias. Requesting the participation of subject matter experts in the research may lead to non-response error and bias. Non-respondents could possess valuable insights and information that differ from the participants who responded (Lewis et al., 2019). Moreover, the recording and interpreting of participants' responses may influence the researcher's reporting bias due to subjective views (Lewis et al., 2019). Interpretivism is a subjectivist philosophy biased by the researcher's values and beliefs. Data analysis through this approach needs to be sensitive to the variability and complexity of these biases to be meaningful (Lewis et al., 2019).

A core characteristic of qualitative research is reflexivity. The researcher making comments about how their interpretation of the findings is shaped by their background engenders good qualitative research (Creswell & Creswell, 2020). In this case, bias can be acknowledged, reduced, or controlled (Dawson, 2019).

1.9. Summary

This study seeks to explore the nascent SBMI research area to understand how organisations can accelerate SBMI and bridge the gap between ideation and implementation, using a qualitative case study strategy. Most research on SBMI has been conducted on some sector-specific organisations and locations, and the associated barriers, drivers, and reasons for failure remain underexplored. There is a knowledge gap in exploring how SBMI is applied in New Zealand and the education sector, specifically tertiary education, and how the sector addresses challenges that affect the ideation-implementation gap and impact SBMI. This research may ultimately benefit several stakeholder groups across each sector of society (government, industry, and civil society). The results of this research may serve multiple stakeholders such as governance boards, employees, managers, customers, and society in general. Five more chapters follow that are outlined in the following section.

1.10. Structure of Thesis

The following outlines the content of each chapter of this thesis.

Chapter 2: Theory and Industry Analysis

This chapter reviews relevant theoretical constructs underpinning this study, followed by an analysis of the TES. Several key theories are highlighted and elaborated on, followed by an analysis of the TES in relation to SBMI.

Chapter 3: Literature Review

The purpose of this chapter is to review extant SBMI literature. Contemporary issues, theories and themes form the basis of this literature review. This chapter outlines the antecedents of SBMI, the driving factors for SBMI, the SBMI concept, the adoption of SBMI, and the application of the SBMI concept adapted to the New Zealand context.

Chapter 4: Research Methodology

This chapter outlines the research methodology of this study. Information about the various methods and analytical techniques used is provided. Moreover, the reasons for selecting the specific approaches and the reliability and validity of this study are discussed.

Chapter 5: Findings and Analysis

This chapter details the findings and analysis of this study. Furthermore, the interpretation of the findings and analysis and how these are aligned with the research question is discussed.

Chapter 6: Recommendations and Conclusions

This chapter provides recommendations and conclusions of this study, and details how the research has achieved the research objectives. Moreover, it outlines the implications for theory, research and practice, the limitations of this research and recommendations for future research.

Chapter 2. Theory and Industry Analysis

This study explores the developments of Sustainable Business Model Innovation (SBMI), which is underpinned by the business strategy and innovation management research fields, and how SBMI is integrated into, and modelled across, the Tertiary Education Sector (TES) in New Zealand. Furthermore, the sector is analysed using the PESTELE (Political, Economic, Social, Technology, Environmental, Legal, and Ethical) framework and a Stakeholder Analysis.

2.1. Introduction

SBMI is a multi-faceted concept drawing from multi-disciplinary fields of research (Evans et al., 2018; Gottel et al., 2015). A key theoretical construct that underpins SBMI, and is used for this study, is Dynamic Capabilities Theory (DCT). Dynamic Capabilities (DCs) are crucial in creating, enhancing, and transforming the Business Model (BM), and are integral to SBMI (Franco et al., 2022; Harreld et al., 2007; Teece, 2007, 2018). The PESTELE framework is used to highlight the factors that influence the TES in New Zealand, and Stakeholder Analysis highlights the needs and expectations of key stakeholders and their influence and participation in SBMI (Casprini et al., 2020; Chofreh et al., 2020; International Institute of Business Analysis, 2015).

2.2. Theoretical Constructs of Sustainable Business Model Innovation

Several theoretical constructs underpin the SBMI concept. For example, Stakeholder Theory underpins the concept of sustainable value flows among multiple stakeholders and supports the understanding of the development and adoption of sustainability innovations (Chofreh et al., 2020; Fobbe & Hilletofth, 2021; Kluza et al., 2021; Badir et al., 2017). Similarly, the Resource-Based View Theory (RBVT) is centred on achieving competitive advantages by leveraging and exploiting resources that contribute to an organisation's ability to respond to external stakeholder demands and to achieve results from innovations (Barney, 1991; Teece, 2018). The Stakeholder and RBV theories are widely applied and have contributed to the environmental sustainability research field (Kluza et al., 2021). Another possible theory that remains underexplored is the role of open innovation (Teece, 2020;

Geissdoerfer, 2019). Seemingly, there is no consensus on the most appropriate theories to apply to SBMI. This study draws from DCT to frame the integration of innovating the BM for sustainability aligned to the strategies of Tertiary Education Organisations (TEOs).

DCT is defined as an organisation's ability to "integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Pisano et al., 1997, p. 516). These DCs are fundamental to the Business Model Innovation (BMI) process (Teece, 2018). Strong DCs support and accelerate the creation and implementation of BMs (Teece, 2018). DCT supports the SBMI process and provides a framework that can reveal the factors contributing to the ideation-implementation gap.

2.2.1. Foundations of Dynamic Capabilities Theory

A strategic management framework, DCT, was developed in response to the dot-com silicon boom in the 1990s (Pisano et al., 1997). DCT is referenced as being built from the theoretical foundations of RBVT. RBVT is centred on bringing together an organisation's assets, namely, resources and capabilities that meet four criteria: (a) valuable, (b) rare, (c) imperfectly imitable and (4) non-substitutable (VRIN). Such features increase business growth and foster longer-lasting competitive advantage (Barney, 1991; Teece, 2018). RBVT is relevant to DCT as it supports the creation of strategies for developing new capabilities. For example, learning and acquiring skills are fundamental where the source of profits for an organisation is controlling scarce resources (Pisano et al., 1997). However, in contrast with DCT, RBVT is static; for example, the RBVT focus on the capabilities necessary to maintain VRIN positioning is limited, particularly in response to rapidly changing market conditions and emerging technologies (Teece, 2020). RBV does not address the need for the reorganisation and renewal of resources and instead maintains the perspective of a "one-shot view of competition" (Teece, 2020, p. 13). While the RBV perspective focuses on sustaining a competitive advantage, DCT is centred on competitive survival; how best to adapt, reconfigure, and integrate resources in response to the rapidly changing business market environment (AlQershi et al., 2022).

Winter (2003) references DCs within the overall portfolio of an organisation's capabilities that are found on two levels. The base level includes ordinary and operational capabilities such as routine activities and governance that support organisations to pursue activities efficiently. Above this level are the micro-foundations and high-order DCs. Micro-foundation DCs include recombining and adjusting existing ordinary capabilities, including developing new capabilities. A key micro-foundation of DCs is managerial ability to create and improve BMs (Teece, 2007). Micro-foundation DCs can include new product development, business expansion into new regions and actions that support effective managerial decision-making under uncertainty (Teece, 2018). These DCs are guided by the high-order DCs, for example, (a) sensing future opportunities, creating BMs to (b) seize these opportunities and (c) transforming the configuration of the organisation to realise these opportunities.

Teece (2018) argues that top management should focus on high-order capabilities as these support organisations in solving problems and are relevant to the selection and innovation of BMs to seize opportunities. Seizing depends on managerial competences to devise and refine BMs (Teece, 2007). Designing and implementing BMs is key for dynamic managerial capabilities (Helfat & Martin, 2015). Strong DCs reflect solid skills and knowledge, engender better positioning for organisations compared to competitors, and address unmet customer needs by better sensing and seizing opportunities (Davidsson et al., 2006). Therefore, DCs are critical for the selection and innovation of BMs and hence should be a key focus for senior management (Teece, 2018).

2.2.2. Sustainable Business Model Innovation and Dynamic Capabilities

The SBMI literature highlights that businesses require DCs to innovate their BMs for sustainability (Bocken & Geradts, 2020; Teece, 2018). BMI involves innovating the value creation, delivery, and capture mechanisms and in return generating economic value (Teece, 2010). BMI is key to remaining competitive, as is an organisation’s capability to proactively move into new BMs, which is an essential source of competitive advantage and necessary for SBMI (Amit & Zott, 2012; Geissdoerfer, 2019). DCs are primary antecedents for SBMI (Franco et al., 2022). The processes involved in sensing, seizing, and transforming apply to the innovation processes involved in SBMI. SBMI expands the value mechanisms to include environmental and social value, moving from the neoclassical notion of shareholder

prioritisation to include a broader range of stakeholders and their management (Bocken et al., 2014; Bocken & Geradts, 2020).

DCT enables the development of sustainability-focused innovations, such as green innovation, as it supports the capabilities to build, reconfigure and integrate external and internal competencies (Pisano et al., 1997). The organisational processes emphasised in DCT create value, which is integral to SBMI, which both operate on, and result from, the need to innovate in response to rapidly changing market conditions (Cortimiglia et al., 2022; Eisenhardt and Martin, 2000). Furthermore, the relevance of DCT to SBMI is that the design and operation of BMs depend on the organisations' capabilities. Specifically, high-level DC outputs include the processes of creating, refining, implementing, and transforming BMs (Teece, 2018). The strength of an organisation's DCs impacts the ability to design and make changes to the BM and therefore is integral to BMI (Teece, 2018).

The construct of DCT underpinning SBMI can be illustrated by the three higher-order DCs categories: sensing, seizing, and transforming.

Sensing

Increased awareness of sustainability issues seen as opportunities to increase profits by tackling environmental and social challenges has propelled the need to integrate sustainability aspects into the BMI process (Cocklin & Stubbs, 2008). These opportunities can be found in sensing; the capability to search for and identify new business opportunities (Teece, 2020). In this case, sensing involves organisations building their awareness of emerging sustainability issues and evaluating and understanding these sustainability challenges as business opportunities (McWilliams & Siegel, 2011). For example, sensing for SBMI may involve identifying environmental issues like resource depletion that could threaten an organisation's existing resources and capabilities (Hart & Dowell, 2011).

Sensing also involves planning for and monitoring market changes such as new technology, regulatory changes, and societal pressures (Teece, 2018). In this sense, organisations are increasing their awareness of emerging trends that impact their future viability and assessing tools to convert social and environmental challenges into opportunities to address the unmet needs of multiple stakeholders and in response to a constantly changing environment. For example, increased regulatory reporting, such as the New Zealand government's introduction of mandatory climate-related financial disclosure and digitalisation is providing opportunities and incentives for TEOs to transition toward sustainability and create

and transform BMs (Abdelkafi et al., 2022; Durão et al.; 2022; Ministry for the Environment, 2021). However, organisations often lack the capabilities to assimilate technology capabilities into their BMs at scale (Palmie et al., 2021).

Research highlights several factors that influence an organisation's sensing capability: managerial complexity, knowledge configuration, network relationships, the management team, team learning capability, and tools for sensing (Batocchio et al., 2021, Teece, 2007). Managerial complexity highlights that complex structures impact managerial ability to sense (Batocchio et al., 2021; Franco et al., 2022). The organisation's structure must be built to support the ability to find new opportunities, including the resources and processes needed (Bock et al., 2012). Knowledge configuration emphasises the combinations of knowledge, including technological and marketing (Batocchio et al., 2021; Lüdeke-Freund, 2019). Network relationships highlight the value of diverse networks to improve knowledge configuration, encourage proactive cooperation, and increase opportunities (Batocchio et al., 2021; Fobbe & Hilletofth, 2021). Cross-sectoral collaboration with other organisations, government and civil society are essential to mitigate threats, increase learning, and facilitate SBMI (Baldassare et al., 2019, Bengtsson et al., 2021, Lozano, 2018, Henriques et al., 2020). The senior management team's strategic orientation impacts the BM configuration and determines the direction of managerial focus and efforts (Teece, 2007). SBMI helps senior management to understand their organisation's value propositions better and use this knowledge to explore opportunities (Csik et al., 2014; Vladimirova, 2019). The team-learning capability outlines the ability to experiment and learn. To illustrate, experimentation and consistent learning throughout the SBMI process support the creation of value for multiple stakeholders (Bocken et al., 2018). Tools for sensing opportunities, such as BMI processes tools like Vladimirova's (2019) value proposition builder can improve sustainability knowledge, create opportunities, and enable SBMI (Batocchio et al., 2021).

Seizing

This category determines an organisation's capability to quickly mobilise resources to respond to threats and opportunities (Pisano et al., 1997). For example, mobilising resources to address emerging sustainability opportunities captures value by translating these into SBMI opportunities (Teece, 2018). Seizing also involves designing and implementing BMs, investing in new technologies, and addressing capability gaps (Teece, 2007). Batocchio et al. (2021) research highlights six seizing indicators: technological capabilities, resource mobilisation, BMI portfolio management, creativity, BM protection strategies and tools for BM design.

Technological capabilities include designing and implementing technology solutions (Batocchio et al., 2021; Teece, 2007)**.** Technology can be leveraged to accelerate SBMI as it supports the dissemination of environmental and social value, connecting previously unconnected supply and demand, and achieving operating efficiencies (Abdelkafi et al., 2022; Gregori & Holzman, 2020). However, the development of these capabilities depends on the BM type (Abdelkafi et al., 2022).

Resource mobilisation is crucial as BMs require several resources. SBMI depends on the organisation's ability to leverage resources and capabilities to improve its value proposition for stakeholders (Durão et al., 2022). A sufficient number of quality resources must be available to build and implement the BM (Batocchio et al., 2021). Pressing sustainability challenges require the mobilisation of resources to address threats and seize opportunities, generating economic benefits (Hart & Dowell, 2011). BMI portfolio management outlines the organisation's allocation of time and efforts to pursue BMI (Teece, 2018; Winter, 2003). Creativity is the need for diverse input and the management of multiple-stakeholder perspectives needed to design new BMs, which is impacted by an organisation's leadership style and culture (Gregori & Holzmann, 2020). BM protection strategies involve mitigating the risks involved in protecting new BMs and reducing the impact of regulatory pressures, imitability, and retaliation (Teece, 2018).

Transforming

This category is focused on managing the implementation of BMs as part of the BMI process (Franco et al., 2022; Teece, 2018). Transforming involves a continued renewal of an organisation's capabilities towards becoming a sustainable business and is about implementing new sustainable business model concepts (Teece, 2018). Durão et al. (2022) suggest that successful BM transformation depends on strategically leveraging the organisation's resources and capabilities to reconfigure the organisation and improve the value proposition for its stakeholders. As the DCs, including sensing, seizing, and transforming, are integral to BMI, they are also essential for SBMI (McAloone et al., 2019). Several factors impact the transforming category of DCs: organisational design, culture, ambidexterity, resources, and capability building, change management, and human resources management (Batocchio et al., 2021). Transformation capabilities are critical when changes to a BM significantly impact an organisation's design (Pisano et al., 1997). The organisational design demonstrates the practices of value creation and delivery for new BMs and relates to managerial decision-making concerning BM structure (Batocchio et al., 2021).

Organisational culture is centred on the learning culture as part of an organisation's BM, and the influence of leadership can enable or hinder learning and change management (Cortimiglia et al., 2022; Franco et al., 2022; Lüdeke-Freund, 2019). Transformation capabilities are also influenced by organisational culture elements that impact SBMI (Teece, 2018). For example, conventional strategic corporate social responsibility attitudes can hinder an organisation's ability to transform, with cultural problems including senior management often incentivised to meet short-term economic targets above environmental and social considerations (Aldowaish et al., 2022; Bocken & Geradts, 2020). Businesses must tackle short-termism and create structures that support management adhesion to sustainability projects to create value for a broader range of stakeholders, in turn generating economic prosperity and long-term competitive advantage (Berkley Research Group, 2015; Cortimiglia et al., 2022). Ambidexterity is concerned with the strategic management of multiple BMs (Feiler et al., 2014). Resources and capability building is concerned with an organisation's ability to create new capabilities and resources, such as training people and enabling value creation and delivery (Cortimiglia, 2022, Pisano et al., 1997).

There are interrelationships and tensions among the three components (Teece, 2007). The skills required for top management to sense differ from those needed for seizing and transforming (Teece, 2007, 2018). Therefore, Teece (2007) suggests that each of the three DCs components must be built and used simultaneously to be successful. However, all three are unlikely to be found in individual managers; therefore, a team effort supported by the chief executive must be employed (Teece, 2007).

2.2.3. Management of Dynamic Capabilities

DCs are embedded in managerial decision-making and organisational activities (Bocken & Geradts, 2020; Chofreh et al., 2020; Teece, 2018). DCT is centred on developing strategies that inform top management actions and decision-making in adapting to the rapidly evolving and changing business environment while upholding minimum standards to create and maintain competitive advantage (AlQershi et al., 2022). For example, TEOs that have relied on the traditional on-campus delivery of the teaching process can find it challenging to change related processes at short notice in response to changing market conditions and the emergence of new technologies. For example, some TEOs struggled to adapt to digital teaching

in response to the 2020 pandemic (James, 2020). Managers must adapt and leverage their resources while planning and sensing opportunities and threats for the future.

DCT explains an organisation's behavioural orientation, involving the need to constantly recreate, renew, reconfigure, and integrate its resources and capabilities, including reconstructing its core capabilities in response to changing market conditions to achieve and maintain competitive advantage (Teece, 2020). This is similar to Design Theory within an organisational context that outlines the need for a culture of experimentation and prototyping, which is aligned with growing DCs, including practices and skills that can encourage and enable BMI which is needed for SBMI (Baldassarre et al., 2020; Bocken & Geradts, 2020). Recent BMI literature highlights organisational design's effects on DCs required to innovate the BM (Teece, 2018). The organisational design can help senior management achieve the organisation's goals through processes, incentives, people, structure, and strategy (Mintzberg, 1980). Moreover, organisational design affects the DCs needed for SBMI (Bocken & Geradts, 2020).

While Eisenhardt and Martin (2000) refer to capabilities as managerial rules and general routines, Teece (2012) suggests that creating a BM requires a multi-disciplinary approach that is unlikely to be routinised in DCs. Routine processes like evaluating the progress and results of a BM are inadequate as it does not determine the best choice (Teece, 2018).

2.2.4. Drivers and Challenges of Dynamic Capabilities for Sustainable Business Model Innovation

DCs can be perceived as drivers for sustainability innovation, as they conceptualise how organisations adapt and change in response to the external environment (Eisenhardt & Martin, 2000; Pisano et al., 1997). These drivers for change can include enabling resources to integrate sustainability, developing people capabilities, leadership, and strategy translated into performance metrics, including incentives (Bocken & Geradts, 2020). The relevance of leadership, including the vision, beliefs, and values, is demonstrable in SBMI literature (Bocken & Geradts, 2020; Franco et al., 2022). Similarly, the drivers and barriers of SBMI highlight the levers of DCT (organisational culture and learning, strategy, and structure) are also evident in the barriers to integrating sustainability into the tertiary education context (Benayas et al., 2017).

Like SBMI, DCT is multi-faceted, and the strengths and weaknesses of organisations' DCs diverge. Some organisations may possess stronger DCs and be better at designing and implementing BMs, while others may struggle with weaker DCs in identifying new BMs to exploit opportunities (Teece, 2018). This reinforces the contributing factors that challenge and can hinder the SBMI process; ideas are not followed up, SBMs are not implemented, and the implemented SBMs fail in the market (Evans et al., 2018; Geissdoefer, 2019).

Furthermore, DCT provides insights into several challenges that can inhibit the progress of SBMI. Organisational culture and management mindsets, such as the reluctance to allocate resources, can enable or hinder SBMI (Barlow et al., 2017; Barth et al., 2021; Bocken & Geradts, 2020; Boons & Lüdeke-Freund, 2013; Cocklin & Stubbs, 2008). Additional barriers could include cognitive effects that can influence the ability to engage in sustainability innovation and other limitations such as resource availability and competencies (Laukkanen & Patala, 2014; Lüdeke-Freund, 2019). Similarly, BMI success and failure can be attributed to DCT, as stronger DCs enable the organisation to adapt and redesign its BM more easily (Pisano et al., 1997; Teece, 2018; Winter, 2003). DCs determine how an organisation's ordinary capabilities are developed, shaped, and combined, including the competences to sense threats and opportunities, seize these opportunities and capture value, and to transform tangible and non-tangible assets to remain competitive (Harreld et al., 2007; Teece, 2007). Similarly, ordinary capabilities depend on an organisation's structure, resources, and strategy (Eisenhardt & Martin, 2000).

It is suggested that businesses will likely focus more on enhancing ordinary capabilities rather than developing DCs, as research illustrates the difficulty in balancing the strengthening of ordinary capabilities and developing DCs (Batocchio et al., 2021). Research suggests that corporations will invest in developing DCs only when the financial benefits from reconfiguring and changing exceed those of related maintenance costs (Franco et al., 2022; Winter, 2003). This can hinder SBMI as it is difficult to measure the economic gain from sustainability. Similarly, managing multiple stakeholders is time-consuming and more complex sustainability challenges require more resources (Barlow et al., 2017; Barth et al., 2021; Evans et al., 2018). Moreover, the pervasive traditional strategic attitudes of corporate social responsibility and cultural issues of top management incentivised to meet short-term profit targets over the environment are a hindrance (Aldowaish et al., 2022; Bocken & Geradts, 2020). Organisations are also vulnerable to innovations being easily imitated by competitors, which increases the

likelihood of resistance to developing the DCs needed for SBMI (Franco et al., 2022; Hansen et al., 2016).

SBMI antecedents indicate organisational design as a critical managerial change lever, which shapes the DCs of sensing, seizing, and transforming needed to execute the SBMI process. Organisational design is crucial as it influences the organisational structure, culture and overall environment that can either enable or hinder the development of DCs, further impacting the success of SBMI (Albareda et al., 2018; Bocken & Geradts, 2020; Franco et al., 2022). This organisational design shapes the values and beliefs that materialise into operational practices and strategic orientation (Bocken & Geradts, 2020). However, research highlights that DCT does not explain how to create the DCs needed in practice and its link with organisational design factors that inform managerial decision-making and action, which influences the capability of effectively creating SBMI (Franco et al., 2022).

The aim of this first section was to analyse and deduce the relevance of the components of DCT to SBMI for the purposes of this study by outlining the foundations, framework, management, and associated drivers and barriers. In the next section, the focus will be on the analysis of the New Zealand TES to identify influencing factors that shape TEOs' strategy and decision-making, including stakeholders' interests, concerns, power, and influence in relation to SBMI.

2.3. Industry Analysis of the Tertiary Education Sector

This section provides an analysis of the New Zealand TES in relation to SBMI by applying two strategic management tools: PESTELE and Stakeholder Analysis.

2.3.1. PESTELE Analysis

The following is an analysis of the key factors influencing the TES in New Zealand that can impact strategy and influence decision-making.

Political

The government significantly influences the TES and TEOs' sustainability priorities and investment. The Tertiary Education Strategy outlines the New Zealand government's priorities and long-term strategic direction for the TES (Ministry of Education, 2020). This document supports the investment in economic, environmental, and social goals and is intended

to support the aspirations and needs of all learners (MoE, 2020). TEOs must demonstrate their contributions to achieving the TES priorities in their investment plans. This incentivises TEOs to invest in sustainability and mitigate future financial compliance costs.

The National Careers System Strategy led by the Tertiary Education Commission (TEC) is aligned with the TES and outlines the vision, strategic priorities, and actions required to support a broader range of stakeholders, to improve the transition into employment for students and to contribute further to the New Zealand economy (TEC, 2022). Emphasis on student employability influences curricula and supports the integration of sustainability while also facilitating competition among TEOs.

Similarly, New Zealand's commitment to advancing the 2030 Agenda for Sustainable Development and achieving the Sustainable Development Goals (SDGs) influences TEOs strategies. Increasing use of metrics and reporting, such as Treasury's Living Standards Framework and Stats NZ's Indicators Aotearoa New Zealand, help monitor the progress of economic, environmental, social and cultural wellbeing of New Zealand and influence policymaking and resource management. Furthermore, the voluntary national review reporting on SDGs also influences the TES (Ministry of Foreign Affairs, 2019) and with the Reform of Vocational Education (TEC, 2022) the sector is undergoing significant changes which influences sustainability innovation in the TES. TEOs are exposed to the risk of not meeting public expectations of their environmental and social responsibilities which can damage their reputation and their international sustainability rankings. This also encourages TEOs to seek sustainability opportunities and ensure a good level of sustainable development.

Economic

The 2020 global pandemic continues to impact the economic ability of TEOs to invest in sustainability. The value of international education to New Zealand was NZ$5.1 billion in 2018 and was the fourth-largest export earner (Beehive, 2018). However, government restrictions in response to the 2020 pandemic, including the border closure, led to an absence of international students. Consequently, this resulted in the loss of international student revenue and budget deficits, the effects of which may last for several years. However, this period has seen an increase in domestic enrolments, which could be attributed to the government's fees-free programmes and policy changes easing university entrance requirements. Despite this, the TES has had to implement additional cost-saving initiatives, including lowering staffing levels which impact teaching and research programmes and the ability to invest in sustainability.

These factors influence the ability of TEOs to invest in sustainability. However, these factors also encourage TEOs to look at sustainability alternatives to build resilience into their BMs in response to the changing business environment.

Rising inflation is also impacting the sector. Although the government committed NZ$350 million in the 2022 budget over the following four years for operating investment, and NZ$40 million over two years for tertiary education to cover increasing costs, infrastructure upgrades, programme enhancements and enrolment pressures, this may not compensate for the rising inflation rates (MoE, 2022; Stats NZ, 2022). Inflation is also increasing living costs, further impeding TEO's prospective student numbers and current students' ability to continue their studies in response to the economic environment. Moreover, the government mandates tuition fee levels. For example, universities are subject to domestic student fee caps through the Annual Maximum Fee Movement, which was set at 1.1% in 2021 (Universities New Zealand, n.d.). Consequently, the income for TEOs is constrained to levels lower than inflation.

Social

There is an increased expectation from stakeholders for TEOs to demonstrate their social and environmental responsibility. This risks future viability as students are willing to boycott TEOs with poor sustainability credentials (Education New Zealand, 2021). This also provides an incentive to share sustainable development progress publicly. TEOs risk being exposed for not being socially or environmentally responsible, which may act as an incentive to address sustainability challenges actively. Increasing pressure from more sustainably cognizant stakeholders may incentivise TEOs to explore more opportunities for SBMI (Jovanovic et al., 2021; Palmie et al., 2021).

Demographic trends impact student composition and influence the higher education sector planning. In response to government policy to improve open access to higher learning, the composition of the student body has dramatically changed over the past twenty years and continues to change (Atkins et al., 2006; Organisation for Economic Co-operation and Development, 2021). According to the TEC (2022), the tertiary system inadequately supports Pacific, Māori, disabled, and low-income learners who face barriers that hinder participation which can impact the qualification completion rates. To illustrate, the Learner Success Framework emphasises the need for learning environments to be culturally conscious, and for TEOs to design policies and practices that draw from indigenous and diverse learner success practices (TEC, 2022). Similarly, female learners still outnumber males, however, females

represent lower numbers in Science, Technology, Engineering, and Mathematics (STEM) related fields, and females continue to be underpaid compared to their male peers (OECD, 2021). Addressing these equity issues and related social factors is emphasised in the TES objectives. These objectives include improving the wellbeing of learners, providing safe and inclusive environments, considering learner needs, incorporating Te Reo Māori and Tikanga Māori, and increasing collaboration efforts with a broader range of stakeholders (MoE, 2020). This is driving change across the TES and requires significant coordination across areas, which will take time to fully implement (TEC, 2022).

A focus on the needs of the workplace and supporting learners to move into the workforce, is influencing TEOs' approaches to teaching. This is further emphasised in the TES priority of reducing barriers and improving the quality of teaching to support learners to increase their skills needed for work (MoE, 2020). Moreover, the New Zealand Productivity Commission report (2017) emphasises the need for a student-centred approach to enable more flexibility and innovation in the TES to keep pace with the rapidly developing modern world. These social factors provide opportunities to invest in sustainability initiatives and mitigate financial implications from lower student numbers and funding.

Technological

TEOs must harness the benefits of technology to meet the varied needs of tertiary students and the changing workforce. The digital environment provides alternative ways of teaching and valuable insights. For example, data analytics can be gathered from Massive Open Online Courses that can reveal insights to support student progress and behaviours, to develop teaching materials, and to improve teaching practice through personalised support (Guiney & Shrivastava, 2014). Similarly, new technology skills are needed to address the changing workforce and increased demand for technology skills. Embedding technology can lead to environmental and social improvements as it facilitates the ability of TEOs to do more with less and improve service process innovation, create new partnerships, and increase efficiencies through the reconfiguration of value networks (Cheng et al., 2019; Cortimiglia et al., 2022; Mostaghel et al., 2022).

Initial investment costs in technologies can impact technology uptake. However, these technologies are progressively becoming more affordable. For example, lower data storage prices have democratised access to services, and improved computer power is helping organisations to better address social issues and environmental challenges (Brynjolfsson &

Petropoulos, 2022; George & Schillebeeckx, 2022). Similarly, implementing technology and using new technology requires certain capabilities and training. New technologies can support the dissemination of social and environmental values, such as achieving the most efficient ways of operating (Abdelkafi et al., 2022; Gregori & Holzman, 2020). Digital innovation can improve connectivity and accessibility, and technologies such as blockchain can provide smarter market information to drive better and more sustainable decision-making (Ciaburri et al., 2020; Jovanovic et al., 2021). New technologies support the rapid growth of innovating the BM for sustainability purposes and provide TEOs with opportunities to achieve sustainable development however, there is the risk that these technologies will be implemented incorrectly (Cheng et al., 2019; Gao & Li, 2020).

Environmental

TEOs' activities impact the environment, for example, by producing pollution and waste, and consuming natural resources. However, these risks provide opportunities for TEOs to promote the protection of the environment, such as, creating value from waste through effective waste management processes and by implementing circular principles. Climate change is a key issue TEOs face, with risks from increased energy consumption and carbon emissions. However, these provide an opportunity for TEOs to combat climate change through more energy-efficient buildings, implementing pledges such as zero carbon emissions, and facilitating the knowledge and skills needed to empower students and staff to make changes.

Legal

The potential introduction of new legislation is a risk for TEOs. Although there are no mandatory sustainability-related disclosures for TEOs in New Zealand, global trends highlight an increase in regulatory and mandatory sustainability reporting. New Zealand currently has a mandatory climate-related financial disclosure regime for some organisations (MfE, 2021) and has provided a voluntary national review (MFAT, 2019) demonstrating the progress made on the SDGs. These trends incentivise TEOs to manage their sustainability responsibilities and mitigate future risks, such as costs associated with non-compliance. Similarly, associated compliance costs and staff training may reduce funding for sustainable development.

Ethical

Perceived moral values and principles govern and influence TEOs' decision-making and actions. There is a moral imperative for TEOs to play a pivotal role in the transformation towards sustainability (Baker-Shelley et al., 2017; Fitcher & Tiemann, 2018). The

sustainability impact rankings and voluntary reporting demonstrate that New Zealand TEOs are embracing sustainability. TEOs' corporate and social actions expose them to the risk of public backlash which acts as an incentive to incorporate robust policies and procedures to embed sustainability into decision-making and actions.

2.3.2. Stakeholder Analysis

SBMI requires internal and external stakeholder involvement (Chofreh et al., 2020). The planning for, and decisions made about, sustainability projects must take into consideration how they impact on these stakeholders (IIBA, 2015). Stakeholder analysis assesses these relationships and prioritises them based on their level of influence and power. Maintaining relationships is key to project success (Friedman & Miles, 2006).

Stakeholder Map

Tools used for BM design, BMI design, and SBMI help organisations better understand the activities involved at each stage of the innovation process and can be enhanced with visual collaborative business modelling informed by stakeholders' goals (Barth et al., 2021; Franco et al., 2022). Similarly, using stakeholder mapping increases the understanding of stakeholder needs and interests and supports the translation of these into more meaningful sustainable value propositions and opportunities (Baldassarre et al., 2017).

Several stakeholders influence the actions and decisions made by TEOs. Research by Guenther and Hueske (2021) illustrates that multiple stakeholders, such as students, suppliers, and senior management, play key roles in integrating sustainability into TEOs' operations (Benayas et al., 2017). Casasanto (2020) research identified youth as often overlooked stakeholders, and more research is needed to understand their role in system change. It is important to include students as organisational members and to identify their abilities and attitudes when integrating sustainability into the operations of TEOs.

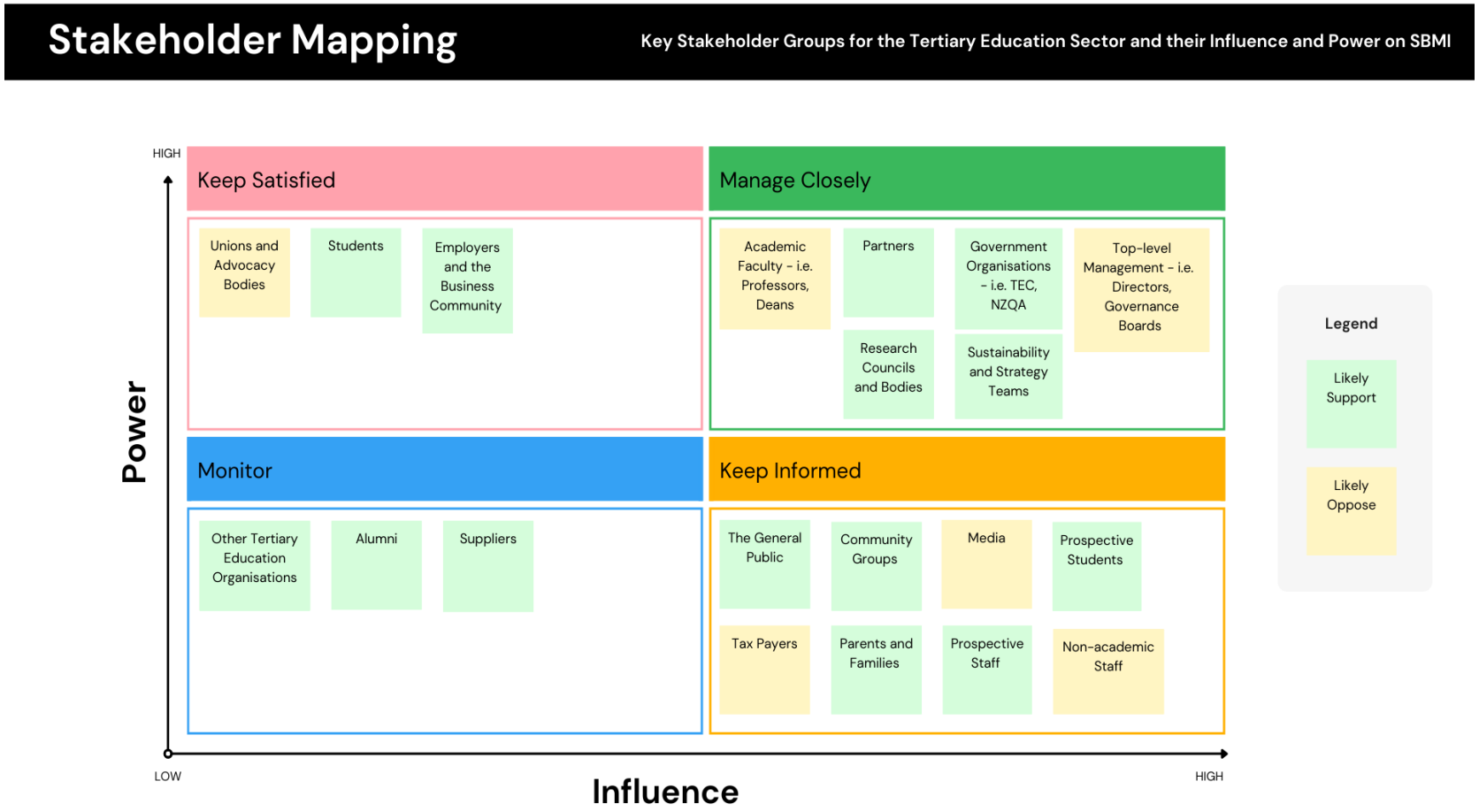
Stakeholder mapping, including the use of a stakeholder power interest grid, outlines the influence and power each stakeholder group has and can determine the level of engagement, collaboration, and means of communicating with each other (IIBA, 2015). Some stakeholders have more power and influence on TEOs than others, therefore stakeholders must be prioritised based on their relative importance which can vary over time (Chapleo & Sims, 2010). Chapleo and Sims' (2010) research highlighted three key factors to evaluate the importance and relevance of stakeholder groups at a strategic level based on their impact on: (a) student

recruitment and satisfaction, (b) policies and strategies, and (c) income. Stakeholder groups such as, academic staff and media influence TEO student satisfaction and recruitment. Some stakeholders that influence policies and strategies can have a high impact and therefore require close management due to their high power and influence, for example, government organisations like the New Zealand Qualifications Authority (NZQA) and the Ministry of Education (MoE). Similarly, stakeholders, including students and government organisations like the TEC, directly impact the TEOs' funding and are, therefore, core to strategy development.

The Stakeholder Matrix (Figure 2.1) is colour coordinated; green highlights a stakeholder most likely supportive of sustainability initiatives, and yellow demonstrates a stakeholder that may oppose such initiatives and require more convincing to ensure they support the initiative. For example, top-level management and senior management have high influence and power as they control the resources required to implement sustainability into procedures and policies effectively. They could potentially hinder SBMI as they may allocate resources based on different priorities. In contrast, the government would likely be supportive as its policies encourage investment in sustainability. However, stakeholders' positions on the matrix often change in response to environmental, organisational, and other project requirement changes, therefore, stakeholder analysis is an iterative process and must be frequently reviewed (IIBA, 2015).

Figure 2.1

Stakeholder Matrix Detailing the Salience of Stakeholders in the Tertiary Education Sector



Source: Kininmonth (2022)

Stakeholder Management

The Clarkson Centre for Business Ethics (1999) emphasises seven key principles for effective stakeholder management that managers should employ and can be illustrated in TEOs' management of their stakeholders.

Principle One outlines that the concerns and interests of stakeholders must be acknowledged and monitored by managers and should be included in management decision-making and operations (IIBA, 2015). Government stakeholders, such as the TEC, set the TES priorities and objectives, influencing the TEOs' sustainability strategies. The implementation of these is directed from the governance boards and includes senior management stakeholders and consultation with academic faculty, research councils and bodies, and partners who have high influence and power, and with other stakeholder groups such as students.

Principle Two emphasises that managers should practise open communication and listening skills. Proactive and effective communication and consultation with all stakeholders will help to mitigate potential issues (Chofreh et al., 2020). Contact between TEOs and their stakeholders is wide-ranging and varies in quantity and quality (Harry et al., 2006). For instance, some TEOs' stakeholders, such as government organisations, would be reached through formal means such as official proceedings, and taxpayers and the general public through advertising and press releases.

Principle Three highlights that adopting behaviours and processes sensitive to stakeholder concerns is important. TEOs' new sustainability processes and associated behaviours must be aligned and consistent with the priorities and objectives of strategic goals and stakeholder interests, for example, the net-zero carbon emissions targets and achieving the SDGs goals. This will ensure broader stakeholder satisfaction from groups such as government organisations, community groups, employers, and the business community.

Principle Four outlines that managers must recognise the interdependence among stakeholders and ensure a fair distribution of corporate activity. Equally addressing the needs of all stakeholders ensures a fair distribution of burdens and benefits and is an essential component of SBMI and value creation (Bocken et al., 2014; Cocklin & Stubbs, 2008; Fobbe & Hilletofth, 2021). To illustrate, Bentley et al. (2014) report highlights that change can have a detrimental impact on the wellbeing of TEO employees who have a relatively higher increase in workload and key concerns such as stress was a significant contributor to reduced productivity.

Principle Five emphasises that the cooperation of all stakeholders is essential in mitigating risks associated with corporate activities. Harry et al. (2006) research on TEO engagement with key stakeholder groups highlighted that effective communication requires reciprocal relationships and a shared vision. Fostering relationships with other organisations can reduce the possibility of harm, and collegiality was reported as providing stakeholders in the TES with a stronger sense of satisfaction (Bentley et al., 2014).

Principle Six highlights that managers should avoid all activities that harm human rights. This can result in the abandonment of projects or restructuring, for example, senior management stakeholders must ensure equitable policies and procedures to ensure non-discriminatory practices that can directly impact stakeholders such as students and community groups. Finally, managers must acknowledge potential conflicts including their own role as a stakeholder and their moral and legal responsibilities, and address these using appropriate means, such as, through appropriate reporting systems (Fobbe & Hilletofth, 2021; The Clarkson Centre, 1999). NZQA has a quality assurance system for TEOs including self-assessment to maintain and improve the outcomes for their stakeholders, such as employers and students.

Effective risk management mitigates damage and possible penalties resulting from unethical actions which can weaken stakeholder relationships (Friedman & Miles, 2006). NZQA collects information on TEOs, including the concerns of stakeholders such as government organisations, staff, and students. Additionally, TEOs are subject to legal action for any breaches of the Education and Training Act 2020. Stakeholders who feel ignored can often lead to protest (IIBA, 2015). Furthermore, poor relationships with stakeholders, like employees, can impact productivity, loyalty, creativity, and retention (Friedman & Miles, 2006). Developing strong stakeholder networks fosters the exchange of information on topics such as market conditions, technological advances, and consumer trends that can help TEOs' DCs to sense, seize, and transform in response to changes in the market (Friedman & Miles, 2006; Teece, 2018).

2.4. Summary

DCT underpins SBMI and provides a framework that can reveal the contributing factors to the ideation-implementation gap. The design and implementation of SBMs require the DCs of sensing, seizing, and transforming. This necessitates the development and effective

management of an organisation's resources. The strength of DCs determines how well an organisation can align its BM with customer needs (Teece, 2018). The PESTELE analysis outlines several factors influencing the TES and the opportunities and threats to sustainable development. Stakeholder analysis emphasises that TEOs must identify, interact with, and appropriately manage, multiple stakeholders and their interests and concerns to ensure the effective and efficient management of innovating the BM for sustainability.

Analysing the components of DCT as they apply to SBMI, and in relation to the purposes of this study, allowed the researcher to understand better the essential capabilities needed to innovate the BM for sustainability purposes. The DCT framework provided the researcher with a deeper understanding of the key capabilities needed to successfully innovate the BM for sustainability that can drive SBMI and the challenges that can hinder SBMI. Moreover, DCT reveals key insights on the managerial and leadership implications, which provides more context for the researcher to understand the role of top-level management and senior management who control the resources required for, and direct the development of, sustainability in TEOs.

The PESTELE analysis provides insight into the contemporary issues the TES faces. Identifying several factors that influence TEOs' strategies and decision-making allows the researcher to have a greater awareness of the drivers and barriers that can support and hinder SBMI. Furthermore, the analysis of interests, concerns, influence, and power of several key stakeholders within the TES supports the purpose of this study, which is to accelerate SBMI by assessing the effectiveness of processes and strategies employed at TEOs and exploring the associated advantages and challenges to develop a theory to bridge the ideation-implementation gap. An overview of the developments of SBMI within extant literature is provided in Chapter 3.

Chapter 3. Literature Review

The purpose of this chapter is to provide a review of extant SBMI literature. This chapter details the antecedents of SBMI, the driving factors for SBMI, the SBMI concept, the adoption of SBMI, and the application of the SBMI concept adapted to the New Zealand context.

3.1. Introduction

A nascent research area, Sustainable Business Model Innovation (SBMI), provides scope for businesses to achieve competitive advantages by actively embedding sustainability into their practices for economic, environmental, and social value (Evans et al., 2018). However, sustainable development lags behind the scale required to tackle a rapidly developing global environment (Albareda et al., 2018; Baldassarre et al., 2020; Franco et al., 2022). The literature reflects that the successful adoption of SBMI has been scarce, and organisations require a more comprehensive approach and clearer guidance on the processes involved in moving their business modelling towards SBMI. Furthermore, SBMI and the theoretical rationalisations of its components require further elaboration (Bocken & Geradts, 2020; Chofreh et al., 2020; McAloone et al., 2019). Extant research highlights a knowledge gap regarding the application of SBMI in New Zealand. Moreover, new technologies provide an opportunity to accelerate the adoption of SBMI.

The aim of this literature review is to explore developments within SBMI, its challenges and advantages, and the role of tools like technology in facilitating SBMI. The following sections outline the history of SBMI, the drivers and components of SBMI, the adoption of SBMI, and its relevance in New Zealand. Recent studies attributed to SBMI have elaborated on key themes that support SBMI at the macro, meso and micro levels. These include Environmental, Social and Governance (ESG) drivers, the impact of digitisation, digitalisation, and emerging technologies, organisational design, and culture, creating value for all stakeholders, frameworks, sector-specific innovation, collaborative ecosystems, and embedding technological innovation.

This literature review was partly completed as part of MGT803, the research methodology component of the Master of Applied Management qualification, of which this thesis is the final element. Amendments have been made from the original literature review

completed as part of MGT803. As MGT803 is the research methodology paper for this Master of Applied management qualification thesis component, self-citation was not required.

3.1.1. Search Strategy

A structured literature review was employed by outlining the research parameters, search terms and phrases, and criteria to select studies. Databases utilised included: ProQuest, Science Direct, nzresearch.org.nz, EBSCOhost and Google Scholar. Peer-reviewed academic journal articles, trade journals, dissertations, theses, books, conference papers, and reports primarily published within the last ten years were used. Information beyond ten years was referenced to broaden the understanding of related topics. New Zealand government databases and reports were also used to support the understanding of current sustainable developments and business innovation.

Keywords included, but were not limited to:
Sustainable Business Model Innovation, Business Model Innovation, Business Model, Sustainability, Technology, Innovation, Strategy, New Zealand.

3.2. The Antecedents of Sustainable Business Model Innovation

A multi-faceted concept, SBMI is derived from the theoretical foundations of Business Models (BMs), Sustainable Business Models (SBMs), and Business Model Innovation (BMI). The literature highlights that these evolving concepts are still in a consolidation stage (Chofreh et al., 2020; Gottel et al., 2015).

3.2.1. Business Model

Some research suggests that the origins of BMs can be found during the 1990s dot-com boom when it was widely publicised in the press and gained greater significance with the creation of e-commerce (Csik et al., 2014; Evans et al., 2018). In contrast, research by Gottel et al. (2015) highlighted that the BM concept has been documented across several fields of study and has been present in scientific discussion since the 1950s. Conversely, industry provides examples of BMs that have existed since the 1800s that are still in use today (Csik et al., 2014). For example, the razor and blade model is synonymous with Gillette. The primary

product (razor) is cheap, and the consumables (blades) are sold at high margins. However, the literature is fragmented, with diverse interpretations and applications of the BM concept.

Evans et al. (2018) grouped these diverse understandings into three BM definition groups (a) model, (b) abstract concept, and (c) reduced scope. They suggest that a BM is defined as a model of an organisational system, representative of a characteristic of an organisational unit, or is reduced to represent individual elements consistent with the varied definitions available and to achieve specific means. Despite the attempts to develop a clear BM concept, the fragmented extant literature reinforces a lack of consensus on the BM's components and a comprehensive definition.

A commonality across definitions is the role of value (see Chapter 2. Theory and Industry Analysis). More recent research defines a BM as representing an organisation's value proposition, value creation and delivery, value capture, and the interactions between these elements (Bocken et al., 2014; Evans et al., 2018). Further developments have included the role of value intention, networks, and partnerships that greatly influence an organisation's value creation (Barth et al., 2017; Bitzer et al., 2021; Evans et al., 2018). However, most BMs focus on the value proposition and revenue logic.

3.2.2. Sustainable Business Model

BM developments have included the integration of sustainability considerations. The SBM was conceptualised to facilitate businesses contributing to a more sustainable economic system, support the integration of sustainability concerns, and achieve their sustainability goals (Cocklin & Stubbs, 2008; Evans et al., 2018). SBMs create, deliver, and capture value that aims to increase the positive effects, and/or decrease the adverse effects, on society and the environment (Cocklin & Stubbs, 2008; Gunaratne et al., 2021).

The literature highlights various SBM manifestations. For example, the circular BM and the sharing economy BM. In contrast to the BM, the SBM holds a long-term perspective, incorporates the proactive management of multiple stakeholders, and pursues the creation of non-monetary and monetary value for a broader range of stakeholders (Evans et al., 2018). Nevertheless, the way BMs support sustainable innovations to create economic, environmental, and social value for all stakeholders remains underexplored (Boons & Lüdeke-Freund, 2013;

Dembek & Lüdeke-Freund, 2017; Hansen et al., 2012). The increased importance of being sustainability-driven across all levels of society, and in response to changing market conditions, could suggest that the SBM may supersede the BM concept in the future.

3.2.3. Business Model Innovation

The capability to successfully move into new BMs is an essential source of competitive advantage (Geissdoerfer, 2019). The literature has identified various archetypes and strategies for innovating BMs. Bocken et al. (2014) defined eight archetypes that outline the mechanisms and solutions to create BMs for sustainability. For example, create value from waste, and maximise material and energy efficiency. However, these archetypes are primarily rooted in the perspective of optimisation. Furthermore, there are limited examples of how each component helps integrate sustainability innovation.

In contrast, Barth et al. (2021) mapped the eight archetypes proposed by Bocken et al. (2014) into the agricultural sector. Like Gao and Li (2020), Barth et al. expanded the influencing factors the business environment and geographical locations have on the organisation's capability to innovate. Nevertheless, in response to global market changes and the prevalence of ESG measures, more archetypes are needed that integrate ESG principles (Aldowaish et al., 2022). Conversely, the literature suggests that many BMIs fail, and the reasons why remain underexplored (Evans et al., 2018; Geissdoerfer, 2019; Lüdeke-Freund, 2019).

What constitutes BMI remains a hotly contested topic. Like the BM, BMI is an evolving concept in academia and industry. Businesses' interpretation of innovation is diverse and predominantly attributed to developing novel products or improving operational processes (Howard & Pells, 2019). Furthermore, companies focus on development over research as benefits are achieved sooner and with less risk. Despite sustainable developments, it could be argued that the business' bottom-line drives the underlying motivation of the BM and BMI.

3.2.4. Business Modelling and Innovation Before Sustainable Business Model Innovation

BMs were used as a strategic asset for business performance and competitive advantage. In response to new innovative revenue mechanisms during the 1990s dot-com

boom, businesses often used BMs to communicate their ideas to secure investment (Csik et al., 2014; Amit et al., 2011). In response to increased organisational complexity, subsequent developments resulted in BMs being used to analyse, plan, and communicate the configuration and implementation of organisational units (Doleski, 2015). Similarly, in response to transforming into a more sustainable economic system, sustainable considerations were embedded into the BM. Various strategies and tools were used to structure and navigate the BMI process (Bocken et al., 2014; Evans et al., 2018).

3.3. The Driving Factors for Sustainable Business Model Innovation

Several drivers have contributed to the creation and adoption of SBMI. These include ESG drivers, digitisation, digitalisation and emerging technologies, creating value for all stakeholders, and organisational design and cultural factors.

3.3.1. Environmental, Social, and Governance Drivers

Increasing pressure from consumers, investors, and the government to disclose ESG performance influences organisations' attitudes toward sustainability (Gunaratne et al., 2021; Kluza et al., 2021). ESG certification systems can facilitate an organisation's approach to innovating sustainably (Aldowaish et al., 2022; Gunaratne et al., 2021; Kluza et al., 2021). However, extant research highlights knowledge gaps regarding the relationship between ESG and the BM, and the implementation process of ESG factors into core operations (Aldowaish et al., 2022). Similarly, social issues are often a neglected component of sustainability, as research is predominantly focused on environmental innovations (Aspelund & Hermundsdottir, 2020). More research into how organisations can leverage resources to capture and create sustainability value is needed (Abdelkafi et al., 2022; Bocken et al., 2014; Franco et al., 2022).

Aspelund and Hermundsdottir (2020) found that the pressure to integrate ESG factors into the BM leads to a reluctance to adopt ESG. In contrast, more stringent sustainability regulations drive innovation activities and improve an organisation's competitiveness and performance (Aldowaish et al., 2022; Kluza et al., 2021). However, ESG regulations diverge globally. For example, according to a European Corporate Governance Institution study, only 25 countries have introduced mandatory ESG disclosures from predominantly large and listed companies and state-owned enterprises (Krueger et al., 2021). In contrast, Aldowaish et al.

(2022) argue that financial markets greatly influence organisations; the prioritisation of financial factors above all else persists. Consequently, organisations exert little effort to integrate sustainability into their BM and core operations. Greenwashing, social-washing, and blue-washing are increasing in the pursuit of embedding sustainability into the BM to secure finance and satisfy stakeholders (Sailer et al., 2022; Caporale et al., 2021). More research is needed to understand how to facilitate integrating ESG principles into the BM (Kluza et al., 2021).

3.3.2. Digitisation, Digitalisation, and Emerging Technologies

Digitalisation is being harnessed to accelerate the transition toward sustainability and transform and create new BMs (Abdelkafi et al., 2022; Durão et al., 2022). Employing technologies that help organisations identify sustainable business practices is common, as is using technologies to innovate and transform BMs (Durão et al., 2022; Jovanovic et al., 2021). In response to the 2020 pandemic, there has been a concentrated proliferation in the use of digitisation adopted by organisations to meet the changing needs of stakeholders (Mostaghel et al., 2022). However, research suggests that organisations struggle and lack the capabilities to assimilate related technology capabilities into their BM and core operations at scale (Palmie et al., 2021). Furthermore, it is unclear how to measure the contribution of technologies, and more research is needed to understand how digitisation and digitalisation enable SBMI (Ciaburri et al., 2020).

Digitisation is fueling the development of new technology tools to enable organisations to embed sustainability into their BMs (George & Schillebeeckx, 2022). Nevertheless, the successful transformation of a BM must be facilitated by choosing and employing the right digital technologies based on the specific needs of an organisation (Bikfalvi et al., 2020; Gregori & Holzmann, 2020). Similarly, research highlights that particular BMs do not fully exploit the potential of emerging technologies (Abdelkafi et al., 2022; Mostaghel et al., 2022). For example, Abdelkafi et al. (2022) argue that big data analytics (BDA), the use of advanced analytical techniques to analyse large volumes of data sets to capture, manage, and process data with low latency, seems optional in circular BMs, such as product-as-a-service BM. In contrast, BDA is necessary for BMs that optimise a linear supply chain. For instance, value is generated from the production of goods and services and follows a linear process from the suppliers to the manufacturers and onto the distributors and consumers (Jensen, 2022; Kelly & Marchese,

2015). However, their research does not consider the barriers to integrating BDA technologies and solutions. In contrast, Multinational Enterprises (MNEs) deal with multiple global and conflicting stakeholder expectations making it more challenging to choose the right technologies (Barth et al., 2021; Bitzer et al., 2020, Gao & Li., 2020).

Similarly, digitisation and digitalisation have transformed how organisations create, capture, and deliver value for stakeholders, and have brought new capabilities to industries (Durão et al., 2022; George & Schillebeeckx, 2022). For example, the combination of machine learning algorithm developments, lower data storage prices that have democratised access to services, and improved computer power is helping organisations innovate and better address environmental and social issues (Brynjolfsson & Petropoulos, 2022; George & Schillebeeckx, 2022). For example, digital and emerging technologies in the health sector have improved predictive and diagnostic issues (European Commission, 2019).

In comparison, Durão et al. (2022) claim that successful BM transformation depends on the organisation's ability to strategically leverage its resources and capabilities to improve the organisation and its value proposition for its stakeholders. For example, Palmie et al. (2021) findings identified that three core AI capabilities are required for organisations to innovate their BMs successfully and scale AI: data pipeline, algorithm development, and AI democratisation. To scale the necessary capabilities, organisations need to innovate their BMs through agile customer co-creation, data-driven delivery operations, and scalable ecosystem integration (Abdelkafi et al., 2022; Bocken et al., 2016; Evans et al., 2018). However, when to develop technological capabilities depends on the type of BM (Abdelkafi et al., 2022). In contrast, although digital technologies have the potential to enable SBMI, the development of emerging technologies is still in its infancy. Furthermore, there is limited research on the potential of novel and rapidly developing digital technologies to facilitate SBMI, providing scope for further exploration (Ciaburri et al., 2020).

Advancing technologies, such as AI, deliver value creation by providing more accurate information on customer behaviour, creating better and quicker decision-making. Similarly, virtual reality enhances the customer experience, the use of blockchain (BC) technology captures value, and BDA is changing revenue models in the retail industry (Abdelkafi et al., 2022; Brynjolfsson & Petropoulos, 2022; Ciaburri et al., 2020; Mostaghel et al., 2022). Conversely, emerging technologies, such as AI, cannot produce immediate significant changes as more time and investment is required for organisations to develop and implement these technologies (Brynjolfsson & Petropoulos, 2022). Additionally, extant literature is fragmented

and lacks a comprehensive understanding of how digitisation enables SBMI (Cheng et al., 2019; Gao & Li, 2020; Gregori & Holzmann, 2020; Palmie et al., 2021). In contrast, Ciaburri et al. (2020) maintain that BC can be a source of innovation and facilitate an organisation's ability to transform its business modelling toward SBMI. They argue that BC is an effective tool when transparency, accountability, and verifiability are key value drivers. Moreover, BC's strongest feature is data security. Nevertheless, changing data into BC is complicated, requires significant processing, storage capacity, and time (latency), and is also vulnerable to cyberattacks (DalleMule & Davenport., 2017; Mostaghel et al., 2022).

As environmental issues such as climate change require concerted global efforts, the incentive for organisations to innovate their BMs for sustainability is hampered by political willingness and ability to impose these regulations (Cortimiglia et al., 2022; Porter, 2013). For example, measuring the contribution of technologies is difficult as gross domestic production excludes the often free goods and services provided by AI and other technologies, which increase productivity, create jobs, and boost economic growth (Brynjolfsson & Petropoulos, 2022). Better measurement frameworks could assist policymakers, academia, and industry in effectively managing and mitigating risks (Aspelund & Hermundsdottir, 2020; Cortimiglia et al., 2022; McAloone et al., 2019). Nevertheless, digital, and emerging technologies have the potential to increase transparency (Ciaburri et al., 2020).

Government efforts to address Internet of Things (IoT) security governance are globally divided, making compliance confusing and costly for organisations (World Economic Forum, 2020, 2021). In contrast, digital technologies can increase security, transparency, and accountability to ensure organisations act responsibly and improve sustainable practices (Ciaburri et al., 2020; George & Schillebeeckx, 2022). For example, China's regulatory clampdown on its big technology companies includes increased protection of data, restrictions on the use of algorithms, anti-trust provisions, and regulations (Creemers et al., 2021; Wenyan, 2019). More research is needed to understand the applications of digital technologies, technological capabilities, investment costs and benefits and how to mitigate the growing challenges of privacy and security issues (Ciaburri et al., 2020; Gregori & Holzmann., 2020; Mostaghel et al., 2022).

3.3.3. Creating Value for All Stakeholders

SBMI requires engagement with external stakeholders to develop multi-stakeholder value propositions and ways to capture value, making external stakeholder input invaluable to the business modelling process and functioning (Albareda et al., 2021; Bitzer et al., 2021). However, stakeholder engagement requires considerable effort during the SBMI process, yet the literature reflects limited research into this component (Evans et al., 2018). While several tools exist to support businesses in developing conventional value propositions, tools integrating sustainability considerations into business practices are limited (Baldassarre et al., 2017; Franco et al., 2022).

The literature indicates that the value innovation process is in constant flux requiring an iterative approach to create additional forms of value (Baldassarre et al., 2017; Bocken et al., 2018; Franco et al., 2022). For example, incorporating design thinking into the process creates added forms of value, including previously overlooked stakeholders in the value proposition. Similarly, Bocken et al. (2018) highlight the importance of experimenting and consistently learning through BMI for sustainability to create value for multiple stakeholders. Like Bocken et al. (2016), Baldassarre et al. (2017) suggest involving potential stakeholders in the iterative design process for user-driven innovation that results in realised sustainable value propositions and a "superior problem-solution fit" (Baldassarre et al., 2017, p. 175). These authors propose a framework to map stakeholder needs and interests to better understand and combine them into more meaningful value propositions. However, the search for sustainability is a continuous process, and developing sustainable value propositions involves a lengthy process that entails numerous product-market iterations (Evans et al., 2018; Franco et al., 2022). In contrast, the iterative process of the value proposition allows for the inclusion of a broader range of stakeholders that improves support, acceptance, and commitment to SBMI (Bitzer et al., 2021; Bocken et al., 2016).

Vladimirova's (2019) value proposition builder, facilitated by workshops, provides enhanced insights about businesses' stakeholders, and supports the ability to communicate targeted value propositions. Vladimirova suggests it can be used in collaboration with other frameworks. However, exploring alternative means of conducting innovation workshops is necessary as it may be more useful using a digital tool (Cheng et al., 2019; Gregori & Holzmann, 2020). Moreover, Evans et al. (2018) argue that the ideas facilitated in these types of workshops are not followed up, which is a key failure for SBMI. For example, several

challenges that inhibit organisations from innovating toward an SBM include the difficulty in co-creating and balancing economic, environmental, and social benefits, the organisational mindset, reluctance to allocate resources, and the time taken to engage with stakeholders (Barlow et al., 2017; Barth et al., 2021; Boons & Lüdeke-Freund, 2013; Cocklin & Stubbs, 2008; Evans et al., 2018).

The need for alignment of multiple stakeholders with business illuminates why SBMI is difficult, in contrast to the traditional approach to BMI (Bocken et al., 2019, 2020; Baldassarre et al., 2017; Bitzer et al., 2020, 2021; Evans et al., 2018). As Barlow et al., (2007, p. 605) note, "A main source of complexity in BMI is given by the uncertainty of impacts and behaviours of network members regarding the three sustainability dimensions". Similarly, Bocken et al. (2020) highlight the multi-stakeholder and alignment complexity, which emerges through varying understandings of value, diverging interests, division of risks and responsibilities, and existing processes and activities which limit stakeholders' willingness to cooperate. Comparably, Bitzer et al. (2020) claim that the multi-stakeholder engagement process requires mutual boundary changes to enhance businesses' understanding of the value and to capture value. In contrast, Bocken et al. (2016) argue that design thinking elements help firms overcome conflicting stakeholder interests and stimulate the ideation process. Similarly, Cortimiglia et al. (2022) claim that interconnected variables and behaviour patterns lead to successful innovations. For example, organisations operating in markets subject to environmental regulations and pressure from consumers and suppliers are encouraged to develop innovative capabilities.

Secondary to the SBMI value process is the follow-up to systematic and well-established management practices and tools that provide the business with stability and continuity (Evans et al., 2018). Likewise, these tools can be enhanced with visual collaborative business modelling informed by stakeholders' goals (Barth et al., 2021). However, despite the literature on the value innovation process, research suggests no comprehensive description of the SBMI process exists (Franco et al., 2022; Geissdoerfer, 2019).

3.3.4. Organisational Design and Cultural Factors

The increase in global issues that impact business practices should necessitate SBMI. However, organisations often lack the Dynamic Capabilities (DCs) to proactively manage and respond to these changing environmental and social needs (Chofreh et al., 2020; Geissdoerfer,

2019; Franco et al., 2022). These interlinked capabilities have been identified at various levels within organisations and are influenced by the elements of organisational culture (Cortimiglia et al., 2022; Bocken & Geradts, 2020; Gregori & Holzmann, 2020). Business capability to successfully shift towards SBMI offers a competitive advantage and leverage to increase sustainable business practices and performance (Aspelund et al., 2020, Evans et al., 2018). Nevertheless, ineffective organisational design and capabilities will not provide the foundation required to facilitate innovation and sustainability in business modelling (Bocken & Geradts, 2020; Chofreh et al., 2020; McAloone et al., 2019).

To enable more sustainability in business practices, the business organisational design must be conducive to DCs to effectuate SBMI (Bocken & Geradts, 2020; Franco et al., 2022). These capabilities to transform the current BM are shaped by certain institutional, strategic, and operational factors that hamper or enable the transformation (Bocken & Geradts, 2020). Building up these SBMI capabilities is elaborated further in a process framework that highlights the organisational setup of the process and success factors (Geissdoerfer, 2019). However, this framework is based on a skewed number of sector-specific organisations with broader applicability to different contexts not yet empirically validated. Moreover, Gregori and Holzmann (2020) argue that these capabilities are influenced by the elements of organisational culture, whereby the fundamental beliefs and values determine the direction a business considers valuable to pursue and dictates whether opportunities for sustainable business practices are considered. For example, traditional strategic attitudes toward corporate social responsibility persist that can hinder businesses' ability to transform, with cultural problems of executives incentivised to meet profit targets over society or the environment (Aldowaish et al., 2022; Bocken & Geradts, 2020). As an example, a corporation's chief executive's performance package is typically linked to short-term quarterly profits.

Cortimiglia et al. (2022) argue that more research into managerial incentives and governance structures is necessary to ensure management adhesion to sustainability projects. Moreover, certification systems like ESG and government incentives facilitate an organisation's approach to innovating sustainably (Aldowaish et al., 2022; Gunaratne et al., 2021; Kluza et al., 2021).

The literature highlights how several determinants, such as age, size, and objective business functions, directly impact sustainable-oriented transformations. It is suggested that large-cap corporations are hindered by institutional inertia and an unclear commitment to sustainable development (Loorbach & Wijsman, 2013). Similarly, MNEs are experiencing

operational challenges in managing increased geopolitical, market, and organisational tensions (George & Schillebeeckx, 2022). Incumbent businesses typically are only reactive to new entrants that change the market with sustainability technologies or products and services (Hansen et al., 2012). This incumbent inertia from large-cap firms makes them less likely to invest in SBMI (Albareda et al., 2018). In contrast to Vladimirova (2019), this would hinder businesses' capability to identify sustainable value propositions.

Research suggests SBMI should be more prevalent. Nevertheless, more research is needed to provide clearer guidance on how businesses and decision-makers can create an environment that fosters capabilities to be proactive to the changing needs of the environment and society (Chofreh et al., 2020; Franco et al., 2022). SBMI literature recognises that businesses require DCs to create SBMI. However, the influence of organisational design in fostering DCs for this purpose has not been adequately addressed (Bocken & Geradts, 2020). Additionally, the generic perspective of DCs does not detail how to create these capabilities in practice. The literature emphasises knowledge gaps between DCs, design, and implementation (Abdelkafi et al., 2022; McAloone et al., 2019). Franco et al. (2022) argue that to create SBMI capabilities more effectively, a definition of what DCs look like and how they are linked to the organisation's design is needed to inform managerial action better.

3.4. The Sustainable Business Model Innovation Concept

Three SBMI components and four organisational configurations to deliver SBMI have been identified. Several frameworks outline the features of SBMI, and working examples highlight the benefits. Conversely, there is a lack of clarity and a comprehensive description of SBMI (Franco et al., 2021; Geissdoerfer, 2019). Furthermore, the rationalisations of the components of SBMI require further elaboration (Bocken & Geradts, 2020; Chofreh et al., 2020; McAloone et al., 2019).

3.4.1. Features of Sustainable Business Model Innovation

Chofreh et al. (2020) propose three SBMI components comprising (a) Sustainable Value Proposition Innovation (SVPI), (b) Sustainable Value Creation and Delivery Innovation (SVC&DI), and (c) Sustainable Value Capture Innovation (SVCI). SVPI is focused on creating opportunities and building long-term relationships with customers. These include market or

product and service innovations. For example, market innovation includes market diversification (Hestad et al., 2021). SVC&DI is focused on an organisation's key activities, including managing value chain networks, resources, channels, and customer relationships (Chofreh et al., 2020; Gunaratne et al., 2021). SVCI is focused on capturing environmental, social, and economic value achieved through an organisation's ability to design new sustainable cost structures and revenue models. However, their research did not elaborate on the interdependent nature of SBMI components or metrics for SBMI. In contrast, Barth et al. (2021) research highlights complimentary value aspects like value intention that focuses on the mindset of the business managers, including their motivations and attitudes towards innovation. There is an opportunity to explore and identify more value aspects and sub-components of the evolving SBMI concept.

Evans et al. (2018) outline four organisational configurations to deliver SBMI: (a) start-ups, the creation of a new organisation based on SBMI, (b) acquisitions, organisations can identify, acquire, and integrate an existing SBM, (c) transformation, organisations can transform from one BM to another in line with sustainability principles, and (d) diversification, diversify the current BM with the development of a new SBM. However, research suggests there is a high failure rate. Geissdoerfer (2019) research on the design-implementation gap in SBMI highlighted three key contributing factors: (a) ideas are not followed up, (b) SBM concepts are not implemented, and (c) implemented BMs fail in the market. Similarly, research highlights several challenges that could inhibit SBMI. For example, business capability, organisational culture, and management mindsets, such as the reluctance to allocate resources, can enable or hinder SBMI (Barlow et al., 2017; Barth et al., 2021; Bocken & Geradts, 2020; Boons & Lüdeke-Freund, 2013; Cocklin & Stubbs, 2008). Nevertheless, in the literature referenced, there is limited research on the root causes of failure and more working examples are needed to explore the underlying failure modes.

3.4.2. Frameworks Toward Sustainable Business Model Innovation

A commonly cited framework in SBMI literature is the eight SBM archetypes of Bocken et al. (2014). These archetypes are based on the triple bottom line principle and developed according to the type of innovation the BM is based on; either organisational, social, or technological. For example, the create value from waste archetypes such as the circular economy or circular BM, and the adopt a stewardship role archetype such as ethical fair trade.

However, it provides a limited number of examples of how these components help integrate sustainability innovation into business practices and lacks a detailed framework for incorporating sustainable value innovation. Furthermore, these archetypes predominantly emphasise environmental innovations. In contrast, Albareda et al. (2018) adapted the eight SBM archetypes into nine archetypes. Nonetheless, these archetypes are difficult to generalise in a broader context. Additionally, more archetypes are needed in response to changing market conditions, increasing use of technology and ESG reporting (Aldowaish et al., 2022).

The literature suggests that many SBMI approaches are founded on established BM theory, with some research suggesting that SBMI is a subcategory of BMI (Dembek & Lüdeke-Freund, 2017). Conversely, SBMI literature does not leverage more recent BMI advancements. For example, more recent research has contributed new processes and design tools to better understand the activities at each phase of BMI (Franco et al., 2022). Research suggests that various BMI approaches are suitable for sustainable strategies like the circular model (Gunaratne et al., 2021; McAloone et al., 2019). However, research suggests that the circular model and sustainability principles have predominantly been addressed as separate knowledge areas. For example, Bocken et al. (2017) highlight that the circular model is depicted as achieving sustainability but with little focus on the social and economic dimensions. Furthermore, not all systems incorporating circular principles are inherently more sustainable (Bocken et al., 2016). An example of this is that efficiency improvements can make jobs obsolete; similarly, socially orientated BMs can have unintended environmentally detrimental impacts (Hestad et al., 2021). Similarly, BMs alone may be insufficient to innovate for sustainability. Although BMs are sources of value creation and competitive success, extant research questions whether it is an all-in-one solution for sustainability success (Lüdeke-Freund, 2019).

Conversely, a comprehensive SBM framework that balances economic benefits with solving and mitigating environmental and social issues does not exist to support practitioners and academia in understanding how to conceptualise, design and implement SBMs (Aldowaish et al., 2022; McAloone et al., 2021). In contrast, McAloone et al. (2019) analysed conceptual models, existing methods, and tools. They applied a three-stage (sensing, seizing, transforming) DCs based view to better understand the approaches in practice and research. However, many approaches they have included in their analysis are still being refined and validated.

Similarly, Kluza et al. (2022) and Gunaratne et al. (2021) have catalogued several approaches that are indicative of SBMI. For example, Gunaratne et al. (2021) identified seven existing manifestations of SBMI: base of the pyramid, circular, lean and green, product service system, sharing, social and integrative. The pyramid or base BM focuses on catering to the needs of vulnerable community members by developing innovations that alleviate poverty while also being profitable (Prahalad, 2011). The lean and green BM focuses on the lean philosophy of maximising customer value by minimising waste (Balocco et al., 2019). Conversely, Franco et al. (2022) research highlights a gap in the integrative perspective of SBMI that balances all three aspects of sustainability, how to implement it, and with what tools. The literature highlights the current difficulty in quantifying the tangible and intangible benefits of corporate sustainability and responsibility that provides scope for further theoretical and empirical research that can address these issues (Barth et al., 2021; Chofreh et al., 2020; Geissdoerfer, 2019; Gregori & Holzman, 2020).

Bocken et al. (2016) claim that few processes have been developed to support businesses embedding sustainability into their BMs. For example, work on the circular BM is still emerging, and insights are drawn from the few existing similar approaches like the Lean Start-up. Elkington (2018), who coined the Triple Bottom Line (TBL), a sustainability framework, claims it has reached a saturation point. A bewildering number of methods exist to measure businesses' TBL that subsequently has been used as an excuse for business inertia. For example, Social Return on Investment (SROI), Blended and Shared Value, the ESG framework, and the Environmental Profit and Loss approach (Elkington, 2018). More recent research suggests a better examination of the antecedents and evolving processes of SBMI is needed. Further extending extant research encourages researchers to analyse the evolution of the BM over time by examining the process and focusing on the how, what, and who questions (Amit & Zott, 2012; Barth et al., 2021).

SBMI is predominantly characterised based on archetypes and patterns that are hard to generalise in a broader context (Chofreh et al., 2020). Furthermore, a principal limitation to the categorisation of SBM archetypes is the development of radical new approaches and the advent of SMART (Self-Monitoring, Analysis, and Reporting Technology) technologies not included in their analysis (Bocken et al., 2014; Ciaburri et al., 2020). "Advances in information and communication technologies, as well as Industry 4.0 technologies, appear to play a significant role in Sustainable Business Model Innovation" (Gunaratne et al., 2021, p. 8). Industry 4.0 technologies enhance current technologies with autonomous and smart systems driven by data

and machine learning, like the Internet of Things (IoT), which impact the way organisations create value (Deloitte, 2017). For example, in the manufacturing sector, technologies can increase energy efficiency and sustainability through optimisation, as highlighted in a case study of a MNE in the plastics sector that reduced power consumption by 40%, saving over $200,000 per annum (Sirimanne, 2022).

Furthermore, the literature highlights overlapping related concepts, research areas, and siloed approaches to investigating SBMI perpetuating confusion. The literature is fragmented with inconsistencies and conceptual ambiguity due to multi-disciplinary contributions from various research fields, making the concepts subjective (Abdelkafi et al., 2022; McAloone et al., 2019; Kluza et al., 2021; Lüdeke-Freund, 2019). Extant research suggests that the BM and BMI concepts and related bodies of knowledge are still in a consolidation stage (Evans et al., 2017). Similarly, the heterogeneous research content creates difficulty for practitioners to identify which approach to follow and where to start (Dembek & Lüdeke-Freund, 2017; Abdelkafi et al., 2022). More research into SBMI is needed to expand current findings and compare these with working examples.

3.4.3. Benefits of Sustainable Business Model Innovation

SBMI is often referred to as a strategic tool that produces substantial environmental and societal value achieved through businesses' creation of value propositions (Bocken et al., 2016, 2017; Vladimirova, 2020). This process includes making strategic choices to maximise financial viability, social benefits, and environmental regeneration beyond the traditional 'profit-focused' BMs and entails the development of new sustainable value propositions (Bitzer et al., 2020; Kluza et al., 2021).

SBMI frameworks guide businesses through the innovation process by mapping key activities and potential challenges that can help companies achieve their sustainability aspirations and lead to more sustainable solutions for all stakeholders. For example, the Sharing Economy BM demonstrates that through SBMI businesses can enhance competitiveness and profitability and simultaneously improve societal good. An example is the Sheke Network platform that matches architectural firms with projects, thereby increasing employment. The platform also leads to environmental improvements as it supports the ability to do more with less, which allows for better service process innovation, new partnerships, and value network reconfigurations to improve efficiencies. Like Gregori and Holzmann (2020), it utilises

technology to innovate the BM for sustainability to improve efficiencies and create environmental and social value. However, digital solutions require responsible use and are not a panacea for sustainable development.

SBMI supports entrepreneurs and business managers to understand their company's current value propositions better and use this to explore possible opportunities (Csik et al., 2014; Vladimirova, 2019). In contrast, organisational design and capabilities are needed to facilitate SBMI (Bocken & Geradts, 2020). The underlying values and beliefs of the corporate culture dictate what a business will consider worthwhile to pursue. Nevertheless, SBMI supports businesses in identifying entrepreneurial opportunities to implement more sustainable solutions into their BMs (Bocken & Geradts, 2020). These entrepreneurial opportunities can provide a competitive advantage for industrialists through economic, environmental, and social attributes of sustainable value. Integrating sustainability into business practices and adopting an SBM can enable companies to adapt better to complex environments and achieve sustainable competitive advantages (Bitzer et al., 2020).

3.5. The Adoption of Sustainable Business Model Innovation

A purpose-driven organisation is influential in enacting the change needed to employ sustainability (Bocken & Geradts, 2020). However, little is known about the successful adoption of SBMs, and several challenges exist hindering an organisation's SBMI capability (Barlow et al., 2017; Bocken et al., 2014; Evans et al., 2018; Albareda et al., 2018). The following section outlines three key themes found in SBMI literature; the results of adopting SBMI vary between sectors, collaborative ecosystems can support and hinder SBMI, and the outcomes of embedding technological innovation.

3.5.1. Different Sectors, Varying Results

Gao and Li's (2020) framework links SBMI with the business environment. Their research suggests that business sustainability achievements depend on innovating its SBM to adapt to the business environment. For example, Mobike in the United Kingdom relies on the stable UK market and legal environment compared with Mobike China which is subject to rapidly changing political and legal factors. Similarly, business capability to adopt SBMI is influenced by national geographical differences. Barth et al. (2021) identified northern Sweden

as having higher organisational innovation than eastern and southern Sweden. Their research suggests that innovation needs are stronger depending on environmental, economic, and organisational challenges. For example, in response to the harsher climate, sparser population, and longer distances, North Sweden agri-entrepreneurs seemingly prioritised the repurpose for society/environment SBM archetype (Bocken et al., 2014). However, their research used SBM archetypes that emphasise environmental innovations. Similarly, Kluza et al. (2019) study identified geographical differences and crucial correlations between innovation and ESG factors. For example, they found that European companies innovating their BMs for sustainability are influenced by Europe's social model of the state and economy. However, their research focuses on the European context. More research is needed in other contexts to identify how different business environments and locations, and ESG factors impact SBMI and to assess to what extent non-financial factors affect SBMI.

In contrast, collaborative cross-sector SBMI research highlights the inherent complexities of bringing together stakeholders with likely differing interests and practices (Henriques et al., 2020). Similarly, operating within different boundaries or nations can also hinder business capability. For instance, multi-stakeholder engagement often involves struggles due to conflicting goals and differing value frames, norms, expectations, and cultures (Bitzer et al., 2020). Moreover, research suggests the development of BMs for MNEs is influenced by diverse cultures, policies and management practices, and the often conflicting needs of diverse stakeholders (Albareda et al., 2018; Escobar & Vredenburg, 2011). Challenges exist in managing the SBMI process across sectors. For example, management of the initiation of the ideation stage, and the follow-up and implementation of ideas. These challenges are influenced by divergent organisational cultures and market conditions (Baldassarre et al., 2017; Evans et al., 2018).

Activities in one country can have implications for stakeholders in other countries (Bajo & Duran, 2014; Bocken & Geradts, 2020). Integrating sustainable business practices into everyday activities and international supply chains and subsidiaries is a significant challenge (Albareda et al., 2018; Abdelkafi et al., 2022; Hayward & Lacy, 2011). In contrast, businesses can identify the interconnected barriers and drivers of SBMI, which assists in the identification of opportunities to integrate more sustainability into their business activities (Evans et al., 2018). Furthermore, these barriers can be overcome through cross-sectoral collaborative ecosystems (Bengtsson et al., 2021; Bocken et al., 2021; Henriques et al., 2020). For example, these ecosystems can bridge the gap between organisations and consumers to better manage

waste by collaboratively adopting appropriate ideas and technologies (Abdelkafi et al., 2022). Conversely, other research suggests that the effectiveness of collaborative innovation is inconclusive (Baumgartner et al., 2017; Chi et al., 2018; Mostaghel et al., 2022).

3.5.2. Implementing Collaborative Ecosystems

Organisations are transitioning from a firm-centric to network-centric operational logic that involves reimagining their BM to facilitate the decoupling of resource consumption and value creation (Bocken et al., 2016; McAloone et al., 2019**).** For instance, organisations will not be competing individually; instead, they will be part of a larger ecosystem by partnering with their competitors and implementing a coopetition strategy into their BMs (Bengtsson et al., 2021; Franco et al., 2022). Moreover, open innovation can assist in overcoming barriers to implementing sustainable innovations (Bocken et al., 2021; Henriques et al., 2020). For example, an increasingly uncertain global environment is forcing many organisations to implement alternative supply chains to reduce dependence on certain geographies (George & Schillebeeckx, 2022). Partnerships and cross-sectoral collaboration among organisations, civil society, and government are essential to facilitate SBMI, mitigate risks, increase learning, and address the systemic nature of sustainability (Baldassare et al., 2019, Bengtsson et al., 2021, Lozano, 2018, Henriques et al., 2020). For instance, research suggests that a MNE is more likely to be a stronger partner to its suppliers due to a greater alignment with its subsidiaries, reducing the risk of any objections to decisions made by the headquarters (Bajo & Duran, 2014; George & Schillebeeckx, 2022). However, extant research lacks clarity on how to create effective partnerships, and the effectiveness of collaborative innovation for sustainable innovation is debatable (Baumgartner et al., 2017; Chi et al., 2018; Mostaghel et al., 2022).

The literature suggests that preparation for collaboration is key to developing successful collaborative conditions and partnerships. Bengtsson et al. (2021) research highlights that certain collaborative conditions, including value creation types and socio-material conditions, can encourage sustainable development. They claim that two perspectives of institutional logic and power assist in identifying partners' interests towards BMI for sustainability and how they plan to pursue and achieve these interests. For example, organisations with strong interdependencies avoid conflicts and instead employ manipulation and other means of power to work in their favour. Other organisations with strong interdependencies but considerably conflicted interests use their power to manipulate the direction of compromises and,

consequently, how sustainability value creation is traded in the BM (Bengtsson et al., 2021). The capability to use manipulation or technology-based tools is needed to maintain effective collaboration and mitigate possible tensions; otherwise, organisations may face adverse compromises (Bitzer et al., 2021; Bengtsson et al., 2022; McAloone et al., 2019).

In contrast, collaboration can worsen the social and environmental dimensions of SBMI. For example, certain sector-specific organisations more skilled in manipulation and collaboration can hinder social and environmental development as these organisations will likely prioritise economic value creation and capture (Aspelund & Hermundsdottir, 2020). In contrast, research suggests that integrating open innovation and sustainability has contributed significantly to achieving business and sustainability goals (Kluza et al., 2021). Cortimiglia et al. (2022) research highlights several factors that drive the business success of green innovation, including the importance of governance practices that positively mediate engagement and collaboration with stakeholders. However, these moderating and mediating factors that impact the relationship between sustainability innovation and competitiveness are context dependent. In contrast, market, industrial, and firm-level factors can identify effective and ineffective strategies (Aspelund & Hermundsdottir, 2020).

Lüdeke-Freund (2019) identified two major perspectives: agency, someone who makes decisions and acts, and systems, whereby the BM is embedded within socio-technical contexts and is influenced by stakeholder interests that determine how and if BMs are innovated for sustainability. Similarly, integrating the innovation and sustainability concepts aims to develop products, services, and processes to implement innovation and transform organisations' business modelling toward SBMI (Kluza et al., 2021). However, the literature highlights that environmental issues and societal challenges are commonly addressed separately, and sustainability research is often more focused on the environment (McAloone et al., 2019). Longitudinal research results on adopting SBMI at leading corporations showed that large, capitalised firms mostly adopted the environment-orientated archetypes (Albareda et al., 2018). "Prioritising any one of the three aspects of sustainability may lead to serious unintended consequences" (Gunaratne et al., 2021, p. 3). Both environmental and societal pillars of sustainability must be addressed to adequately tackle societal challenges collaboratively (Aspelund & Hermundsdottir, 2020).

The rapid development of new technologies like AI, a changing global environment, and increasing pressure from more sustainably cognizant stakeholders increase the importance of exploring collaborative ecosystems and opportunities for partnering for SBMI (Jovanovic et

al., 2021; Palmie et al., 2021). Similarly, technologies are transforming partnerships and changing strategic alliances (Mostaghel et al., 2022). In the food sector, implementing open innovation and using suitable technologies has contributed to achieving sustainable goals, for example, safer and healthier foods, lessened environmental impacts, and lowered costs. Moreover, selling homogenous products offered in a saturated market like retail has perpetuated the need to differentiate BMs based on value delivery activities (Mostaghel et al., 2022). For example, partnering with financial facilitator Afterpay improves value delivery as consumers can buy now and pay later.

Similarly, in response to the 2020 pandemic, retailers heavily relied on their logistic partners to deliver products to customers. Education providers had to adapt and rely on digital technologies to deliver coursework. However, students across New Zealand universities criticised the lack of ability of universities and teaching staff to adapt to and deliver online learning during the lockdowns (James, 2020). More research is needed to understand new shared revenue models for technologies and how to manage and implement partnering and governance (Jovanovic et al., 2021; Palmie et al., 2021).

3.5.3. Embedding Technological Innovation

By employing technology, businesses can support the dissemination of social and environmental value by connecting formerly unconnected supply and demand and achieving more efficient ways of operating (Abdelkafi et al., 2022; Gregori & Holzman, 2020). Embedding technology into the SBMI process leads to environmental and social improvements as it facilitates the ability of the business to do more with less, subsequently improving service process innovation, creating new partnerships, and increasing efficiencies through reconfigurations of value networks (Cheng et al., 2019; Cortimiglia et al., 2022; Mostaghel et al., 2022). For example, the Sheke Network platform connects architectural businesses with available projects, thereby increasing employment and business opportunity in the sharing economy while reducing wastage (Cheng et al., 2019).

However, as demonstrated in the Mobike case study, using green technologies in green industries like the sharing economy does not necessarily result in businesses achieving sustainable development (Gao & Li, 2020). They argue that businesses must understand their environment and design, adapt, and innovate their BM to drive sustainable practices and implement SBMI. Similarly, Gregori and Holzmann (2020) claim that although digital

innovation can improve connectivity and accessibility, it is not a panacea for sustainability as it can run counter to social and environmental objectives. Nevertheless, using technologies like blockchain to facilitate the SBMI process can create more inclusive trade, open access to financial services, and provide smarter market information to drive better and more sustainable decision-making (Ciaburri et al., 2020; Jovanovic et al., 2021).

Extant research is predominantly based on conceptual and review studies. There is little reference to how digital technologies enable businesses to improve their business practices for SBMI (Cheng et al., 2019; Gao & Li, 2020; Gregori & Holzmann, 2020). For example, value creation and capture, and resource flow to enable SBMI. This may perpetuate a lack of business understanding about leveraging technology to accelerate more sustainable business practices and SBMI. In contrast, circular BMs like Mobike or the Sheke Network sharing platform indicate that new technologies support the rapid growth of innovating the BM for sustainability purposes. These case studies support the need for more research into leveraging technology to accelerate SBMI.

To accelerate the pace of change needed to make positive impacts at scale, more research is required to provide clear guidance on adopting and implementing technologies that enable and drive SBMI (Chofreh et al., 2020). Digital logic delivers socio-environmental value creation and supports businesses' ability to establish profitable value propositions and simultaneously provide stakeholders with social and environmental value (Gregori & Holzman, 2020). Technology can facilitate the SBMI process and support the dissemination of social and environmental value.

3.6. The Application of Sustainable Business Model Innovation in New Zealand

The literature supports that sustainable initiatives are being implemented across sectors in New Zealand. However, finding SBMI and related literature proved difficult. Similarities between the aforementioned SBMI themes and limited related sustainability sources referenced could be derived. These include organisational design and culture factors, BM approaches and values, collaborative ecosystems, metrics and multi-stakeholder management. Similarly, several drivers support sustainability, including government influence, the United Nations (UN) Sustainable Development Goals (SDGs), and technology.

3.6.1. Sustainability Initiatives Across Sectors - Challenges and Advantages

Wylie (2018) research centred on the creation of a toothbrush as a sustainable product employing the principles of the circular economy and using a subscription service BM. He found that instead of the employed strategies to innovate, the mindsets within the product development teams hindered their ability to find solutions. This reinforces the issues of organisational design and cultural factors that can enable and hinder SBMI. Similarly, these mindsets are found in the value intentions of innovation identified in SBMI literature (Barth et al., 2021). Wylie further suggests that the circular economy is a great solution. However, New Zealand's recycling capability is limited. Not all systems incorporating circular principles are more sustainable (Bocken et al., 2016). These findings provide scope for more research to expand on SBMI value components and possible sub-components.

Similar to Wylie (2018), Casasanto (2020) research highlighted the importance of collaboration to ensure innovations are sustainable. Her research focused on cross-sector partnerships (CSP) and her conceptualisation of a four-stage process for effective CSP. SBMI theme similarities were found in the knowledge gap regarding metrics, such as, monitoring and reporting effectiveness. However, the four stages do not address the inherent complexities in collaborative ecosystems, such as the multi-stakeholder and alignment complexities. For example, differing understandings of value, diverging interests, division of risks and responsibilities, and existing processes and activities, limit stakeholders' willingness to cooperate (Barlow et al., 2017; Bocken et al., 2020; Bitzer et al., 2020).

Various New Zealand organisations are also documented as innovating for sustainability. An example of this is Allbirds. Conversely, the footwear industry globally is a major polluter across all stages of the supply chain (Airehrour et al., 2020). Similarly, organisations are adopting the use of technology to facilitate the process. An example of this is Spark Energy's FutureFit gamified carbon calculator (Airehrour et al., 2020).

3.6.2. Sustainability Influencing Factors – Drivers

The government is influencing sustainability priorities. An example of this in the education sector is the two statutory documents; the Statement of National Education and Learning Priorities and the Tertiary Education Strategy, which reflect New Zealand government expectations and define the priorities for the education sector (Ministry of

Education, 2020). For example, objective five in the TES outlines the focus for New Zealand education to be inclusive, trusted, and sustainable. However, engagement with tertiary staff identified a need for more supportive and sustainable ways to inform decision-making and accountability processes within the tertiary education system (MoE, 2019). Moreover, it highlighted several barriers, including insecure working conditions, lack of professional capabilities and cultural competencies required to upskill and reskill. Similarly, a review of initiatives in the secondary sector highlighted the challenge of supporting the development and integration of sustainability into curriculum and teaching practices, the need for more professional learning, and the reassessment of the government strategy and policies in creating sustainable change (Cooper et al., 2010).

New Zealand universities are collaborating with other sectors at a national level to implement the UN SDGs (Education New Zealand, 2021). However, only 11 New Zealand higher education institutions are listed as providing sustainability-related study programmes (Education New Zealand, 2021). Similarly, Casasanto (2020) research highlighted that youth are stakeholders that are often overlooked in management literature, and more research is needed to understand their role in system change for social value to achieve the SDGs. Reports emphasise that students are willing to boycott educational institutions with poor sustainability credentials (Education New Zealand, 2021).

Similarly, the digital environment is providing new ways of teaching. For example, Massive Open Online Courses provide data analytics to support student progress and behaviours. This information can support the development of teaching materials and improve teaching practice through timely and personalised support (Guiney & Shrivastava, 2014).

How, and to what extent organisations in New Zealand and the education sector embed sustainability into their BM remains unclear. Similarly, engagement with tertiary staff highlights significant challenges that may hinder tertiary education institutions' capability to enact the change necessary to meet the objectives for education and proactively embed sustainability (MoE, 2019). These knowledge gaps provide scope to explore how SBMI is applied in different contexts and support organisations’ transition towards SBMI.

3.7. Conclusion

SBMI is an important and increasing field of interest for researchers and practitioners. The SBMI concept is evolving, and more research is needed to understand its components and

theoretical rationalisations further, and to explore sub-components and additional forms of value. There are several archetypes, configurations, frameworks, and tools to support SBMI. However, a comprehensive SBMI framework to help businesses understand how to conceptualise, design, and implement SBMs does not exist. Similarly, these archetypes are primarily rooted in the perspective of optimisation, and more archetypes are needed in response to market changes, for example, ESG principles and technology factors. Furthermore, there are limited examples of how each component helps integrate sustainability innovation. BMI and SBMI have had a relatively high failure rate. However, there is a dearth of research on the root causes of failure and underlying failure modes. Sustainability research is predominantly focused on environmental innovations though technologies used in the adoption of SBMI focus more on optimisation. Nevertheless, rapidly developing technologies have the potential to accelerate businesses' transition toward sustainability.

Academic debate, coupled with a changing global business landscape, government intervention, and increasing consumer awareness, supports the pressing need for responsible management practices. The literature suggests that businesses still struggle to integrate sustainability into their business practices. How to overcome the barriers of integrating sustainability into BMs remains underexplored. Research on the use of technologies and their effectiveness in SBMI is scarce. The literature suggests that organisations lack the knowledge and skills to effectively harness the potential of technologies that help facilitate the SBMI process. The literature highlights the need for more guidance on managing SBMI and how to bridge the gap between ideation and implementation to support businesses' moving toward SBMI. Similarly, the application of SBMI is currently only found in some sector-specific industries and locations, with no research in the databases referenced on the application of SBMI in New Zealand.

This study is an opportunity to fill these knowledge gaps. This research will contribute by exploring how SBMI is applied in the education sector in New Zealand. It will explore the challenges that hinder an organisation's ability to innovate its BM for sustainability and bridge the gap between ideation and implementation. The analysis of the data collected will lead to the formulation of a new theory (Lewis et al., 2019). An overview of the qualitative approach using case study analysis is provided in Chapter 4.

Chapter 4. Research Methodology

The purpose of this chapter is to introduce the research methodology employed for this qualitative case study research.

4.1. Introduction

A qualitative case study methodology was used to explore how to accelerate Sustainable Business Model Innovation (SBMI) and understand the drivers and barriers that impact the processes. This approach allowed for a deeper understanding of the participants' experiences and perspectives on innovating for, and embedding, sustainability into their respective Tertiary Education Organisation (TEO) Business Models (BMs) within the New Zealand Tertiary Education Sector (TES). This approach provided a way to develop theory from the data to proffer clearer guidance and a more comprehensive approach for businesses to move their business modelling toward SBMI.

This chapter was partly completed as part of MGT803, the research methodology component of the Master of Applied Management qualification, of which this thesis is the final element. As MGT803 is the research methodology paper for this Master of Applied Management qualification thesis component, self-citation was not required.

The pertinence of an interpretivist approach and case study methodology for this study are discussed in this chapter, as are the research design, methodology, participants, procedures, analyses, limitations, and ethical considerations.

4.1.1. Research Question

This study sought to contribute theory in exploring the following research question:

RQ1: How can organisations, specifically TEOs, accelerate SBMI and bridge the gap between ideation and implementation?

4.2. Research Philosophy and Design

This section outlines the research methodology. This includes the relevance of interpretivism philosophy, an inductive approach to theory development, and research design.

The design involved a qualitative study and an exploratory research purpose and employed a case study research methodology accompanied by a general inductive strategy. Data was collected within a cross-sectional time horizon and gathered from semi-structured interviews conducted by the researcher, who also drew from documentation and archival records. The section concludes by detailing the thematic and comparative qualitative data analyses utilised, information on the researcher, and the challenges encountered.

4.2.1. Interpretive Philosophical Assumptions

The interpretivism philosophy is appropriate for business management research due to the uniqueness and complexity of the contexts, specifically, the circumstances and interactions at a given time between individuals (Lewis et al., 2019). The researcher worked within the interpretivist philosophy to create new and richer understandings and interpretations of the processes involved in innovating and embedding sustainability into the BMs of TEOs in the TES by investigating organisational realities and contexts, and participants' perspectives and meanings, and examining the relationships between these meanings (Lewis et al., 2019).

Other approaches, such as positivism and critical realism, were rejected because they were not appropriate for the aim of this study, research question and objectives. Positivism was rejected because it is objective in contrast with the explicitly subjective interpretivist philosophy. Furthermore, positivism is appropriate for scientific study focussed on observable and measurable facts, using large samples to establish causal relationships between variables and predict the occurrence of phenomena (Collis & Hussey & 2014; Creswell & Creswell, 2020). Similarly, critical realism identifies reality as independent, external, and not directly accessible through observations or an individual's knowledge (Lewis et al., 2019). A critical realist approach is appropriate for a study focusing on pre-existing objective structures and relying on an in-depth historically situated analysis of these structures (Lewis et al., 2019).

4.2.2. Inductive Approach to Theory Development

An inductive approach is typical of research within the interpretivist paradigm to gain an interpretive understanding of social phenomena within a given context (Collis & Hussey, 2014). This study employed an inductive approach to theory development. An inductive approach was appropriate as this study aimed to develop a theory on how to accelerate SBMI by assessing the effectiveness of the processes involved in innovating the BMs of TEOs within

the New Zealand TES context. A deductive approach was rejected because it is more appropriate for research aligned with the natural sciences that employ theory verification and falsification with data used to evaluate hypotheses and propositions following the logic that if the premise is true, then the conclusion must be (Creswell & Creswell, 2020; Lewis et al., 2019).

To gain a deeper understanding of the influencing factors that drive and enable the innovation process, the researcher interpreted the answers to questions from participants involved in current and past sustainability and strategy projects to understand better what has happened and what is happening, and the nature of issues encountered. The subsequent data analysis led to the development of theory (Lewis et al., 2019).

4.2.3. Qualitative Study

A qualitative study is an appropriate approach if the aim of the research is to explain a phenomenon by exploring and understanding the attitudes, behaviours, and experiences of participants and the meanings they attribute to human and social problems in a given situation (Creswell & Creswell, 2020). According to Dawson (2019), compared with qualitative research, quantitative research is appropriate when the researcher seeks to generate quantifiable results or statistics, and to reach a larger quantity of people more quickly. In contrast, a mixed-methods approach is appropriate if a quantitative or qualitative approach cannot sufficiently address the research question. However, it can be more time-consuming and is often associated with critical realism and pragmatism philosophies (Lewis et al., 2019).

A qualitative research process was employed for this study as it is aligned with the interpretivist philosophy and case study methodology which uses smaller sample sizes. Moreover, the researcher required an in-depth understanding of the participants' experiences, perceptions and meanings they ascribed to the innovation processes, drivers and barriers, and the use of different tools and frameworks. Qualitative research is often used with interpretivist philosophy to make sense of the socially constructed and explicitly subjective meanings individuals ascribe to a phenomenon (Lewis et al., 2019).

4.2.4. Exploratory Study Research Purpose

The purpose of this study is exploratory, as SBMI is a nascent and evolving research field with few theories and a deficient body of knowledge (Collis & Hussey, 2014). An exploratory research purpose is aligned with the researcher's aim to develop a theory to extend current SBMI literature and understandings and explore the drivers and barriers that influence the processes involved in SBMI. This exploration assisted the researcher in identifying patterns and ideas, developing propositions, and gaining more significant insights into perceived challenges and advantages to support businesses further in innovating their business modelling towards SBMI. The flexible and adaptable characteristics of exploratory research supported semi-structured interviews and the development of questions that were iteratively refined based on the participants' contributions which guided subsequent stages of the research.

4.2.5. Case Study Methodology

This qualitative study was conducted using a case study methodology. Yin (2018) defines a case study methodology as being appropriate when the purpose of the research is to investigate a contemporary phenomenon in a real-life context and when boundaries are not clearly evident between the phenomenon and the context. According to Collis and Hussey (2014), case study research employs typical methods of interpretivist philosophy, including in-depth investigations, small samples, and qualitative methods with multiple sources of evidence. A case study facilitates in-depth inquiry and appropriately addresses the research question of "*How"* (Creswell & Creswell, 2020; Lewis et al., 2019). Employing a case study methodology allowed the researcher to assess the innovation processes and associated influencing factors and compare these aspects within the case and between each participant to highlight differences and similarities to support businesses to innovate, identify opportunities, design SBMI and measure its effectiveness.

A case study focuses on the interactions between the case subject and related context (Lewis et al., 2019). The case selected for this study was the contemporary phenomenon of SBMI as modelled across purposively sampled and self-defined as sustainable TEOs within the New Zealand TES. These TEOs included universities and Te Pūkenga Institutes of Technology and Polytechnic (ITP). A homogenous sampling of participants involved in sustainability at their respective TEO to support theoretical generalisations.

Case Study Research and Applications: Design and Methods by Yin (2018) provided a foundation for this study and outlined the tenets of the case study methodology employed in this research study. The general analytic strategy used for this study was inductively working with the data from the "ground up" (Yin, 2018, p.169). The researcher assigned codes based on the topics of interest and concepts that emerged from examining the data collected. This technique was also aligned with the use of thematic and comparative qualitative data analyses, detailed later in this section.

4.2.6. Data Collection: Interviews, Documentation, and Archival Records

Data was collected using a mono-method qualitative methodology to gather data from semi-structured interviews. Secondary data sources, including documentation and archival records, were also drawn from, for example, governmental and independent research reports, sustainability reports and related publications provided by the sampled TEOs. These sources allowed the researcher to gain a deeper understanding of the influencing factors that can enable and hinder the sustainable innovation processes in the TES and how to bridge the gap between ideation and implementation.

4.2.7. Data Analysis: Thematic and Comparative Qualitative Data Analyses

As this research sought to describe and interpret the phenomenon in relation to participants' social worlds and realities, findings were derived from both thematic and comparative qualitative analyses. Thematic analysis is aligned with an inductive approach to theory development. Comparative analysis is closely aligned with, and complementary to, thematic analysis (Dawson, 2019). There were six phases of inductive thematic analysis: (a) data familiarisation, (b) initial coding, (c) searching for themes, (d) reviewing themes, (e) defining themes and (f) the final analysis, and reference was made to the relationship with extant literature and RQ1 (Braun & Clarke, 2006).

The researcher focused on emerging themes from the data and conducted background reading to support the analysis and explanation of emerging themes. Employing comparative analysis, the researcher compared and contrasted the data from each interview transcript until the researcher identified that no new issues had arisen. The collection and analysis of the data took place simultaneously. To support the analysis, the researcher triangulated data, moving between interview transcripts, self-memos, summary forms, extant literature and other

collected secondary data sources. This provided the ability to increase the breadth of, add depth to, and obtain more richness from the research. This exploratory study had a broad scope that narrowed as data was collected. Data were analysed to identify themes, patterns, and relationships and involved referencing these with extant literature to generate theory.

4.2.8. The Researcher

The researcher worked as a business professional for 11 years and holds a Bachelor of Business Studies in International Business. No conflict of interest existed as the researcher and participants were unknown to each other prior to making contact for this study which mitigated potential bias in the research study.

The researcher has the experience and skills required to carry out this study. The researcher has professional experience interviewing senior leadership members across industries globally with the intent to advise on, provide support with, and elicit business needs. The researcher's skills include training in communication, active listening, negotiation, and business analysis gained through corporate professional development training. Additionally, necessary skills were gained from the completion of research papers, including qualitative research, which were prerequisites and core components of Southern Institute of Technology's Master of Applied Management.

4.3. Method 1: Interviews

This section outlines the use of interviews as the primary data source for this study and the associated piloting, procedures followed, participants and sampling, and data analysis.

4.3.1. Purpose of Interviews

Bano et al. (2018) claim that interviews are the most effective data-collection elicitation technique. Interviews are relevant methodical approaches used to elicit important information from participants by asking relevant and engaging questions and documenting the responses for analysis (Murphy-Hill et al., 2013). Interviews allowed the researcher to collect information from participants to better understand their roles and experiences in embedding sustainability into their respective TEOs' BM. Interviews conducted under an interpretivist philosophy

allowed the researcher to explore the participant's perspectives, including their opinions, understandings, feelings, and behaviours (Collis & Hussey, 2014). Interviews helped the researcher to generate a richer understanding of the innovation processes, drivers and barriers, and tools and frameworks used.

Furthermore, interviews provide ample opportunities to build rapport between the researcher and participants and increase participant involvement (IIBA, 2015). Cheah et al. (2018) suggest that when effectively conducted, interviews can reveal important information by building rapport, encouraging participation with two-way open communication to encourage participants to express their opinions freely and allowing the researcher to observe how participants say things and their non-verbal behaviour. Interviews effectively help the researcher generate insights about how sustainability is embedded into the core of their TEO and why participants believe certain factors influence the process. Moreover, interviewing participants with experience and knowledge of the ideation and implementation of sustainable initiatives in the TES provided more significant insights into how sustainability is embedded and implemented into the TEO BMs, the steps and processes involved and clarified what enables and hinders progress towards SBMI.

4.3.2. Interview Design

Structured interviews are used to collect quantifiable data and are therefore used in quantitative research using standardised and pre-determined identical questions (Collis & Hussey, 2014; Creswell & Creswell, 2020). In contrast, unstructured interviews do not follow a pre-determined format (IIBA, 2015). Dawson (2019) claims that unstructured interviews are appropriate if the researcher needs to create a holistic understanding of the life history of participants. In comparison, semi-structured interviews often prepare pre-determined questions to encourage the interviewees to discuss specific topics of interest (Collis & Hussey, 2014; Dawson, 2019). When using a case study strategy semi-structured interviews are commonly used to gather data for qualitative analysis and follow a form of guided conversation with a fluid stream of questions rather than rigid questions used in a structured interview (Lewis et al., 2019; Yin, 2018). Semi-structured interviews are appropriate when the researcher wants to know specific information to compare and contrast with information gleaned from other interviews (Dawson, 2019).

This study used a semi-structured interview design. The use of semi-structured interviews allowed the researcher to analyse the 'how' research question and understand the elements of 'what' and 'why' (Lewis et al., 2019). Moreover, semi-structured interviews were chosen as they aligned with the study's interpretivist philosophy and exploratory research purpose. The researcher needed to understand the reasons for participants' opinions and attitudes regarding innovating the BM for sustainability and the associated drivers and barriers. Furthermore, the flexibility of semi-structured interviews supplemented the inductive approach to theory development and allowed themes to evolve from the data collected and analysis of this data.

The researcher utilised several approaches to support the analysis of interviews. Self-memos were used regularly throughout each interview that detailed the researcher's thoughts. Summary forms were completed after each interview that provided context to the interview. Prior to subsequent interviews, a cursory level of analysis was conducted between interviews.

The same questions or topics were discussed in each interview to ensure continuity. However, there was sufficient flexibility to ensure additional important information could arise and the interview questions and topics could evolve depending on participants' contributions from previous interviews (Creswell & Creswell, 2020). Questions evolved based on participants' contributions and guided subsequent interviews and stages of the research. The researcher used probing questions to encourage the participant to explain, clarify, and elaborate on their answers to further the researcher's understanding and data analysis. Lewis et al. (2019), emphasise that the ability to probe is important with research conducted following the interpretivist philosophy as the researcher is concerned with understanding the participants' meanings associated with various phenomena. Probing questions are commonly used in semi-structured interviews and add depth to the data obtained by allowing the researcher to elicit and gain maximum information (Collis & Hussey, 2014).

Open-ended questions were used. The interviews began with two questions about the participant's interest and involvement in sustainability and strategy-related projects and their understanding of sustainability. The following questions were more in-depth with the intent to understand their experiences and perspectives about the related processes and associated drivers and barriers. Additional questions were used including summary questions to avoid ambiguity and validate data and hypothetical questions to encourage broader thinking to explore needs and values (Collis & Hussey, 2014). The interview conclusion was framed to encourage additional thoughts on the topic and to understand to what extent technology played

a role in the innovation process. These conclusion questions gave the researcher a clearer understanding of how resources and individual capabilities influence how, and the rate at which, sustainability is embedded into the TEO.

Interviews were conducted using a web-enabled video conferencing application and the telephone. The interviews were electronically recorded using an audio recording software application on a password-protected Apple computer. The researcher completed the transcription of the interviews with the help of transcription software. All company employees of the transcription service have signed a confidentiality agreement. All interviews were conducted after both verbal and written informed consent was obtained from the participants. Single interview sessions were conducted with each participant.

4.3.3. Pilot Testing

The interview questions were piloted to test whether the questions were succinct, clear, unambiguous and logically flowed to improve the possibility of obtaining the results required for this study (Dawson, 2019). Several pre-determined questions were created based on topics and themes gleaned from extant literature aligned with the research question, aim and objectives. The researcher also referenced and piloted potential questions with two individuals who have worked within industries and in roles relevant to this study. Based on the feedback received, the questions were refined. Pilot testing can ensure well-suited and targeted data is collected and improve the quality of questions (Creswell & Creswell, 2020; Yin, 2018).

Table 4.1

Pilot Testing Participants

Participants	Employment History	Education	Experience *(years)*	Contact
Participant 1	Scientist, Regional Director of Research, Author	**PhD** *Oxford University, The University of Melbourne*	40 <	Phone
Participant 2	Senior Software Engineer, Data Security Analyst	**Undergraduate** *Auckland University*	30 <	Online

4.3.4. Procedures Followed

Approval was sought from Southern Institute of Technology's Ethics Committee. Once approval was received (see Appendix A. Ethics Approval), the researcher directly e-mailed senior management at the respective TEOs that presided over the areas of interest, using email for initial contact that was tailored to the individual and the TEO. Potential participants were screened based on their public profile and stated involvement in sustainability at their TEO. Based on the responses, eight participants were selected for the interviews. A signed consent form was required and collected from each participant before they participated (see Appendix D. Consent Form).

An interview schedule was prepared, which outlined basic information, an introduction, and opening background questions to put the participant at ease, followed by content questions and probes to garner explanations and more information, and completed with closing instructions (Creswell & Creswell, 2020). This included several topic-based questions. Questions and themes were identified through brainstorming SBMI, clustering and categorising similar themes and questions that were then organised into a logical sequence from easy-to-answer general questions to more specific ones to understand experiences followed by opinions and feelings. The researcher extensively used open questions to facilitate longer and more developed answers (Collis & Hussey, 2014). One day prior to the interview, participants

were contacted by email with some pre-determined questions (as shown in Appendix C. Interview Questions).

The schedule was used for each interview to ensure continuity. However, as interviews progressed, this schedule was updated and revised based on the additional information and important issues gleaned from participants that were significant to the research aim and objectives. The interview schedule allowed the researcher to focus on the topic, ensure all relevant topics were covered and highlighted potentially controversial or sensitive topics (Dawson, 2019).

Interviews commenced with two general questions to build rapport with the interviewee. Participants were interviewed using web-enabled video conferencing software, Zoom and Microsoft Teams. One interview was conducted predominantly over the telephone due to connectivity issues. Once connected with the participant, the researcher did not commence the interview until the participant was in a private room without distraction. As part of the interview introduction, the researcher briefly reiterated the aim of the research, the participant's ethical rights, sought any questions, and verbal re-confirmation from all participants that they were comfortable with the interview being audio-recorded and transcribed before the commencement of each interview and recording took place.

The interviews were electronically recorded using Apple's voice memo software application. The recordings were securely stored on a password-protected device. Each interview was a single interview session. The researcher completed the interview transcription using the artificial intelligence transcription software, Otter.ai. The researcher then employed a data-cleaning process by listening to each transcript and making the necessary amendments to ensure accuracy. *Otter.ai* was chosen as it employs privacy and security practices aligned with global regulatory requirements. Access required two-factor authentication, and all recordings and transcriptions were only accessible by the researcher. Furthermore, the data stored was encrypted, the software was protected from malware, and all data was permanently purged from their database at the conclusion of the research.

Interviews averaged 45 minutes; the shortest was 38 minutes, and the longest was 61 minutes. The interviewer provided the opportunity for each participant to receive a copy of the transcript to review and make necessary amendments. Each interviewee confirmed they were fine with the information they had provided. Participants did not have access to other participants' interviews and were not involved in the writing and editing of this research report.

To ensure sufficient interviews were conducted, interviews continued until the researcher reached data saturation. The interviews continued until little or no new information and themes were revealed, and the full range of ideas had been identified (Creswell & Creswell, 2020; Dawson, 2019). Data saturation was reached after the eighth interview. Although data saturation was realised, the SBMI phenomenon is still in its nascency, as is the application of the BM concept and strategy research fields in the TES, therefore, the phenomenon is yet to be fully explored (O'Reilly & Parker, 2012).

To minimise potential bias and produce more reliable data, self-memos were used frequently throughout the study to record personal thoughts, preliminary analyses, practical details, and methodological issues (Dawson, 2019; Yin, 2018). The use of summary forms that contain details about the interview were completed after each interview, and transcript summaries to produce a summary of key points and a reflective diary detailing the researcher's experiences to aid further research (Lewis et al., 2019; Yin, 2018). As qualitative data is often understood within a context, several factors can influence the data collected, for example, time and location, and legal and political factors (Collis & Hussey, 2014). These research aids provided the researcher with contextualisation and supported the data analysis and findings.

4.3.5. Study Participants and Sampling

The sample was drawn from the TES and purposively chosen TEOs that were self-defined and assessed as sustainable based on their publicly purporting to be engaged in embedding sustainability into their BMs. This assessment was based on publicly available information, for example, their websites, annual reports, and social and print media. The target population to interview were based on their respective position, expertise and knowledge of sustainability, and their level of involvement in sustainability and strategy-related projects at their respective TEO. Participants were not chosen based on their age and gender, as this was not the focus of this study. However, all interviews were conducted in English; therefore, each participant was fluent in English.

Participants were recruited by directly contacting by e-mail relevant senior managers who presided over Academic Quality, Research, and Sustainability at the chosen TEO. The researcher used an e-mail template, which was tailored to each respondent. This e-mail included a request for leads on suitable individuals who fit the type of participant sought, as outlined in Appendix B. Information Sheet for Participants. The researcher also made contact

via telephone and on the TEO website information e-mail in cases where e-mail information for the relevant individual was unavailable. The researcher had no involvement or affiliation with any of the sampled TEOs or the participating individuals.

Participants were asked to respond to the e-mail to determine their suitability based on the participation details provided in Appendix B. A follow-up e-mail was sent to suitable participants to confirm availability with a range of dates and times provided and the Consent Form (shown in Appendix D), which was required to be signed by each participant before participating in the semi-structured interviews. The sample pool was limited to the participants solicited for this research and as defined by this study. The final number of individual participants included was eight, as determined by data saturation. Individuals from six of the eight New Zealand universities and two from Te Pūkenga were included in this research.

Table 4.2

Summary of Study Participants

Participants	Gender	Organisational Level	TEO
Participant 1	Female	Senior Management	University
Participant 2	Male	Senior Management	University
Participant 3	Male	Senior Management	University
Participant 4	Male	Senior Management	Te Pūkenga
Participant 5	Male	Senior Management	Te Pūkenga
Participant 6	Male	Middle Management	University
Participant 7	Male	Middle Management	University
Participant 8	Male	Senior Management	University

4.3.6. Data Analysis

Transcripts were coded in chronological order after each interview was conducted. This allowed the researcher to identify themes that evolved from the data collected and make amendments to the interview questions. Coding was based on the data collected and used to facilitate the research process and data analysis. Coding helped the researcher to understand participants' perspectives better and combine their experiences for analysis. The source of codes was data and theory driven. The focus was on analysing topics, themes, patterns, and relationships found in the data, which were compared and contrasted with the data already collected until no new issues arose. These codes were created manually and contrasted with those generated by Computer-Assisted Qualitative Data Analysis (CAQDAS) software to decide the most important ones, refine them, and cluster them into categories and themes.

NVivo Use

The CAQDAS, NVivo, was used to manage the research project and data collection. Cheah et al. (2018) highlight that the information elicited from interviews can be used with CAQDAS to identify patterns and trends. The software was used as a database to sort and retrieve relevant data that informed the analysis process. This allowed the researcher to structure, code, and summarise the data and keep a research journal to record thoughts, questions, and reflections to support emerging theoretical ideas. The research process was led by the researcher not NVivo, and keywords produced by NVivo were contrasted with manually identified themes and categories. The software was also used to create visual displays and diagrams to examine the data and explain emerging patterns.

Qualitative Analyses

Thematic and comparative analyses were used to simultaneously analyse the data collected and included background reading to help explain emerging themes (Collis & Hussey, 2014). Both thematic and comparative analyses are often used together to analyse qualitative data collected (Dawson, 2019). These analyses were supplemented with the general analytic strategy of inductively working with the data from the ground up (Yin, 2018).

Thematic analysis allowed the researcher to draw inferences and conclusions from the interview transcripts. Aligned with the interpretivist philosophy, thematic analysis allowed the researcher to explore differing interpretations about how sustainability is embedded into the BMs and the associated drivers and barriers. Furthermore, as is essential for interpretivist study,

quotes from the data collected were used extensively (Collis & Hussey, 2014). Thematic analysis allowed the researcher to create more detailed descriptions, explanations, and theorising (Lewis et al., 2019). Data from each participant was compared and contrasted until the researcher was satisfied that no or few new issues arose. Comparative analysis allowed the researcher to identify how the categories were connected to each other based on the participants' perspectives and was necessary to achieve the research aim and objectives.

The researcher became familiar with the data by regularly re-reading data collected to identify meanings, patterns, and themes. Data were then coded to categorise and cluster similar meanings based on the research question and objectives. Once all the data was coded, the researcher identified themes, patterns and relationships supported by transcript summaries, document summaries, self-memos, and a reflective diary. Themes were refined and combined with other themes or reorganised into different themes. The researcher identified relationships between themes and sought alternative explanations and examples that did not conform to the proposed relationships to ensure credible and valid conclusions (Lewis et al., 2019).

4.3.7. Challenges

The researcher experienced several challenges in contacting potential participants. Some individuals the researcher had identified as suitable participants were unavailable, for example, on holiday. It is also possible that the organisation's gatekeeper may not have been interested in this study. These potential participants could have contributed additional and valuable insights to answer the research question and achieve the research aim and objectives.

Several TEOs did not publicly provide clearly defined senior management profiles and contact details. This made it difficult for the researcher to ensure that contact was made with the appropriate senior management staff members. Moreover, the researcher did not receive an acknowledgement of receipt from all contacts made. This meant multiple attempts were made and led to the discovery of the e-mails being forwarded to prospective participants without the researcher's knowledge. This resulted in one known instance where there was more than one department manager contacting the researcher. Similarly, some senior management gave the researcher conflicting information regarding whether they could conduct interviews.

The researcher used web-enabled video conferencing software, which resulted in some connectivity issues between the researcher and the participant. These issues may have negatively influenced the participants' perceptions, behaviours, and answers to the questions.

As a result, this may have impacted the research results. Poor connectivity for one interview led to it being predominantly conducted over the telephone.

4.4. Limitations, Reliability, and Bias

Interpretivism is a subjectivist philosophy, and an axiological implication of this is that the researcher's values and beliefs bias the researcher's interpretation of the data collected (Creswell & Creswell, 2020). Therefore, the findings of this study are value-laden and biased with both the participants' and researcher's interpretations. The analysis of data collected through this approach must be sensitive to their variability and complexity to be meaningful (Lewis et al., 2019). Collis and Hussey (2014) maintain that although interpretivism tends to produce low reliability, it does support high validity and allows for the findings to be generalised from one to another similar setting.

To construct validity and reliability, Yin (2018) emphasises three data collection principles relevant to this study: (1) include several data sources, (2) create a database, and (3) maintain a chain of evidence to ensure that the process of data collection is explicit. To ensure validity and reliability, the researcher used multiple sources of evidence, including the primary source of semi-structured interviews and secondary sources, including archival records and documentation. A case study database was created to store notes, documents, and narratives, and a chain of evidence was maintained that detailed the data collection process.

Secondary sources are an unobtrusive method that often require fewer resources (Dawson, 2019; Lewis et al., 2019). These sources allowed the researcher to make comparative analyses with the primary research collected and were used to triangulate the findings of this study. However, the initial purpose of these data sources differs to the purpose of this study and therefore impact its relevance and accuracy (Dawson, 2019). Moreover, the researcher had no control over the quality of the data and in some cases gaining access was difficult and expensive.

Part of the success of this study depended on the researcher's ability to obtain access to participants, build rapport, and gain cognitive access (Lewis et al., 2019). Dawson (2019) emphasises that building rapport is difficult and requires the researcher to demonstrate diplomacy, tact, and perseverance to build trust for the participants to reveal personal knowledge. Lewis et al. (2019) highlight that gaining access to organisations requires ongoing and cognitive access. Gaining access may have been hindered as TEO staff members are

frequently approached with research requests and are often not prepared to engage due to the time and resources required. The access request may not interest the gatekeeper due to a lack of perceived value, perceptions of credibility, and potential sensitivity or other unrelated external and internal events (Dawson, 2019; Lewis et al., 2019). As the study was conducted by an external researcher, this may have impacted the researcher's ability to gain cognitive access. Cognitive access was determined by the participants taking part in this study. This was dependent upon the researcher's ability to convey research salience and relevance to stimulate participants' interest (Lewis et al., 2019). To mitigate associated issues, the researcher conveyed competence and integrity by providing a clear and concise e-mail with an attached information sheet (refer to Appendix B) that introduced the researcher and outlined the research aim, type of participant being sought, details of participation, and ethical guidelines. The researcher also conducted preliminary research to become familiar with the sampled TEO and developed new contacts. The researcher also outlined the possible benefits to the organisation as a result of participating in this study. A copy of the ethical committee research approval letter (refer to Appendix A) was also provided to build credibility.

Several data quality issues are associated with the use of semi-structured interviews. A key concern is the lack of standardisation and, therefore, the interpretation of data collected, and the results are subjective to the researcher's interpretation. Interviews are subject to the interviewer's interpretation which impacts the validity and reliability of documentation (Coughlan & Macredie, 2002). Moreover, the reliability and dependability of the data collected in these types of interviews can be impacted by bias. It is possible that the researcher may have impacted the way the participants responded to the questions asked. For example, the researcher's tone of voice and non-verbal communication. This could have led to interviewer bias. To mitigate this risk, the researcher demonstrated interest in the participant by directly looking at the camera, making appropriate verbal responses and facial gestures, and modulating their voice to maintain the participant's interest.

Other conditions could have altered the researcher's interpretation of the data collected leading to researcher error. For example, having multiple interviews in one day can lead to fatigue and adversely impact how questions are asked. To mitigate this, the researcher conducted no more than two interviews in one day and provided participants with a range of date options to choose their most convenient date and time.

As semi-structured interviews are flexible and can be perceived as an intrusive method, the participants may have felt hesitant to discuss certain topics or may have been apprehensive

of probing questions (Dawson, 2019). This may have led to participant and response bias. To mitigate this, the researcher provided participants with some pre-determined interview questions prior to the interview, as shown in Appendix C. Interview Questions. Additionally, prior to each interview, the researcher discussed the ethical guidelines with each participant and any questions they had and verbally reconfirmed their informed consent before commencing all interviews.

Similarly, other factors can produce a false result leading to participant bias. For example, it is possible that participants interviewed at their workplaces were afraid that other colleagues overhead their answers to questions which can lead to false positives. To mitigate this, the researcher outlined the details of participating in the interview in the information sheet, outlining a time and place that the participant chose that was private, comfortable, and without distraction. The interviews did not start until the participant was comfortably situated. It is also possible that certain factors adversely impacted how participants performed in the interviews and led to participant error. As interviews were conducted in the afternoon, some of the times chosen by participants could have been during lunch hours. Participants' performance can differ before and after lunch, and typically participants are more alert and receptive (Lewis et al., 2019).

Additional factors may have led to participation bias. As the researcher had requested up to one hour for interviews, this may have biased the sample of participants. To mitigate this, the researcher only sampled suitable participants based on their roles in, and knowledge of, embedding sustainability into their TEO's BM. Certain cultural factors, for example, the researcher's assumption that it would be acceptable to discuss the research topics with an outside researcher, may have also contributed to participation bias. To mitigate this, the researcher included cultural reflexivity in their preparation. This involved choosing to conduct and engage with participants one-on-one using semi-structured interviews which allowed for a more informal conversational approach.

A possible limitation of this study was non-response error and bias as non-respondents could hold insights and valuable information that differs from participants who responded and were included in this study (Lewis et al., 2019). This may have caused unreliable and biased data. The involvement of suitable participants optimises the accuracy and validity of the research (Heerkens, 2006). Due to the exploratory purpose of this research, conducting in-depth individual interviews with subject matter experts involved in sustainability projects at their

respective TEOs, including some that had taught, advised, and had experience beyond their current roles, increased the reliability and the quality of the participants' contributions.

Purposive and volunteer sampling are considered to have a low likelihood of the sample being representative (Lewis et al., 2019). The researcher employed judgemental or purposive sampling, which dictates that the choice of participants is chosen prior to the commencement of the study and does not pursue other potential contacts, which limited this study to the chosen participants. Similarly, the use of volunteer sampling, including snowball sampling, carries great bias as individuals identifying potential participants are likely to identify others like themselves, resulting in a homogenous sample (Lee, 1999). However, in some situations where the subject matter expert and individuals involved in sustainability were not always clearly publicised at the sampled TEOs, this was the only possibility for the researcher to make contact. Furthermore, homogenous sampling provides in-depth exploration and assists in identifying minor differences (Creswell & Creswell, 2020).

Due to the nature of the research question and objectives, the use of qualitative case study research, semi-structured interviews and non-probability sampling techniques, there was no need to statistically estimate the characteristics of the entire population. Therefore, generalisability and transferability were not key concerns. However, to ensure the data was dependable, the researcher has detailed in this chapter, and demonstrated in Chapter 5 Findings and Analysis, how the data was obtained and analysed. This single case study included interviewing a cross-section of participants across several settings within the TES, which led to collecting data from a representative sample. Similarly, to demonstrate the broader significance of this research, the findings were related to extant theory and validated by testing propositions.

4.5. Ethical Considerations

This study was approved by Southern Institute of Technology's Ethics Committee (refer to Appendix A). Before the collection of data, participants were provided with a detailed research project outline and consent form to ensure they made an informed decision to participate in this study. The research information and ethical guidelines were also verbally summarised before the commencement of each interview to ensure participants were fully informed, comprehended what was asked of their participation, and knew their participation

was entirely voluntary. In addition, the researcher verbally re-confirmed permission to audio-record the interview and to transcribe it thereafter with all participants before recording began.

This research project adhered to the underlying principles of research ethics to ensure autonomy, beneficence, non-maleficence, and justice (Office for Human Research Protections, 2018), and was conducted per the New Zealand Privacy Act 1993.

4.5.1. Method 1: Semi-structured Interviews

An Information Sheet for Participants, (shown in Appendix B), and Consent Form (found in Appendix D), were provided to each participant prior to the interview to ensure they made an informed decision about participating in this study. Aligned with the underlying principles of research ethics, these documents addressed the following key ethical considerations:

Informed Consent

To ensure participants were fully informed, the researcher provided each participant with an information sheet and consent form signed by the participants to confirm that the scope of the research had been fully explained and any questions satisfactorily answered. An emphasis on their ethical rights, for example, to confidentiality and anonymity, was verbally read to the participant at the beginning of each interview and the opportunity to ask questions to discuss the Information Sheet, Consent Form, and Questions to reconfirm they were fully informed.

Confidentiality

Participants were informed that the information given during the interview would be used for the sole purposes of this research and not disclosed to other people or agencies without their consent. Furthermore, they were informed that the interview recording would not be played to individuals outside the research group.

Voluntary Participation

Participants were informed that their participation was entirely voluntary. Moreover, they were informed that they could withdraw from participating in the research at any time until the data collected was anonymised and amalgamated into the report without any explanation or disadvantage.

Anonymity

The transcript data were de-identified, appropriately fragmented, and coded with pseudonyms to ensure anonymity. To ensure participant safety, their identities and personal information were kept anonymous. This research report did not disclose the names and characteristics that could lead to participants and the respective TEOs being identified.

Privacy

The recruitment of participants involved contacting the Heads of Academic Quality or related Head of Research and Vice-Chancellor or related head of sustainability at the purposively chosen TEOs. These individuals advised the researcher of potential participants interested in participating in this study. Participants were directly contacted based on publicly available profiles detailing their sustainability involvement at their respective TEO. In cases whereby the researcher could not identify the relevant individual's contact details, the request for research participation was sent via the sustainability and information group e-mail addresses listed with the chosen TEO.

Data Access and Storage

Participants were informed that they could request to view completed draft sections of the study they had contributed to at any time. Similarly, the researcher informed participants of their right to read the interview transcript to provide feedback and make amendments until the data was anonymised and amalgamated into the report. The researcher also asked participants at the conclusion of each interview if they would like a copy to read through.

The opportunity to request a copy of the final report was provided in the Consent Form. The researcher also informed each participant that requested a copy, the timeframe, including the dates that these would be sent at the conclusion of the research. Moreover, they were informed that the results could be presented at conferences and published in an academic journal.

Participants were informed that the data collected would be securely stored so that only the researcher could access it on a password-protected computer.

Destruction Procedures

Aligned with the Southern Institute of Technology's research policy, participants were informed that all raw data, including the recordings and signed consent forms, would be stored securely on a password-protected computer database for up to five years from the end of the

research and then appropriately destroyed. This minimised confidentiality risks for participants.

Safety

The risk to participants in this study was minimal as all participants were above the age of 18, did not display cognitive impairment, and held senior positions in their respective TEO. Similarly, as the interview was conducted using web-enabled software, participant and personal researcher safety risks were minimised.

4.6. Summary

The aim of this chapter was to outline the research methodology employed for this study. A discussion of the research procedures, data collection methods, participants, and interview questions detailed how the research was conducted and the participants involved in the study. The researcher employed an interpretivist philosophical approach and an inductive approach to theory development aligned with the exploratory research purpose. The researcher used a case study strategy conducted within a cross-sectional time horizon and conducted semi-structured interviews with subject matter experts at the purposively chosen TEOs in the New Zealand TES. This was supplemented with secondary data sources. The general analytic strategy used for this study was an inductive approach to working with the data and employed thematic and comparative analyses. The development of theory was built from the contributions of all participants. The participants shared their experiences of embedding sustainability into the core of their TEO, and their perspectives on the factors that enable and hinder the processes involved. Particular attention has been given to the 'Limitations, Reliability and Bias' inherent in this research as the researcher considers it important to acknowledge all actual and potential factors related to such mono-method research. The next chapter, Chapter 5 Findings and Analysis, details the results of this study, and emphasises the methodology described in this chapter.

Chapter 5. Findings and Analysis

This chapter contains the findings and analysis of the case study methodology conducted to answer the research question:

RQ1: How can organisations, specifically TEOs, accelerate SBMI and bridge the gap between ideation and implementation?

This chapter also includes a discussion of the major findings as related to relevant literature and a discussion on connections to this study and the theoretical construct of Sustainable Business Model Innovation (SBMI).

5.1. Introduction

This chapter details that the analysis was consistent with an interpretive qualitative case study methodology and how this analysis aligns with the research question. The comparative analysis and thematic process used to analyse the transcripts from the eight semi-structured individual interviews and analyse the secondary sources to contrast and compare data and discover codes and themes is detailed in this chapter. There were six phases of inductive thematic analysis: (a) data familiarisation, (b) initial coding, (c) searching for themes, (d) reviewing themes, (e) defining themes and (f) the final analysis, and reference was made to the relationship with extant literature and RQ1 (Braun & Clarke, 2006). Data collected was triangulated, contrasted, and compared for comparative analysis and to support themes emerging from the data.

The theory of how to accelerate SBMI by exploring the contributing factors to bridge the gap between the ideation and implementation stages of embedding sustainability into the core of the Tertiary Education Sector (TES) TEOs' Business Models (BMs) is multi-faceted, and findings are discussed as they relate to six major themes: (a) existing knowledge and awareness, (b) innovating toward sustainability (c) organisational structure and leadership, (d) resourcing sustainability, (e) measuring sustainability, and (f) external impacts on sustainability.

5.1.1. Sample

Eight participants were interviewed for this study. All participants are employed in the New Zealand TES and involved in implementing sustainability at their respective Tertiary Education Organisations (TEOs). Six participants were from universities and two were from Te Pūkenga. Seven participants worked full-time and one part-time. Seven participants identified as a Director, Lead, Head, or Manager, and one as an Officer. Six participants had doctorate-level qualifications, and the qualifications of two were unknown.

The TEOs were purposively sampled and chosen based on their publicly purporting to actively implement sustainability into the core of their organisational practices. Five of the sampled TEOs have more than 10,000 students, and six have more than 1,000 staff members.

5.1.2. Data Collection

The primary source of research data was the eight interviews with individuals currently employed in the TES and involved in sustainability at their respective TEO. After each interview, summaries were completed, interviews were transcribed, and initial manual coding of these was commenced. After the second interview, interim analyses were created, which informed the subsequent interview questioning. Some questions were simplified, and probing questions were increasingly used. For example, the question in Appendix C regarding the sustainability business model was simplified for the interviewees unsure of the concept so that they could draw relevance and elaborate on their experiences. After every second interview, the transcripts were reviewed to search for, review, and define themes. Secondary sources were also collected and followed the same procedure. By following this method, the researcher ensured that a case study methodology and the inductive thematic process were embedded throughout the data collection research process.

5.2. Qualitative Analysis: Interview Findings and Themes

This section presents the findings from the data collected through semi-structured interviews. All six themes that emerged from working with the data from the ground up and analysis are provided.

5.2.1. Theme 1: Existing Knowledge and Awareness

Understanding of Sustainability

Various aspects were emphasised by participants in their understanding of sustainability. Interviewees Beta, Epsilon, Eta, and Theta emphasised a future-focused approach, which Eta also stated required a holistic approach. Interviewees Delta, Gamma and Zeta also discussed a regenerative sustainability approach. Some participants highlighted the challenges of defining sustainability, given that its scope is ever-increasing. Delta noted the difficulty with defining sustainability, stating that "One of the first challenges coming here was everybody wanted a nice and tidy definition of sustainability. To me, it doesn't lend itself to that sort of deterministic approach of giving a definition". Interviewees Alpha and Epsilon described how sustainability was often associated with environmental aspects but was now broadening. Epsilon stated, "now, however, sustainability has expanded to include almost anything", and Alpha noted that "sustainability…is very broad" and included other aspects "human capability, financial capability, environmental sustainability, being sustainable in a social sense".

Some participants discussed the diversity in sustainability understanding. Delta, Theta, and Zeta illustrated the diversity within the TEO and subsequent diversity in thinking about sustainability. Epsilon also highlighted the challenge of implementing sustainability across courses stating, "nursing, for example…they go through the programme…suddenly out of the blue, there's a section or a class on sustainability that people think well, why you're talking about this". The biggest challenge for engagement for Beta was with the "fairly apathetic middle trying to engage them at a time when they've got such little time available".

Culture and Values

Participants emphasised culture and values and the interdependent relationship between the organisational and individual levels in fostering a culture of sustainability. Some participants emphasised that the organisational culture drove sustainability. According to Eta, it is easier to implement sustainability ideas when they are "really embedded in the culture...of the business", while Epsilon emphasised the need for "an organisation that is welcoming and culturally oriented from the top-down to support sustainability". Some participants discussed the individual values of passion, meaning, and personal values among stakeholders that have historically driven sustainability. Epsilon claimed that sustainability flourishes from

individuals, while Zeta described their core values and motivation for improvement as driving forces. Beta held that, "Sustainability success is achieved when sustainability is strategically prioritised and supported by sustainability values driven individual[s]".

5.2.2. Theme 2: Innovating Toward Sustainability

The TEO role

Several participants emphasised the TEOs' societal role and responsibility and the higher expectations and obligations of the TES to drive sustainability. Epsilon emphasised the "moral obligations" TEOs have towards the future, and Eta claimed that it is in the definition of a TEO "to come up with new solutions". Delta explained that the fundamental role of TEOs in New Zealand was to be the:

> *critic and conscience of society…we have a responsibility to contribute to the sustainability agenda, we are here to advance knowledge and learning for the benefit of society… [TEOs] have a higher expectation on them for that to be threatened in law to do everything we do to the highest ethical standards. I think how we interact and their impact on sustainability is a is clearly part of that role.*

Theta outlined that organisations must acknowledge their responsibility and impact, as "denying that you have negative impact doesn't make it go away". Alpha stated that an organisation "is inevitably going to have a limited life" if it does not achieve the full scope of sustainability. Epsilon further noted that TEOs need to think not just of their sustainability obligations but strategically as "you will be seen as backwards if you are not moving down that road and…in a convincing manner. So I think that dinosaurs might be flushed out".

Innovating the Tertiary Business Model for Sustainability

Discussion with the participants on how the BM of the TEO was innovated with sustainability highlighted a multidisciplinary approach, which they predominantly attributed to their respective sustainability strategic frameworks, plans, and policies. Beta and Epsilon referred to sustainability as a major organisational strategic goal, which Beta further noted as influencing different business aspects and moving towards being embedded in "business as usual". Other participants focused on other aspects of innovating. Eta included decision-making and Theta described the operational aspects.

There was some initial hesitancy from Beta and Gamma who were unsure what the term business model meant. Some participants described not associating the BM concept with TEOs but could reference certain business sustainability activities. Delta shared that the BM term "would not be acceptable across the university" and referenced the integration into programmes as "part of how we do business". Zeta outlined how "a lot of people don't really like to see the university as a business" but understood that it was "a word to describe the business of a university, which is fine for me".

Strategic Frameworks

Strategic sustainability frameworks were described by participants as currently in use with varying durations or as draft versions in development. Beta emphasised that sustainability had become more of a strategic priority and Zeta described sustainability as one of the pillars of their overall TEO's strategic framework. Delta discussed using their sustainability framework to support other departments in embedding sustainability into their framework. Beta and Zeta discussed drawing from the Learning in Future Environments framework (LiFE) as a basis for their sustainability framework. Epsilon described the limitations regarding how much of a framework they could independently produce while waiting for the national sustainability framework, which Theta noted was challenging to discuss as the framework was at a draft stage.

Several areas were highlighted as priorities in their sustainability frameworks. These included teaching and learning, research, operations and engagement. Some participants discussed specific examples, including embedding sustainability into courses and programmes. Other participants discussed embedding sustainability into building designs, addressing their footprints and engaging with stakeholders.

Some participants emphasised that decision-making regarding sustainability ideas and implementation needed to be both regionally and locally driven, as different regions face different challenges and local stakeholders have different needs. Epsilon and Alpha refer to the importance of consulting with local stakeholders, while Gamma noted the importance of including relevant people across departments as "it's more likely to be kind of embedded, and there is more likely to be a bit more ownership". This focus was echoed by Delta, who stated that sustainability plans should be "generated locally rather than them being dictated from a more centralised version" to ensure the relevant department could make sense of what it means in their context and set appropriate goals. Delta noted the "responsibility to make a contribution

in this specific region", and Theta concluded you cannot have one size that fits all, "It has to be flexible enough where it can be implemented in the ways that suit that particular region and sometimes even communities".

Several participants emphasised the challenge of sustainability approaches becoming just another compliance task. Delta emphasised that certain approaches were viewed as "another order…another task...it was too similar to other compliance activities". Epsilon agreed and stated that it is essential that any approach be "an approach that doesn't burden people and…[become] a tick box kind of thing of saying, well, I did sustainability".

Alpha described the associated risk and reluctance of businesses, including TEOs, to integrate sustainability and that this needed de-risking and incentivising.

> *If you put your main business at risk, in a search for sustainability, or environmental sustainability, then you end up losing your financial sustainability. And if you lose financial sustainability, the business is going to collapse, it doesn't matter how environmentally sustainable you are.*

The Role of Technological Solutions

The use of digital technologies in embedding sustainability was discussed as being leveraged at varying degrees. These technologies were often used in collaboration with several departments to inform the sustainability team and internal and external stakeholders on how key sustainability focus areas were progressing. Theta emphasised that they were in the process of obtaining software to monitor their sustainability journey and to calculate their emissions, and Gamma highlighted the use of artificial intelligence to make these calculations. Beta mentioned being able to use various digital technologies to identify engagement levels and to help strengthen the argument that students demand sustainability content, "so academics, it's in your interest to include it, but there's grounds there that it's kind of a strategic imperative for us to do more of a top-down, kind of push".

Several challenges were discussed in the use of technological solutions. Gamma emphasised that such solutions required change management and getting people on board and noted that confidence in its use and accuracy was a key concern. Eta described the implementation of one technological solution as having been a "hassle*"* as it was not suited to the users' needs, while Zeta noted the frustration of users who were used to other systems and users who were using the software for purposes other than for which it was developed.

A number of participants emphasised the desire to utilise existing technologies further and investing in more technologies, but these required more resourcing. Delta highlighted that access to good, localised and current data was a barrier due to devolved and distributed decision-making, “we don't have a data warehouse yet that we can get really good instant data without a significant lag”. Zeta welcomed the opportunity of using technological solutions, however, they claimed they lacked training in those solutions and there was a need for allocating staff and time to analyse the data.

One participant discussed how a technological solution currently in development was an opportunity to overcome associated investment risks, support sustainability decision-making and implement sustainability. “In terms of implementation. I mentioned before how using [technology name] can reduce the risk of spending money on expensive hardware and then discovering that it doesn't give you what you want” (Alpha).

5.2.3. Theme 3: Organisational Structure and Leadership

Top-Level Management

In order to progress and implement sustainability, participants emphasised the need for support from top-level management and the influence and impact they have on the success and direction of sustainability projects. Alpha, Eta and Zeta agreed that having a Sustainability Vice Chancellor supporting initiatives is very helpful and Epsilon asserted that having a senior sustainability role among top-level managers who are knowledgeable and proactive helps to progress sustainability. “We are in the very fortunate position of having a sort of formal acknowledgement of its importance. So we sort of, those ideas go right into the ears of those who make the best supporting decisions”.

Regarding top-level management, Beta stated:

> *their influence across the organisation can be a champion for us beyond what we can just do ourselves.. so if you've got high level champions on your side and assessing those projects, then all the better… if we, if you run into difficulties, or there's parts of the organisation that are putting up roadblocks…that...helps kind of remove some of those roadblocks*.

Decision-Making Structure

The processes involved in creating sustainability ideas and implementing these varied among participants. Alpha described some decisions as “devolved” and “diffuse” and at times complicated as some decisions involved multiple heads of schools and pro-vice-chancellors. Delta similarly described several schools developing their own sustainability committees or taskforces to develop objectives and stated that implementation was “across many different operations...that’s more than one team can cover”. Beta described how the implementation of sustainability was managed as “pretty loosely” and, with smaller scale projects as “ad hoc and it evolves as it goes”, which sometimes becomes a challenge. An “ad hoc” approach was also highlighted by Zeta who further described distributed leadership as “just very keen people”. This opinion was shared by Beta who regarded individuals as being driven by their “personal commitments…value set”. However, Epsilon stated, "up until now, one of the nicer things about having a fairly loose strategy is the people who are really engaged and motivated to do things”.

The challenges participants encountered with the structure of the organisational decision-making processes were emphasised. Delta pointed to “long bureaucratic processes… and quite a lot of ambiguity in those bureaucratic processes” to which Epsilon added that organisations lack the skills to have appropriate conversations and pointed out “I think a lot of that has got to do with the structure of bureaucracy”. Epsilon further explained that traditionally there had been too many males in positions of power and that there were benefits to working with women as it is “so refreshing to have people who are emotionally literate and open in those ways of being able to talk as a whole person and not just as a rational mind”. Zeta, while referring to the size of their TEO, described that in “large organisations…everything takes forever”, and Eta drew comparisons between their TEO structure and other corporations they had worked for, stating that they are “so different…the structure…it's not as defined and clear…You know, you knew exactly who was responsible for what”.

Building Sustainability Skills

Several participants highlighted the need for individual capability and capacity to implement projects. Eta referred to the importance of education on using sustainability-driven technology correctly to ensure it remains sustainable. Theta touched on the role of TEOs in training people to use sustainable technologies. Eta’s belief was supported by Gamma’s observation that people required training and “support in knowing that they can build those capabilities”.

Alpha and Epsilon emphasised the organisational sustainability skills needed, and other participants highlighted the need for the recruitment of staff with the requisite skills. Alpha noted the importance of having ways to "acquire people or develop people's skills*",* which Theta pointed out must be included in the recruitment policy stating, "our leaders, our managers, or directors, the high-up level management that is being hired…They need to embed sustainability into decision-making every day".

Some participants highlighted that staff needed more support to understand the relevance of sustainability across the TEO. Epsilon discussed the potential for a lack of clarity regarding the relevance of sustainability across programmes and the issue of diverging interests which Zeta also considered a challenge.

5.2.4. Theme 4: Resourcing Sustainability

Financial Considerations

Participants emphasised the importance of resourcing sustainability, particularly the substantial reliance sustainability has on financial resources. Eta described the need to justify "value for money" to get sustainability initiatives implemented. Gamma asserted that finance is a key barrier which Alpha highlighted was an overall constraint of affordability for the TEO. Alpha also highlighted the financial impact of lower numbers of international students and the financial trade-offs in the decision-making process of allocating funding for sustainability initiatives. Beta and Theta highlighted their frequent involvement with the finance team. "People don't realize, [the] sustainability function has a lot to do with finance, constantly" (Theta).

Staffing

A number of participants highlighted the need for staff resources and time to implement sustainability. Zeta highlighted that a project was stopped due to a lack of staff capacity to support it and Gamma also mentioned that, although funding may be available, implementing sustainability can be hindered by existing staff capacity. Beta compared a long list of things that could be done, which was more "than what we actually have capacity to deliver", while Delta emphasised the amount of work as being "more than one team can cover". Beta and Epsilon emphasised that a lack of staff resources contributed to the de-prioritisation of sustainability work, while Eta highlighted that their limited time made it challenging to address all potential sustainability opportunities.

the biggest constraint is the resourcing…I mean, my time is [part-time], it's not much. So I do have to prioritise what I do and even if there are some good ideas, like I cannot follow up all of them which is a bit annoying (Eta).

Decision-Making

Resourcing was emphasised by participants as a key consideration in decision-making on what sustainability initiatives to implement and in identifying where there are opportunities to progress sustainability. Gamma emphasised the cost and budget when assessing potential sustainability ideas and Delta highlighted resourcing availability. Zeta and Beta mentioned that a decision on whether a sustainability initiative continued to be viable was based on available resources with Zeta stating, "is the amount of resource that we're putting into the scheme worth the impact that we make from the scheme".

Processes

Some participants focussed on the processes involved in securing financial resources. Zeta explained the necessity to "bid for money to get stuff done", and Beta stated that securing funding for more extensive projects required you "to build up a business case behind it…it's a competitive process". "Higher up senior leadership team is a bit more reserved…the pragmatic side kicks in, and, and they're like, whoa, whoa, alright, so what, who will have the budget? How are we gonna resource this?" was identified by Eta. Zeta described how receiving the resources needed can take years and explained that for one project it took three years from when the plan was written before, "I could get resourcing, for somebody to actually do it".

5.2.5. Theme 5: Measuring Sustainability

Annual Reporting

Annual reporting was emphasised as a key sustainability performance measurement. Beta referred to the report as providing the previous year's successes and challenges, which Gamma highlighted helped to understand how effective their TEO was in moving toward their sustainability targets. Comparably, Delta stated that one aspect they had "not done a good job of, is annual reporting, on the wider sustainability work", however, like Alpha, they were consulting widely to identify specific aspects stakeholders would like to hear about.

Several participants spoke of the difficulty in measuring the impact of specific sustainability initiatives. Beta, Gamma, and Zeta described the difficulty in quantifying the

impact of behaviour change initiatives and reporting on these. Zeta mentioned that these change programme outputs were excellent and "powerful…But it's when you measure it and report on that doesn't look good". Some participants spoke of assessing performance by identifying appropriate key performance indicators (KPIs). Beta referred to assessing performance as a "pick and choose what your best metric is" and the necessity of KPIs to achieve some accountability. Eta commented that they lacked clear key measures and targets but that these were currently in development.

Assessment Tools

Some participants highlighted the Times Higher Education impact rankings as another means of measurement. Beta highlighted the visibility of the THE impact rankings favoured by senior leadership "as you know, big wigs at the university, they tend to like getting involved in ranking exercises", and Gamma mentioned how it was good to see the improvements made. Delta described the expectations of universities to manage their impact on sustainability and the implications of not doing so, "So if we are not doing that, things like the Times Higher Education impact rankings, then we stopped being a preferred place to study". Alpha, Beta, and Delta described certification programmes as another assessment tool for implementing a sustainability building project. These included the Living Building Challenge and the New Zealand Green Building Council. Delta and Theta discussed the importance of risk management tools to demonstrate how sustainability research and activities can bring value and opportunity.

5.2.6. Theme 6: External Impacts on Sustainability

The Legislative and Government Impact

Several participants emphasised the dual impact of the legislative environment and the government's impact on sustainability and discussed anticipating changes. Zeta and Delta referred to legislative changes as drivers, which Zeta described as "listening to government signals" and TEOs being "strongly encouraged to fall in line…with the government's carbon neutral programme". Delta emphasised "the financial risk and reputational risk" of anticipated legislative changes as a driver and Epsilon described the "huge challenge" that the reform of vocational education (RoVE) legislation provided "across the board". Zeta illustrated the historical shift in government legislation during his more than a decade in the sustainability team:

there had been some languaging and…legislation that indicated that the government wanted universities…to adopt sustainability, sustainable practices, then, you know, with that national government that was in for a really long time, all of that dropped away…It's actually quite hard to justify expenditure for green projects, if there isn't that kind of driver coming that legislative driver, and now that's really come back with full force…there's been a complete change in thinking.

Theta emphasised the importance of TEOs achieving New Zealand's sustainability aspirations and the need to prepare the workforce for these changes. Alpha highlighted that more investment in research would help:

The primary barrier is limited investment by companies and by the government in research, which New Zealand's investment in research is about 1.3% of GDP, which is about half of the average for the OECD countries. Therefore, we spend less on research than we probably should.

The COVID Impact

Participants highlighted the continued challenges and impacts that the COVID pandemic had on sustainability within their respective TEOs. Zeta described operations as a result of COVID, saying, "it's been...messy…that's kind of why...we're not…fully up to speed", and Delta expressed the difficulty of implementing ideas stating, "In the last two years…there's been some really good ideas....and they've fallen by the wayside, mainly because of COVID". Gamma further described how COVID "played a big part...what we've been able to do and what we haven't".

Some participants described the resourcing implications. Alpha referred to financial constraints due to the lower number of international students. Beta stated that their TEO implemented a "hiring freeze as a money saving thing through COVID crisis times" and further illustrated the impact on staff and the challenge of having sustainability resourcing re-directed to the TEO's core business.

so the amount of time that they have, to, kind of, allocate to, things that aren't either emergent, reactive, emergency kind of stuff, the firefighting things that you have to just attend to straightaway. Or things that aren't just the core business of trying to just deliver you know the basic teaching and research in the university (Beta).

However, Alpha emphasised that COVID provided the opportunity for improvement in the decision-making approach to, and the way people perceived, sustainability, and described moving away from, “leaving it the way that it was pre COVID”.

The Sustainable Development Goals

The impact of the United Nations (UN) Sustainable Development Goals (SDGs) was consistently referred to as one of the drivers in the TES for TEOs and individuals. Theta discussed the SDGs as a “common goal”. Zeta stated that the SDGs were incorporated into their TEO’s strategy and that “the idea is to make sure…the Sustainable Development Goals are woven throughout the curriculum”. SDGs were also referenced as a key consideration by Beta who stated that they monitor and assess the number of SDG research publications produced by their TEO. Epsilon and Delta discussed the wide scope of sustainability, which they noted was accelerated by the SDG approach. Delta stated they refer to the SDGs as a means to support people in identifying whether they are “having a sustainability related conversation” and as a way “to find their own meaning of sustainability”.

5.3. Discussion of the Case Study Findings

The approaches, processes, and tools to innovate TEO BMs for sustainability varied across the TES. The six themes identified in the findings highlight the various elements that influence how TEOs innovate their BMs toward sustainability. The interpretation of these themes developed from the interviewees and secondary sources used for this case study on the TES are discussed in this section. These themes are dynamic as the TES faces constant change and innovating for sustainability continues to develop.

The analysis of the TES in relation to SBMI, as outlined in section 2.3, highlights several factors that influence how TEOs innovate for sustainability. Significant changes within the sector are shaping the way sustainability is embedded into the core of TEOs’ BMs. Some of these changes include the transition for Institutes of Technology and Polytechnics (ITP) to Te Pūkenga resulting from the RoVE, legislative and regulatory changes, government goals, the emergence of new tertiary models which are needed in response to changing market conditions, and increased demand for more support and skills training in response to these changes. These factors are further discussed in each of the themes in this section.

This section concludes by discussing how the results of this study support answering the research question regarding how to accelerate the SBMI concept by identifying the influencing factors that shape the ideation and implementation of SBMI and how to bridge the ideation-implementation gap.

5.3.1. Theme 1: Existing Knowledge and Awareness

Broadening and Diverse Understandings of Sustainability

Participant responses and secondary data emphasised the broadening scope of sustainability, specifically the increasing plethora of dimensions the concept encompasses. The diversity of participants' responses regarding the various aspects of sustainability was also reflected in their respective TEO websites and sustainability publications. This study highlights diverse and divergent understandings and interests that suggest that these conditions influence the approaches to sustainability innovation across the sector and emphasise the complexity of managing multiple stakeholder interests. Bocken et al. (2020) and Bitzer et al. (2020) describe these complexities associated with managing multiple stakeholders and potential issues resulting from diverging interests and differing values that influence stakeholders' preparedness to cooperate. However, diverse input and multiple perspectives can effectuate the creativity needed to innovate the BM for sustainability (Gregori & Holzmann, 2020). The diversity of understanding of what sustainability is highlights that this understanding is subjective, which potentially provides an additional layer of complexity in the management of multiple stakeholders.

External influences, discussed later in this section, were mentioned by participants as key factors that have shaped sustainability discourse which is further demonstrated by sustainability reporting across the sector. Specifically, legislation and government policy, such as the government's carbon neutral programme (Ministry for the Environment, 2021) and commitment to the SDGs (Education New Zealand, 2021) which to a significant degree together underpin sustainability planning, have influenced the sector's sustainability priorities and practices.

Innovation Thrives in a Sustainability-Oriented Culture and from Individuals' Values

Cultural dimensions are emphasised by the findings as key drivers for sustainability progress. Participants described the organisational culture and individuals' sustainability-

oriented personal value-sets as underlying motivators that drive the implementation of sustainability. However, feedback suggests that more support is needed to build these cultural competencies (Ministry of Education, 2021). The results of this study elicited three sentiments regarding the conditions that facilitate the success of implementing sustainability: (a) when sustainability is embedded into the culture there are fewer barriers to innovate, (b) individuals' personal value-sets act as motivators and are fundamental for long-term success, and (c) organisational culture and individual value-sets are interdependent.

Organisational cultural factors are held in extant Dynamic Capabilities Theory (DCT) literature (section 2.2.2) as major influencers that impact organisations' capabilities. For example, to seize; mobilise organisational resources in response to opportunities and threats (Pisano et al., 1997) and to *transform;* reconfigure the organisation to improve the value proposition for stakeholders (Durão, et al., 2022) which Pisano et al. (1997) stresses is critical when changes to the BM significantly impact on the organisations' design.

Teece (2007) also highlights the interrelationships between the three high-order capabilities, whereby all three capabilities likely do not exist in an individual senior manager and argues the need for a team effort supported by the chief executive. The results of this study suggest that the skills needed for these DCs have been, to a degree, fostered through distributed sustainability leadership and found in sustainability-oriented individuals who have innovated for sustainability purposes on their own accord and are seemingly not always in positions of top-level management. Furthermore, the results suggest that personal value sets are interdependent with the organisational culture. These findings suggest that a sustainability-oriented organisational culture can foster more sustainability-oriented individual value sets, consequently facilitating sustainability innovation.

5.3.2. Theme 2: Innovating Toward Sustainability

TEO Structure Compatible with Innovating for Sustainability

The results of this study emphasise that TEOs have high expectations based on their perceived role, responsibility, and purpose in society of advancing knowledge and educating society to meet the needs of a rapidly developing future workforce and contributing to the sustainability agenda. As highlighted in the PESTELE analysis (section 2.3.1), TEOs play a pivotal role in New Zealand's transformation towards sustainability (Baker-Shelley et al., 2017; Fitcher & Tiemann, 2018). The sector creates access to opportunities and improves

society by developing a skilled workforce, increasing productivity, creativity, and innovation (New Zealand Productivity Commission, 2017; Price Waterhouse Coopers, 2020).

A government inquiry into the models of tertiary education suggested a considerable level of inertia exists in the tertiary system rather than being a characteristic of TEOs (NZ Productivity Commission, 2017). This inertia has been attributed to TEOs reluctance to shift from traditional models and regulatory requirements and funding rules. Hansen et al. (2021) argue that incumbent businesses are only reactive to sustainability products and services when new entrants change the market. Albareda et al. (2018) elaborate on this sentiment of incumbent organisational inertia. However, the results of this study suggest that TEOs' role in society and core business structure makes them more able and better placed to innovate for sustainability compared to the private sector. This may provide the foundational support for the DCs of sensing, seizing, and transforming, as described in section 2.2.2. However, the organisational structure must be built to support the capabilities to identify new opportunities, including mobilising resources and having effective processes in place to drive innovation (Batocchio et al., 2021, Teece, 2007).

An underlying sentiment shared by participants, and supported by secondary data, is that it is within the best interests of TEOs to proactively innovate for sustainability to mitigate the considerable associated risks of not doing so, such as the financial, reputational, and missed opportunities for improvement that impact future viability. The results suggest that TEOs face more short-term and long-term risks if they do not meet the increasing demands and expectations of their stakeholders related to sustainability.

Innovating The TEOs' Business Models for Sustainability is Underpinned by Evolving Strategic Sustainability Frameworks, Planning, and Policies

All participants described multidisciplinary and multi-faceted approaches to innovating their BMs for sustainability. Several participants described various business aspects and processes as a means of innovating the BM for sustainability, while others described the activities and priorities. The variation of approaches was also evident in each TEOs differing sustainability strategies, planning, frameworks, and policy documents. Only a few ITP have publicly available sustainability documentation, and these together with that of the universities tended to focus on five to six high-level key areas. The first two priorities were a variation of teaching, learning, education, and research. The diverse examples of approaches and priorities support the results of this study that suggests SBMI is happening to varying degrees across the

sector. Chofreh et al. (2020) proposed three components of SBMI as described in the features in section 3.4.1. An example of the first component, Sustainable Value Proposition Innovation, is demonstrated across the sector in TEOs inclusion of sustainability-related courses in their curricula, thereby creating sustainability practitioners and long-term relationships with its students and society.

It is clear from university sustainability reports that their frameworks have been aligned to the SDGs to varying degrees, however, ITP documentation is not so definitive though participants in this study did mention how their framework objectives take into consideration the SDGs. However, Te Pūkenga's Sustainability Stocktake Report (Yaeghoobi, 2022) indicates that SDGs have been used to varying degrees across their ITP network and stated the desire that these be included in their upcoming national framework.

Some participants highlighted the influence of sustainability frameworks on staff, specifically on their motivation to adopt these frameworks. Several participants described how they might be seen as additional compliance work. Interestingly one participant, with reference to the changes in the RoVE, highlighted that up until these changes there had been benefits of a looser strategy, describing how in essence it acted as a better means to motivate individuals compared with a national framework. Similarly, this sentiment of being more or less centrally dictated to was shared by some university participants who described the associated impact on staff motivation, of the expectation to implement sustainability. The results of this study suggest that this centralised approach potentially reduces the meaning and relevance of sustainability for staff who might come to regard it as just another compliance task. Secondary data supports this in finding that excessive management impacts tertiary staff's ability to do meaningful work (NZ Productivity Commission, 2017) and innovation is not motivated by TEO policy and expectations (Averill & Major, 2020)

The results of this study suggest that TEOs framework, planning, and policy documentation dictate how they innovate their BM for sustainability. Bocken et al. (2014) proposed eight SBM archetypes developed depending on the type of innovation; social, organisational, or technological. For example, The University of Waikato (2021), in collaboration with researchers from five other New Zealand universities, and several national and international organisations have been funded by the Ministry of Business, Innovation, and Employment to research a circular economy for Aotearoa New Zealand. This is one of the eight archetypes; create value from waste archetype, of which a circular sustainable business model is an example. Creating value from waste is also evident in the reporting of waste in TEOs'

sustainability reports across the sector and in the focus on operations emphasised in their sustainability plans.

The focus on engagement, specifically collaboration with other organisations and stakeholders at local, regional, national, and global levels is also highlighted across the sector and evident in TEOs sustainability frameworks, planning and policies. The DC of sensing can be improved by collaborating with other stakeholders to increase learning, mitigate threats, and increase opportunities to innovate the BM for sustainability (Baldassare et al., 2019, Bengtsson et al., 2021, Lozano, 2018, Henriques et al., 2020). Secondary data suggests that, despite some participants expressing hesitancy in their understanding of the BM concept and its relevance and association of it with the tertiary sector, SBMI is relevant and a means to enhance sustainability innovation.

Flexible Frameworks Developed for Regional Needs which are Locally Driven are Important

Several participants emphasised the need for flexible frameworks. Some talked about their responsibility to local communities and how frameworks needed to be regionally focussed. Other participants felt it was essential to include local stakeholders to support the development of appropriate and meaningful goals. Central to the RoVE, the establishment of Te Pūkenga and the importance of accountability both regionally and locally is emphasised in the Controller and Auditor-General report (2022) and highlighted in Te Pūkenga's Sustainability Stocktake Report (Yaeghoobi, 2022) as being important as different regions face different challenges and have multiple stakeholders with different needs. Regional differences were found to be important by Barth et al. (2021) who identified the influence of national geographic differences and correlated the level of innovation needs in response to economic, environmental, and organisational challenges which influences the prioritisation of certain archetypes over others. Similarly, according to Gao and Li (2020), sustainability achievements depend on innovating the SBM to adapt to the local environment. They drew contrasts between different political and legal factors that influence innovation.

Technological Solutions are Evolving and Sought-After but Require More Resourcing

Participants described different types and uses of technologies. Some participants described the opportunities technologies provided to support sustainability innovation as does secondary data as described in sections 2.3.1 and 3.3.2. Other participants described how

technologies were used varyingly for planning, monitoring progress, and mitigating the risks of investing in other technologies. The results of this study suggest that the use of technologies has supported the innovation process to varying degrees. According to Teece (2018), seizing involves this investment in technology. However, several participants highlighted a lack of staff and financial resources needed to leverage the potential of these technologies.

Several participants described varying levels of confidence and capabilities in using technologies. These capabilities are emphasised by Palmie et al. (2021), who argue that organisations have inadequate capabilities to assimilate technological capabilities into their BMs. These technological capabilities impact the design and implementation of technological solutions (Batocchio et al., 2021; Teece, 2007). The results of this study suggest that TEOs require more resourcing and support to leverage technology solutions to support sustainability progress.

5.3.3. Theme 3: Organisational Structure and Leadership

Top-Level Management Support is Fundamental for Sustainability Innovation Success

All participants referenced top-level senior management support as important throughout the innovation process. Specifically, having staff appointed to sustainability positions and staff knowledgeable about sustainability at this level helped to progress sustainability initiatives and overcome potential barriers. The results of this study identified that this: (a) acknowledges the importance of sustainability, (b) increases the likelihood of sustainability initiatives being prioritised and implemented, and (c) breaks down barriers accelerating the processes involved in implementing sustainability innovations. Underlying these sentiments was an inference that transparency and increased investment in sustainability are two key considerations in achieving the implementation of effective and long-term sustainability solutions. The management team is one of several factors that influence the organisation's DC of sensing, and the team's strategic orientation influences the direction of managerial focus, efforts, and influences the configuration of innovating the BM for sustainability (Batocchio et al., 2021, Teece, 2007). Innovating the BM for sustainability can support top-level management in better understanding the sustainability value propositions of

their organisation and leverage this knowledge to sense opportunities (Chofreh et al., 2020; Csik et al., 2014; Vladimirova, 2019).

Secondary data from across the sector highlights that the appointment of Deputy, Pro and Assistant Vice-Chancellors of Sustainability seemingly formalises and acknowledges the importance of sustainability. Several participants expressed that these individuals had been very helpful in implementing and expediting the process. Some participants emphasised that being in close proximity to, and having access at, this level of management helped with progressing decision-making. Packard's (2010) research highlighted that a significant barrier in the tertiary sector was a lack of support from top-level management, specifically the Chief Executive and Vice-Chancellors. The results of this study suggest that the appointment and formalisation of these roles at this level have helped, and support at this level has improved at some of the TEOs.

Transparent and Simple Decision-making Processes are Essential

All participants described decision-making processes, specifically the widely distributed approaches and multi-disciplinary contributions. Some described the complexity of several layers of management involved in the associated processes. This complexity is highlighted in existing literature regarding multiple stakeholder management, which is held to be time-consuming, and the more complex a sustainability challenge the more resourcing that is needed (Barlow et al., 2017; Barth et al., 2021; Evans et al., 2018). Batocchio et al. (2021) and Franco et al. (2022) suggest that complex structures impact the DC of sensing, therefore the capability to explore new sustainability opportunities is impacted by the organisation's structure. The results of this study reflect the magnitude of work involved in the management of sustainability which has the potential to become unmanageable without transparent and simple processes.

Several participants described the challenge of the decision-making processes, which the findings suggest are largely attributed to a bureaucratic structure. It is suggested that bureaucracy in the tertiary sector has led to a waste of resources and is a barrier to effecting changes and to innovating (NZ Productivity Commission, 2017). This issue with bureaucracy was highlighted by several participants as making processes longer and giving rise to issues of ambiguity. Averill and Major (2020) research found that institutional processes and structures impacted tertiary staff motivation to be innovative. Institutional structures were held to stifle TEOs' agility which is needed for innovation and to rebuild the tertiary sector post the COVID-19 pandemic (PWC, 2020). More complex structures impact management's DC of sensing

(Batocchio et al., 2021; Franco et al., 2022). Cortimiglia et al. (2022) suggest that management dedication to sustainability innovation requires effective governance processes.

A lack of diversity was highlighted as a potential contributing factor to this issue of bureaucracy, with it being suggested that more females in top-level management positions involved in decision-making may help. The need for more ethnic diversity in the sector was also highlighted as a potential motivator for success (NZ Productivity Commission, 2017). The acknowledgement of diversity as an underpinning value and indigenous knowledge and practices as a means to support sustainability is evident in some of the TEOs sustainability planning, strategies, and policies, and TEOs are guided in this regard by the learner success framework (TEC, 2022). Similarly, equity issues are emphasised in the tertiary education strategy objectives (MoE, 2020) though ethnic diversity among the teaching profession does not reflect the student population (MoE, 2021). The results of this study suggest that more diversity in terms of gender and ethnicity in top-level management could improve sustainability innovation decision-making and processes.

Investment in, and Consistent Building of, Sustainability Skills and Competence is Necessary

The results of this study demonstrate a need to develop sustainability skills. Several participants highlighted the need to support existing staff to upskill and some participants highlighted the importance of recruiting staff skilled in sustainability. This was also supported by Williams (2008) research which recommended investing in professional development and recruiting appropriate sustainability leaders. Strategic human resources management, for example, hiring and assigning appropriately skilled individuals, and capability building, such as creating new capabilities and training employees and other stakeholders, are key to the DC of transforming. This transforming involves reconfiguring the organisation to realise sustainability opportunities and the constant renewal of the organisation's capabilities, both of which are needed to implement sustainability into the BM and to enable sustainability value creation and delivery (Batocchio et al., 2021; Cortimiglia, 2022; Pisano et al., 1997; Teece, 2018).

Some participants highlighted a key issue of managing diverging interests, specifically providing clarity on the relevance of sustainability across multiple stakeholders. Multi-stakeholder complexities, which include diverging interests and understandings of sustainability value, within TEOs with pre-existing processes can hinder staff members'

readiness to cooperate and enable innovation (Barlow et al., 2017; Bocken et al., 2020; Bitzer, 2020). The results of this study suggest that investment in sustainability training will support individuals to draw sustainability meaning and relevance to their work, and improve commitment to, and encourage more, sustainability-driven innovations.

5.3.4. Theme 4: Resourcing Sustainability

Sustainability Innovation Relies on Sufficient Financial and Staffing Resourcing

While all participants discussed the amount of resourcing needed to implement their sustainability initiatives at their respective TEO, the results of this study suggest that the progression of sustainability innovation relies heavily on two specific resources: financial and staff resources. The DC of seizing; mobilizing resources to address threats and opportunities and generate economic benefits, requires sufficient quality resources, and influences the DC of transforming; leveraging the resources needed to design and implement SBMs (Batocchio et al., 2021; Franco et al., 2022; Hart & Dowell, 2011; Teece, 2018). As discussed in section 3.4.1, the second component of SBMI, Sustainable Value Creation and Delivery Innovation, involves the key activities of the organisation which includes the management of resources (Chofreh et al., 2020). As expressed by some participants, funding availability has been further constrained by the pandemic. The impact of the pandemic and these issues of resourcing are also evident in secondary data. They are further discussed in section 2.3.1, and later in this section pertaining to external impacts. For example, the government's response to the pandemic, consequential lower international student numbers, and the resulting additional cost-saving practices initiated throughout the sector, impacted both the financial and staffing resources available and required to innovate for sustainability.

This study's results highlight that finance and staffing resourcing are interdependent. While financial resources might be available, the staff capacity and availability required for innovating the BM for sustainability might not be. According to several participants, potential opportunities and ideas are not addressed or followed up, and initiatives stopped or are not implemented due to a lack of staff capacity, capability, or availability.

Obtaining the Resources Needed is a Demanding Process

All participants emphasised the amount of time involved in receiving the resources needed, specifically the need to justify the value of their sustainability innovation. Secondary research emphasises the challenges of allocating funding to sustainability research (Williams,

2008), the competitive nature of government-led funding mechanisms and processes for TEOs (NZ Productivity Commission, 2017), and the problem of TEOs competing for an increasingly limited student pool (PWC, 2020). As highlighted by several participants, processes involved in obtaining resources and the time taken to allocate them delayed the progression of innovations, in some cases, by years. The results of this study suggest that the competitive nature of resourcing, changing financial and staffing constraints among TEOs across the sector, and rapidly developing market conditions, result in trade-offs in the decision-making process involved in the allocation of resourcing for sustainability innovations.

In the absence of adequate resourcing, the TEOs' sustainability teams could find it difficult to achieve the TEOs' sustainability goals and meet the expectations of both internal and external stakeholders. Consequently, this may impact the TEOs' reputation and financial positions and result in a decrease in their future prosperity in an increasingly competitive and sustainability-focused environment.

5.3.5. Theme 5: Measuring Sustainability

Communicating Sustainability Progress is Challenging

The importance of reporting sustainability progress was identified by all participants, essentially as a tool and means to monitor progress, ensure accountability, and communicate this to their stakeholders. The use of an annual sustainability report was mentioned by several participants, which is also accessible on each university TEO website. Each report is seemingly tailored to their respective overall strategy, sustainability strategies or planning key focus areas and priorities, as discussed in this section's Theme 2. They are also underpinned by the SDG framework, varying performance indicator frameworks and Key Performance Indicators (KPIs). In contrast with universities, ITP have reportedly been inconsistent with their reporting and disclosure (Yaeghoobi, 2022). This is evident by how few ITP have sustainability web pages and related publications highlighting their achievements. Others have briefly mentioned sustainability in their annual reports and acknowledge developing such reports. Elkington (2018) suggests that an abundance of measurement methods can lead to inertia and has minimised the essence of the triple bottom line. As highlighted by some participants and evident in the reports across the sector, the results suggest that reporting is still in its infancy and is predominantly narrative, and that benchmark data and tools used to measure

sustainability are still in development. There also remains inconsistency among the sector on how best to report on sustainability achievements.

Several participants highlighted the reporting challenges of quantifying sustainability. This is similar to existing literature suggesting that measuring the economic gain and tangible and intangible benefits of implementing sustainability is difficult (Barth et al., 2021; Chofreh et al., 2020; Geissdoerfer, 2019; Gregori & Holzmann, 2020). An underlying desire from participants to convey meaningful results while balancing the expectations of stakeholders was evident. For example, several participants' responses alluded to top-level management and other stakeholders having a fondness for the impact of numbers and larger events over the often smaller projects that some participants described as behaviour-related projects the outcomes of which were hard to measure. The results of this study suggest that not all sustainability progress can be quantified and that the influence of stakeholders, like top-level management and their preferences, may result in skewed reporting and impact the direction of sustainability innovations. Consequently, these conditions are fertile grounds for potential degrees of sustainability washing.

External Assessment Tools Support Progress and Accountability

All participants highlighted using external sustainability assessment measurement tools and certification processes to measure progress and convey the value and opportunities from investment in sustainability. Extant research suggests that certification systems can facilitate the organisation’s adopted approach to innovation (Aldowaish et al., 2022; Gunaratne et al., 2021). Franco et al. (2020) and Winter (2003) highlighted that organisations are more likely to invest in developing DCs when the financial benefits of changing and reconfiguring exceed maintenance costs.

The influence of international sustainability rankings was mentioned by all university participants, specifically how they influenced stakeholders' perceptions of their TEO. Overall, each university TEO publicises the various rankings that they have in comparison with global universities. Secondary data highlights that students globally are factoring these sustainability considerations into deciding which university they invest in (Education New Zealand, 2021). According to Teece (2018), planning and monitoring the market for changes, such as these societal pressures, are key components of the DC of sensing. Assessment tools can convert pressing sustainability challenges into opportunities and meet the unmet needs of a broader range of stakeholders (Teece, 2020). The results of this study suggest that increased demand

from stakeholders coupled with increased measurement of sustainability may act as an incentive for TEOs to invest in developing their DCs to sense, seize, and transform in response to sustainability opportunities and encourage more sustainability innovation.

5.3.6. Theme 6: External Impacts on Sustainability

Legislation and Government Shape Sustainability Innovation

All participants discussed legislation and government directives, their impacts on resourcing and the need for compliance. Several participants expressed the need to anticipate changes. Responding to change is consistent with the DC of sensing*;* planning for and monitoring changes like regulatory changes. This DC influences the future viability of TEOs which need to sense opportunities in the social and environmental challenges they face to meet the needs of stakeholders and respond to an everchanging environment (Teece, 2018).

As discussed in the political and economic factors in section 2.3.1, government goals influence TEO sustainability innovations which is evident from the sustainability publications across the sector and highlighted by several participants' responses. For example, the associated goals and calculation of carbon emissions is a key TEO measurement aligned with the government's transition to a net-zero economy (MfE, 2021). Increased regulatory reporting can provide opportunities and incentivise TEOs to innovate their BMs for sustainability (Abdelkafi et al., 2022). The DC of sensing can be improved by the value of network relationships which increase knowledge configuration and opportunities (Batocchio et al., 2021; Fobbe & Hilletofth, 2021), and by cross-sectoral collaboration with government organisations which is essential to mitigate threats and facilitate SBMI (Baldassare et al., 2019; Bengtsson et al., 2021; Lozano, 2018; Henriques et al., 2020). The results of this study suggest that legislation and government goals influence the direction of the sector's sustainability innovation activities.

Some secondary data suggest government regulation may impede TEOs ability to innovate, as they are faced with increased costs and experimentation and innovation constraints that potentially encumber their ability to attend to current and prospective student interests (NZ Productivity Commission, 2017). Regulations and rules appear to place continued pressure and expectations on leadership and governance to ensure they remain compliant and able to manage potential compliance risks (Deloitte, n.d.). Although the RoVE is depicted across media as an opportunity to deliver more value for students and industry, address the learning needs of

historically under-served demographics, and support innovation, collaboration and sustainability across regions (Controller and Auditor-General, 2022; TEC, 2022), some participants suggested that these changes may delay the current sustainability innovation progress across the ITP, as mentioned by Epsilon and may take considerable time, as highlighted by Theta.

Similarly, several university participants suggested that sustainability progress is impacted by political willingness and investment. However, as discussed in section 2.3.1, aligned with the Tertiary Education Strategy, TEOs are obligated to demonstrate their contributions to achieve priorities which include sustainability considerations (MoE, 2020), which can incentivise TEOs to mitigate future risks, compliance costs, and invest in sustainability innovations. The results of this study suggest that regulation can incentivise TEOs to innovate their BMs for sustainability and the DCs to sense, seize and transform (section 2.2.2) are greatly influenced by legislation and the government.

Market Conditions Disrupt and Drive Innovation

Interviewees noted that the disruption of the COVID-19 pandemic affected sustainability innovation targets, predominantly for operations, and also the environmental footprints across the sector which is evident in TEOs sustainability frameworks and planning. However, this drove TEOs to build contingency plans for continuing sustainability initiatives. Some participants' responses alluded to the pandemic as an opportunity to pivot toward more sustainability favourable decision-making. As discussed in section 2.2.3, DCs inform management decision-making and actions in reconfiguring the organization to adapt to changing market conditions which can engender competitive advantages (AlQershi et al., 2022; Bocken & Geradts, 2020; Chofreh et al., 2020; Teece, 2018). The pandemic also put pressure on TEOs to reconfigure the way they delivered their services (CAG, 2022). Interviewees identified that stakeholders' expectations and demands have changed; for example, students expect more flexibility, there is an increased demand for in-work training, and the amount of learning required for certain industries has changed (PWC, 2020). The DC capabilities of sensing these types of changes by identifying, planning for, and monitoring them, seizing opportunities from these changes and transforming as a result of these changes to improve the value proposition for stakeholders are further described in section 2.2.2. The results of this study suggest that market conditions can force TEOs to build resilience into their BMs and drive innovation.

Several participants associated the COVID-19 impact with resource constraints, essentially limiting sustainability progress. These resource constraints are also discussed in the analysis of the TES' economic factors (refer to section 2.3.1), highlighting the potential long-term impacts of revenue loss and budget deficits and the consequent cost-saving activities that impact staff capacity and influence sustainability investment. Staff stress resulting from increased workloads and financial constraints as evident from deficits across the TES was reported in 2020 and is ongoing (CAG, 2022; Deloitte, n.d.; Te Pūkenga, 2021). These findings suggest that market conditions can disrupt the organisation's capability to innovate the BM for sustainability.

The Sustainable Development Goals Promote a Collective Goal for Innovation

The government's commitment to achieving the SDGs and voluntary reporting influences the TES (MFAT, 2019). University TEOs sustainability publications suggest a focus on the SDGs as an underpinning framework to innovate their BMs for sustainability and are interwoven throughout their frameworks, planning, and policies. In contrast, across Te Pūkenga ITP network, six have incorporated the SDGs to varying degrees, for example, in policies, strategic objectives, planning, frameworks and teaching (Yaeghoobi, 2022). Across the sector the SDGs are evident to varying degrees in TEOs teaching, learning, research, and engagement which is supported by several participants' responses. The results of this study suggest that the SDGs are drivers toward (a) increasing sustainability discourse, (b) innovating existing services and (c) measuring and communicating sustainability progress. As discussed in section 2.2.2, the organisational processes in DCT create value which is fundamental to SBMI. Both DCT and SBMI can drive sustainability-centred innovations as they both operate and result from the need to innovate (Cortimiglia et al., 2022; Eisenhardt & Martin, 2000; Pisano et al., 1997).

5.3.7. Alignment with the Research Question

The analysis of the findings of this research is aligned with the research question:

RQ1: How can organisations, specifically TEOs, accelerate SBMI and bridge the gap between ideation and implementation?

The development of the nascent SBMI concept (as described in section 3.4) underpins the first part of the research question on how to accelerate SBMI and was approached by exploring aspects of the concept within the TES. Bridging the gap between the ideation of

SBMI and implementation of the concept was approached by exploring TEOs' sustainability strategies and activities, from participant responses and from secondary sources. The alignment of the research question with the findings and results of this study, as described in the six identified themes, is discussed in this section.

The analysis of existing knowledge and awareness identified two key considerations that influence SBMI:

- Broadening and diverse understandings of sustainability, and
- Innovation thrives in a sustainability-oriented culture and from individuals' values.

The increasing breadth and scope of sustainability reflect high levels of subjectivism and subsequent complexity in managing multiple stakeholders' ascribed meanings and relevance. This can make engagement with stakeholders to develop sustainable value propositions, capture their value, and implement SBMI challenging. The individuals' value sets act as motivators and supports innovation processes. However, organisational cultural elements can influence the capabilities needed to adapt the incumbent BM to effectuate SBMI.

An examination of innovating towards sustainability highlighted four conditions that effect the SBMI concept:

- TEO structure is compatible with innovating for sustainability,
- Innovating the TEOs' business models for sustainability is underpinned by evolving strategic, sustainability frameworks, planning, and policies,
- Flexible frameworks developed for regional needs which are locally driven are important, and
- Technological solutions are evolving and sought-after but require more resourcing.

A TEO's expectations, purpose, and business practices make them better placed to conceptualise and implement SBMI. The processes involved in innovating their BMs are centred on their frameworks, planning and policies that help to conceptualise their approaches to SBMI. Factors including motivation to adopt these frameworks and the directive to do so further influence SBMI progression. A regional and locally driven approach can influence the ideation and implementation of SBMI as can technological solutions that provide opportunities and can help facilitate SBMI.

Investigating the organisational structure and leadership theme emphasised three critical conditions that affect SBMI:

- Top-level management support is fundamental for sustainability innovation success,
- Transparent and simple decision-making processes are essential, and
- Investment in, and consistent building of, sustainability skills and competence is necessary.

These factors can help clarify the levels of support required at top-level management, the processes involved in facilitating SBMI, and the need for continued investment in skills that impact the strategy processes and effectiveness of SBMI.

The analysis of resourcing sustainability revealed two essential considerations that impact the components of SBMI:

- Sustainability innovation relies on sufficient financial and staffing resourcing, and
- Obtaining the resources needed is a demanding process.

Resourcing was defined as fundamental to implementing sustainability initiatives, and the processes involved highlighted the issues and reasons contributing to the ideation-implementation gap of SBMI.

The theme of measuring sustainability revealed two influencing factors on SBMI:

- Communicating sustainability progress is challenging, and
- External assessment tools support progress and accountability.

These two factors influence the ongoing management and embedding of SBMI as reporting and external assessment on TEO sustainability was a means to monitor and measure the progress of their sustainability innovations.

Interpretation of the external influences on sustainability ascertained three contributing factors that influence SBMI:

- Legislation and government shape sustainability innovation,
- Market conditions disrupt and drive innovation, and
- The sustainable development goals promote a collective goal for innovation.

These three factors shape and influence how SBMI can be leveraged and contribute to the ideation-implementation gap.

5.4. Summary

This chapter contains the analysis of the findings, aligns the analysis to the research question, and demonstrates that the analysis is consistent with a case study methodology. Eight participants were interviewed for this case study and secondary sources were used, including government and independent reports, theses, and sustainability reporting from each university and, where available, from the Te Pūkenga ITP network. The interview questions were designed to explore how to accelerate SBMI and how to bridge the gap between the ideation and implementation of the concept. The research question was approached by exploring aspects relating to SBMI within the TES with reference to TEOs' sustainability strategies, activities, and tools used to innovate their BM for sustainability, and from participant responses and secondary sources. All participants were employed within the New Zealand TES and involved in implementing sustainability at their respective TEOs. Six participants were from universities and two were from Te Pūkenga. Five of the sampled TEOs had more than 10,000 students, and six had more than 1,000 staff members.

Consistent with a case study methodology and thematic analysis, there were six phases of analysis: (a) data familiarisation, (b) initial coding, (c) searching for themes, (d) reviewing themes, (e) defining themes and (f) the final analysis, and reference was made to the relationship with extant literature and RQ1 (Braun & Clarke, 2006). Data collected was triangulated, contrasted, and compared following a comparative analysis. These analyses supported the overall general analysis and was used to identify emerging themes from the data. The six themes revealed from the results of this study summarise the contributing factors that influence SBMI in the TES: (1) existing knowledge and awareness, (2) innovating toward sustainability, (3) organisational structure and leadership, (4) resourcing sustainability, (5) measuring sustainability, and (6) external impacts on sustainability.

While embedding sustainability into the strategy of the TES and TEOs' BMs was reported to have steadily increased, the results of this study suggest that SBMI is happening at varying levels across the sector despite not always being identified as such, and that several influencing factors impact the ideation and implementation of SBMI. The interpretation and discussion of the six themes reveal several conditions, considerations, and influencing factors that affect the acceleration of SBMI and the bridging of the gap between ideation and implementation. These include, a broadening and diverse understanding of sustainability, culture and individual values, TEO structure, strategic frameworks, planning and policies,

locally driven development meeting regional needs, technological solutions, top-level management support, transparent and simple decision-making processes, investment in skills, sufficient resourcing and easily accessible resources, tools to communicate, monitor, and assess progress, legislation, government policies, market conditions, and SDGs.

Chapter 6 Recommendations and Conclusion, describes the relationship to previous research, provides conclusions to the findings, an analysis of the research process, and discusses research limitations and recommendations for future research.

Chapter 6. Recommendations and Conclusion

This chapter details the recommendations and conclusion of this exploratory case study. It also summarises the purpose of this study, discusses the implications for theory and practice, the limitations of this study, and concludes with recommendations for future research.

6.1. Purpose of the Research

The purpose of this qualitative case study was to explore the nascent and evolving research field of the Sustainable Business Model Innovation (SBMI) phenomenon.

This exploratory case study enabled an in-depth inquiry to address the research question:

RQ1: How can organisations, specifically TEOs, accelerate SBMI and bridge the gap between ideation and implementation?

This study aimed to extend current SBMI understandings and literature by exploring the concept within the Tertiary Education Sector (TES) and developing a theory to bridge the gap between the ideation and implementation of SBMI.

To accomplish the research aim involved four objectives:

OBJ1: To explore the challenges and advantages of applying the SBMI concept across the New Zealand TES,

OBJ2: To clarify the issues and reasons contributing to the ideation-implementation gap,

OBJ3: To assess TEOs' SBMI strategy processes and their effectiveness, and

OBJ4: To identify the tools and frameworks used to facilitate SBMI.

Chapter 2 discussed the theoretical constructs of SBMI, several of which underpin the concept. This study drew from the Dynamic Capabilities Theory (DCT) to frame the integration of innovating the BM for sustainability in the TES and explore the sustainability strategies and activities of Tertiary Education Organisations (TEOs). This chapter also examined the industry using PESTELE and Stakeholder analyses of the TES in relation to SBMI.

Chapter 3 examined extant SBMI literature. This chapter described five key themes identified through the literature review comprising: (a) antecedents of SBMI, (b) driving factors

for SBMI, (c) SBMI features and benefits, (d) adoption of SBMI, and (e) application of SBMI in New Zealand.

Chapter 4 outlined the research methodology. This included working within interpretive philosophical assumptions, an inductive approach to theory development, conducting qualitative research with an exploratory purpose, and using a case study methodology. A mono-method of data collection was used by gathering data from semi-structured interviews and triangulating with secondary sources. The TEOs were purposively chosen based on their sustainability progress. This study's findings and results were deduced from thematic and comparative data analyses.

Chapter 5 described the findings and results of this study. The results of this study were discussed as they related to the identified six themes: (1) existing knowledge and awareness, (2) innovating toward sustainability, (3) organisational structure and leadership, (4) resourcing sustainability, (5) measuring sustainability, and (6) external impacts on sustainability.

The development of the emerging SBMI concept is associated with the initial component of RQ1: *how to accelerate SBMI,* through exploring aspects of the concept in the TES. The second component of the question, *and bridge the gap between ideation and implementation* of SBMI, was explored through reference to TEOs' sustainability strategies and activities, from participant responses and secondary sources. The interpretation and discussion of the six themes revealed several considerations, conditions and factors that impact the acceleration of SBMI and bridging the ideation-implementation gap and that are aligned with the research objectives.

Theme 1 identified two considerations that influence SBMI:

- Broadening and diverse understandings of sustainability, and
- Innovation thrives in a sustainability-oriented culture and from individuals' values.

Theme 2 highlighted four considerations that effect SBMI:

- TEO structure is compatible with innovating for sustainability,
- Innovating the TEOs' business models for sustainability is underpinned by evolving strategic, sustainability frameworks, planning, and policies,
- Flexible frameworks developed for regional needs which are locally driven are important, and
- Technological solutions are evolving and sought-after but require more resourcing.

Theme 3 emphasised three conditions that affect SBMI:

- Top-level management support is fundamental for sustainability innovation success,
- Transparent and simple decision-making processes are essential, and
- Investment in, and consistent building of, sustainability skills and competence is necessary.

Theme 4 revealed two considerations that impact the components of SBMI:

- Sustainability innovation relies on sufficient financial and staffing resourcing, and
- Obtaining the resources needed is a demanding process.

Theme 5 distinguished two influencing factors on SBMI:

- Communicating sustainability progress is challenging, and
- External assessment tools support progress and accountability.

Theme 6 ascertained three contributing factors that influence SBMI:

- Legislation and government shape sustainability innovation,
- Market conditions disrupt and drive innovation, and
- The sustainable development goals promote a collective goal for innovation.

These themes were developed as a result of exploring the challenges and advantages of applying the SBMI concept to the TES, assessing the various sustainability innovation strategies and processes and their effectiveness, identifying the tools and frameworks used to facilitate aspects of SBMI, and helped to clarify potential issues and reasons associated with the ideation-implementation gap.

6.2. Implications for Theory and Research

This section presents the conclusions of this study's implications for DCT and SBMI.

6.2.1. Dynamic Capabilities Theory

The conclusion of this study identified similarities and differences with DCT. This study concludes that several considerations, conditions, and factors influence the development and strength of organisational and managerial capabilities, and the processes involved in

creating, refining, implementing, and transforming BMs. This study also concludes that broadening, diverse and divergent sustainability understanding and interests are contributing factors that can influence senior management strategic orientation and managerial focus. Consequently, this conclusion impacts the organisation's DC of sensing capability. Furthermore, this study concludes that the progression of sustainability innovation relies heavily on two specific resources: financial and staff resources. Therefore, this has an impact on the DC of seizing that requires sufficient quality resources and influences the DC of transforming of leveraging the resources needed to design and implement SBMs (Batocchio et al., 2021; Franco et al., 2022; Hart & Dowell, 2011; Teece, 2018). Based on the findings in relation to resourcing, it is concluded that interdependencies between the DCs are underpinned by resourcing. For example, Covid-19 created resourcing constraints, and although financial resources might be available, progress can depend on staff capacity and capabilities.

The importance of strategic human resources management was evident in this study therefore hiring and assigning appropriately skilled individuals is essential, and capability building, and training are key to the DC of transforming (Batocchio et al., 2021). Moreover, in relation to culture, the results conclude that organisational culture can drive and hinder an organisation's DCs. Similarly, based on the importance of organisational structure and the impact of complex structures this study concluded that there is a complexity of layers of management involved in decision-making and that the influence of bureaucracy and ambiguity impact the development of DCs, and that diversity at top-level management can potentially enhance DCs. Therefore, the results of this study conclude that more complex structures hinder these capabilities, that all structures must be conducive to supporting DCs and that having effective processes in place is needed to drive innovation (Batocchio et al., 2021, Teece, 2007).

This study concludes that flexibility is important as is incorporating regional needs with locally driven implementation. Micro-foundation DCs support effective managerial decision-making under uncertainty and includes expansion into new regions (Teece, 2007, 2017). Furthermore, with reference to the work of Teece (2007) that the three DC components are unlikely to be found in individual managers, this study concludes that these three skills have been fostered through distributed leadership and are found in sustainability-oriented individuals who have innovated for sustainability of their own volition but who are not always in managerial positions.

The results of this study conclude that legislation and government significantly impact the DCs to sense, seize and transform. Similarly, this study agreed with the current literature understanding that sensing can be improved by the value of network relationships which improves knowledge configuration and increases opportunities (Batocchio et al., 2021; Fobbe & Hilletofth, 2021). Additionally, this study concludes that cross-sectoral collaboration with government organisations can improve the mitigation of threats, identify opportunities, and enable innovation for sustainability (Baldassare et al., 2019, Bengtsson et al., 2021, Henriques et al., 2020; Lozano, 2018). Moreover, based on the findings in relation to market conditions that can incentivise organisations to invest in, and encourage the development of, DCs, this study concludes that these conditions disrupt and drive sustainability change.

6.2.2. Sustainable Business Model Innovation

With reference to Bocken et al. (2020) and Bitzer et al. (2020) research on the complexities of managing multiple stakeholders and the diverging interests and differing values that affect stakeholder willingness to cooperate, the study concludes that a broadening and diverse understanding of sustainability emphasises a high degree of subjectivity and potential for innovation inertia. Therefore, this provides an additional layer of complexity in managing multiple stakeholders. Similarly, this study concludes that external influences, including legislation and government policy, can significantly affect sustainability priorities, practices, and the direction of sustainability innovation. Moreover, market conditions can force TEOs to build resilience into their Business Models (BMs) and drive innovation but can disrupt organisations' capability to innovate the BM for sustainability.

Pertaining to Bocken et al. (2014) eight archetypes and Aldowaish et al. (2022) identified need for more archetypes, this study concludes that more archetypes are needed, specifically archetypes based on the SDGs, as this study found that frameworks, measurement, and reporting across the TES have been aligned to the SDGs to varying degrees. This study concludes that the SDGs are drivers toward (a) increasing sustainability discourse, (b) innovating existing services and products, and (c) measuring and communicating sustainability progress.

With regard to the findings on resourcing, the conclusions are that sustainability innovation relies on sufficient financial and staffing resources that are interdependent, and both need to be available in sufficient quantities to progress SBMI. According to several

participants, potential opportunities and ideas are not addressed or followed up, and initiatives are stopped or implemented due to a lack of staff capacity, capability, or availability. This study concludes that having simple processes to obtain these resources is important as obtaining the resources required often takes substantial time and delays the progression of innovations. The study found that bureaucracy made processes longer and gave rise to ambiguity issues. Furthermore, this study concluded that a competitive environment for resourcing, varying staff and financial constraints across the TES, and rapidly developing market conditions result in trade-offs in the decision-making process involved in resourcing allocation for SBMI.

The results of this study agree with the notion expressed in the literature that inadequate capabilities exist in organisations to assimilate technology into their BMs (Palmie et al., 2021), which impacts the implementation of these solutions (Batocchio et al., 2021; Teece, 2007). This was supported by several participants who described varying levels of capabilities and confidence in using technological solutions. The conclusions of this study are that more resourcing is required to leverage technology solutions to support sustainability progress and that investment in sustainability training will support individuals to draw sustainability meaning and relevance to their work, improve commitment to, and encourage more, sustainability-driven innovations.

Research suggests that Multinational Enterprises are likely to have stronger partnerships with their suppliers due to better alignment with their subsidiaries which reduces objections to headquarters decision-making (Bajo & Duran, 2014; George & Schillebeeckx, 2022). This study concludes that a centralised system has the potential to reduce meaning and relevance for staff, leading to innovating for sustainability becoming mere compliance work and can act as a de-motivator. Similarly, based on the work of Barth et al. (2021) regarding complementary value aspects of SBMI, this study concludes that more diversity in terms of gender and ethnicity in top-level management could improve sustainability innovation decision-making and processes. Based on the findings in relation to organisational structure, the conclusions are that the formalisation of sustainability roles at top-level management acknowledges the importance of sustainability, increases the prioritisation of sustainability innovation, and breaks down barriers, consequently, expediing the processes involved in implementing sustainability innovations.

Based on the findings in relation to cultural dimensions as drivers for sustainability innovation progress, this study concludes that a sustainability-oriented organisational culture can foster more sustainability-oriented individual value sets which facilitates more

sustainability innovation. Moreover, the conclusions of this study are that certain factors support the success of implementing sustainability innovations: (a) embedding sustainability into the culture results in fewer barriers to innovation, (b) individuals' value-sets act as motivators and are fundamental for long-term success, and (c) organisational culture and individual value-sets are interdependent.

Based on the work of Barth et al. (2021) regarding regional differences and Gao and Li (2020) regarding the adaptation of innovation to the local environment, this study concludes that flexible frameworks are important and that they need to be developed for regional needs and be locally driven. Moreover, based on the findings concerning the difficulty in measuring the economic gain and tangible and intangible benefits from implementing sustainability (Barth et al., 2021; Chofreh et al., 2020; Geissdoerfer, 2019; Gregori & Holzman, 2020), the conclusions are that not all sustainability progress can be quantified and that the influence of stakeholders, like top-level management and their preferences, likely result in skewed measurements and reporting and therefore impact the direction of sustainability innovations. Consequently, these conditions increase the likelihood of sustainability washing.

6.3. Implications for Practice and Industry

The conclusions of this study highlight several implications for practice and industry that can support SBMI in the TES. Sustainability frameworks, planning, policies, and diverse examples of approaches and priorities demonstrate that SBMI, to varying degrees, is happening across the TES and among TEOs. Despite some hesitancy about the relevance and association of the BM concept to the TES, the results of this study emphasise the opportunities SBMI can provide to enhance sustainability innovation and embed sustainability into the BMs in the sector.

This study concludes that investment in sustainability training will support individuals to draw sustainability meaning and relevance to their work, improve commitment to, and encourage, more sustainability-driven innovations. Therefore, it is recommended that resourcing efforts be prioritised to design and deliver targeted and consistent sustainability training for all staff and potentially for other stakeholders. Similarly, prospective staff should be screened for sustainability orientation and skills, especially for leadership positions. Additionally, this study concludes that the use of technologies has supported the innovation process to varying degrees, however, sufficient resourcing is required to leverage the potential

of these technology solutions to support sustainability progress. Therefore, it is advisable for government organisations to allocate more resourcing to support TEOs' in their sustainability innovation investments in building technology solutions and enhancing staff technological capabilities.

It is emphasised in this research that TEOs' role in society and core business structure can make them more able and better placed to innovate for sustainability in comparison to incumbent organisations in the private sector. Furthermore, TEOs potentially face considerable risks in not proactively innovating their BMs for sustainability and meeting their stakeholders' increasing sustainability demands and expectations. These risks include financial and reputational damage and missed opportunities for improvement that impact future viability. These factors can act as incentives for TEOs to invest in SBMI. Moreover, this study concludes that operating from a centralised approach can reduce the meaning and relevance of sustainability for staff who might come to regard it as just another compliance task. Therefore, as demonstrated by the results of this study, flexible and regionally focused and locally driven frameworks would overcome potential barriers to innovating for sustainability.

Based on the findings in relation to establishing sustainability roles and appointing sustainability-knowledgeable staff at the top-management level, such as chancellor, the conclusions are that this, (a) acknowledges the importance of sustainability, (b) increases the likelihood of sustainability initiatives being prioritised and implemented, and (c) breaks down barriers accelerating the processes involved in implementing sustainability innovations. Therefore, it is advisable to implement a similar structure which may provide similar benefits across the TES.

This study concludes that issues relating to bureaucratic structures and ascribed ambiguity potentially stifle TEO's agility to innovate their BMs for sustainability and that this could become unmanageable. Therefore, it is essential to have transparent and simple processes. Moreover, the issues with bureaucratic structure may be associated with gender and ethnic diversity. Therefore, these issues may be ameliorated by having more diversity in top-level management to improve sustainability innovation decision-making and processes.

The importance of resourcing was emphasised in this study as the progression of sustainability innovation relies heavily on two specific resources: financial and staff resources. This study's results also highlight the interdependency between staff and financial resourcing and suggests that staff require more time and support to build the capabilities required to

innovate for sustainability. Therefore, sustainability-related funding from the government, like the Tertiary Education Commission (TEC), should allow for the allocation of more adequate levels of resourcing within TEOs for sustainability innovation. Additionally, the results conclude that the time involved in obtaining such resources could delay innovation progress for up to years, with insufficient resourcing impacting the achievement of goals and meeting stakeholder expectations. Therefore, the processes involved in obtaining resourcing should be simplified.

The results of this study conclude that not all sustainability progress can be quantified and that the influence of stakeholder behaviour, like top-level management's seeming penchant for numbers, rankings, and other general preferences, may result in skewed reporting and impact the direction of sustainability innovations. This implication highlights potential degrees of sustainability washing and must be carefully managed. Comparably, based on the findings of increased demand from stakeholders and increasing ways of measuring sustainability, this study concludes that this may incentivise TEOs to invest in developing their DCs to sense, seize, and transform in response to pressing sustainability issues and encourage more opportunities for sustainability innovation.

The conclusions of this study are that external influences shape, disrupt and drive sustainability innovation. Legislation and government goals influence the direction of the sector's sustainability innovation activities, and this study concludes that regulation can incentivise TEOs to innovate their BMs for sustainability. This study also concludes that market conditions disrupt an organisation's capability to innovate the BM for sustainability and force TEOs to build resilience into their BMs and drive innovation. Furthermore, based on the findings regarding SDGs, these SDGs engender a collective approach with collaborative goals that are drivers toward (a) increasing sustainability discourse, (b) innovating existing services and (c) measuring and communicating sustainability progress.

6.4. Limitations of the Present Study

The researcher maintains that an exploratory qualitative case study was an appropriate methodology for this research. Nonetheless, a mono method has been associated with a weaker approach than multiple methods that can mitigate method bias (Collis & Hussey, 2014). This research initially proposed exploring how technology was leveraged in the TES to support

SBMI. However, the research question was changed as there was insufficient evidence of technological solutions playing a pivotal role.

A total of eight interviews were conducted until data saturation was reached. However, saturation does not suggest that the number of interviews was sufficient, and that the phenomenon has been fully explored (Lewis et al., 2019). Similarly, the researcher encountered non-respondents who could have contributed valuable insights and information to complement the participants who did respond (Lewis et al., 2019). Moreover, this study did not include all TEOs in the TES. Data collection could not be conducted in person due to the wide geographical locations, which necessitated online interviews that were hampered by internet-mediated limitations, specifically connectivity issues. Furthermore, interpretivism is a subjectivist philosophy potentially biased by the researcher's values and beliefs. Therefore, recording and interpreting participants' responses may have induced the researcher's reporting bias due to this subjectivity (Creswell & Creswell, 2020; Lewis et al., 2019).

A delimitation of this study is that it involved participants who were predominantly senior-level managers in positions that contributed to, or were involved in, the sustainability projects and strategies at their respective TEO. Accordingly, this is likely not fully representative of individuals engaged in different positions and levels within the TES and TEOs. Another delimitation is that the individuals worked within research and sustainability teams. Contributions and viewpoints likely differ among and between stakeholder groups. Furthermore, the data collected was restricted to universities and Te Pūkenga, and the latter is currently undergoing significant organisational transformation and is at varying stages of implementing sustainability frameworks and developments among their networks. Developments of innovating the BM for sustainability, influencing factors, and perspectives likely vary at different levels within the education sector.

6.5. Recommendations for Future Research

Extant research is predominantly based on conceptual and review studies and more case studies are needed. Future research should be conducted using multiple methods to facilitate a richer means of data collection and approach to analysis and interpretation (Lewis et al., 2019). More research is required to expand on the findings and conclusions of this study to better understand to what extent the themes identified in this study influence SBMI in the TES.

Future research pertaining to the significance of legislation and government influence in shaping sustainable innovation is needed. Understanding the policies and systems in place at this level and the impact it has across the TES can support the development of SBMI. Similarly, due to the Reform of Vocational Education, Te Pūkenga's sustainability framework is in development and the sector is undergoing tremendous changes. Therefore, it would be valuable for future research to investigate how these changes influence sustainability innovation and SBMI.

Including a larger sample of participants at all levels of the organisation could provide more valuable insights regarding the challenges, advantages, and processes attributed to SBMI. Future research could include other crown-interest TEOs like Wānanga and other TEC-funded education and training organisations to provide more valuable insights regarding sustainability strategies and engender opportunities for further research into SBMI and how it can be leveraged.

Future research could glean significant insights into the contribution of indigenous innovation to SBMI. Including the current three Wānanga TEOs may provide additional aspects that influence an organisation's sustainability value creation and broaden the existing components of SBMI. Understanding how the Māori approaches to teaching and learning, unique to the New Zealand context, may strengthen awareness within the cultural dimension of sustainability and provide diversity to SBMI literature. According to Aspelund and Hermundsdottir (2020), social issues are often a neglected component of sustainability, as research is usually concentrated on environmental innovations.

Knowledge gaps are also identified by Aldowaish et al. (2022) regarding the relationship between ESG and the BM and the processes of implementing ESG factors into operations (Kluza et al., 2021). As this study highlighted, more research is needed into the relationship between the SDGs and the BM, the associated processes of embedding these goals into the core of the TES, and how they influence approaches to SBMI and capture and create sustainability value.

There is little reference to how digital technologies can enable businesses to improve their business practices for SBMI (Cheng et al., 2019; Gao & Li, 2020; Gregori & Holzmann, 2020). As Chofreh et al. (2020) noted, more research is needed to improve guidance on adopting and implementing technologies for SBMI and how it can enable SBMI (Ciaburri et al., 2020). Future research regarding emerging and digital technologies in the TES may

engender additional valuable insights into understanding the role technological solutions play and how they can be leveraged to accelerate SBMI.

Franco et al. (2022) research highlights a gap in the integrative perspective of SBMI that balances all three aspects of sustainability, how to implement it, and with what tools. The development of the inclusion of sustainability-related courses in TEO curricula is a potential working example that future research could explore to understand better how to conceptualise, design, and implement SBMI. Similarly, future research is needed to understand the fourth sustainability pillar, purpose or what is commonly referred to as cultural performance, found in the quadruple bottom line that has yet to be adequately addressed in SBMI literature.

More research is needed to provide clearer guidance on how businesses and decision-makers can create an environment that fosters capabilities to be proactive to the changing needs of the environment and society (Chofreh et al., 2020; Franco et al., 2022). SBMI literature recognises that businesses require DCs to create SBMI. However, the organisational design influence on fostering DCs for this purpose has not been adequately addressed (Bocken & Geradts, 2020). Therefore, more research could be conducted on the influence of organisational design on SBMI and the interdependency with DCs.

As discussed in section 6.3, the following are several recommendations and points of advice:

- Sustainability-related funding from government and other entities, like the TEC, should allow for the allocation of more adequate levels of resourcing within TEOs for sustainability innovation,
- Government organisations should allocate more resourcing to support TEOs in their sustainability innovation investments through building technology solutions and enhancing staff technological capabilities,
- The processes involved in obtaining resourcing should be simplified,
- Flexible, regionally focused, and locally driven frameworks would overcome potential barriers to innovating for sustainability,
- Resourcing must be prioritised to design and deliver targeted and consistent sustainability training for all staff and potentially for other stakeholders,

- Prospective staff should be screened for sustainability orientation and skills, especially for leadership positions,
- Implementation of a leadership structure for appointing sustainability skilled staff at top-level management may engender benefits across the TES, and
- Increasing diversity in top-level management may ameliorate issues associated with sustainability innovation decision-making and processes.

6.6. Conclusion

This research extended current SBMI literature by exploring SBMI within the New Zealand TES. The results of this study suggested that six themes influence SBMI in the TES: (1) existing knowledge and awareness, (2) innovating toward sustainability, (3) organisational structure and leadership, (4) resourcing sustainability, (5) measuring sustainability, and (6) external impacts on sustainability. The six themes comprise several conditions, considerations, and influencing factors that impact the acceleration of SBMI and the bridging of the gap between ideation and implementation. The first theme suggests that broadening and diverse sustainability understandings can make the development of SBMI challenging. Moreover, organisational culture elements can influence the capabilities needed to effectuate SBMI and individual value sets can be motivators that enable innovation.

Interpreting the second theme of innovating toward sustainability suggested that TEOs may be more able to conceptualise and implement SBMI than incumbent private sector organisations. Moreover, SBMI is centred on TEOs' frameworks, planning and policies, which can help conceptualise SBMI approaches. Motivations regarding adopting these frameworks and directives were emphasised as influencing SBMI progression. Furthermore, flexibility in frameworks that can be developed for regional needs and be locally driven influences the ideation and implementation of SBMI. Innovating toward sustainability also suggested that technologies provide solutions to facilitate SBMI.

As emphasised by participants, support from top-level leadership is fundamental to sustainability innovation success. Transparency and simple decision-making are also needed to facilitate SBMI. Furthermore, investment in building sustainability skills and capabilities can enhance the effectiveness of SBMI.

Interpreting resourcing sustainability revealed financial and staff resourcing as fundamental in implementing sustainability. The demanding processes for obtaining resourcing highlighted another challenge contributing to the SBMI ideation-implementation gap. Similarly, measuring sustainability influences the embedding and management of SBMI. Regular reporting and external assessment tools provide a means to monitor and measure the progress of sustainability innovations.

The significance of external influences identified factors that shape and influence how SBMI can be leveraged and contribute to the ideation-implementation gap. Legislation and government shape sustainability innovation, market conditions can disrupt and drive innovation, and SDGs provide collective goals for sustainability innovation.

It is hoped that future research can progress SBMI toward a more comprehensive understanding and framework that can be leveraged to tackle society's pressing sustainability issues. The researcher believes that this study simply introduces the SBMI concept to the New Zealand and TES contexts and that SBMI provides an alternative avenue to support the case for increased investment in fostering sustainability innovation by embedding it into the core of TES BMs. Whether the relevance of such is acknowledged or not, the associated elements of SBMI will likely replace elements of BMI, similar to sustainable BMs steadily replacing the incumbent BM. An increasingly competitive environment with increasingly limited resources, regulation, and mandatory measures, and more cognizant stakeholders will force the market to be reactive and test the future viability of many organisations and, in turn, incentivise organisations to innovate for sustainability. These conditions are fruitful for competitive survival, producing significant competitive advantages and long-term benefits for those prepared to make the necessary long-term investment in innovation for sustainability.

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Appendix A. Information Sheet for Participants

Bridging The Ideation-Implementation Gap Towards Sustainable Business Model Innovation

Information Sheet for Participants

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate, I thank you. If you decide not to take part, there will be no disadvantage to you of any kind and I thank you for considering my request.

Introduction

I am Anne-Marie Kininmonth, the researcher, a post-graduate student completing my Master of Applied Management study at the Southern Institute of Technology. I am conducting my thesis research project to further research into how businesses can move their business models towards Sustainable Business Model Innovation (SBMI) for strategic purposes.

What is the aim of the project?

- This project aims to investigate and evaluate the ideation and implementation stages of embedding sustainable practices into an organisation's business model and the associated frameworks and tools used to better support businesses shifting towards Sustainable Business Model Innovation. It will involve conducting semi-structured interviews. I want to understand how organisations conceptualise and implement sustainability into the business models and explore ways to provide a more comprehensive approach, clearer guidance, and more support for businesses in their move towards Sustainable Business Model Innovation.

What type of participants are being sought?

The researcher is looking for subject matter experts who work or have worked within sustainable strategy and related projects within the education sector. Their expertise and experience are critical to understanding the process of embedding sustainable practices into organisational activities.

What will participants be asked to do?

If you agree to participate in this project, you will be asked to participate in a semi-structured interview conducted by the researcher for up to one hour, which will be audio-recorded with your permission. Your participation is entirely voluntary, and a set of pre-determined questions will be provided to you prior to the beginning of the interview. As the interview progresses, the researcher may ask additional questions to get a better

understanding, and you will have the opportunity to speak freely about any additional information on the topic that you feel is relevant. Only topics related to the Sustainable Business Model Innovation process and strategy will be discussed. You will be interviewed at a time and place you choose that is comfortable, private, and without distraction at your workplace or a location of your choice. The meeting will take place virtually via a web-based application if a face-to-face meeting is not feasible.

Please be aware that you can withdraw from participation in the project at any time without any disadvantage to yourself of any kind.

Can participants change their minds and withdraw from the project?

You may withdraw from participation in the project at any time up until the point at which the data is anonymised and amalgamated into the report, without any disadvantage to yourself of any kind.

What data or information will be collected and what use will be made of it?

Semi-structured interviews will be audio-recorded in order to be transcribed by the researcher soon thereafter. The recording will not be played to people outside the research group. After it has been transcribed, the data and recordings will be kept for five years.

Data collected in the interview will be used solely for the research. A copy of your transcript will be provided to you upon request should you want it and if you would like to provide any additional feedback or make necessary amendments.

Your name will not be used in the final report, and you will not be identified in any way. Your information will be kept confidential, and the data will only be used by the researcher for the purposes of this study.

What will happen to the results?

The final report will be available in the Southern Institute of Technology library (Invercargill, New Zealand). You are welcome to request a copy of the project results if you are interested. The results of the project may also be presented at conferences and published in an academic journal.

How will the data be stored?

The data collected will be securely stored so that only the researcher can access it. At the end of the project any personal information will be destroyed immediately except that, as required by Southern Institute of Technology research policy, any raw data, including recordings on which the results of the project are based, will be retained in secure storage for five years, after which it will be destroyed.

What if you have any questions about the project?

If you have any questions about the project, either now or in the future, please feel free to contact:

Researcher: Anne-Marie Kininmonth
Southern Institute of Technology
Email: [redacted]

Supervisor: Dr Robyn Hill
Southern Institute of Technology
Email: [redacted]

This research has been approved by the Human Research Ethics Committee at SIT.

If you have concerns about the ethical conduct of this research or the researchers, the following procedure should occur.

Write to the following:

The Secretary of the Human Research Ethics Committee
Southern Institute of Technology
133 Tay St
INVERCARGILL 9840 NZ
Tel: 03 211 2699

All information is confidential and will be handled as soon as possible.

Appendix B. Interview Questions

Interview Questions for
Bridging the Ideation-Implementation Gap Towards
Sustainable Business Model Innovation

The following questions will be asked during the interview.

- What have been your roles during sustainability and business strategy related projects?
- What does sustainability mean to you?
- How is sustainability embedded into the organisation's business models?
- How are sustainability ideas captured and managed?
- How is the implementation of sustainability ideas managed?
- How is the effectiveness of the processes involved in implementing sustainability measured?
- What challenges were encountered during the process?
- What technologies are used during sustainability and business strategy projects?
- What challenges were experienced in the use of these technologies?

Appendix C. Consent Form

Declaration of Consent to be Interviewed for Bridging the Ideation-Implementation Gap Towards Sustainable Business Model Innovation

I have had the scope and nature of the research fully explained to me. Any questions about the research have been satisfactorily answered, and I understand that I may request further information at any stage. I accept and note that:

1. My participation in this research is entirely voluntary.

2. I may withdraw from participation in the research at any time up to the point at which the data is anonymised and amalgamated without explanation, disadvantage, or disincentive.

3. The information given during the interview is being utilised solely for the purpose of the specific research project and will not be disclosed to any other person or agency without my express consent.

4. With my permission the interview will be audio-recorded for later transcription.

5. I will have the option to read my interview transcript and provide feedback to the researcher and to make any amendments at any time up to the point at which the data is anonymised and amalgamated.

6. This information may be incorporated into the research report but actual names or other characteristics that may lead to the identification of individuals or the tertiary education organisation will not be disclosed.

7. I may at any time request to view any completed drafts or sections of the research report to which I have contributed.

8. A copy of the completed research report will be made available to me, on request, at the conclusion of the research.

DECLARATION

I have read and understood the information set out on this form and give my informed consent to be interviewed in accordance with the stated terms and conditions.

Name of Participant:	Name of Researcher/Interviewer:
……..	……
Signature ……	Signature ……
Date …….	Date …….