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**"STRATEGIC LEADERSHIP IN DISRUPTIVE INNOVATIONS:
INTRA-ORGANIZATIONAL CAPABILITIES FOR BMI
IN MANUFACTURING FIRMS"**

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SYED MINHAI RAZA

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ABSTRACT

The significance of strategic leadership in the world of disruptive innovations inside manufacturing organizations is explored in this research study. With a strong emphasis on Business Model Innovation (BMI), the main aim was to identify and evaluate the intra-organizational competences necessary for successfully managing disruptive innovations. This study emphasizes the crucial role of strategic leadership in enabling manufacturing organizations to navigate and profit from disruptive technological breakthroughs through a thorough evaluation of the body of existing literature.

Using content analysis from the available literature, the study explores the connections between strategic leadership qualities and intra-organizational capabilities, specifically focusing on business models and disruptive innovation. Literature defines a massive need in manufacturing firms to respond to the environmental dynamics and continuous change in real-time practices.

The study aims to pinpoint certain crucial elements of strategic leadership that support the practical application of BMI in manufacturing companies. Visionary thinking, proactive decision-making, resource management, organizational agility, and promoting an innovative culture are some of these components. The study also looks at the effective orchestration and alignment of these competencies across the organization by strategic leaders to maximize the advantages brought forth by disruptive technologies.

This study offers insights and tactics that strategic leaders can use to foster a BMI-friendly environment by examining relevant scholarly literature. It emphasizes how crucial leadership behavior is to developing intra-organizational capacities and promoting the effective implementation of BMI.

This research adds to the theoretical understanding of BMI in the manufacturing sector by examining how disruptive innovations and strategic leadership interact. This study's findings can help manufacturing companies develop the strategic leadership skills they need to embrace disruptive innovations and grab new opportunities.

By clarifying the functions of strategic leadership in the context of disruptive innovation within manufacturing organizations, the research findings contribute to the body of existing information. The identified intra-organizational competences establish the foundation for upcoming empirical studies and provide useful prospects for managers and leaders looking to handle the opportunities and challenges brought on by disruptive technology. Ultimately, this study seeks to advance knowledge of the strategic leadership behaviors and skills required for manufacturing companies to endure and thrive in the face of disruptive technologies, ultimately generating enduring competitive advantage.

CHAPTER 1: INTRODUCTION

Technological disruption has accelerated tremendously in recent decades, resulting in transformation in many industries. Artificial intelligence, blockchain, advanced robotics, and similar advancements have created new market opportunities and challenges, requiring manufacturing organizations to rethink their strategy in order to maintain competitiveness and relevance. It is also known as Industry 4.0 or the Fourth Industrial Revolution. (Zhou et al., 2015). Through the integration of digital technology and enhanced automation, it is a continuous change in traditional industries and industrial processes. It symbolizes a dramatic shift in how things are developed, manufactured, and distributed, emphasizing increasing efficiency, flexibility, and customization.

The concept of strategic leadership, which entails the creation and execution of forward-thinking strategies to span the complexity raised by disruptive breakthroughs, is at the heart of this revolutionary process. Strategic leadership pertains to a leader's ability to foresee and envision the future of their organization and develop and implement strategies that allow the company to achieve its goals and objectives. Strategic leaders are responsible for setting the organization's direction, aligning resources and competencies to support the strategy, and promoting an ambiance of innovation and continuous improvement. They must be able to assess complex data, recognize trends and patterns, and make judgments that balance short-term and long-term goals. Strategic leaders must also be effective communicators, able to convey the organization's vision and strategy to stakeholders both inside and beyond the organization. Strategic leadership is critical to organizational success, particularly in dynamic and rapidly changing environments. (Bolatan et al., 2022).

Several business giants have become obsolete in recent decades, while some established firms and newcomers have stolen the spotlight. This outcome was the result of various leadership decisions. Despite superior resources, several big industry corporations could not keep up with the changing environment and/or remained incompetent in their success. As a result, their company's net value rapidly declined. The necessity of the time is to remain reactive to new trends, to go a few steps further in providing better value to clients, and to develop a culture of innovation and adaptation within the firm. (McGrath, Rita Gunther, 2013).

The term "disruptive innovation," coined by Clayton Christensen, refers to the process in which a new competitor overturns an established market by offering a good or service that is easier to use, more affordable, and more convenient than the market leaders. Typically, disruptive inventions start by filling a niche that the competition ignores or undervalues; then, they gradually enhance their offering to appeal to a broader audience. Disruptive innovations typically have lower profit margins than traditional services; however, they can generate new markets and overgrow by appealing to customers seeking a more economical or convenient solution (Christensen et al., 2003). Disruptive technologies can remove existing incumbents and establish new market leaders over time. Disruptive innovation differs from sustaining innovation, which refers to incremental enhancements to current products or services to retain incumbents' market positions. Because they do not initially fit the needs of their present customers, disruptive innovations are frequently disregarded or dismissed by incumbents. Still, they have the potential to revolutionize the market and generate new growth opportunities.

The abilities, tools, and procedures a business requires to develop, adapt, or restructure its business model to generate new value for stakeholders are referred to as intra-organizational capabilities for business model innovation. These capabilities may include the following. Strategic vision to identify emerging trends and anticipate future market needs (Tece, D. J. 2007). Collaborative mindset, to work across functional areas and engage with external partners to co-create solutions and to leverage employees' diverse perspectives and expertise to develop and implement new ideas (Nambisan, S., & Sawhney, M. 2011). agility, the capacity to quickly adjust and react to shifts in the competitive environment or market. The ability to take chances, try out novel concepts, question the status quo, and cultivate an innovative and creative culture within the company. Customer-centricity, understanding and anticipating customer needs, and designing business models that create value for customers and build long-term relationships. Constant improvement is necessary to assess and track performance, draw lessons from the past, and gradually enhance the organization's business model. Companies need to have organizational skills for business model innovation to be competitive in today's quickly evolving business environment. By developing these capabilities, companies can create new value for stakeholders, build sustainable competitive advantages, and achieve long-term success. However, manufacturing companies must build specialized skills suited to the particular difficulties presented by disruptive advances. (Christensen, C. M., & Raynor, M. E. 2003).

Businesses seeking a competitive edge in today's more complicated and rapidly evolving business environments must invest in BMI. Maintaining an outdated business model might create unfavorable results and force to bring change in the business model. Researchers have explored a wide range of tactics used by businesses to promote BMI. The development of service capabilities, radical experimentation, digitization, and manufacturing flexibility are a few of these (Yang et al., 2020).

While all firms have a business model, not all of them have a strategy or a plan of action for handling probable unforeseen circumstances (Casadesus-Masanell and Ricart, 2010). The contemporary confusion relating to strategy and business models, especially in the practical world and occasionally even among scholars, is highlighted by this abruptness. But despite their connections, business models and strategies are two different ideas. A company's business model acts as the foundation for allocating its resources, generating value, and capturing it for internal and external stakeholders. A change in the business model happens when particular conditions need strategic modifications, which in turn require the innovation of the business model to preserve the firm's competitive edge (Amit and Zott, 2012).

Business model innovation, or BMI, has become a crucial and vital skill for every business trying to gain a clear competitive edge (Chesbrough, 2010). It has been demonstrated that BMI has a significant role in the performance of many firms (Sosna et al., 2010). Numerous research studies have evidenced that changes to business models are among the most durable and sustainable types of innovation. This type of innovation is the ideal illustration of a holistic approach, where innovation encompasses the entire business model rather than just new goods or services.

Contemporary market actors are facing substantial economic pressure due to the abbreviation of product lifecycles, the prevalence of excess supply in most markets, and the swift pace of change. Due to the increased likelihood of copying products and processes, organizations increasingly use business model differentiation to escape from fierce competition (Kopetzky et al., 2013). Corporate models have evolved into the latest arena in order to reduce conflicts and enhance developments (Bursuk et al., 2016). Since the dot-com bubble burst and the influx of

new ICT-based business models, business model innovation (BMI) has garnered attention from both academia and industry.

CHAPTER 2: METHODOLOGY

2.1 Research Design

This literature review-based thesis' research design is primarily deductive. We performed a thorough content analysis, which entails synthesizing current literature and research findings on the different but interconnected themes of strategic leadership, disruptive innovation, intra-organizational competencies, and business model innovation.

2.2 Literature Search Terms

The literature review phase begins with selecting research studies, which begins with identifying search phrases. The search terms for the review are listed below. This content analysis' search terms are determined by taking into account the study's aims and research topic. The primary search phrases for this study were, "strategic leadership", "disruptive innovation", "intra-organizational capabilities", and "business model innovation:

The articles that meet the inclusion criteria were selected after extracting primary search results and reviewing the abstracts and titles. Further searches were conducted, which included the more descriptive or targeted search terms like,

"leadership traits". "leadership types", "leadership roles", "strategic leadership and innovation", "strategy for transformation", strategic vision", "innovation in manufacturing firms", "forces encouraging innovation", "disruptive technologies", "digitalization strategy", "disruptive innovation process", "organizational capabilities", "organizational learning", "intra-organizational communication", "knowledge sharing", "bmi implementation", "bmi strategies", "business model manufacturing industry", and others.

Academic databases like Scopus, Web of Science, and Google Scholar were among the platforms used to retrieve open-access data for this study. Our approach was to prefer recent and relevant research articles. Hence formulating our inclusion/exclusion criteria for this research. The literature review phase was conducted using a systematic approach.

2.3 Research Approach

The study aims to identify the many strategic leadership elements that manufacturing companies require to implement BMI successfully. These components include developing an innovative culture, resource allocation, proactive decision-making, visionary thinking, and organizational agility. The study investigates how strategic leaders may coordinate and align these organizational strengths to take advantage of disruptive developments best.

The objective of this research is to ascertain and investigate the crucial elements of strategic leadership that are crucial for manufacturing companies to effectively assess the necessity of revising existing business models and incorporating business model innovation. These elements include, among other things, creating an innovative culture inside the organization, allocating resources, making proactive decisions, exercising visionary thinking, and being organizationally agile. The study explores how the strategic leaders can operate, coordinate and align these organizational assets within a disruptive environment to best capitalize on the opportunities.

2.4 Data Collection and Analysis:

The collected literature was organized into distinct categories related to the four central themes: strategic leadership, disruptive innovation, intra-organizational capabilities, and business model innovation. A detailed review and synthesis of each category was carried out, highlighting key findings, theoretical frameworks, and empirical evidence.

The analysis employed various content analysis techniques, such as co-citation analysis, keyword analysis, and citation mapping. Data were processed through content analysis to visualize and interpret the extracted textual information and findings.

The following four chapters will individually discuss the main topics of our thesis in detail to find common grounds in this particular direction.

2.5 Key Research Objectives

The study aims to achieve several key objectives:

1. Examine the role of strategic leadership in identifying and responding to disruptive innovations.
2. Analyze how manufacturing companies can develop intra-organizational capabilities to drive business model innovation.
3. Explore the interlinkages involving strategic leadership, intra-organizational capabilities, and business model innovation.

2.6 Research Questions

The initial literature review identified the following research observations.

First, research on disruptive innovation in the context of the developing digital economy is scarce, particularly for businesses involved in manufacturing. To make disruptive innovation theory more applicable, recent studies have postulated its integration into emerging contexts (Si and Chen, 2020).

Secondly, the gap relates to mapping the occurrence mechanism of disruptive digital manufacturing innovation using the process view. This innovation's growth and fulfillment trajectory is still unclear.

Third, current literature identifies unexplored areas of strategically leading a manufacturing company, which involves establishing a clear vision, aligning organizational resources, and making decisions that facilitate business model innovation and transformation. However, strategic leaders are responsible for cultivating an environment that encouraging experimentation, collaboration, and continuous learning (Alblooshi, Shamsuzzaman, & Haridy, 2021). Despite concerning disruptive innovations, they require advice and support to navigate them. Thus, this study imports strategic leadership's role, specifically in responding to disruptions.

Fourth, analyzing the role and importance of cross-functional collaboration in the context of disruptive innovation and Business Model Innovation (BMI) is crucial for manufacturing

companies. To promote and facilitate cooperation among departments that were previously segmented, strategic leaders must devise effective strategies.

Further exploration from an organizational perspective is essential. While prior studies have delved into organizational capabilities, there is a need for more focused research to precisely identify the intra-organizational competencies that not only embrace, but also support and adapt to change. This focused research is particularly pertinent in the context of BMI adaptability and evolution in a disruptive environment.

Lastly, the importance of dynamic capacities and business model innovation has been recognized in the domains of disruptive innovation, digital innovation, and entrepreneurship. However, insufficient focus has been on their interrelationships, which could provide specific insights into understanding the mechanisms in the sector. There is limited knowledge regarding how the combination of dynamic capability deployment, the adoption of digital technology, and business model innovation can effectively propel disruptive innovation in the manufacturing industry.

Therefore, this study suggests the following research questions:

RQ 1: How does Strategic leadership impact disruptive innovations in manufacturing firms?

RQ 2: Do intra-organizational capabilities effectively manage disruptive innovations for Business Model Innovation in the manufacturing industry's context?

RQ 3: Does strategic leadership enable manufacturing firms to navigate and capitalize on disruptive technological advancements.?

To address the issues mentioned, this study conducts an exploratory literature review focused on the bounds of manufacturing enterprises. The study underscores the interconnectedness of dynamic capabilities and business model innovation in the evolution and fulfillment process. In a disruptive environment, while maintaining the balance between strategic managers' role and the favorability that intra-organizational abilities provide. This research enhances the synergy among relevant literature streams and aims to provide valuable resources for digital entrepreneurship and disruptive innovation in startups.

The remainder of the research follows this structure: The "Literature Review" section delves into previous research within three significant literature streams. Section "Research Design" introduces the research design elements. The content analysis findings are presented in Section "Findings." building on the case findings, the "Discussion" section proposes conceptual models for startup disruptive innovation in the digital age, offering thorough explanations of the fulfillment path and evolution mechanics. Finally, the limitations are outlined in the conclusion section, along with the theoretical and practical ramifications.

2.7 Significance of the Study

This study contributes to the theoretical understanding of BMI in the manufacturing sector by exploring the interplay between disruptive innovations and strategic leadership. The insights derived from this research can assist manufacturing companies in developing the necessary strategic leadership abilities to embrace disruptive innovations and capitalize on emerging prospects.

The study's conclusions improve our knowledge of the unique function that strategic leadership plays in manufacturing firms when disruptive innovation is present. These identified intra-organizational competencies lay the groundwork for further empirical investigations and provide valuable guidance for managers and leaders in navigating the challenges and opportunities posed by disruptive technology. The study's ultimate goal is to increase our understanding of the strategic leadership traits and competencies that manufacturing organizations need to prosper in the face of disruptive technology and maintain long-term competitive advantages.

2.8 Main Methodology

This research employs a content analysis approach, utilizing a diverse collection of case studies and research articles. Data was collected from a varied sample encompassing discussions about manufacturing companies. Combining these methods enhances the study's robustness, offering a more comprehensive perspective on the research question.

2.9 Content Analysis

The following lines were extracted from research papers discussing the topic of Strategic Leadership in Disruptive Innovations, explicitly focusing on the intra-organizational capabilities for business model innovation in manufacturing firms:

Disruptive Innovation:

" For manufacturing firms to stay competitive in the quickly evolving economic landscape of today, they must adapt to disruptive developments." – (Voelpel, Leibold, & Tekie, 2004)

"Manufacturing businesses may have to adapt their existing business models when confronted with disruptive developments, necessitating change and innovation. Strategic leaders can facilitate this process by identifying and seizing new opportunities, developing new competencies, and managing the transition to fresh business models." – (Wirtz, 2019)

Analysis: Business innovation in manufacturing organizations requires the presence of disruptive breakthroughs. To thrive in today's dynamic business landscape, firms must demonstrate flexibility and an ability to adjust their business models. Strategic leaders play a vital role in this adaptation process by actively identifying and capitalizing on emerging opportunities, cultivating new competencies, and effectively overseeing the transition to innovative business models.

With a primary focus on technological integration and the development of innovative business models, this research content analysis delves into the role of disruptive innovation within manufacturing organizations. Manufacturing enterprises rely significantly on disruptive innovation to maintain competitiveness in a continuously evolving market. To thrive in today's rapidly changing business landscape, manufacturing organizations are embracing technology and reconfiguring their business strategies. The objective of this analysis is to gain a comprehensive understanding of the dynamics, challenges, and opportunities associated with disruptive innovation in the manufacturing sector.

Strategic Leadership:

"In the face of disruptive technologies, strategic leadership is crucial for guiding manufacturing companies toward successful business model innovation." – (Doz & Kosonen, 2010)

"Successful strategic leaders recognize new disruptive innovations, predict their industry impact, and proactively adapt the organization's business model in response." (Osiyevskyy & Dewald, 2015)

"To cultivate a culture promoting experimentation, risk-taking, and continuous learning – all essential for successful business model innovation – leadership at various organizational levels is required." – (Osiyevskyy & Dewald, 2015)

"Strategic leaders also must adeptly manage organizational change resulting from disruptive innovations, ensuring staff embraces new operational methods and comprehends the strategic rationale behind the changes." – (Tidd & Bessant, 2020)

"The development and implementation of intra-organizational skills for BMI can be significantly aided by strategic leaders who nurture an innovative culture, encourage risk-taking, and allocate resources for experimentation." – (Micheli, 2015)

"Manufacturing organizations require strategic leadership to successfully adopt disruptive innovations, manage risks, and develop new business models, fostering an innovative culture." – (Carayannis, Sindakis, & Walter, 2015)

"Strategic leaders need to foster an innovative culture by creating an atmosphere that encourages calculated risks and generates fresh ideas." – (Ciampi et al., 2021)

"The fundamental assets and competencies necessary for successful business model innovation within organizations are referred to as intra-organizational capabilities." – (Hofmann & Jaeger-Erben, 2020)

"Companies facing obstacles in their business model innovation journey, such as overcoming resistance to change, acquiring new resources and capabilities, and combatting inertia, can benefit from strategic leadership." – (Huang et al., 2013)

"Strategic leaders can facilitate the creation and execution of innovative business models by providing clear directives and guidance while also allowing staff to experiment and take calculated risks." – (Gibbons, 2015)

"Middle line supervisors/managers are highly active groups in organizations, and link bi-parties up and low streams of connections, flow of info and act intervening teams ………" – (Batt, 2004)

Analysis: Strategic leadership is required to drive disruptive breakthroughs in industrial firms. A clear vision and the capacity to spot chances for business model innovation are essential qualities for leaders. In order to generate disruptive ideas, they must cultivate a company culture that rewards creativity and taking risks. Leadership across various organizational levels is imperative to cultivate an environment fostering experimentation, risk-taking, and continuous learning – all integral to successful business model innovation. Moreover, strategic leaders must adeptly manage organizational change arising from disruptive innovations, ensuring staff not only embraces new operational methods but also comprehends the strategic rationale driving these transformations.

Intra-Organizational Capabilities:

"In order for manufacturing companies to develop and implement innovative business models, intra-organizational capabilities— such as resource allocation, knowledge sharing, and cross-functional cooperation—are crucial." – (Bettiol, Capestro, Di Maria, & Grandinetti, 2023)

"One of the main drivers of BMI is intra-organizational capabilities, which help manufacturing companies create and execute new business models more quickly and effectively." – (Andersen, Aagaard, & Magnusson, 2022)

" A supportive organizational culture that is marked by transparency, collaboration, and a willingness to question established procedures is necessary to create the intra-organizational competences needed for successful business model innovation in manufacturing organizations."
– (Di Toma & Ghinoi, 2021)

"It is impossible to overstate the importance of senior management in setting clear goals, coordinating resources, and supporting business model innovation." – (Smith, 2014)

" To tackle the difficulties of disruptive innovation and successfully deploy business model innovation (BMI), manufacturing businesses need to possess strategic leadership." – (Behera, 2017)

"Business models have integrity to adopt constant regularity into the organization's setting, work on unique identification, new learnings, needed disruption, competition, agile circumstances, and capital flexibility." – (Tilman & Jacoby, 2019)

"It is important for business reproductions to assume continuous uniformity to the organizational setting by taking into account risk taking, resources distribution, competitive gain, agile conditions, and investment tractability." – (Teece, 2017)

"In manufacturing businesses, BMI places importance on certain intra-organizational characteristics, such as:

Technology capabilities: the capacity to create and apply novel technologies in order to facilitate novel business strategies.

Market Intelligence Capabilities: the capacity to gather and examine market data in order to spot fresh BMI opportunities.

Organizational agility: the capacity to modify an organization swiftly in order to accommodate new business models.

Human capital capabilities: The capacity to draw in, train, and hold onto workers who possess the competences required for the manufacturing companies." – (Do Vale, Collin-Lachaud, & Lecocq, 2021)

"A corporation needs a collection of skills, knowledge, and resources known as intra-organizational capabilities in order to successfully deploy disruptive innovations. These competencies encompass managerial, organizational, and technology competencies." – (Hofmann & Jaeger-Erben, 2020)

"A company's technological capabilities refer to its capacity to create and apply new technologies. An organization's capacity to coordinate the efforts of several departments and functions and handle complicated transitions is known as its organizational capacities. The capacity of a company's managers to make wise judgments and carry them out successfully is known as management capabilities." – (Storbacka, 2012)

" Through a number of strategies, such as R&D expenditures, staff training, and the formation of alliances with outside parties, manufacturing organizations can fortify and expand their internal capacity for business model innovation." – (Westerlund & Rajala, 2010)

Analysis: The existing literature asserts that strong intra-organizational competencies are essential for successful business model innovation. These competencies encompass gathering and assessing market data, identifying customer needs, and anticipating future trends. To ensure that the organization is well-prepared to seize disruptive opportunities, strategic leaders should invest in facilitating their employees' acquisition of these skills. Technological capabilities, organizational agility, market intelligence capabilities, and human capital capabilities are important intra-organizational features in the context of BMI for manufacturing organizations.

This study delves into the vital importance of intra-organizational competencies within manufacturing organizations. The research places particular emphasis on the intricate relationship between business model development and technology adoption. Given the rapidly evolving nature of the contemporary business landscape, it is imperative for manufacturing enterprises to adapt to shifting market demands and technological advancements.

In order to thrive in this dynamic environment, businesses must diligently foster and leverage their internal organizational capabilities to facilitate the seamless integration of technology and the adaptation of their strategic approaches. Through an extensive content analysis, this research systematically examines the pertinent literature and empirical evidence concerning how manufacturing organizations harness these competencies to sustain their innovativeness and competitiveness.

Manufacturing Firms' Characteristics:

"Manufacturing organizations who successfully leverage their intra-organizational capacities for business model innovation are more likely to achieve a durable competitive advantage in the face of disruptive developments." – (Hofmann & Jaeger-Erben, 2020)

"Manufacturing companies have a stronger foundation for driving business model innovation when they prioritize investments in the skills and competencies of their workforce, particularly in the domain of disruptive technologies." – (Müller, Buliga, & Voigt, 2018)

"By investing in the development of intra-organizational capabilities for business model innovation, manufacturing organizations can improve their chances of success in the disruptive innovation era and achieve long-lasting competitive advantages." – (Strøm-Andersen, 2020)

Analysis: Manufacturing organizations must align abrupt changes with their overall strategy to effectively integrate disruptive breakthroughs. In the context of disruptive innovations, manufacturing companies can achieve sustainable competitive advantages by leveraging their internal capabilities to innovate their business models. A crucial component of contemporary manufacturing companies is smart factories. The capacity to gather and process massive volumes of data in real time is one of the features of smart factories. It can cut costs,

increase productivity, and make well-informed decisions with the aid of this data. The factory's integration of multiple components, which produces a constant flow of goods and information, is another aspect. Automation is essential to smart manufacturing because it lowers human error rates and boosts productivity. All things considered, smart factories are transforming the industrial sector by enhancing competitiveness, flexibility, and operating efficiency.

The present study endeavors to explore the pivotal role of strategic leadership within manufacturing organizations, with a particular emphasis on the manner in which leaders harness technology and develop business models to drive success in an ever-evolving industry landscape. Manufacturing organizations are increasingly recognizing the imperative need to adapt to rapidly changing market conditions and technological environments. In this context, this study aims to identify the essential leadership qualities and strategies that enable manufacturing firms to effectively transform their business models and capitalize on the full potential of technology.

This necessitates a proactive approach driven by resource utilization, competitive pressures, and management skills. It necessitates a thorough comprehension of the fundamental advantages of the company as well as a readiness to grow and change.

Business Model Innovation

" Developing a new business model or altering an existing one is known as business model innovation. It has the potential to cause upheaval, either by generating new markets or upending established ones." – (Osiyevskyy & Dewald, 2015)

"Manufacturing companies face significant challenges when dealing with disruptive business model innovations. Value creation, delivery, and capture must adapt in response to these developments." – (Kaplan, 2012)

"Manufacturing companies can leverage innovative business models to gain a competitive edge and explore new growth opportunities." – (Saqib & Satar, 2021)

“Intra-organizational capabilities crucial for business model innovation in manufacturing companies include:

- *Market Sensing Capabilities: the ability to recognize and comprehend novel opportunities and industry trends.*
- *Technological innovation capability: The capacity to develop and implement new technologies that support novel business models.*
- *Organizational Agility Capabilities: The ability to swiftly adapt the organization's structure, processes, and culture to support new business models.*
- *Collaboration skills: The proficiency to collaborate effectively with internal and external stakeholders in implementing new business models.” – (ul zia, Burita, & Yang, 2023)*

“The advantages of business model innovation for manufacturing companies encompass increased revenue and profitability, enhanced customer satisfaction, and heightened competitive advantage. “– (Kastalli, Van Looy, & Neely, 2013).

Analysis: In manufacturing organizations, strategic leaders are vital for fostering an environment conducive to business model innovation (BMI). They create a vision for BMI, allocate necessary resources, and remove innovation impediments (Alblooshi, et al., 2021).

Manufacturing companies must develop specific competencies to succeed in BMI, including organizational learning, dynamic adaptability, and technical proficiency.

Disruptive technologies challenge traditional manufacturing business models, demanding flexibility and creativity to thrive.

Strategic leaders are essential in navigating disruptive developments through the recognition and acquisition of new opportunities, the development of new competencies, and the driving force behind the adoption of new business models.

In the face of disruptive events, this study emphasizes the value of strategic leadership and intra-organizational capabilities in enabling manufacturing organizations to pursue business model innovation.

In summary, the existing body of literature on strategic leadership within the context of disruptive innovations underscores the paramount importance of intra-organizational proficiencies for cultivating novel business paradigms within manufacturing enterprises. Strategic leaders are instrumental in recognizing and adapting to disruptive concepts, fostering a climate conducive to innovation, and infusing an attitude of creativity. The successful adoption of disruptive alterations in business models within the manufacturing domain hinges upon cultivating intra-organizational competencies spanning technological, organizational, and managerial discipline corrections.

For manufacturing organizations embarking on journeys centered around disruptive technologies, it becomes evident that both intra-organizational aptitude and strategic leadership are imperative prerequisites. Strategic leaders are tasked with the duty of risk management, the identification of novel business models, and the cultivation of an environment conducive to innovation. Meanwhile, intra-organizational capabilities, encompassing proficiencies in technology, organization, and management, function as the bedrock supporting the manifestation of disruptive transformations in business models.

Notably, the landscape of research on strategic leadership for business model innovation within the manufacturing sector has evolved over time, with earlier investigations concentrating on the spheres of strategic leadership and innovation management. In more recent inquiries, the critical role of intra-organizational competencies in fostering business model innovation has been brought to the forefront, underscoring the dynamic nature of this field of study.

2.10 Emerging Themes

This analysis highlighted emerging themes in contemporary research. It emphasized the role of digital technologies and sustainability in disruptive innovation within manufacturing companies (Dotsika & Watkins, 2017).

2.10.1 Research Themes

Several important research themes have been identified through the examination of previous studies in the fields of strategic leadership and business model innovation in manufacturing businesses:

Disruptive innovation strategies in the manufacturing sector have been explored (Ciacci & Penco, 2023).

The impact of *intra-organizational capabilities* on innovation has been investigated (Lu, Yuan, & Wu, 2017).

Leadership's role in fostering innovation within manufacturing firms has been examined (Walden, Lie, Pandolfo, & Nemme, 2020).

Strategies to adapt and transform the *business model* to respond to market disruptions have been discussed (Cozzolino, Verona, & Rothaermel, 2018).

2.10.2 Key Contributions

The study identified influential authors who have contributed significantly to this research area. Notable scholars include (Alblooshi et al., 2021), (Hollen et al., 2013), (Kurzahls et al., 2020), and (Cortes & Herrmann, 2021). Their work has been widely cited and has had a lasting impact on the field.

Much research has been conducted on the role of strategic leadership in disruptive innovations, particularly on intra-organizational capabilities for business model innovation in manufacturing companies. In addition to highlighting the role of leadership in driving and managing disruptive innovation within organizations, these contributions also helped identify the key capabilities needed to meet the challenges presented by disruptive technologies and changing market dynamics.

Researchers have contributed significantly to understanding how to drive strategic change through visionary and transformational leadership. In research studies, leaders with a clear vision, practical communication skills, and a willingness to take risks are likelier to foster a culture of innovation and inspire their employees to adopt technologies and disruptive business models. Such leadership is essential for manufacturing companies to respond effectively and efficiently to disruptive innovations.

Identifying the intra-organizational capabilities necessary for successful business model innovation constitutes another essential contribution of researchers. An organization's ability to identify disruptive trends and technologies in the external environment, to experiment and learn from failures, to quickly adapt its business models in response to changing market conditions, and to build and exploit Strategic partnerships and networks is one of these capabilities. As businesses face disruptive technologies, developing these capabilities is essential to thrive and innovate.

Additionally, manufacturing companies must foster a culture of innovation through strategic leadership. Creativity, risk-taking, and collaboration are essential aspects of an organizational environment. A culture of innovation is more likely to be created by leaders who prioritize innovation and allow experimentation and learning to thrive.

CHAPTER 3: STRATEGIC LEADERSHIP

3.1 Overview of Strategic Leadership

The concept of strategy finds its roots in classical Greek thought, originating from the fusion of the Ancient Greek words "Stratos" and "ago," which collectively conveyed the idea of "to send, to direct, to carry, and to herd" (Burnes, 2004). Several scholars have employed the term "strategy" in diverse ways. Some used "management's game plan" to define it (Thompson & Strickland, 2001), while others termed "making a difference" in this (Porter, 2002). It is essential to clarify that strategy should not be confused with a long-term plan; instead, it encompasses all of an organization's operations.

From the era of Plato to the contemporary landscape, scholars have exhibited a persistent captivation with the notion of leadership (Barutçugil, 2014). Since the early 20th century, leadership has garnered substantial attention from researchers, particularly in the discipline of management (Dhammika, 2014). At the onset of the 20th century, leadership was commonly perceived as an inherent trait. However, research conducted at Iowa University in the 1930s introduced the idea that successful leadership could be cultivated through training and experience. This paradigm shift gave rise to the trait theory, positing that the leader's traits were the most influential variables affecting the success of the process (Elkins, 1980). Another hypothesis that seeks to elucidate the concept of leadership asserts that a leader's effectiveness is more closely associated with their behaviors while in charge than with their inherent qualities (Owens & Valesky, 2007). Post-1970s, "Hersey and Blanchard's Situational Leadership Theory" emphasized that diverse situations necessitate varying leadership philosophies (Barutçugil, 2014).

Baron and Henderson (1995) categorized strategic leadership as a distinct leadership style, while (Davies and Ellison, 2006) argue that strategic leadership represents an intrinsic characteristic shared by all types of leadership rather than constituting a distinct category like transformational or instructional leadership.

In order to achieve shared objectives, establish teams, and enhance human resources, the presence of a strategic leader is considered indispensable (Adair, 2004). Pisapia devised a scale

comprising five components for utilization in empirical studies on strategic leadership. According to (Pisapia et al., 2005), the dimensions of strategic leadership are discussed below.

3.2 Role of Strategic Leadership in Digital Transformation

Developing a digital strategy model, exemplified by the work of (Sebastian et al., 2017) and also (Ross et al., 2016), proves essential for facilitating digital transformation. It engages customers in reshaping the go-to-market process by leveraging an operationally excellent backbone or embracing digitized solutions that revolutionize the business model. Moreover, integrating a digital services backbone comprising microservices, advanced analytics, and interconnectivity enhances the organization's market capabilities.

As highlighted by (Westerman, Bonnets, and McAfee, 2014), leaders must focus on three key areas – business models, operations, and customer experiences – when orchestrating organizational transformation. By harnessing technology, this approach can significantly boost a company's performance and broaden its reach. To offer an alternative to conventional strategy development methods, the balanced scorecard was introduced by (Kaplan and Norton, 2008), a four-dimensional measurement model encompassing financials, customers, internal business processes, and learning and growth aspects. Originally conceived as a performance monitoring tool in 1996, (Kaplan et al., 2008) suggest that balanced scorecards have since evolved into strategic planning tools.

According to (Codrington and Grant-Marshall, (2011), the adoption, or the lack thereof, of technology in the workplace represents a significant source of generational division concerning human capital and generational influence. Achieving successful digital transformation demands effectiveness and leadership. Modern generations are digital natives, having grown up witnessing the progress of technology and being proficient in the digital languages of various platforms; this observation aligns with Codrington and Grant-Marshall, (2011) argument regarding managing the generational gap. A digital immigrant, in contrast, lacks the upbringing in the digital age but has acquired some technological knowledge and is adapting to this new environment, albeit not proficiently. Digital markets are accustomed to rapid information retracing, making multitasking and parallel processing more apt. Consequently, digital

immigrants, representing the Baby Boomer and X generations, must harness the skills of the Y generation and the newer generations when overseeing their employees.

3.3 Managerial Roles in Disruptive Innovations

Business model innovation is becoming more widely acknowledged as a critical mechanism for success in today's intensely dynamic and competitive business environment, offering a convincing explanation for variations in a business's performance (Foss & Saebi, 2017). In a time of significant social and economic change, business model innovation has become a strategic focus for managers and entrepreneurs alike (Kraus et al., 2020). Scholars striving to fortify the theoretical foundations of this field have exhibited a growing interest in this transition (Ritter & Lettl, 2018).

Business model innovation encompasses either adapting an existing business model, or the design and execution of an entirely new one (Massa & Tucci, 2014). A business model summarizes and consolidates a company's fundamental activities (Wirtz et al., 2016). A business's operation is encapsulated in these models, which explain how value is created (Zott et al., 2011). Business models bridge a company's strategy and day-to-day operations (Teece, 2010), thus pivotal in guiding companies toward achievable operational objectives.

Facilitating social interactions among managers within an organization fosters the exploration of new opportunities and expedites the progression of the business model innovation process (Schneckenberg et al., 2018). Recent research has scrutinized the multiple phases, organizational capabilities, learning mechanisms, and leadership traits requisite for supporting business model innovation as a dynamic process (Foss & Saebi, 2017). This renders BMI a multifaceted process that attends with a considerable risk of failure, hinging on relationships with individuals and networks for success (Berends et al., 2016). Examining various innovation processes at the organizational level (Björk, 2012) underscored the growing significance of network characteristics, asserting that "different network structures have demonstrated importance for distinct innovations." According to (Moellers et al., 2020), encouraging the adoption of innovative business models within multi-enterprise firms necessitates the employment of innovation brokerage practices and individuals capable of connecting various organizational divisions.

The interactions among managers, influenced by both their formal and informal connections, prove critical to this process, as indicated by existing research (Foss & Saebi, 2017). Nevertheless, a substantial knowledge gap persists regarding how managers collaboratively work to promote business model innovation explicitly. Our comprehension of BMI as the culmination of a creative process encompassing the dissemination and accumulation of novel knowledge remains constrained.

A proven approach to understanding how social connections impact creativity involves examining brokerage roles (Belso Martinez et al., 2015). Astonishingly, this perspective has received limited attention from researchers delving into the intricacies of the business model development process. Internal strategies enable firms to scrutinize the actions and decisions underpinning this process while ascertaining how organizational, and managerial roles shape these behaviors.

3.4 Top Management and Middle Managers

Top management and middle management both play crucial roles in driving disruptive innovation within organizations. Top management teams are responsible for establishing the strategic direction and creating an environment that fosters innovation (Christensen & Raynor, 2003). Their decisions about resource allocation, risk-taking, and long-term vision can significantly impact the organization's ability to pursue disruption.

On the other hand, middle managers serve as vital links between top management and frontline employees. They often deeply understand the organization's operational dynamics and can champion disruptive ideas by aligning them with the overall strategy (Birkinshaw & Gibson, 2004). Moreover, middle managers are essential for navigating the complexities of implementation because they have a strong reach of the day-to-day processes and can facilitate the execution of disruptive innovations (Floyd & Lane, 2000).

By recognizing and capitalizing on the unique contributions of both top and middle management, organizations can enhance their capacity for disruptive innovation, ultimately fostering sustainable growth and competitiveness in dynamic markets.

Fostering internal knowledge sharing is a key driver of a company's innovation potential (Aalbers et al., 2014). The significance of advisory networks as channels for disseminating information within organizations has been extensively investigated in prior research (-Smith & Mannucci, 2017). (Hock, 2015) posits that seeking advice is fundamentally linked to effectively implementing creative efforts, making it a critical factor in examining innovation processes, especially in the context of BMI.

Interorganizational links are characterized by individuals acting as mediators advising information flows between two parties (Shi et al., 2009). These brokers enhance their significance within the network by leveraging their structural positions. Recent studies (Stea et al., 2017) emphasize the importance of internal brokering or inside coordination in ensuring accurate and timely knowledge dissemination and its impact on strategy implementation (Shi et al., 2009). But even with the expanding corpus of literature, notable gaps remain. The connection between managerial relationships and the business model creation process has received limited attention in previous studies. Information about creating and disseminating knowledge for business model innovation by managers at all hierarchical levels is lacking. Previous research often overlooks interactions among groups of managers within organizations, instead focusing on middle managers' objectives and individual contributions. Consequently, there are still gaps in our theoretical understanding of middle managers' contributions to strategic processes, particularly in business model creation.

Despite addressing crucial components of the business model creation process, earlier research has not yielded conclusive insights into managerial responsibilities. Some studies (Bashir & Verma, 2019) have explored how top management teams impact business model innovation but have disregarded the roles of managers at different hierarchical levels. While the management literature acknowledges the significance of middle management in the strategic realm, research elucidating their role remains underdeveloped (Wooldridge et al., 2008). (Chesbrough, 2010) contends that organizations should identify individuals driving new business model development and emphasize the importance of investigating how middle managers balance their objectives with the company's broader needs. Furthermore, none of these inquiries have scrutinized middle managers' roles from a brokerage perspective. Investigating the intra-organizational relationships among groups of managers at various hierarchical levels would be

beneficial to bridge these gaps and gain a comprehensive and decisive understanding of the BMI process.

3.5 Top Management's Role in BMI

The role of top management in disruptive environments and BMI has been a topic of considerable scholarly interest. Researchers have examined this area to illuminate the significant influence of senior executives in driving innovative strategies. For example, (Bashir and Verma, 2019) studied the impact of top management teams on BMI, emphasizing the importance of leadership at the highest levels. Likewise, (Sirmon et al., 2011) have explored the strategic responsibilities of top management in shaping and guiding innovation efforts, underscoring the critical role that senior executives play in setting the innovation tone within an organization. In addition, (Zhang and Li, 2010) have contributed by investigating the interaction between top management and business model innovation, recognizing that executive decision-making and vision significantly shape the direction and success of innovation initiatives. Although the managerial literature has acknowledged the pivotal role of top management in strategy development, these studies highlight the need for further exploration to understand how senior executives contribute to business model innovation comprehensively.

To gain a deeper understanding regarding organizations' choice to engage in business model innovation (BMI), it is crucial to investigate the factors within the organization that trigger this. Specifically, assessing how the cognitive abilities, capabilities, and actions of senior management affect BMI at the corporate level is important. Previous research has pointed out various elements related to top managers, such as their cognitive skills, narrative abilities, managerial expertise, relational networks, Dynamic Capabilities (DC), leadership styles, personal connections, industry-specific behaviors, and diversity among the team of top managers, as factors contributing to Business Model Innovation. Nevertheless, these researches have mainly concentrated on the abilities and behaviors of senior corporate executives while neglecting the potential influence of employees' psychographics and skills, which include motivation levels and engagement. It is imperative to broaden the scope of investigation to encompass employees' contributions, as their skills and behaviors also significantly influence BMI performance.

3.6 Top Management's Role Against Resistance to Change

In the process of strategic adaptation, top management plays a crucial role in overcoming organizational resistance to change. One common issue in management is the presence of rigid cognitive frameworks within a company, which often leads to resistance to change. Dynamic talent management serves as a means to facilitate coordinated adaptation and address resistance to change during the reconfiguration process. In addition to their language and communication skills, the social-cognitive abilities of managers are likely to impact their dynamic capabilities (Helfat & Peteraf, 2015). The capacity to perceive, seize, and reorganize capabilities is essential for harnessing the advantages of disruptive technologies. These dynamic capabilities are closely tied to the cognitive skills of managers, distinguishing them from ordinary capabilities, as their focus is on change (Winter, 2003).

Hock (2015) highlights that soliciting advice is fundamentally linked to the effective implementation of creative efforts, making it a crucial consideration when examining innovation processes, especially in the context of BMI. As the driving force behind organizational strategies and goals, top management significantly influences the culture of innovation and change within the company.

Strategic adjustments are instrumental in nurturing dynamic capabilities and advancing a company's evolutionary fitness hinges on improving managers' cognitive capabilities. This, in turn, leads to the reconfiguration of capabilities, strategic adaptations, and, ultimately, a transformation in the company's business strategy. This intricate relationship can be elucidated through the lens of dominant logic.

Research by (Shi et al., 2009) emphasizes the importance of internal brokering or inside coordination in ensuring accurate and timely knowledge dissemination and its impact on strategy implementation. This suggests that top management should collaborate with internal brokers to facilitate change and innovation processes.

3.7 Formulating a Strategic Vision and Manager's Bias

A captivating area of research pertains to examining how strategic leaders develop their strategies while considering their personal biases and the biases of their followers, both within and outside the company (Gavetti, 2011). This topic is relevant given the increasing prevalence

of businesses requiring ambidextrous strategies in today's landscape. A clear strategic vision serves as a guiding force for a company, driving innovation and competitive advantage. Academic literature has widely acknowledged that formulating a strategic vision is integral to a company's potential for innovation (Aalbers et al., 2014). This raises questions about how strategic leaders should adopt a flexible approach in shaping their visions and how they should navigate the psychological biases arising from their organizations' concurrent exploration and exploitation activities. Given the rapid pace of change in the current business environment, addressing these questions appears highly pertinent.

On the other hand, the issue of managerial bias is equally significant. While fostering knowledge sharing and open dialogue is essential, it is imperative to recognize and address the potential biases that can affect decision-making. Studies on advice networks have underscored the importance of minimizing biases in managerial relationships, particularly when it comes to disseminating knowledge and implementing innovative strategies (Shi et al., 2009). Biases can hinder effective communication, creating barriers to collaboration and impeding the development of innovative business models. Therefore, it is crucial for organizations to manage and mitigate managerial bias actively, ensuring that decisions and advice are based on objective information and a shared strategic vision.

3.8 Psychological Capabilities for Leadership

The act of perception involves several mental processes, including data interpretation and pattern recognition (Smith, 2010). Cognitive capacity significantly influences opportunity sensing (Eisenhardt & Martin, 2000). Identifying novel patterns in the environment is a crucial aspect of recognizing opportunities. Attention plays a pivotal role in discerning stimuli based on specific information. A keen attentional, cognitive skill is essential for identifying possibilities and risks in a complex, rapidly changing, ambiguous environment. To scan the environment, one can direct attention toward relevant cues. Furthermore, attentiveness contributes to identifying and generating new opportunities, with orienting capacity guiding attention to pertinent information (Cohen, 2013). Helfat & Peteraf, (2015) emphasize that a dynamic managerial sense relies on the cognitive capacity of attention.

Cognitive abilities also form the basis for dynamic managerial competencies in seizing opportunities and addressing new risks. Creating a business model for a start-up can be a prerequisite for seizing an opportunity. The ability to construct business models and make strategic investments likely shares a standard foundation. Cognitive problem-solving abilities are probably better indicators of managers' capacity to develop profitable business models and invest wisely. Correctly identifying and leveraging new opportunities can foster a company's growth and profitability. The triad of dynamic capabilities attains growth and profitability through the strategic optimization, consolidation, and restructuring of the company's assets and capabilities (Helfat & Peteraf, 2015).

3.9 Managerial Insight for Changing Environments

In times of rapid change, an organization's capacity to recognize the need for restructuring its assets and implementing internal and external changes is invaluable (Teece & Pisano, 1994). For a business to gain and sustain a competitive edge, it is crucial to develop and employ sensing, securing concurrently, and transformational/reconfiguration skills (Teece, 2007). The advent of disruptive technologies has provided opportunities for businesses, yet perception-related issues have often hindered their ability to capitalize on these opportunities (Langlois, 1997). Furthermore, businesses must reorganize their capabilities to leverage disruptive advancements (Lavie, 2006).

Bridging the cognitive gap is essential to enhance the success of reconfiguration efforts. This involves aligning managerial insights and cognitions with the cognitive capacity of the incumbent (Lavie, 2006). On the other hand, dynamic capability refers to the management's capacity to swiftly identify and seize opportunities, address challenges, integrate and restructure resources to meet evolving customer demands, and adapt to changing challenges. Ultimately, this creates lasting value for stakeholders by supporting and enhancing evolutionary fitness (Teece, 2007).

However, despite the growing body of research, notable gaps remain. The connection between managerial relationships and the business model creation process has received limited attention in previous studies. There is still a dearth of information regarding the creation and dissemination of knowledge for business model innovation by managers at all hierarchical

levels. Existing research has often overlooked interactions among groups of managers within organizations, primarily focusing on middle managers' goals and individual contributions. Consequently, our theoretical understanding of middle managers' contributions to strategic processes remains incomplete, particularly in business model creation.

3.10 Dynamic Managerial Capabilities

Individual leadership plays a crucial role in dynamic potential (Rosenbloom, 2000). Dynamic managerial capacities can elucidate variations in managerial decision-making. (Adner and Helfat, 2003) define dynamic management capabilities as the managerial abilities to develop, integrate, and reorganize organizational resources and competencies. An individual's dynamic managerial capabilities is determined by three fundamental elements: managerial cognition, managerial social capital, and managerial human capital. The data discloses a strong correlation between the development of organizational competencies and a manager's worldview. (Tripsas & Gavetti, 2000).

An understanding of managerial cognition can influence the development of dynamic managerial competencies (Helfat & Peteraf, 2015). Cognitive processes are believed to account for why some top managers excel in predicting, interpreting, and adapting to changing environmental demands. A manager's ability to engage in cognitive tasks is termed their management cognitive capability (Foss & Knudsen, 2020). The capacity to perform one or more mental processes associated with cognition is referred to as managerial cognitive capability. In this definition of cognitive competence, emphasis is placed on the specific tasks or functions served by cognition. The human brain carries out various mental functions, including perception, problem-solving, and attention. Despite their interdependence, these mental activities are distinct from one another (Grant & Baden-Fuller, 2004).

Cognitive psychologists have observed that each of these activities serves a distinct purpose, and it has been demonstrated through brain imaging studies that specific brain regions are associated with different mental activities (Helfat & Peteraf, 2015).

3.11 Leadership Styles

3.11.1 Transformational Leadership

(Bass, 1990) defined transformational leadership as a style that values employees' perspectives while nurturing an understanding of the group's vision and objectives. This approach places the well-being of the workforce above the group's self-interest. Transformational leaders aim to advance their organizations while ensuring their team members' personal and professional growth. They motivate their team to strive for personal development. An essential aspect of this leadership approach involves proactively addressing significant organizational challenges rather than merely reacting to employee interests. This strategy builds trust and motivates team members to engage in discussions related to achievement, progress, and growth (Bass & Avolio, 1990).

According to (Pisapia, 2007), transformational leaders exhibit both the positive and negative aspects of effective leadership techniques. Emphasis is placed on growth, an organizational vision is presented, and alignment with the organization's environment is achieved. Transformational leaders accomplish these goals through various means, including inspiring their followers and meeting their audience's emotional and intellectual needs (Avolio, B. J., & Bass, B. M., 2004).

3.11.2 Managerial Leadership

According to (Pisapia, 2009), managerial leadership's primary emphasis is on preserving and maintaining the existing organizational structure. Managers excel in managing ongoing tasks and short-term objectives (Mullins, 1996). When necessary, they make adjustments to the organization's existing procedures to enhance its efficiency. (Kotter, 2020) distinguishes management as dealing with complexity, whereas leadership addresses change. Managers handle complexity by engaging in activities such as planning, budgeting, goal setting, and resource allocation to achieve those goals. In contrast, leaders who advocate for positive change initiate plans to realize their future vision. In their roles within the decision-making process, managerial leaders engage with people (Zaleznik, 1999). They effectively maintain established principles while simultaneously adding value to their organizations (Rowe, 2001).

3.11.3 Ethical Leadership

Ethical leadership aims to perpetuate ethical principles guiding organizational decision-making and elucidate the ethical elements inherent in each managerial decision (Jose & Thibodeaux, 1999). To address client concerns, ethics committees can be established, ethical awards can be instituted, and ethical codes can be utilized to shape an organization's ethical policies and practices (Howell & Costley, 2006). Ethical leaders consistently uphold and reinforce the organization's principles through symbols, norms, speeches, and catchphrases. Nevertheless, their actions carry more weight than their words or symbols (Daft, 2000). Consequently, the selection of an ethical leadership role model is crucial for the moral development of staff. Role models can significantly benefit an organization's ethical culture by emphasizing observable behaviors and demonstrating the practical application of specific ideals. It is essential to recognize that a single role model can influence an audience in both positive and negative ways (Howell & Costley, 2006).

3.11.4 Political Leadership

Among many managers, the ideology of political leadership often elicits negative sentiments (Ferris, Perrewe, Anthony, & Gilmore, 2000). To guide the organization's adaptation to the ever-changing external/outside environment, executives must recognize the significance of political competence (Adair, 2005).

In the realm of professional expertise, political competence is denoted as the capacity to effect change in the workplace primarily through the channels of persuasion, manipulation, and negotiation. It entails the acquisition of a fundamental comprehension of one's colleagues and the utilization of this insight to propel organizational goals forward. It is essentially the art of effectively influencing people through the engagement of others. As a result, political leaders are adept at discerning social cues and understanding the motivations behind their audience's actions. According to (Treadway, Hochwarter, and Ferris, 2004), they excel at creating efficient communication networks.

Furthermore, political competence significantly impacts a leader's behavioral style and each individual's performance (Douglas & Ammeter, 2004). (Ahearn, Ferris, Hochwarter, Douglas, & Ammeter, 2004), as well as (Treadway et al., 2004), have underscored the positive effects of

political skill on team performance. Additionally, research has investigated how followers react to political talent.

3.12 Forces Propelling Organizations into BMI

The significance of examining the study of organizational design within the framework of Business Model Innovation or BMI from the perspective of organizational design theory should not be underestimated. Although previous research has underscored the critical role of organizational design in BMI success, the existing literature does not seem to include investigations into the causes of BMI from an organizational design perspective. While prior studies have conducted comprehensive inquiries into the determinants of BMI, it becomes apparent that the fundamental objectives and underlying motivations for BMI remain insufficiently explored (Lee, K., & Miller, D., 2019). This is primarily due to a predominant focus on external factors influencing BMI. Consequently, scholars need to reevaluate previous findings and embark on a more rigorous and systematic exploration of the causes of BMI.

The variations in how different studies have identified BMI antecedents underscore the necessity for carefully comparing and analyzing diverse research methods and findings in future research and academic endeavors. In order to attain a more thorough comprehension of the motivations and impelling factors that lead organizations towards Business Model Innovation, it is recommended that future research on the Antecedents of BMI should encompass a diverse array of factors stemming from both internal and external sources within the organization. (Johnson, R., & White, S., 2015).

3.13 Dominant General Management Logic

The company's direction is defined by management, and critical resources are allocated based on a predominant general management rationale. (Prahalad & Bettis, 1986). This logic dictates the allocation of resources in areas such as technology, product development, distribution, advertising, and human resources (Jones, 2018). Schemas, as structures, encapsulate this prevailing logic. Process knowledge is retained, like the chosen process for resource reduction or the evaluation of new technologies. The prevailing logic thus serves as both a collection of eliciting management procedures and a knowledge structure (Teece, 2007).

In the business sector, the dominant logic signifies the mindset, worldview, and management tools used to achieve goals and make decisions. The ruling coalition maintains a shared cognitive map or schema. Prahalad & Bettis, (1986) describe the process of acquiring problem-solving behaviors. Research on cognitive processes reveals that managers might misapply a "different" mindset and toolkit when confronted with a "different" business, and changing these biases requires a substantial amount of 'learning' (Gavetti & Levinthal, 2000).

This shift in dominant logic is vital for companies facing rapid industry changes. Concerns arise about the firm's learning capacity and its dominating coalition (Prahalad & Bettis, 1986). Understanding the organization's prevailing rationale is necessary to make appropriate strategic decisions (von Krogh, Erat, & Macus, 2000). This implies a fundamental approach of gradually modifying the system in response to incoming information through the lens of the prevailing logic, which leads to a progressive change in approach.

An unanswered question pertains to the role of the existing logic in introducing radical new techniques. Here, creativity and imagination become invaluable in formulating a strategy. Strategic decision-makers must develop these new approaches amid uncertainty. Hence, the dominant logic serves as a lens, filtering information as its primary function. The dominant logic model of the environment filters historical data and provides categories and patterns for strategists to interpret the data and plan future scenarios (von Krogh et al., 2000). Managers bring forth this information when they conceptualize their surroundings intelligently.

The dominant logic's category system conceptually relates two functions: the funnel's perception of the environment and the lens' ability to envision futures. The organization's potential outcomes are constrained when the strategic direction is perceived using dominant logic (von Krogh et al., 2000). It is constituted by multiple categories, including people, culture, product, brand, competitor, customer, and technology, encompassing both the internal and external environment. The broader a company's prevailing logic, the more effectively it can respond to significant environmental changes (von Krogh et al., 2000).

The company's market position, management's perspective, and the appropriate course of action are all reflected in this reasoning. Dominant logic embodies the CEO and senior management's key strategies, presumptions, and ambitions, representing their dominant way of thinking. Managing competencies encompass managerial cognition, specifically managers' opinions and assumptions about a company. Managers employ various mental models and schemas to make sense of the complex world around them (Kor & Mesko, 2013). Effective collaboration among the CEO and senior executives is essential, employing dynamic management skills to rejuvenate a company's dominant logic. A higher degree of success in revising the prevailing logic to attain evolutionary alignment is attained by management teams possessing a robust team absorptive capacity (Kor & Mesko, 2013).

CHAPTER 4: DISRUPTIVE INNOVATION

4.1 Defining and Predicting Disruptive Innovations

How can managers carry out the assessment of potential technological disruptions affecting the business? Bower and Christensen initially introduced the concept that emerging technologies can give rise to new markets or profoundly transform existing markets, leading to disruption, in their influential 1995 article "Disruptive Technologies: Catching the Wave" (Bower & Christensen, 1995). Although they were not the first to acknowledge the phenomenon of creative disruption resulting from new technologies, their work provided a framework for assessing the impact of these innovations on markets. This disruption of innovation's influence on markets triggered a movement aimed at enhancing our comprehension and predictive abilities regarding the effects of such technologies on markets (Chen, & Yu, 2011). This body of research primarily focuses on predicting market disruptions caused by groundbreaking innovations.

4.2 Potential for Disruptive Innovation and the Market's Influence

Managers must determine how to identify potential disruptive technologies in established markets to prevent adverse consequences, such as market share loss, damage to their reputation, or organizational failure (Bower & Christensen, 1995). But how can the management ascertain whether a specific technology will cause a disruption in the market or have no impact at all? One prevailing notion is that managers can capitalize on potential market disruption by recognizing disruptive innovations early or, at the very least, protecting their organizations from collapse. Researchers have attempted to make such predictions given the significant implications of foreseeing disruptive breakthroughs. However, these efforts face three common challenges. Disruptive innovations may affect some organizations but not others, leading to questions about this variation. Data becomes available only after a disruption occurs (Hang et al., 2011). These challenges underscore the need for researchers to provide a clearer and more precise definition or identification of disruptive innovations.

The mechanisms through which new technologies drive market transformations are elucidated, as marketplace disruptions and the influence of new technologies on established markets were delineated by Christensen and Bower. In other words, we can pinpoint the technological characteristics that influence market disruptions, thus expanding the scope of disruptive innovation theory. Numerous attempts have been made in various articles to define disruptive

innovations from the perspective of innovation. (Schmidt & Druehl, 2008), These definitions have not fully articulated the specific innovation characteristics that could clarify the concept of a disruptive innovation. It is imperative to precisely and unambiguously define disruptive innovations for both academic and practical purposes. On the academic front, the importance of establishing a precise definition for disruptive innovation cannot be overstated, as it serves as a fundamental requirement for addressing the matter of the causal theory of reference (Kripke, 1977). As the philosophers of business, researchers are responsible for defining terms within their respective domains. The term "disruptive innovations" has been employed to describe advancements in the business world, especially by (Bower and Christensen, 1995). This practice of terminology ownership by academics is common. If academics in the business world wish to lay claim to this concept, they must establish a precise and unambiguous definition of "disruptive innovation." Otherwise, the term may remain vague and lack a clear definition, risking becoming another business buzzword.

A precise definition of disruptive innovation is deemed essential for practical consideration by managers.

4.3 Identification of Disruptive Innovation Characteristics

These factors are independent of the innovation itself due to their changeability. Conversely, innovation features are intrinsic qualities inherent to the innovation.

The owner determines the costs, but several external factors can influence them. On the other hand, quality is determined by the user and may vary in response to developments unrelated to the specific innovation. Unlike other advancements, customer expectations evolve over time and are independent of any single innovation. These definitions essentially expand upon Christensen's original definition by addressing the market conditions that can potentially lead to market disruption rather than defining inherent innovative features, thereby broadening the theory of disruptive innovation.

Thomond and Lettice (2002) recommend using innovation adoption theories, particularly those emphasizing innovation traits, to identify key intrinsic innovation characteristics with the potential to disrupt markets. Three critical innovation qualities that have the potential to reshape

markets are identified by the literature on innovation adoption: radical functionality, discontinuous technical standards, and innovation ownership.

In the context of innovation adoption literature, "radical functionality" refers to innovations that enable users to adopt new behaviors or accomplish previously unattainable tasks (Dahlin & Behrens, 2005). According to Christensen's theory of "new market" disruption, these dramatic breakthroughs transform existing markets into entirely new ones. Discontinuous technical standards, also recognized in the research on innovation adoption, have the potential to impact markets (Dewar & Dutton, 1986). According to Christensen's concept of "low-end" innovation, markets are often disrupted by discontinuous innovations, which utilize novel materials or production techniques to improve existing technologies, providing more cost-effective materials or more streamlined manufacturing methods.

4.4 Innovation Diffusion Theory

The incorporation of radical functionality, discontinuous technological standards, and innovation ownership is observed in various ways within several innovation adoption theories (Swanson, 1994). Among these theories, Innovation Diffusion Theory (IDT) stands out as it posits that an innovation's acceptance is influenced by five key characteristics (Rogers, 1995). The traits mentioned above, comprising relative advantage, compatibility, complexity, trialability, and observability, are essential considerations in assessing innovation. Particular attention is given to relative advantage, which emphasizes the influence of an innovation's functionality on consumer acceptance, acknowledging the subjectivity and variation in innovation functionality among diverse technology users.

The technical standards of innovation are closely related to the constructs of compatibility and complexity within IDT. Complex technologies often introduce new technical standards that may pose consumer knowledge barriers. Conversely, compatibility suggests that innovations with similar technical standards are more likely to gain acceptance (Attewell, 1992). Adopters must overcome knowledge hurdles when an innovation is complex to effectively use it (Attewell, 1992). The remaining IDT criteria, trialability, and observability, are linked to market awareness and distribution methods and influenced by innovation ownership. Owners of innovations can impact the trialability and observability during the market introduction (Rogers, 1995).

Moreover, adaptations and extensions of adoption theories have further enhanced the concepts of usefulness and technical standards, especially in the context of radical and discontinuous developments. Numerous organizational components, including firm organizational features, organizational strategy and structure, context, and organizational adoption, have been examined in relation to these radical breakthroughs.

Innovations, whether radical or discontinuous, including those with new functionality or novel materials and production processes, profoundly impact existing organizational structures, strategies, contexts, and usage patterns, often leading to significant disruptions.

4.5 Ownership of Innovation

The ownership of innovation is a fundamental trait that influences its disruptiveness. Unlike tangible aspects like functionality and technical standards, ownership is an abstract quality with no physical form. However, it substantially influences various aspects of business operations, both internally and externally. Ownership impacts expenses, employee engagement, and overall organizational effectiveness (Huang, 1997). Externally, it plays a role in resource development, allocation, marketing strategies, and innovation-related services (Stam, 2009).

Furthermore, ownership, including intellectual property like patents, copyrights, and trademarks, places constraints on multiple facets of innovation, encompassing production, distribution, and usage terms (Chon, 1993; Joyce & Patterson, 2003). The ownership structure also affects how the marketplace perceives and embraces innovation (Merges & Reynolds, 2000).

Ownership carries various implications for innovations within the market, given its pivotal role in determining market prices, innovation-related services, and how innovations interface with the market. Although factors such as pricing, services, and other market offerings significantly influence the perception of innovation, they ultimately result from the choices made by owners. In established sectors, different ownership models have disrupted traditional structures, influencing aspects like pricing and accompanying services. These changes, in turn, impact how the market views and anticipates innovations (Johnson & Greening, 1999).

4.6 Digitalization Strategy for Disruptive Innovation

Digitalization is undeniably one of the most significant sociotechnical changes currently affecting various businesses (Ritala et al., 2021). Hence, the challenge of integrating digitalization and fostering digital transformation through the development of a digitalization strategy must be addressed by companies (Gobble, 2018). To achieve this, businesses must align their strategic orientation with an appropriate digitization plan (Becker and Schmid, 2020). It's worth noting that the concept of a digitalization strategy is relatively recent in scholarly exploration (Bharadwaj et al., 2013) and continues to be an evolving area of study (Mithas et al., 2013).

A "digitalization strategy" can be defined as a business plan supported by high-performance, user-friendly technologies that offer integrated and distinctive business capabilities, adaptable to changing market conditions (Sebastian et al., 2017).

The importance of having a digitalization strategy is progressively underscored when evaluating a corporation's operational efficacy. Within this context, digitalization is acknowledged by the European Union as a potent catalyst for change, and, in response to events such as the worldwide COVID-19 pandemic, the Digital Europe (DIGITAL) program has been initiated, featuring a substantial €7.5 billion budget to facilitate support for businesses, citizens, and governmental entities (European Commission, 2021). Organizations with higher digital maturity demonstrated greater adaptability during pandemic-related lockdowns than those lagging behind digitally (Fletcher and Griffiths, 2020). The value of this adaptability is underscored in a study of Kodak by (Lucas Jr. and Goh, 2009). This highlights that Kodak's ability to respond to the emergence of digital photography promptly was impeded by a deficiency in a forward-thinking digitization strategy, in conjunction with factors such as management, corporate culture, and a stringent bureaucratic structure. This, in turn, led to a diminishment in its market share (Lucas Jr. and Goh, 2009). It is plausible that Kodak could have adapted and evolved had it embraced forward-thinking digitization strategies.

It is well-recognized that disruptive innovation has strategic implications (Govindarajan and Kopalle, 2006), and fostering innovation is closely linked to having an entrepreneurial mindset, with digitization playing a pivotal role in this context as part of "digital entrepreneurship" (Nambisan, 2017).

Today, it is acknowledged that innovation extends beyond research and development, and digitalization transcends mere marketing or information technology (Gobble, 2018). A comprehensive corporate strategy is imperative, as digitization has the potential to overhaul an organization, impacting its interactions with clients, staff, and the broader market (Gobble, 2018). Given its multifunctional nature, a digitalization plan must concurrently reconfigure information technology and business resources across the entire organization (Bharadwaj et al., 2013). This complexity is a key factor that complicates the revision and implementation of a digitalization plan (Yeow et al., 2018). In a perpetually changing environment, digitalization strategies need to be developed by organizations (Yeow et al., 2018).

Furthermore, (Pagani, 2013) has demonstrated how networks with digital empowerment influence both technological and commercial strategy. In response to the competitive environment within the digital business sector, the evolution of a digital business strategy is noted (Mithas et al., 2013). Digitalization, driven by significant shifts in consumer behavior, can potentially disrupt existing business models. For example, consumers may transition from purchasing physical goods to acquiring online products they can create themselves (Hopp et al., 2018). Importantly, digitalization and the strategies devised to counter it can also act as catalysts for business innovation (Roblek et al., 2021). Effective use of social media, for instance, can stimulate both incremental and disruptive innovations within the retail industry, with the company's digital organizational capabilities serving as a crucial mediator in this beneficial interaction (De Oliveira et al., 2020).

4.7 Disruptive Innovation and its Impact on the Manufacturing Firms

Scholars and industry professionals recognize the significance of the business model (BM) in recognizing innovation, establishing a competitive advantage, and enhancing long-term performance (Zott, 2011). However, recent research examining the link between BM innovation and company performance across different geographies and industries has yielded conflicting results.

Society, the economy, and enterprises have transitioned into the digital era due to the widespread adoption of digital technology (Cai et al., 2022). Digital technologies enable

corporate innovation and expansion of organizational boundaries (Trenerry et al., 2021). The wave of digitalization, facilitated by adaptable and pervasive digital technology, has created various entrepreneurial opportunities and significant industry disruptions (Trischler and Li-Ying, 2022). As a result, the imperative and challenge of digitalization are being embraced by society, offering both risks and opportunities to incumbent businesses and newcomers through disruptive innovation (Roblek et al., 2021). This shift has significantly lowered entry barriers, enhancing disruptive innovation and entrepreneurship potential, which is particularly beneficial for resource-constrained yet adaptable start-ups (Vial, 2019). The exploration of the subject of disruptive innovation within the realm of digital-era start-ups is a research topic of relevance and timeliness.

Several literature streams related to this study topic reveal existing knowledge gaps. The definition of disruptive innovation has been refined, and researchers like (Zach et al., 2020) and (Vergara and Valls-Pasola, 2020) have investigated its influencing factors. Disruptive innovation can stem from ongoing technological developments (Wang et al., 2022), product or service enhancements (Zheng et al., 2021), or alterations to business models (Schmidt and Scaringella, 2020). Furthermore, disruptive innovation is recognized as an ongoing process, not just an isolated event (Snihur et al., 2018). Concurrently, there has been an increase in momentum within the realm of research pertaining to the digital transformation of innovation and entrepreneurship. This research underscores the disruptive potential of digital technology (Lyytinen and Rose, 2003) and characterizes digital transformation as a continuous process (Vial, 2019). A significant gap in the literature on disruptive innovation in the digital age persists despite the convergence in adopting a process-oriented perspective and their mutual relevance to disruption.

Moreover, while start-ups play a pivotal role in digital innovation and entrepreneurship, they have received less attention from researchers compared to established large firms (Fraser and Ansari, 2021). Although corporations have adopted certain practices, the academic community has been slow in developing equivalent theoretical frameworks. It is crucial not to underestimate start-ups because of their significant disruptive innovation potential, especially concerning their growth trajectories. The distinctions between established businesses and start-ups mean that findings from the former may not directly apply to the latter. A substantial knowledge gap exists regarding the triggers, essential steps, and anticipated outcomes of digital

disruptive innovation realization within start-ups. The success rates of start-up digital disruptive innovation are hindered, and the risk of failure is increased due to a lack of comprehension regarding the dynamic evolutionary pathway and mechanism.

Insights into fundamental processes supporting disruptive innovation and digital entrepreneurship, encompassing aspects such as business model innovation, agile development, innovation ecosystems, and the enhancement of organizational capabilities, have been furnished by prior research studies (Trischler and Li-Ying, 2022). Dynamic capabilities have emerged as a potential theoretical underpinning for comprehending digital entrepreneurship within a company's volatile, uncertain, complex, and ambiguous business environment (Vial, 2019). According to (Silva and Grützmann, 2022), the primary driver of disruptive innovation is business model innovation, which entails alterations to the value architecture. However, prior studies have often examined these components individually, neglecting their interdependencies. Focusing on a single perspective may result in an inadequate explanation of the intricate mechanisms underlying disruptive innovation in the context of digital technology.

4.8 Disruptive Innovation and Sustained Innovation

Some businesses struggle to grasp the intricacies of their institutional context, posing a significant threat to their survival. The self-reinforcing cycle eventually ceases for these businesses, rendering them incapable of competing. This results in gradual inertia, evolutionary limitations, and diminished adaptability over time (Barnett & Hansen, 1996). Typically, businesses operate within stable industry structures and employ a strategy-making process to address linear strategic dynamics that are generally predictable and understandable. However, nonlinear strategic dynamics overpower a business's capacity for strategic decision-making (Burgelman & Grove, 2007). This is a primary factor contributing to the short lifespan of institutions. Nonlinear strategic dynamics emerge when industry participants alter the rules, often driven by newcomers rather than incumbents.

Alterations in the standardized rules facilitate disruptive and sustaining innovation. To remain competitive, businesses must adapt to evolving market demands, which encompasses maintaining innovation. However, implementing disruptive innovation or revolutionizing their markets presents a set of challenges (Christensen, 1997). Sustainability involves enhancing

products or services in a manner already valued by mainstream consumers (Danneels, 2004). These innovations sustain these businesses by offering their major customers more than what was previously available. Disruptive innovations create entirely new markets when they introduce products or services of inferior performance according to mainstream performance indicators (Christensen & Overdorf, 2000).

These innovations failed to meet the requirements of key customers in established markets, thus leading to disruptions in those markets. Furthermore, these innovations possessed characteristics that allowed their application in new markets. They also developed rapidly enough for mainstream markets to leverage them. While industry leaders with extensive experience often conceive and introduce sustainable ideas, they typically struggle to implement or manage disruptive technologies effectively (Christensen & Overdorf, 2000).

Numerous disruptive developments can be attributed to new and disruptive technologies. The fundamental difference between disruptive technologies and mainstream technologies lies in the distinct performance they offer, typically performing worse according to metrics important to mainstream customers. Consequently, they initially cater to specialized markets that recognize their unique performance characteristics (Christensen, et al., 2015). As they refine further, mainstream consumers become content with their performance on key mainstream attributes. Nonetheless, disruptive technologies still lag behind mainstream, well-established technologies, which continue to improve. A new technology disrupts the mainstream market by replacing an established one, even if it performs worse according to primary criteria (Adner, 2002).

4.9 Industry 4.0 and Disruptive Innovation

The academic community often ponders why industry leaders struggle to maintain their competitive edge amidst market and technological advancements. Disruption theory, as a tool for predicting behavior, offers a solution to this challenge (Dillon, 2020). This tool holds fundamental value for assessing and forecasting within an organization. To make informed decisions, organizations must select the optimal course of action (Shang et al., 2019). One significant business move that contributed to IBM's survival and ongoing growth was the sale of IBM's laptop program to Lenovo.

The implementation of fundamental paradigms in work automation and computerization characterized the Third Industrial Revolution (1960-2010). The Fourth Industrial Revolution, commonly referred to as Industry 4.0, saw the processes being digitalized and informatized. Mariani and Borghi, (2019) describe Industry 4.0 as a socio-technical paradigm that proposes a policy concept focusing on research and development, deregulation, risk capital financing, and global intellectual property protection to promote and encourage innovative entrepreneurship (Herrmann, 2019). In a modern knowledge society, information, knowledge, and human resources are collectively managed through networking the economy, and success in the Fourth Industrial Revolution relies on information and knowledge (Kabir, 2019). Maximizing resources, reducing costs, and enhancing efficiency are key to an organization's competitive advantage. Furthermore, considering values and the value system is equally vital for achieving a balance between work and personal life, fostering a creative environment, and enabling self-realization (Martin-Rojas et al., 2019). The development of the social superstructure is contingent on meeting specific conditions in the broader social environment. In addition to advancing knowledge, individual consciousness and environmental attitudes must also progress (Bongomin et al., 2020).

In the course of the Third Industrial Revolution, businesses harnessed technology to lower expenses and elevate convenience, thereby enabling the emergence of novel business paradigms and the creation of technologically advanced and superior products and services. Nonetheless, it is frequently observed that groundbreaking advancements are associated with specialized technologies within the framework of Industry 4.0. Industry 4.0 underscores the establishment of cyber-physical systems (CPSs) that serve to connect the tangible and digital realms (Lu and Xu, 2018). These systems facilitate human-machine interactions along the value chain (Kagermann et al., 2013). Various challenges are encountered as direct communication and collaboration with machines as equal partners become more prevalent in the smart manufacturing industry. These challenges encompass employee resistance, apprehensions regarding substituting individuals with machinery and artificial intelligence, and the sufficiency of managerial competencies required for managing organizational processes (Seeber et al., 2020).

Cyber-physical production systems (CPPSs) are brought into existence within manufacturing companies by the integration of CPSs into production processes (Schiele and Torn, 2020). As smart factories evolve, the significance of these systems is heightened, as they facilitate the

establishment of connections throughout the supply chain, encompassing external suppliers and the environment (Roblek et al., 2020). Within the organization CPPS, the prominence of the industrial Internet of things and the integration of production systems with one or more CPS is increased as a result of modifications made to production processes (Panetto et al., 2019). Industrial clouds, physical devices housing computer power supplies and control process units, store, analyze, and share data via network connections, fostering autonomous machine setups and process optimization. Smart factories make efforts to achieve self-organization through decentralized production control, and shop floor management, based on lean management principles, undergoes a transformation through the utilization of innovative production process control software. Real-time enterprise resource collection on the planning level (top floor) is facilitated by Enterprise Resource Planning (ERP) through the utilization of objective performance data.

Manufacturing Execution Systems (MES) play a pivotal role in improving production processes, encompassing data related to production, ERP, and business planning (Oesterreider and Teuteberg, 2016).

Technological advancements, embodied by self-directed production manufacturing and service-oriented architects (Oztemel and Gursev, 2020), form the foundation and driving force behind disruptive innovations in smart factories within Industry 4.s the context.

4.10 Industry 4.0 and Smart Factories

A technological advancement is propelling the growth of smart goods and services. Within the framework of Industry 4.0, "smart factories" can be seen as the outcome of intelligent production of personalized, smart products, necessitating extensive collaboration within production networks, including external partners (Frank et al., 2019).

The Fourth Industrial Revolution drives the digital transformation of technology and business models, and it has given rise to the smart factory concept. In this context, both established businesses and new entrants encounter opportunities and challenges associated with disruptive technologies. In order to convert a factory into a smart facility, it becomes essential to ensure that all aspects related to production systems are digitally transformed and monitored. However, when Industry 4.0 niche technologies such as big data and big data analytics, cloud computing, cybersecurity, advanced robotics, additive manufacturing, augmented reality, simulation,

horizontal and vertical system integration, and the Industrial Internet of Things (IIOT) are adopted by a manufacturing company, a disruptive innovation is introduced, revolutionizing the production process. For instance, (Bruer et al., 2018) and (Tortorella et al., 2018) have examined the relationship between lean manufacturing and Industry 4.0. As noted by (Ben-Daya et al., 2017), SCM “supply chain management” and the internet of things (IoT) are interconnected. The impact of additive manufacturing on supply chain performance and processes has been investigated in various studies. A dynamic supply chain model and algorithm for smart factories have been proposed by (Ivanov et al., 2016). This model and algorithm are based on factors such as temporal machine structures, distinct processing speeds at parallel machines, and the dynamic arrival of jobs. The influence of blockchain technology on disintermediation in supply chain management has also been the subject of recent research (Venkatesh et al., 2020). Just like disruptive breakthroughs, niche technologies can impact an organization's culture (Tortorella et al., 2018). Previous studies of disruptive forces in the industry enable us to identify five critical manufacturing disruptive techniques that facilitate smart manufacturing.

In the context of Industry 4.0, multiple authors (Nosalska et al., 2019) and other have noted that a digital transformation is currently in progress, resulting in the establishment of smart factories within multiple manufacturing sectors, including breweries, automobiles, food, textiles, and footwear. The ascent of the digital (smart) supply chain is being observed (Garay-Rondero et al., 2020), additive manufacturing technologies (D'Aveni, 2018), changes in business models, and a company's competitive capabilities are all influenced by the digitalization of production. As manufacturing technologies become more interconnected through the Industrial Internet of Things (IIoT), facilitating improved machine communication and localized data processing, noteworthy innovations in the domains of complete automation, robotization, and the advancement of manufacturing technologies are observed. Within different German manufacturing sectors, the utilization of IIoT for the enhancement of cost efficiency is predominantly carried out by automotive suppliers. The critical partner networks within electrical engineering and information and communication technology companies are of primary significance. The alteration of workforce qualifications is a matter of substantial importance for machine and plant engineering firms (Arnold and others, 2016).

4.11 Industry 4.0 and SMEs

The significance of technology and the Industrial Revolution for SMEs was examined by (Hamzeh et al., 2018). Their study encompassed interviews conducted with SME consulting managers who foresaw the potential influence of Industry 4.0 technology on production costs, agility enhancement, and service offerings. It should be emphasized that this prospective study was undertaken among a diverse cohort of SME consulting managers.

The study's objective of Chan et al. (2019) was to ascertain how small and medium-sized enterprises (SMEs) could attain agility in response to disruptive digital innovation. Their conclusions indicated that innovative capability within SMEs can be cultivated by means of achieving organizational adaptability, and the promotion of boundary openness can alleviate organizational rigidity. SMEs must seek a state of equilibrium between organizational ambidexterity and resource constraints.

Loonam et al., (2018) pointed out that transforming conventional factories into smart factories would provide new insights into disruptive technological advances affecting organizational culture, agility, value chain transformation, business processes, and adjustments to human resource policies. However, even in the era of smart organizations, management should acknowledge the persistence of business and organizational challenges. Ongoing factors, such as evolving supply networks within value chains, influence both internal and external organizational environments (Akkermans and Van Wassenhove, 2018). To address these challenges, management must grasp the significance of disruptive innovations theory and utilize it for objective forecasting (Wördenweber and Weissflog, 2006).

4.12 DI and Organizational Culture

To succeed as disruptive innovators, organizations must instill in their employees the belief that disruption is not synonymous with innovation or the creation of something novel. Instead, disruptive innovations involve a process of resource allocation within the company, focusing on ongoing technological advancement and adapting to the evolving needs of both current and potential customers (Rastogi et al., 2019). Management should recognize disruptive innovation policies' significance in the Fourth Industrial Revolution context as part of their overall strategy. To achieve this, the organization's strategy underscores the importance of shaping and modifying

organizational culture, procedures, systems, and other elements that facilitate flexibility, even in situations with lower levels of innovation (Jaques, 2017).

According to (Mohelska, Sokolova (2018), To secure success within the evolving work environment brought about by Industry 4.0, it is imperative that an adaptation of the organizational culture is undertaken. In this regard, a novel set of standards, behaviors, and thought patterns, which follow the organization's goals and the prevailing social milieu, are deemed essential for the cultivation of this new culture. The organizational culture of the Industry 4.0 era is inherently shaped by its openness to the external environment, its promotion of extensive collaboration, its provision of relational autonomy, its utilization of the potential of both internal and external partners, and its continued receptiveness to novel ideas, alterations, and occasional mistakes. Moreover, it underscores implementing innovative ideas and strategies while maintaining discipline and effectively integrating participants into the networks formed around novel activities (Al-Haddad, Kotnour, 2015).

4.13 Dynamic Capability

According to Teece et al. (1997), the concept of dynamic capability within a company encompasses the ability to integrate, adapt, and adjust both internal and external resources to respond to a rapidly changing business environment effectively. Long-term competitive advantages within a business are primarily focused on being created and maintained through this concept. Various perspectives, including the organizational learning perspective described by (Zollo and Winter, 2002), the resource integration process perspective proposed by (Eisenhardt, Martin, 2000), and the strategic integration perspective, have contributed to our understanding of dynamic capability.

Dynamic capability has gained significant prominence in today's unpredictable business landscape, particularly in the domain of innovation development at both the firm and national levels, as indicated by Hameed et al. (2021). Notably, several studies have explored the roles of dynamic capability in the context of disruptive innovation. For instance, (Wang et al., 2020) demonstrated how exploratory, exploitative, and transformational learning capabilities, with a focus on absorption capability, can facilitate disruptive breakthroughs. The relationship

between disruptive business model innovation and dynamic capabilities was investigated by (Schmidt, Scaringella, 2020). This investigation was centered around mediating this relationship by value proposition innovation.

These discussions underscore the benefits of integrating the literature on disruptive innovation and dynamic capabilities, drawing from empirical data across various industries, without singling out the digital environment. Emerging management trends have heightened the relevance of the dynamic capability approach in the context of the evolving digital economy. The concept of IT-enabled Dynamic Capabilities (ITDCs) was introduced by (Ilmudeen, 2021). A company's innovation capacity and strategic agility can be improved by incorporating capabilities such as sensing, coordinating, learning, integrating, and reconfiguring. To elucidate the core functions of business intelligence, (Chen and Lin, 2021) developed the Sense-Transform-Drive (STD) conceptual model, grounded in dynamic capabilities theory. Furthermore, within the realm of digital startups, the dynamic capabilities approach was employed to clarify the relationship between business model innovation and technological innovation (Guo et al., 2021).

Collectively, these studies provide a strong theoretical framework that bridges the uncertain digital era with the potential of dynamic capabilities. This study categorizes dynamic capabilities into three dimensions, following (Teece, 2007): the ability to sense, seize, and reconfigure.

4.14 The Current Technological Scenario and its Impact on Manufacturing Firms

Understanding the impact of digitalization on sustainability in manufacturing necessitates an extension and adaptation of economics-based definitions for business models (BM) and business model innovation (BMI). This change can be driven by factors internal to the BM or external influences, with the former being influenced by the latter.

The value proposition is considered an external element of the BM, as it affects the BM by serving as an input. However, it is not an intrinsic component of any specific BM and can be satisfied by various BMs. On the other hand, endogenous factors relate to value creation and

capture. Value capture pertains to cost structures and revenue streams, while value creation encompasses critical activities, resources, channels, partners, and technology (Richardson, 2005). It is important to note that BMI is not a requirement for all innovation processes. Incremental or sustaining innovation often involves making minor adjustments to the existing BM, supporting it without necessitating a complete redesign. Radical innovation, on the other hand, describes disruptive changes that require BMI.

Figure 1. illustrates two potential BMI processes that enhance our understanding:

- (a) BMI initiated by a change in one factor within the current BM, such as new technology, a new partner, or institutional requirements.
- (b) BMI prompted by the need to transition from the current BM state to a specific desired state, for instance, improving billing capabilities, transitioning from manual to automated processes, or adopting green practices.

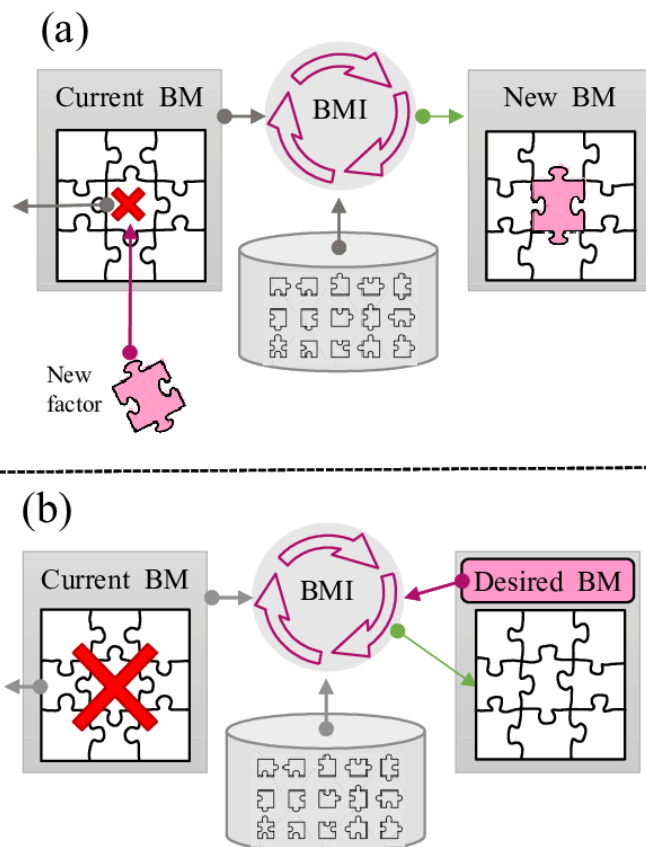


Figure 1: (a) The change in one factor results in a modification of BMI. (b) A discrepancy between the current and desired states leads to a BMI modification. “Characterization of the impact of digitalization on the adoption of sustainable business models in manufacturing”

(Maffei et al.,2019)

Both processes can operate independently of BM stakeholders' goals and plans or in alignment with them.

Process (a) allows us to anticipate the impact of digitalization on the manufacturing sector. Manufacturing companies now have access to new digital solutions, and they can implement BMI by replacing or integrating their existing infrastructure and operational processes. Transitioning to sustainable manufacturing aligns with process (b), where companies strive to achieve objectives like carbon neutrality. This work aims to separately delineate the key aspects of both BMI processes related to digitization and sustainability, make comparisons, identify areas of overlap, regions where they do not intersect, and trade-offs.

To gain clarity on these processes and delve into the context of BMI, it is essential to utilize a model encompassing all components of a BM. In other words, the value-based approach to BMs needs to be broadened to incorporate specific elements. While business models (BM) have integrated various theories and perspectives over time, systematic attempts to map BM components trace back to the early 2000s and have given rise to a widely acknowledged strategy known as the Integrated Business Model (IBM). Each of the three component families comprising the IBM has three sections with associated models (Wirtz, Göttel, & Daiser, 2016). Figure 2 provides a visual representation of the IBM components and their partial models.

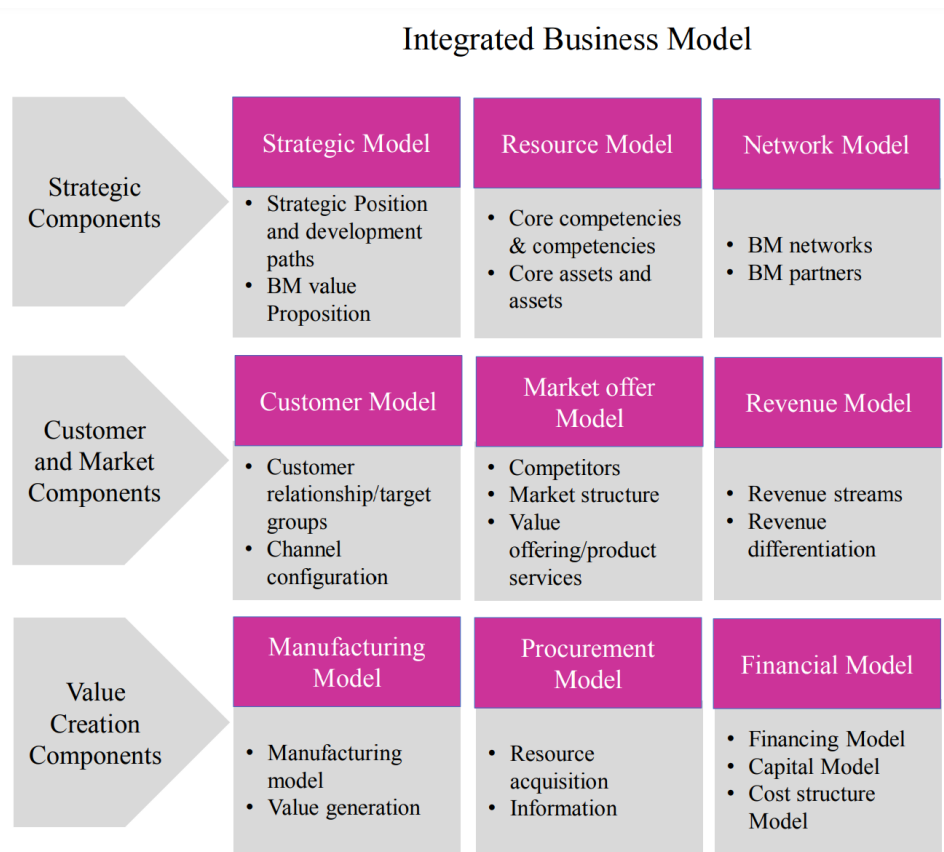


Figure 2: Component and partial models of an integrated business model (adapted from B. W. Wirtz, A. Pistoia, S. Ullrich, and V. Göttel, "Business models: Origin, development, and future research perspectives," *Long Range Planning*, vol. 49, no. 1, pp. 36)

4.15 Disruptive Innovation, Framework for Managers

How can corporate decision-makers assess a technology's potential to disrupt their industry or company? Christensen highlighted that breakthrough technology can have varying impacts (Alberti-Alhtaybat, Al-Htaybat, & Hutaibat, 2019), disruptive to some but not all. Can an innovation reshape an industry or a company, potentially leading to significant changes or even its demise? Are business professionals navigating a rapidly changing technical landscape left to their own devices? (Andersen et al., 2022)

In light of this debate, this research aims to address three critical issues related to disruptive innovations (Buhalis et al., 2019), providing managers with a framework to evaluate new developments and tackle perplexing questions in this technological category:

- *What precisely constitutes a disruptive innovation?*
- *How can disruptive innovations appear incremental or sustaining to some users while being destructive to others?*
- *Is it possible to predict disruptive innovations before they cause organizational disruption?*

To address these challenges, the scholar departs from the traditional definition of disruptive innovation, which emphasizes market characteristics, new markets, and low-end breakthroughs. Instead, we will adopt an innovation adoption theory approach to identify three pivotal innovation characteristics that can differentiate disruptive innovations in the technological realm from those in the market: an innovation's technical standard, functionality, and ownership. We will discuss the rationale for incorporating these attributes into the definition.

This revised perspective allows for a comparison of an innovation's characteristics with the technologies already in use by an organization, potentially revealing the innovation's relative impact on that organization. By utilizing the value chain, we can also better understand how a potentially disruptive innovation might affect an organization, assessing its impact on primary and secondary operations, ranging from disruption to sustainability to no effect.

4.16 Disruptive Innovation Types

This study aims to define disruptive innovation by first examining relevant literature. The challenge of defining "disruptive innovation" has been the subject of debate among academics (Mahto et al., 2020). Questions have arisen regarding the clarity and cohesiveness of Christensen's original conceptualization from 2006, despite its widespread recognition as fundamental (Hopp et al., 2018).

As outlined by Christensen (2006), two types of disruptive innovation are broadly categorized: low-end and new-market disruptions (Yu and Hang Chieh, 2008). Low-end disruption presents

a cost-effective alternative to existing products or services, albeit of lower quality, while performance improvement remains significantly unaddressed (Henderson, 2006). In contrast, innovative functionalities are introduced to customers in a novel manner through new-market disruption, often showcasing distinct attributes and performance aspects when compared to existing products or services (Reinhardt and Gurtner, 2011).

It's important to note that disruptive technologies eventually win over mainstream consumers who initially resisted them (Schmidt and Druehl, 2008). Consequently, many scholars concur that disruptive innovations can potentially disrupt established businesses by creating new markets and offering unique functionalities (Danneels, 2004). This perspective aligns with Schumpeter's theory of economic transformation, which popularized the concept of "creative destruction," characterizing innovation as an ongoing process of rendering the old obsolete and perpetually generating the new (Gilbert, 2003).

In this study, the scholar investigates disruptive innovation, assesses its impact, and presents a method for the potential identification of disruptive ideas prior to their materialization. The research concluded with a discussion on the advantages of this redefinition, potential practical applications, and paths for future exploration (Henderson, Miller, & Hambrick, 2006).

4.17 Disruptive Innovation Approach

Numerous approaches have been taken in the study of disruptive innovation. These include investigations into the financial incentives driving disruptive innovation (Adner, 2002), analyses of incumbent firms' strategies for managing disruption (Charitou, Markides, 2003), and assessments of the impact of disruptive innovation on the economy and market expansion (Ahlstrom, 2010). Supplementary factors influencing the pace of disruption, challenges related to the definition of disruptive innovation, the effects of technological advancements and shifts in consumer demand on the process of disruption, predictive analysis of innovation outcomes, and evaluations of disruptiveness designed to respond to criticisms of disruption theory, as well as competency-based rationales for the innovator's dilemma, have been examined by researchers. (Henderson, 2006), proposed refinements to the definition of disruptive innovation (Markides, 2006), fresh conceptualizations of "new-market disruption" with implications for

industry-spanning innovation (Burgelman and Grove, 2007), resource allocation within firms (Lucas Jr. and Goh, 2009), exploration of disruption as firm exit or industry destruction rather than merely a loss of industry leadership (Bergek et al., 2013), a theory suggesting that some new entrants must collaborate with incumbents to succeed (Marx et al., 2014), and explanations for the varying speed of disruption in different industries (Adner and Kapoor, 2016). Surprisingly, no one has examined the role of digitization and business model invention within the disruptive innovation research contribution, underlining our work's originality and contemporaneity.

4.18 Explanation of Disruptive Innovation Theory

As defined by Christensen (1997), disruptive innovation entails introducing products and services that may not immediately match the quality of existing offerings but eventually displace established market leaders and alliances. Christensen et al. (2015) points out that disruptive technologies, despite their challenges, offer simpler, more practical, and cost-effective products, attracting new or less demanding clients. In this context, "disruptive innovation" refers to unanticipated changes in a product or service, often achieved through cost reduction or targeting a different customer base. These breakthroughs alter the competitive landscape by disrupting established companies and creating new profit opportunities (Christensen, 1997), though it's crucial to emphasize that only radical innovations lead to such growth.

Kawamoto and Spers, (2019) define disruptive innovation as a product, service, or business strategy that effectively reshapes the needs and desires of an existing market, displacing established market leaders. Kivimaa et al. (2021) describe disruptive innovation as substantially changing organizational operations. Ho (2021) characterizes disruptive innovation as a product, method, or service with novel or well-known features that deliver significant performance or cost improvements, reshaping or creating markets. (Roblek et al. (2021) highlight the use of disruptive technology to create and expand new markets through innovative functionalities, often at a lower cost than previous products. This issue arises from loyal customers' reluctance to adopt disruptive technologies due to cost and product quality concerns. However, businesses using disruptive technologies strive to provide reliable, high-quality goods to appeal to a broader customer base (Christensen et al., 2003). According to Christensen, disruptive innovations stimulate growth because higher-quality products attract more investment.

Sounderajah et al. (2020) emphasize that disruptive innovation is a relative concept, with many business executives using novel products to update their current business models to enhance operational efficiency. For instance, Dell Computers adopted a disruptive sales strategy, opting for email and telephone sales approaches, which proved both innovative and viable. Companies often seek to update their business models or broaden the appeal and accessibility of their products to maximize profits (Sounderajah et al., 2020).

Khatab and Yousef (2021) focused on using the disruptive innovation hypothesis to explain all forms of disruptive inventions, advocating for treating the theory of disruptive innovation as a distinct phenomenon. They argue that disruptive innovations do not always outperform conventional competition strategies, and business owners introducing disruptive ideas can dominate the market. They challenged Christensen's earlier theory that attributes all disruptive breakthroughs to disruptive innovation. Established businesses should not immediately adopt disruptive ideas, as doing so could harm their chances of success. Business executives must thoroughly understand the issue before making choices that could affect their existing companies (Dedehayir et al., 2017). They cite British Airways and Unilever as examples of companies that, when faced with competition, had to plan and adopt disruptive ideas to compete successfully with rivals. They acknowledge the challenges businesses encounter in the face of fierce competition but recommend considering disruptive and efficient innovation techniques. However, they advise companies using disruptive technologies to seek innovations that do not jeopardize their current operations or business plans.

Zubizarreta et al. (2020) assert that, despite disruptive innovation being a favorable strategy for SMEs exploring new markets, many business leaders still perceive it as an assault. They discuss disruptive innovation's numerous opportunities and how some SMEs can leverage these prospects.

4.19 Technological Advancement Timeline

According to Boag (2013), senior management's trust in technological development, innovation, and digital transformation is lacking due to their incomplete understanding of these

domains, necessitating a road map for navigation in this uncharted terrain. The inception of the Third Industrial Revolution was heralded by the internet in 1994, and the Fourth Industrial Revolution, encompassing Levels 1 and 2 (1994–2020), was ushered in by cloud computing. Level 4 (2020–2025) is characterized by the encouragement of risk-taking and experimentation with future technologies, while Level 5 (2025 and beyond) envisions a future that extends beyond the scope of this study. Exponential advancements within the existing framework define level 3 (2020).

A business's competitive prowess in the digital economy hinges on its platform's capability to facilitate seamless interactions among humans, machines, and data. This is underscored by the parallel technological timeframes in Figure 3, (Sebastian et al., 2017), and (Ross et al., 2016), to guarantee the secure flow of the ecosystem, the operational and digital service foundations established by level 3 technologies have been put in place. The transition of technologies from level 3 to level 4 includes the incorporation of artificial intelligence (AI), machine learning, robotics, virtual and augmented reality (VR and AR), nanotechnology, three- and four-dimensional (3D) printing, cybersecurity, and blockchain. (Bordignon, 2017). A crucial role is played by CEOs possessing a robust technological foundation in the process of technology selection for their digital transformation, the promotion of innovation and risk acceptance, as well as the transformation of the organizational culture to adopt a data- and model-driven mindset conducive to success in the digital economy (Kaldero, 2018).

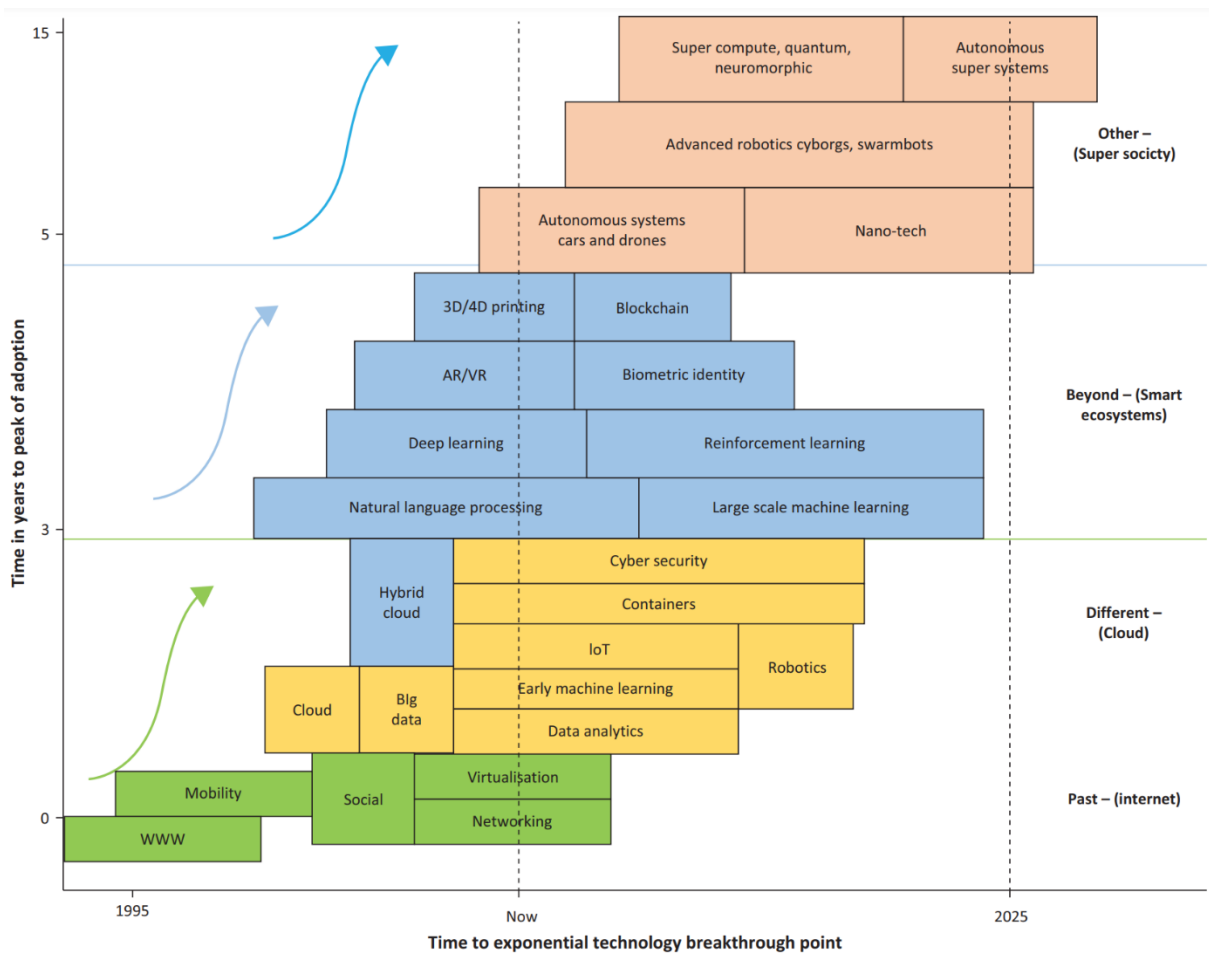


Figure 3: Horizons of technological change in the digital enterprise maturity levels

Source: Bordignon, D. (2017). *The exponential digital world*. Dimension Data Australia, pp. 1–67. Retrieved from <https://www.linkedin.com/pulse/exponential-digital-social-world-debra-bordignon/>

IoT, Internet of Things; AR, augmented reality; VR, virtual reality.

The importance of innovation in strategic leadership has been reaffirmed through a recent thematic analysis of strategic leadership research spanning the last decade. The emphasis on innovation is underscored by the convergence of insights, and due to its limited presence, it is recommended that forthcoming studies maintain their exploration of its significance within the framework of ongoing digital technology advancement instigated by the proliferation of industrial revolutions like IR4.0. The focus of a substantial portion of extant research pertaining to strategic leadership and innovation has been centered on the attitudes of senior executives and their influence on organizational creativity (Elenkov & Manev, 2005). As indicated by

recent research, an increased emphasis has been placed on the requirement for a renewed outlook on strategic leadership in the digitalization age.

The transformation of business practices is being revolutionized by digitalization, resulting in a fundamental reshaping of how value is both generated and captured (Torre & Sarti, 2020). The emergence of novel business models and governance structures has been stimulated by state-of-the-art technologies including blockchain, artificial intelligence, big data analytics, cloud computing, the internet of things, and virtual reality (Ciasullo & Lim, 2022). The importance of identifying and prioritizing core competencies and critical success factors that enable organizations to effectively navigate innovation and transformation in the modern marketplace, thereby maximizing value creation and capture, is underscored by strategic leaders.

In our increasingly globalized world, the recognition of data-driven technologies and the associated capabilities of big data as vital knowledge assets must be mastered and leveraged by strategic leaders for strategic and operational decision-making is prevalent. This is particularly evident in a landscape where data is frequently referred to as the new oil (Ciasullo et al., 2022). Contemporary scholars have emphasized the strategic significance of big data and strategic knowledge management in fostering co-innovation among strategic leaders and followers, with the objective of allowing organizations to achieve and sustain a competitive advantage (Bresciani et al., 2021).

In the forthcoming research endeavors within this domain, an examination should be conducted regarding the response of strategic leaders to innovation and digital transformation, taking into account potential variations in responses. These variations encompass the configurations, capacities, and experiences of boards of directors and top management teams (referred to as BOD and TMT).

Moreover, due consideration should be given by upcoming investigations to the transition from centralized and hierarchical decision-making to a more collective and collaborative approach driven by disintermediation. The inquiry into the fundamental skills and critical success factors

necessary for effective strategic leadership in the context of innovation and digital transformation within the contemporary landscape is similarly recommended.

Building upon this, an investigation could be conducted to explore the actions and procedures by which the impact of strategic leadership on innovation and digital transformation is either mediated or moderated.

Additionally, research could investigate the specific attributes of strategic leadership that hold significance in the context of these two developments. Moreover, future research should provide practical recommendations on how strategic leaders can effectively use big data and data-driven technologies to inform strategic and operational decision-making.

In conclusion, the investigation within this domain could be undertaken to ascertain the potential role of strategic knowledge management as a strategic asset and resource for strategic leadership. Additionally, an exploration of how dynamic technological and market conditions, which are subject to continuous change, can be addressed by innovative and adaptable knowledge-intensive processes may be pursued (Ciasullo et al., 2022).

CHAPTER 5: INTRA-ORGANIZATIONAL CAPABILITIES

5.1 Intra-Organizational Capabilities for Business Model Innovation in Manufacturing Firms

We have identified several aspects that support increased organizational efficiency: organizational learning, opportunity recognition, and organizational culture. These components converge to form what we term "Organizational Capabilities," which play a pivotal role in boosting a business's productivity and revenue. These qualities wield a significant influence on a company's long-term performance. This stems from fostering an open environment that promotes knowledge sharing and robust collaboration within the organization and its affiliated network. Consequently, these factors enhance the business's adaptability and resilience, ensuring its sustained success rather than merely short-term gains (Latifi et al., 2021).

As Schrage (1990) described, collaboration is a "process of shared creation, where two or more individuals with complementary skills interact to establish a shared understanding that none of them could have developed independently." This definition holds relevance in the context of organizational collaboration, where the shared understanding of a process, a finished product, or an event is the outcome. Consideration of temporal and spatial dimensions aids in comprehending intra-organizational collaboration (IOC). It is essential to differentiate collaboration from cooperation based on the timing of interactions (Neumayr et al., 2018).

Intra-organizational capabilities are instrumental in shaping the organizational structure and procedures necessary to achieve strategic agility and effective management. Organizations can enhance their performance and identify business opportunities by possessing the intra-organizational capabilities to analyze both internal and external environments. These capabilities are vital for generating innovative ideas, penetrating new markets with a leading strategy, and gaining a competitive edge by entering new markets and securing a share of the market (Muthuveloo & Teoh, 2013). Organizations must maintain constant vigilance to remain adaptable and responsive to business needs and enhance organizational performance. This can be achieved by integrating intra-organizational capabilities into business processes, regularly monitoring the business environment, optimizing business processes, collecting and analyzing

data and trends, and staying attuned to customer preferences and market demand (Mukerjee, 2014). Intra-organizational capacities are intricate within an organization.

5.2 Intra-Organizational Networks

Cooperation involves task distribution among participants, enabling them to complete individual tasks before aligning the parts to create the final output (Holsapple & Joshi, 2000). Synchronized and coordinated actions or exchanges constitute collaboration (Haythornthwaite, 2006). This distinction is nuanced, as both synchronous and asynchronous interactions can co-occur (Neumayr et al., 2018). The simultaneous occurrence of synchronous and asynchronous interactions in collaboration can be viewed as an ongoing coordination process (Lee & Paine, 2015). In comparison to synchronous engagement, the concept of continuous interaction holds more significance.

Intra-organizational networks play a crucial role in promoting innovation (Aalbers and Dolfma, 2015). As per the findings presented by (Kelley et al., 2009), it was asserted that networks are employed as channels through which the diverse and context-specific knowledge demands of an innovation project may be fulfilled across the organizational domain. A growing body of research has been dedicated to understanding formal and informal relationship patterns, interactions, and perceptions within working groups, which are aptly exemplified by social networks. (Park et al., 2020). As noted by (Lomi et al., 2014), social interactions among individuals contribute to establishing effective coordination mechanisms that transcend internal organizational barriers. Business model innovation emerges through synthesizing and reconfiguring information acquired from cognitive exploration and experiential learning mechanisms, with interpersonal communication and advice-giving enhancing this process.

The connection between business model innovation and organizational change processes has been extensively examined in business model innovation research, with a specific focus on organizational learning mechanisms (Andries and Debackere, 2013). Nevertheless, (Foss and Saebi, (2017) highlight significant theoretical gaps related to cognition, learning, experimentation, and organizational design.

Formal business protocols are upheld as informal intra-organizational networks coexist alongside conventional hierarchical structures, incorporating control and coordination mechanisms (Pauget and Wald, 2018); the efficacy of hierarchies for control and coordination has occasionally been diminished by the increasing complexity of business and the imperative for swift responses to environmental challenges (Fjeldstad et al., 2012). Consequently, researchers have explored alternatives to hierarchical organizational structures (Lee and Edmondson, 2017). One such approach is the actor-oriented approach, proposed as a beneficial organizational design for fostering intra-organizational collaboration. However, a comprehensive theoretical understanding of the development of these alternative organizational structures and their relationship to the process of business model innovation remains absent.

5.2.1 Intra-Organizational Advice Networks

Given the essential role of advice exchange in innovation (Schneckenberg et al., 2019), pivotal recognition has been accorded to organizational advisory networks for fostering innovation (Perry-Smith and Mannucci, 2017). Intra-organizational advice networks, as described by (Lomi et al., 2014), constitute powerful coordination mechanisms capable of transcending formal organizational boundaries. Their structure and evolution are shaped by the goals of knowledge exchange, which, in turn, encourages the recombination of ideas to generate novel ones.

Advice networks within organizations serve as the primary sources of knowledge and information, both essential components of the innovation process. Three key ways in which knowledge transfer is facilitated within an organization were identified by (Lomi et al., 2014). These involve providing information for addressing issues necessitating diverse expertise, facilitating the discovery of pertinent knowledge within the organizational structure, and promoting cross-functional conversations.

Research by Aalbers and Dolfsma, (2015) and Brennecke and Rank, (2017) highlights the significance of social networks in promoting innovation. Social networks offer a valuable social infrastructure that enhances the likelihood of generating new ideas.

Creating networks for advice exchange is a non-linear and complex process, often influenced by organizational boundaries designed to encourage specialization within units or roles, where

individuals typically collaborate with peers possessing similar knowledge bases. Nonetheless, solely relying on top-down hierarchical decisions may not consistently yield positive outcomes. A business model innovation can be promoted by adopting an actor-oriented approach, as suggested by (Fjeldstad et al., 2012). This approach emphasizes "control and coordination based on direct exchanges among the actors themselves rather than hierarchical planning." Three essential components required for the transition to an actor-oriented architectural framework have been delineated, including (1) the presence of actors who are capable of self-organization, (2) the provision of shared spaces for resource pooling, and (3) the development of protocols, processes, and infrastructures that facilitate collaborative endeavors among multiple actors. The establishment of new organizational structures is contingent upon the abilities of individuals to self-organize their work across various initiatives (Benkler, 2002).

5.2.2 Intra-Organizational Social Networks

When assessing intra-organizational networks from a social network perspective, it becomes evident that these networks offer both opportunities and constraints for accessing various resources that influence individuals' attitudes and behaviors (Burt et al., 2013). In line with this, social exchange theory posits that individuals make rational decisions in their relationships, aiming to maximize benefits while minimizing costs. These social exchange relationships are fortified through ongoing resource exchanges within trust-based connections rooted in the concept of reciprocity (Emerson 1976). Notably, in the context of friendship networks, it is generally observed that robust connections, characterized by frequent and emotionally charged interactions, are often developed by individuals with high centrality (Bae and Kim 2013).

Furthermore, individuals who have earned high trust from their peers exhibit positive psychological attributes, such as social fulfillment, psychological stability, and strong loyalty to the organization (Venkataramaniet al., 2013). Such team members, who possess a deep emotional connection with the organization, tend to engage in innovative behaviors, going beyond their usual roles and taking risks to contribute to the organization's continuous development (Lee and Sung 2019).

Conversely, individuals with low network centrality face challenges in resource exchange with their colleagues. These employees encounter obstacles in generating and implementing complex or novel ideas crucial for organizational effectiveness and receiving adequate support for their resource requests. This limitation is primarily due to their infrequent interactions with

other team members (Cattani and Ferriani, 2008). Consequently, these individuals are more inclined to self-censor their thoughts and ideas, fearing potential reactions from their coworkers or superiors (Tangirala and Ramanujam, 2008).

In summary, high social network centrality and workplace spirituality are likely to reduce organizational silence and foster innovation behaviors, as voice behavior counters employee silence (Van Dyne et al., 2003) and high network centrality promotes voice behavior. Conversely, individuals with low network centrality encounter difficulties in resource exchange, hampering their ability to access essential resources and hindering their contributions to organizational innovation.

5.3 Actor-Oriented Method

However, rigid organizational structures should not hinder the promotion of new forms of engagement and creativity. Salmimaa et al. (2018) pointed out that managers overseeing the innovation process may find themselves constrained by their official roles, potentially diminishing their effectiveness. To implement an actor-oriented approach for sharing recommendations geared toward business model development, managers need the ability to self-organize their actions, regardless of their formal responsibilities. In light of the necessity for business model innovation to be regarded as the amalgamation of cognitive frameworks and organizational practices founded on experiential knowledge, the importance of adaptability is underscored in the context of any organizational learning mechanism with the objective of managing business model components (Berends et al., 2016).

5.4 Coopetition

In their conceptual definitions, cooperation and competitiveness represent opposing concepts. However, when organizations simultaneously put them into practice, they give rise to the paradoxical notion of "coopetition". As a strategic process, coopetition results from the pursuit of equilibrium, where all involved parties concurrently experience gains and losses (Brandenburger & Nalebuff, 1995). Collaboration aims to create value, while competition involves dividing that value (Bouncken et al., 2015). This dynamic engenders strategic interdependence among organizations, where individual interests converge, depending on collective efforts to generate value, as noted by (Hidalgo et al., 2020). Companies engaging in

cooperation aim to enhance profitability while strengthening their market presence, as proposed by researchers like (Luo et al., 2006). These cooperatively competitive organizations employ competition to maximize value capture and cooperation to foster value creation. This win-win scenario serves as the primary driver of competitive interactions among rivals, as highlighted by (Bouncken et al., 2015).

Scholars emphasize the significance of resource access in establishing a competitive edge when discussing the benefits of cooperative competition. Sharing provides access to new resources and technology, offering advantages in terms of scale, negotiating power, enhanced operational efficiency, cost savings, and risk mitigation (Bengtsson & Kock, 2000; Scaravonatto et al., 2021).

The interaction between cooperative and competitive techniques is termed cooptition, although it may not always achieve perfect balance. According to (Bengtsson and Kock, 2000), one mode of interaction typically dominates, resulting in varying levels of relationship intensity. When competition takes precedence, cooperation can suffer, and vice versa. Analyzing the intricate structure of cooptitive relationships becomes challenging when attempting to separate cooperative and competitive approaches (Dal Soto & Monticelli, 2017). The cooptition paradox raises challenges, including the need for increased cooperation to achieve superior cooptitive outcomes, which may raise concerns about unfair competition. Consequently, the quality of the relationship plays a pivotal role in determining whether the outcome is favorable or unfavorable (Gernsheimer et al., 2021). Excessive competition can impede competitors' ability to perform effectively (Crick & Crick, 2020).

Intra-organizational cooptition involves using cooperative and competitive dynamics within an organization to achieve departmental objectives, promote value creation, and capture value (Bouncken et al., 2015). Before implementing this strategy, organizations should establish policies and incentives that foster knowledge sharing, technological advancement, and overall departmental development through competition and collaboration (Tsai, 2002). Collaborative measures may include resource pooling, administrative infrastructure enhancement, synergy improvement, communication enhancement, and greater stakeholder social engagement (Bengtsson & Kock, 2000). Notably, facilitating these exchange processes often relies on a

certain level of trust (Gernsheimer et al., 2021). As trust within departments is contingent on employee trust, internal social interactions play a pivotal role in developing intra-organizational trust (Tsai, 2002).

Similar to the cooperative approach, coopetition dynamics incorporate elements of competition within the organization. Consequently, it may manifest in competitive actions driven by departmental objectives, such as pursuing personal benefits, competing for top-level resources (Dorn et al., 2016), or striving to enhance efficiency, fortify internal positions, and expand market presence (Luo, 2005). However, (Tsai, 2002) underscores that even when different organizational units compete, they still aim to maintain positive relationships with each other, primarily to gather valuable information and prepare for the outcomes of competition. Conflicts are inherent in coopetition dynamics (Tidström, 2009). In contrast to interactions between external businesses, intra-organizational coopetition often does not entail significant disruption risks (Bengtsson & Kock, 2000; Tsai, 2002) or intense rivalry (Luo et al., 2006). Nevertheless, it may lead to conflicts arising from the appropriation of individual value, unacknowledged results, and disagreements resulting from the interdependence of involved parties (Raza-Ullah et al., 2014). To manage the fluid interaction between units, managers must address intra-organizational competition. (Prahalad and Hamel, 1990) noted the challenges organizations face when reassigning team members to different units due to organizational constraints. Striking a balance between cooperation and competition presents a significant management challenge for any organization (Eriksson & Laan, 2007).

Despite these challenges, intra-organizational competition often outperforms them when the appropriate infrastructure is in place (Luo, 2005), resulting in collective advantages and benefits. Emphasis on knowledge sharing within the organization fosters cooperation, enabling the integration of departments for mutual learning and process improvement (Luo et al., 2006). Coopetition also enhances product development, process innovation, and quality control among related business divisions (Luo, 2005).

5.5 Cooperative Challenges

Cooperative challenges among businesses include adjustments necessitated by conflicting structures and objectives (Tidström, 2009), and complicating adherence to individual plans

(Bengtsson & Kock, 2000). Relationships can also suffer due to perceived disparities in participant benefits (Dal Soto & Monticelli, 2017). Additionally, opportunistic behavior by competitors can constrain an organization's innovation and knowledge-creation capacity (Do Canto et al., 2017). In this context, mutual trust forms the bedrock of the partners' relationship.

Despite advancements in organizational cooperation research, gaps persist, particularly in the area of intra-organizational cooperation (Dorn et al., 2016). Recent investigations (Gernsheimer et al., 2021) also highlight this deficiency. Consequently, within the domain of organizational studies, intra-organizational cooperation remains relatively uncharted territory.

5.6 Intra-Organizational Relationships

Interpersonal ties, also known as intra-organizational relationships, play a significant role in advancing innovative value-creation methods (Moran and Ghoshal, 1996). Intra-organizational connections encompass organizational networks, shared objectives, trust, norms, and collaboration among organization members (Fukuyama, 1995, 2001). These connections are considered intangible assets, drawing from insights gained through employee interactions (Ben Hador and Klein, 2019).

Scholars have long recognized that traditional organizational charts may not accurately represent workplace communication patterns. In contrast to formal organizational structures, (Blau, 1963) highlighted the importance of informal "water cooler" conversations in understanding how employees operate. (Dalton, 1959) and (Strauss, 2018) have studied how employees subvert formal organizational structures, with implications for productivity and efficiency. Recent studies have also explored the potential differences in employee networks within the same organization.

The structural characteristics of employee networks can profoundly impact learning and innovation outcomes (Paruchuri and Awate, 2017). For instance, (Paruchuri and Awate, 2017) demonstrated that inventors who bridged more structural gaps across semiconductor companies were more likely to engage in local search when submitting new patent applications. (Reagans & McEvily, 2003) found that greater network cohesiveness and reach facilitated knowledge

transfer among staff members at a contract manufacturing company. To understand how work is conducted within an organization, examining the actual structure of networks rather than just the formally assigned ones is crucial.

5.7 Cooperative Competency

The term "cooperative competency" was originally coined by (Sivadas and Dwyer, 2000) to describe the exchange of knowledge between functional divisions or organizational units. This information transfer is supported by three key pillars: coordination among organizational units, effective communication, and trust (Chen et al., 2014). Without these foundational elements, cooperative competency is unlikely to enhance performance. These competencies facilitate garnering support from various organizational levels and the dissemination of innovative ideas, such as opportunities in the market, new products, and marketing campaigns (Galati and Bigliardi, 2017). It is evident that an organization's various units will naturally enhance their coordination, communication, and trust among each other.

5.8 Knowledge-Sharing

Business administration aligns long-term objectives within an organization to facilitate ongoing learning, knowledge sharing, and skill transfer. Establishing a support structure is crucial for enabling experienced leaders and staff to share their expertise, making it accessible to younger and less experienced team members (Tsai and Ghosal, 1998). The unique approach of experienced professionals imparting their knowledge to novices presents both opportunities and challenges for interaction. Employees with greater experience typically share their knowledge with those with less experience, and these differences come with drawbacks. Nevertheless, reciprocity, adherence to defined timeframes, a commitment to learning, and integrating acquired knowledge within the organization are essential components of this knowledge-sharing process (Ghoshal et al., 1994).

CHAPTER 6: BUSINESS MODEL INNOVATION

6.1 Business Model Innovation (BMI) Defined

The term "business model innovation," often abbreviated as BMI, signifies implementing new practices aimed at customers and partners within an established company's business model, leading to observable alterations (Rachinger et al., 2019). Business model innovation is characterized by a highly inventive approach that distinguishes it from other forms of organizational innovation. During this process, a business identifies and seizes new opportunities (Teece, 2010).

The term "business model" has gained increasing importance over time, particularly in the areas of strategy (Casadesus-Masanell & Zhu, 2013), technology, and innovation management, as well as sustainability (Evans et al., 2017).

Some research has focused on operationalizing the business model innovation process by outlining the steps that support systematic business model innovation. Additionally, since businesses often engage in the process of business model innovation via interactions within their network, the creation of shared knowledge has been recognized as a practical managerial solution to address the challenges brought on by interdependence with other organizations (Berglund & Sandström, 2013). Previous studies have also addressed the organizational procedures and competencies needed to support business model innovation (Teece, 2018).

Business model innovation is defined by Mezger (2014) as a dynamic capability encompassing the recognition of opportunities within business models, their utilization through the creation of distinctive and valuable business models, and the reasonable redistribution of a company's resources and competencies. Previous research has attempted to examine the relationship between strategic leadership and organizational design, specifically the influence of the top management team on creating and maintaining the dynamic capabilities that drive the business model innovation process (Bocken et al., 2020).

6.2 BMI Implementation

A study conducted by Andersen et al. in 2022 examined business model innovation in small and medium-sized businesses undergoing digital transformation. The research identified key factors in this process, including the identification of new external opportunities, a sense of urgency, experimentation, and data-driven decision-making. It was observed that while team creativity and empowered leadership played vital roles, they alone could not guarantee the success of the business model innovation process (Amoroso et al., 2021).

Recent research has increasingly emphasized the importance of business model innovation as a distinct process. Organizational learning theories have explored social interaction techniques for organizational players to exchange information and knowledge, fostering creative solutions for their business models (Schneckenberg et al., 2021). Developing new business models requires continuously exploring new options within an environment characterized by unpredictability and rapid change. This holds true even in highly innovative settings such as digital sharing economy platforms, which demand the implementation of novel business model procedures and the exploration of fresh methods for value creation (Grieco, 2022).

6.3 Organizational Learning in BMI Implementation

In the field of organizational learning, business models are regarded as cognitive objects or behavioral patterns (Massa & Tucci, 2014). Individuals conceive the creation and selection of options based on expected outcomes through cognitive search, a forward-looking activity. According to some scholars, conceptual processing primarily contributes to developing new business models before their implementation (Cortimiglia et al., 2016). Business model innovation occurs through social interaction modalities that define the norms, routines, and activities of the conceptual abstraction of strategy (Gavetti & Rivkin, 2007). Similarly, (Martins et al., 2015) found that conceptual fusions and analogical reasoning serve as the basis for creative decision-making in business models.

To mitigate potential cognitive obstacles that may arise in the early stages of the process, (Bitetti and Gibbert, 2022) looked into how different patterns of sensing capacities were set up as Antecedents to business model innovation in different generations of entrepreneurs. On the other hand, experiential learning is a retrospective process whereby completed experiences are

turned into routines, and the choice of whether to keep or discard them is based on how well these routines work. In this context, business model innovation has been likened to a trial-and-error learning process (Mezger, 2014).

6.4 BMI & Value Generation

The "business model" concept has attracted considerable attention in entrepreneurship, innovation research, and corporate operations (Spieth et al., 2016). The amalgamation of complementary components, primarily encompassing value creation, value capture, and value proposition, is increasingly being defined in the business context (Schneckenberg et al., 2017), despite the absence of a universally accepted definition within the research community (Massa et al., 2017).

Value creation entails the activities undertaken by a business to provide services to its customers. As per (Wei et al., 2014), value creation within manufacturing organizations involves tasks conducted both at their own production facilities and by suppliers and partners within the broader business ecosystem.

6.5 Competitive Advantage via BMI

A lasting competitive advantage in a given market is the goal of business models, intricate frameworks encompassing various decision variables linked to venture strategy, design, and economics (Morris et al., 2005). Recent studies suggest that business model innovation involves fundamentally transforming key organizational elements to address external challenges and devise novel approaches to create and deliver value. This process requires a substantial managerial commitment and openness to organizational practice change, supporting innovative concepts and methods that deviate from the conventional entrepreneurial paradigm. It is crucial to understand the organizational context within its environmental surroundings (Joao-Roland & Visser, 2019).

The value proposition, encompassing a variety of goods and services tailored to individual businesses, can be situated conceptually on a continuum that extends from the exclusive provision of goods to the exclusive delivery of services. The exploration of concepts such as

servitization or service business model innovation in the realm of manufacturing is the subject of an expanding body of research (Kastalli and Van Looy, 2013), service infusion in manufacturing (Kowalkowski et al., 2013), and through Industry 4.0, the service supply (Rennung et al., 2016).

6.6 BMI's Influence on Existing Business Model

Business model innovation comprises deliberate, significant, and non-trivial alterations to the fundamental elements of a company's business model and the connections among these elements (Foss and Saebi, 2017). This definition underscores the active role played by corporate management in influencing novel business models. Furthermore, it suggests that these innovations go beyond mere adjustments to the company's environment, like aligning product offerings more closely with market demands. Business model innovations, conversely, attract new clients dissatisfied with current solutions or unable to afford them (Yunus et al., 2010).

Business model innovations aim to increase customer loyalty by providing more extensive value propositions (Enkel and Mezger, 2013) or reducing consumer costs while expanding into new customer segments. New strategies for commercializing emerging technologies may be adopted, or responsibilities between the company and its customers can be reallocated as necessary (Zott et al., 2011). This research illustrates that a business model innovation may have its origins in and predominantly affect one of the three foundational elements of a business model: value creation, value proposition (or value offer), and value capture, following Clauss (2016). This examination of these secondary characteristics of business model innovation allows for a more precise distinction from empirical findings.

In a formal business context, it is imperative to recognize that the three components of the business model are tightly interlinked, resulting in the fact that any innovation in one of them will inevitably have an impact on the other two (Zott and Amit, 2010).

6.7 Innovative and Emerging Trends in Business Model Innovation

To adapt to the evolving demands of the business landscape, emerging trends in business model innovation are continuously evolving. These trends encompass new technology adoption, shifts

in consumer behavior, and the pursuit of sustainability and efficiency. Below are some of the key emerging trends in business model innovation.

6.7.1 BM Co-Creation

The theme of co-creating a business model holds considerable importance in the current body of literature concerning open business model innovation (BMI). Within the nine publications under consideration, seven extensively explore this theme, utilizing terminology like "co-creation," "co-design," "co-innovation," and "co-development" to depict collaborative methodologies for the development of business models. A definition of business model co-creation is provided by (Ebel et al., 2016) as the process in which business models are developed in collaboration with customers. While (Lee et al., 2012) proposed that value is generated within a co-creation framework through collaborations with external stakeholders, and introduced the term "co-innovation". (Trimi and Berbegal-Mirabent, 2012) describes a groundbreaking innovation paradigm that integrates co-creation and collaboration within a platform-based approach. The emphasis on co-innovation lies in the active pursuit of co-creating unique value and experiences with external stakeholders, rather than simply generating value for them.

A variety of strategies, including theoretical models, open software solutions, and interactive design thinking techniques, have been identified in the literature on open BMI. This section will examine design thinking-inspired, game-like innovation activities and software solutions enabling online collaboration in BMI.

In conclusion, research highlights a growing inclination toward collaborative BM development, encouraging active participation from supply chain partners, particularly in the context of smart manufacturing solutions and their ecosystems. An analysis has disclosed that incorporating BM co-creation into the BMI process results in unlocking new economic opportunities (Berre et al., 2013). The enhancement of the quality of generated Business Models is promoted not only by this initiative but also by the active involvement of corporations in assessing the commercial feasibility of new BMs before their implementation through the solicitation of external input and collaboration with customers in the co-creation of Business Models (Chew, 2015). Significantly, literature underscores the vital role of customers and suppliers (external stakeholders) in the BMI process. Direct interaction with clients and potential partners is

indispensable for co-creating solutions beneficial to all involved parties, as asserted by (Ogilvie, 2015). (Buur and Gudiksen, 2012) stress the importance of addressing BMs within the organization, involving suppliers and customers to maintain a competitive edge. (Ebel et al., 2016) underscores the necessity of target group participation for successful BMI. According to (Ogilvie, 2015), customers enthusiastically embrace the opportunity to partake in BM co-creation sessions and are interested in co-creating innovative solutions.

As proposed by Chew (2015), a co-creation approach to business model innovation enhances the alignment of shared value propositions between customer-side and supply-side business ecosystems. In line with this, Ebel et al. (2016) recommend continuously discussing and refining new business model choices with customers and suppliers until a consensus is reached among all stakeholders.

To achieve successful co-creation, it is recommended that an organizational culture characterized by "open leadership" and a dedication to "organizational learning" be fostered by businesses (Chew, 2015). Chew argues that managers should be willing to experiment and accept the possibility of failure, as business model innovation often entails trial-and-error learning. Before resources are committed to designing and implementing innovative concepts, their commercial viability can be evaluated by rapidly experimenting with various business models. This strategy emphasizes the need for flexibility in the competencies and resources of business models to ensure adaptability to changing markets (Ebel et al., 2016).

Additionally, the significance of adopting a "value network logic" instead of solely focusing on a single value chain was suggested by (Zolnowski et al., 2014). This shift promotes collaboration and communication with external partners. (Chew, 2015) further underscores the critical nature of combining resource integration and configuration capabilities to utilize externally generated information for internal processes, a concept referred to as "absorptive capacity."

6.7.2 Customer-Driven BMI

Focusing on the creation of new customer-centric business models, six publications, more than half, examined this approach. (Trimi and Berbegal-Mirabent, 2012) emphasized the need for a "customer-centered model" of business model innovation, and that "greater openness and proximity to consumers should be emphasized in fostering innovation." (Pynnönen et al., 2012) supported this viewpoint, advocating the inclusion of the customer's voice from the outset when developing new business models. They stressed that the value preferences of customers may not necessarily be known by firms. The significance of including customers at various stages of the business model innovation process was underscored.

Zolnowski et al. (2014) similarly placed the customer at the forefront of business model innovation, making them the "starting point." Their research demonstrated how customers co-determine and impact various aspects of the business model by considering all potential points of contact with customers.

Chew (2015) developed a "backward" business model design methodology, suggesting that the first step should be envisioning the unique customer experience before designing the business model and service. The initial customer demands are delineated before aligning the business model's offering with consumer value. A four-stage Business Mapping Framework was introduced to evaluate the alignment of the firm's existing business model with customer value. This framework encompasses identifying core and non-core components and eliminating non-value contributing features by assigning weights to each component based on consumer value preferences (Pynnönen et al. (2012).

A similar strategy was put forward by Trimi and Berbegal-Mirabent, (2012), highlighting the importance of "customer validation" before initiating the project. They embraced the "customer development" concept, which requires obtaining customer approval before moving to the production stage; otherwise, the process is reversed to return to the discovery stage. In the context of business model innovation, customer validation involves confirming details like pricing, distribution channels, and perceived value of the offering.

Pynnönen et al. (2012) also stressed the importance of ongoing consumer interaction to continually align a firm's business model with evolving market needs. They suggested the establishment of (online) consumer communities, akin to social media, to gather real-time information on changing customer preferences.

Of the nine selected articles, six focused on early business model validation. The research underscores the significance of "validation before creation" by involving the target audience and seeking external feedback (Ebel et al., 2016). The objective is to validate fresh business model ideas during the conceptualization phase. Engaging in rapid business model experimentation allows companies to assess the commercial viability of novel business model concepts before committing substantial resources beyond the planning stage (Chew, 2015; Ogilvie, 2015). This approach reduces the considerable uncertainty and associated risks inherent in business model innovation.

Trimi and Berbegal-Mirabent (2012) assert that businesses can enhance their chances of success by engaging in "early ongoing interactions with customers. Ogilvie (2015) similarly describes the development of initial business model validation techniques as the "key to success." Especially for startups, it is essential for business model experimentation to allow for rapid testing and validation of business assumptions. In the early stages of firm development, it is a rare occurrence for the ideal business model to manifest. Consequently, the endorsement of flexible business models that facilitate rapid iterations and the promotion of learning from mistakes is advocated.

6.7.3 Virtual Collaboration

A new business model (BM) concept and a revenue model were introduced in Ogilvie's (2015) exploratory work, both achieved at a relatively low cost. The utilization of visualization and design thinking techniques for the promotion of business model innovation by a renowned UK telematics provider proved to be highly effective. The company employed visual business model prototypes, often presented in the format of posters, during collaborative business model co-creation sessions involving customers and potential partners. Sufficient information regarding the functionality of the business model was conveyed to participants through these prototypes, facilitating opportunities for feedback and the generation of ideas.

The validation process of the business model was deemed satisfactory by the industry partner, who expressed their contentment by remarking, "A standard pricing investigation would have resulted in too much money being left on the table by us" (Ogilvie, 2015).

The use of "virtual collaboration" to encourage open business model creation was another significant trend in business model innovation identified during the review. Four out of the nine included publications discussed this novel strategy. According to (Ebel et al., 2016), IT tools are seen as having a pivotal role in facilitating the collaborative process for creating new business models. Furthermore, it has been observed that "online collaboration can be facilitated by technology, thereby leading to an improvement in the overall quality of knowledge contributed." In presenting software or online platform prototypes for open business model innovation that were pilot-tested as part of the research, all four articles in this category highlighted these open platforms primarily designed to enable innovation communities to develop new business models, thereby enhancing their inventive capabilities. As per (Berre et al., 2013), the primary goal of the innovation community is to enhance innovation capacity by connecting individuals encountering an innovation challenge with those who may possess potential solutions. The fundamental concept of the virtual collaboration strategy for business model innovation is reminiscent of a crowdsourcing approach, wherein collective abilities are mobilized to tackle intricate problems. In manufacturing, crowdsourcing strategies often focus on logistics or new product development (Mladenow et al., 2016).

The virtual business model innovation collaboration tools, as detailed in the literature, were found to incorporate a range of features, such as voting, evaluations, rating, search, and access control. Furthermore, community-oriented attributes such as profile pages, interest groups, messaging, commenting, and other collaboration tools like file sharing were also observed (Chew, 2015). Organizational members can address new business model challenges and ideas through the proposal of novel business model solutions or the establishment of connections with existing ones (Berre et al., 2013). Additionally, these platforms included "community sections" where BM development teams could seek advice or input from external collaborators in the online community, for example, vendors, clients, or research organizations. In two instances, innovation groups and social media platforms were further integrated (Pynnönen et al., 2012).

6.7.4 Design Thinking

Another emerging trend in BMI is the application of design thinking, as evidenced in three publications. Design thinking serves as an overarching framework encompassing various participatory innovation approaches that encourage creative exploration of new solutions through experimentation, utilizing physical resources, and engaging in game-like activities. Participants engage in "tangible business modeling" when employing design thinking tools for BMI, as described by (Buur and Gudiksen, 2012).

Past researchers conducted interactive design-based iterative BM experiments under various contexts to stimulate new discussions and encourage problem-solving. (Gudiksen, 2015) explored diverse BM design games to facilitate deep exploration of fresh BM concepts. It argues that regarding BM as a design problem expands our comprehension of BMI initiatives. Incorporating physical resources and randomizers, such as dice, has proven effective in generating creative ideas and combinations. Gudiksen concluded that two primary advantages are offered by BM design games: (1) clear rules are established for all participants to follow, and (2) an enjoyable and engaging environment is fostered, enabling participants to momentarily break free from reality, embrace a degree of "foolishness," and savor the "freedom to play," thereby promoting experiential learning.

Regardless of the size of the organizations, they must engage in BM experimentation, given the rapidly evolving business landscape (Gudiksen, 2015).

A temporary space for imagination, fostering an experimental, game-oriented culture, is to be established, facilitating improvisation, play, and the testing of BM concepts for the effective integration of design thinking into BMI (Buur and Gudiksen, 2012).

6.8 Antecedents to BMI

6.8.1 Technology-Driven Perspective

Over the past few decades, extensive research has been conducted on the factors influencing business model innovation (BMI), yet comprehensive studies are scarce. Despite the widespread belief that changes in the corporate environment and technological advancements directly affect BMI, most existing research has not substantiated this notion. BMI is, in fact, a

consequence of the rapid evolution of information technology. Consequently, companies must strategically determine how to introduce technology to the market to convince users to embrace technologies that may not yield immediate, tangible benefits (Chesbrough et al., 2002). Consequently, several researchers have initiated investigations into the impact of ever-advancing technology on BMI.

An illustration of this can be found in a qualitative study carried out by (Müller et al., 2018), which encompassed 68 small and medium-sized businesses (SMEs) in Germany. This study suggests the potential for the influence of Industry 4.0 on the business performance of manufacturing-focused SMEs in terms of their BMI. In addition, Sjödin, et al., (2021) conducted an extensive case study involving six major industrial enterprises offering digital services and identified a correlation between the advancement of artificial intelligence (AI) and BMI. Moreover, utilizing survey data from 253 UK-based companies and employing qualitative comparative analysis, A direct and positive influence of big data analytics capabilities on BMI was confirmed by (Ciampi et al., 2021) through the utilization of Partial Least Squares Structural Equation Modeling (PLS-SEM) and Fuzzy Set Qualitative Comparative Analysis.

While extensive research takes a technology-driven perspective, many of these studies tend to overly emphasize business model innovation (BMI) as merely another method of technology commercialization. This viewpoint frequently neglects the fact that BMI represents an organizational-level strategic transformation. Furthermore, technology development often entails substantial investments, which can lead businesses to prioritize the technology itself at the expense of BMI. Consequently, companies may become deeply entrenched in their current business models, making it challenging for them to adapt to shifting market conditions. Organizations must strive to achieve a balance between technology and their business model to achieve sustained commercial success.

Nevertheless, existing studies have not thoroughly investigated the equilibrium and interactions between technological innovation and BMI. Moreover, different firms possess varying technological requirements, and current research fails to comprehend how distinct technologies affect different companies clearly. As a result of this lack of clarity, entrepreneurs and managers

encounter difficulties when assessing the suitability of new technology for their specific circumstances.

6.8.2 Strategy-Driven Perspective

Differences exist between scholars taking a strategic stance and those adopting technology-driven viewpoints, emphasizing the utilitarian aspects of business model innovation (BMI). Strategically oriented academics highlight the importance of BMI aligning with a company's operating context. The existing literature explores BMI in various contexts. For instance, (Sengupta et al., 2021) examined inadvertent factors affecting BMI acceptance among India's economically disadvantaged population, while (Iheanachoret al., 2021) investigated justifications for BMI in Nigeria's financial services sector. (Wiprächtiger et al., 2019) delved into the primary factors influencing BMI in emerging markets. Research by (Cheah and Ho, 2019) supports the idea that a company's co-working spaces can significantly enhance BMI. Recognizing that political factors frequently impact a company's operations is crucial. Prior research suggests that factors such as regulatory frameworks, regulatory uncertainty, and policy combinations can act as catalysts for a company's BMI (Trotter & Brophy, 2022).

As the world's population grows and resources like food and energy become scarcer, an expanding body of research emphasizes circular BMI as a means to reduce the stresses brought about by population growth while safeguarding the environment. Circular economy BMI strongly emphasizes sustainable resource utilization and waste minimization to mitigate the negative effects of economic activity on the environment. Nevertheless, despite substantial interest from businesses, only a handful have successfully implemented circular economy BMI (Bocken & Geradts, 2020). This multidimensional innovation challenge compels companies to explore uncharted territory and question established business models (Bocken & Geradts, 2020). To encourage the adoption of circular BMI, sustainability, circularity, and BMI should be integrated into the design thinking framework (Santa-Maria et al., 2021). According to research findings, it has been observed that in the agricultural sectors of Sweden and Finland, a higher likelihood of adopting BMI is associated with businesses that prioritize sustainability (Rantala, Ukkoet al., 2018).

A firm should leverage its strengths, mitigate its weaknesses, and focus on areas where it excels and operates within its capabilities. This represents another essential principle of the strategic perspective, grounded in a firm's existing resources and capabilities. When a company's

resources and capabilities are constrained, BMI poses challenges. Dynamic capabilities (DCs) are being developed by businesses to address these constraints and foster BMI, as substantiated by experimental research (Heideret al., 2021).

Furthermore, with the increasing complexity and decentralization of global value chains, knowledge resources for Business Model Innovation (BMI) are becoming more widely distributed. This includes knowledge that is acquired from international sources (Von Delftet al., 2019), consumer insights, and other knowledge repositories. In order to access the dispersed information sources crucial for fostering effective innovation, it is imperative for firms to cultivate external knowledge management competencies and execute external knowledge searches prior to the commencement of Business Model Innovation (BMI) (Snihur & Wiklund, 2019).

The comprehensive analysis of how businesses assess BMI opportunities within their internal and external environments, as offered by the strategy-driven perspective, is accompanied by limitations in both this and technology-driven perspectives. These limitations include an overemphasis on environmental impacts, inadequate consideration of a firm's internal operations, a dearth of research regarding the fundamental mechanisms of value creation, restricted exploration of alternative BMI strategies, and a failure to recognize consumers and customers as potential sources of innovation.

6.8.3 Demand-Driven Perspective

Generating value through meeting client needs is the foundation for business model innovation (BMI). However, scholars adopting a strategic approach have at times emphasized a company's objectives, assets, skills, and past achievements, often neglecting the critical aspect of fulfilling consumer requirements. Consequently, an increasing number of researchers are focusing on the needs of target or potential clients. The current body of literature's primary focus lies in examining target customer needs, unfulfilled requirements, and the influential consumer characteristics affecting BMI (Cillo et al., 2021).

With a shift from affluent developed nations to less affluent developing nations, this change in perspective has been gradual. This transformation results from recognizing that the "bottom of the pyramid," frequently denoting developing and underdeveloped countries, represents an immensely attractive market for established and emerging businesses, where consumer demand remains largely unmet.

The impact of BMI on businesses has been investigated by researchers, including the examination of how stakeholder preferences and behaviors, both within and beyond the organization, are influenced. Valuable insights into the company's BMI approach can be gained through the analysis of stakeholder preferences and behaviors, as these may encompass stakeholders who are either internal or external to the industry and could potentially serve as business customers.

The positioning perspective is currently being discussed in the field of BMI facilitation. According to scholars, BMI is influenced by both active and passive market orientation (Maet al., 2021). Despite the focus on demand-driven viewpoints and the significance of businesses in recognizing demand, there exists some uncertainty regarding how businesses identify client demands. Although this method is simpler and more comprehensible, a research gap persists in this particular domain. Consequently, additional research is deemed necessary to comprehensively investigate and understand how businesses recognize and address client needs.

6.8.4 System-Driven Perspective

Some academics argue that BMI is a multifaceted process that defies a single explanatory approach. Consequently, a hybrid paradigm has been proposed to comprehensively elucidate the various factors influencing BMI. An illustration can be found in a study conducted by (Ruggiero et al., 2021), in which the analysis of semi-structured interviews with 22 Finnish enterprises highlighted that several factors affecting firms' engagement in Business Model Innovation (BMI) were discerned. The decisions and actions of firms pertaining to BMI are influenced collectively by factors such as the decline of dominant companies, regulatory changes, and increased competition.

A mixed perspective, when employed, can facilitate the comprehension of how various factors influence BMI; nevertheless, it is imperative that further research be undertaken to gain a comprehensive understanding of the interplay and synergy among these elements. The elucidation of the fundamental drivers of BMI will be achieved through this thorough investigation.

6.9 Process of Business Model Innovation

6.9.1 Component Approach

Considering various viewpoints and contextual circumstances, researchers examining the BMI process must choose, if to build a new model from the ground up or alter the recent. Earlier research mainly aimed to modify the BMI's component parts. To account for the dynamic nature of BMI, researchers have incorporated parts of digital technology into the nine components of the Business Model Canvas, as the technology has evolved.

Furthermore, with the expansion of the platform economy, changes to components have become more intricate, impacting areas such as value propositions, products, partnerships, and profitability models. Simultaneously, shifts in BMI components have been influenced by sustainability trends (Czachorowski, 2021). While the examination of component modifications aids in the analysis of the BMI process, the absence of scholarly consensus on these components has impeded BMI's advancement. Future studies should adopt a more systematic approach to thoroughly investigate every facet of the BMI process, encompassing an exploration of the interplay between the various elements and the intricate connections among them and the overall BMI process.

6.9.2 System Approach

Several scholars advise taking a systems approach viewpoint in order to fully comprehend and evaluate the application of business model innovation (BMI). This point of view is crucial as a business's BMI procedure is complex and multidimensional. According to this perspective, BMI is seen as a dynamic, complex system comprising several interrelated components, including the environment, markets, human capital, organizational structure, and resources. When considered comprehensively, these variables impact the BMI process' efficacy because

they are always changing and fluctuating. According to this viewpoint, the BMI process consists of a series of processes that are added, changed, and finally eliminated. According to (Tykkyläinen and Ritala, 2021), it is imperative that organizations continuously undergo adaptation and refinement of their processes through a process of trial and error for the attainment of their BMI objectives.

A different viewpoint portrays the BMI process as a complex and dynamic system in which multiple variables interact and exert influence on the implementation of the BMI. This perspective underscores the system dynamics aspect of the BMI process. The value of the systems approach in BMI research is underscored in their study, which provides a state-of-the-art methodology for comprehending and interpreting the BMI process. However, it is imperative to acknowledge that although the systems approach provides a wide viewpoint, its practicality may differ in actual situations. Each situation should be evaluated individually to decide the best course of action. Despite its potential, there remains a shortage of literature on the BMI process from a systems perspective, necessitating further investigation to comprehensively understand the BMI process.

6.9.3 Learning and Experimental Approach

As per the findings of multiple scholars, business model innovation is regarded as an enduring process that entails learning, experimentation, and trial-and-error for both individuals and organizations, resembling other variants of innovation (Paiola, Agostini, Grandinetti, & Nosella, 2022). The key objective of this iterative approach is to ensure that new business opportunities are continually generated while the business model (BM) is progressively improved and refined. From this standpoint, the BMI process is in a perpetual state of evolution, requiring ongoing reflection and adaptation to uphold the BM's responsiveness to market demands and its capacity to provide value.

Nonetheless, limited research has been conducted on the efficacy of learning and experimentation within the BMI domain. Prior assessments of the efficacy of learning and experimenting in the context of innovation, as indicated by (Choi & Perez, 2007) and others, have mainly relied on economic outcomes as the primary criterion, which they argue is insufficient. Therefore, it is imperative to link the results and impacts of BMI to the objectives

and methodologies of learning and experimenting, enabling a comprehensive assessment of its success. Consequently, scholars should formulate more comprehensive and systematic evaluation criteria.

Furthermore, the roots of these learning and experimentation initiatives and the mechanisms driving these processes are often overlooked, despite the abundance of studies delving into the many stages and methods connected to learning and experimenting in the context of BMI. Therefore, more investigation is necessary to determine the efficacy of learning and experimenting in BMI. Incorporating an examination of the sources, methodologies, and procedures for learning and experimentation is deemed essential in this research, alongside managerial strategies. A comprehensive study is envisioned to establish the groundwork for a more comprehensive and meticulously structured theoretical framework for the BMI process. This framework will enable adaptation to evolving market demands and the maintenance of a competitive edge.

6.9.4 Steps Approach

Scholars are still actively participating in ongoing discussions concerning the constituent elements of the BMI process. Within this discourse, the inclusion of elements such as experimentation, experiential learning, and a method characterized by a trial-and-error approach is advocated for by some. Conversely, others have sought to delineate specific phases or procedures. For example, (Hanafizadeh et al., 2021) have introduced a four-phase model encompassing inception, conceptualization, integration, and assessment. Correspondingly, Andersen et al. (2022) have identified four pivotal processes: environmental assessment for identifying novel opportunities, fostering a sense of urgency, experimenting with fresh alternatives, and employing a synthesis of intuition and data for decision-making. Furthermore, Lantano et al. (2022) have elucidated the four developmental stages of Sony PlayStation's Business Model Innovation evolution: set-up base is established, an online network is constructed, capitalization on this network is undertaken, and exploration of innovative models is conducted.

Moreover, within the context of the BMI process, an examination of the importance of essential competencies, including dynamic capabilities (DC), responsiveness, reversibility, prediction,

and operationalization, has been undertaken by researchers. However, unexplored variations in competencies and resources at distinct BMI stages and strategies to mitigate associated risks remain a noteworthy lacuna in the existing body of literature. Therefore, forthcoming research endeavors should undertake a more comprehensive exploration of these aspects.

Additionally, the paucity of successful BMI cases due to privacy concerns underscores the exigency for future research devoted to this domain and the exploration of techniques to enhance BMI effectiveness. We proffer the recommendation that organizations tailor their BMI strategies to the unique circumstances they confront, taking into account factors such as their operational milieu, attendant risks, available resources, and leadership styles. This tailored approach assumes paramount importance in the context of adapting to rapidly shifting market conditions and securing a competitive advantage. Acknowledging that diverse scenarios may necessitate distinct BMI tactics and methodologies is crucial. Hence, the incorporation of an array of theories and techniques throughout the BMI process is imperative.

6.10 Types of Business Model Innovation

In the domain of BMI, the consideration of both the categorization of business model types and the exploration of novel business models or the refinement of existing ones is deemed imperative. The foundation of BMI theory is firmly rooted in this classification. Scholars have furnished a variety of categorizations for BMI, some contingent upon the uniqueness of the business model. These categorizations range from those based on empirical observations in business practices to those grounded in evolutionary, targeted, adaptable, and complex BMI.

For instance, in the context of Internet-driven platform-based BMI, scholars have delineated platform skimming, platform income generation, and platform coordination (Markfort et al., 2021). Furthermore, the advent of the sharing economy has given rise to the concept of sharing-based BMI (Ciulli & Kolk, 2019). Various categories, including technology-based, value network-based, and financial barrier-based business model innovations (BMIs), have arisen as a result of the lessons learned from companies such as Kodak and Microsoft in the gaming industry. Differentiated consumption patterns in Chinese consumers have resulted in the establishment of classifications like imitative "good enough" business models, RenQing business models, MianZi business models, and hybrid business models. Additionally,

Carayannis et al. (2019) propose social BMI to enhance human welfare and advance social objectives.

The BMI theory has been bolstered by classifications based on observable events; however, challenges in providing comprehensive insights into BMI for different firms may be encountered by researchers. This is primarily because of the somewhat restricted theoretical underpinnings, unclear standards, and ambiguous boundaries.

In the realm of well-established enterprises, a proactive stance is frequently adopted with the aim of advancing radical or disruptive innovations in business model (BMI). This is achieved through the means of value network innovation, exhaustive external research, and the reconfiguration or transformation of existing market structures or value propositions. Conversely, within social work organizations operating in burgeoning economies, a higher priority is placed on eco-innovation or social innovation to address societal and environmental issues while endeavoring to provide a combination of social and economic advantages. This particular approach may be manifested as circular BMI, green BMI, or strategies of a similar nature.

Multinational corporations, conversely, may opt for either localized or global BMI initiatives to align with the distinctive market requirements and cultural nuances of various countries and regions, as exemplified by the supply chain localization efforts of Zongteng, a Chinese cross-border e-commerce enterprise.

It may be advantageous for Small and Medium-sized Enterprises (SMEs) to consider adopting gradual or adaptive forms of Business Model Innovation (BMI) owing to their inherent flexibility and strengths in niche markets. Conversely, a preference for a more traditional or conservative BMI strategy may be observed in family-owned businesses, motivated by their commitment to preserving core values and heritage. The significance of harnessing the unique culture and relationship network of a family business specializing in non-ferrous alloys, as emphasized in the case study conducted by Malik et al. (2022), underscores the importance of utilizing these assets to maintain the brand image and reputation.

It should be highlighted that the various BMI classifications are not mutually exclusive. The utilization of multiple BMI techniques may be opted for by organizations based on their strategic objectives, market opportunities, or evolving environmental conditions. The case study of Interface, a carpet manufacturer, shows An example of the implementation of diverse BMIs for achieving sustainability objectives, such as product-service system innovation, technological innovation, social innovation, and organizational innovation.

These insights provide valuable information and references; however, it is of utmost importance to recognize that potential biases or oversights inherent in these approaches must be acknowledged. Frequently, they may disregard the influence of cultural, political, and economic factors on BMI in different countries or regions. Consequently, the establishment of a comprehensive and well-structured taxonomy must be diligently pursued by academics to enhance our understanding of the variables that are influenced by distinct BMI types in diverse organizations with varying backgrounds and industries. The identification of the types of businesses most suited for specific BMI techniques should be clarified by such a taxonomy.

6.11 Obstacles to Business Model Innovation

BMI implementation often encounters challenges, including cognitive, resource, and capacity limitations, which can significantly impede successful adoption. It's crucial to understand that a new business model (BM) represents either an extension or a departure from an organization's or an industry's existing business model. While existing models can serve as sources of inspiration for creating new BMS, they can also, at times, restrict management's perspective on BMI.

The adoption of BMI may become complex for management due to a myopic focus on incremental gains and direct competitors, driven by industry-centric tunnel vision and information overload (Vuorio et al., 2018). This can lead to poor decision-making by overlooking vital industry-specific distinctions. Another obstacle to adopting a new BMI is the perceived disparities between employees in the innovation department and those working in the company's core operations. The primary reason for this lies in the substantial investments made by businesses in their existing BMS, and the profound comprehension of the interactions

between these resources and capabilities, which has been acquired through established practices.

Moreover, creating a new business model is associated with considerable uncertainty and risk, prompting businesses to exercise caution in allocating their existing resources and skills to optimize profitability. (Xia-Bauer, et al. (2022) illustrate how the study of the four largest European banks exemplifies severe constraints on BMI due to their existing resources and capabilities. The theories that obstruct BMI implementation are being examined in these studies, with socio-cultural factors like customer knowledge and behavior and political, legal, and economic issues concerning stability and ambiguity frequently being disregarded. Additionally, the investigations fail to provide specific recommendations or detailed descriptions of how these impediments specifically restrict BMI implementation.

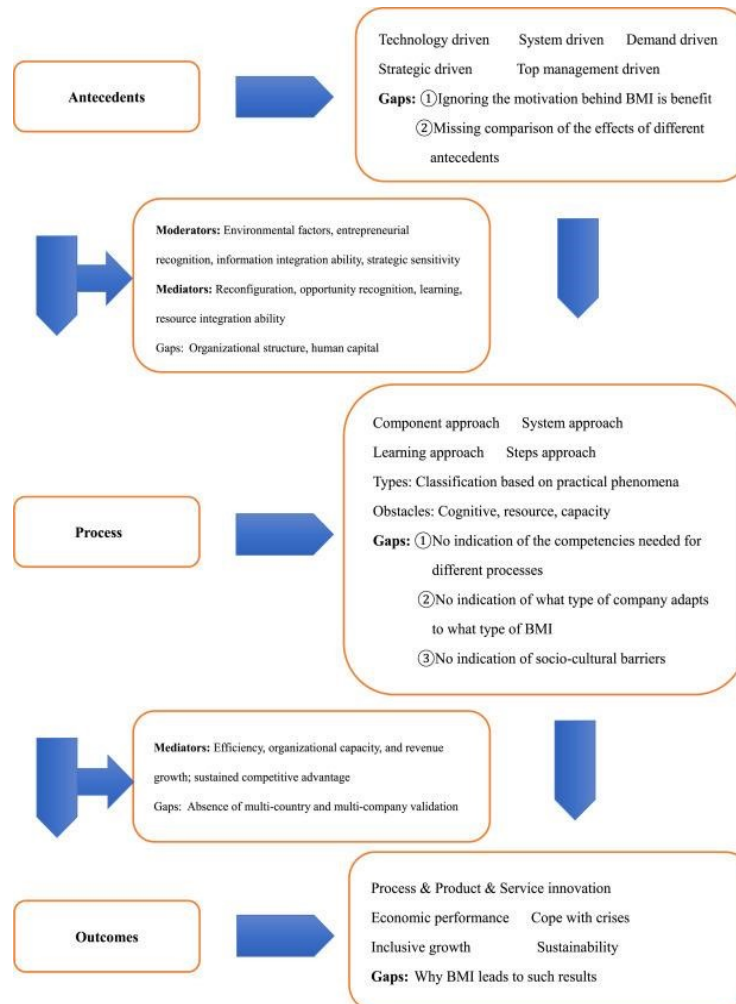


Figure 4: Antecedent-process-outcome theory model of business model innovation.

Source: WenJun Huang, Takeyasu Ichikohji, (2023). “A review and analysis of the business model innovation literature.”

6.12 BMI and Disruptive Innovation

In accordance with Teece (2010), a business model functions as a foundational framework for delineating how an organization generates, transmits, and captures value. From a conceptual perspective, a business model is perceived as a collection of interrelated elements that can provide valuable insights (Zott et al., 2011). The three fundamental dimensions that are considered integral to defining the essential elements of a business model are the value proposition, value generation, and value capture (Howell et al., 2018).

A study has been carried out regarding the substance and evolution of business models in the realm of business model innovation (Zhou et al., 2021). Business model innovation entails the introduction of inventive combinations of elements and the reconfiguration of interconnected components following the principles of business model constituents (Budler et al., 2021).

The pivotal role played by business models in the field of disruptive innovation has been emphasized by numerous investigations (Benzidia et al., 2021). The development of business models has been established as an essential conduit or component of disruptive innovation (Alhtaybat et al., 2019). Furthermore, frameworks for crafting disruptive business models have been explored in comparable studies, with consideration given to their alignment with evolving contexts, such as the sharing economy (Si et al., 2021).

The potential scope of business models has been expanded, and the rate of business model innovation has been accelerated by the advent of digital technology, as noted by Lu and Yu in 2022. The innovative business model known as the platform business model, characterized by attributes such as servitization, agility, and value co-creation, has been one of the models that have emerged in this digital landscape, as outlined by Jääskeläinen et al. in 2021. Additionally, it has become increasingly apparent that business models in this rapidly evolving digital era are dynamic and subject to continuous evolution, as highlighted by Bohnsack et al. in 2021.

6.12.1 BMI Triggered by Digitalization.

The model facilitates the development of a precise operational definition of digitalization. It enhances the comprehensive and continually evolving understanding of this concept,

characterized by integrating digital technologies into daily life through digitizing all feasible components. In this context, the primary focus is on the potential of digital technologies to revolutionize various aspects such as activities, processes, participants, interactions, and products within the previously mentioned IBM domain. This extends beyond the transition from analog to digital and encompasses the effects of this transformation on the value-creation process, offering increased accessibility, availability, and transparency (Amit & Zott, 2001).

6.12.2 BMI Triggered by Shift Towards Sustainable Manufacturing.

The primary focus of this investigation is the "desired BM" or business model aligned with sustainable manufacturing. While there isn't a universally accepted definition, there is some consensus in the literature regarding the characteristics of a sustainable business model. Furthermore, numerous examples fitting this paradigm have been presented (Bocken, Short, Rana, & Evans, 2014).

The following table showcases a curated collection of these archetypes and pertinent examples, with the ones emphasized in bold being the subject of detailed analysis within this research.

| Group | Archetype | Example |
|----------------|---|--|
| Technological | Maximise material and energy efficiency | <ul style="list-style-type: none"> • Low carbon/manufacturing solution • Lean manufacturing • Additive Manufacturing • De-materialization (of products/packaging) • Increased functionality (to reduce total number of product required) |
| | Create Value from waste | <ul style="list-style-type: none"> • Circular economy/closed loop • Cradle-to-cradle • Industrial Symbiosis • Reuse, recycle, re-manufacture • Take back management • Use excess capacity • Sharing assets (shared ownership and collaborative consumption) • Extended producer responsibility |
| Social | Deliver Functionalities rather than ownership | <ul style="list-style-type: none"> • Product-oriented Product Service System (PSS) – maintenance, extended warrantee • Use oriented PSS – rental, lease, shared • Result oriented PSS – pay per use • Private Finance Initiative (PFI) • Design, Build, Finance, Operate (DBFO) |
| Organizational | Develop scale solutions | <ul style="list-style-type: none"> • Collaborative approaches (sourcing, production, lobbying) • Incubators and entrepreneur support models • Licensing, franchising • Open Innovation (platform) • Crowd sourcing, funding |

Table 1: A selection of the sustainable business model archetypes (adapted from (Bocken, Short, Rana, & Evans, 2014). In bold the cases analyzed through literature review.

CHAPTER 7: RESULTS AND ANALYSIS

7.1 Findings

The research landscape on strategic leadership in disruptive innovations is examined in this content analysis, focusing on intra-organizational skills for business model innovation in manufacturing businesses. The objective is to identify trends, significant sources, prominent journals, and developments within this research field by thoroughly evaluating relevant academic articles. The findings of this study provide a summary of the current state of knowledge in the field and suggest potential directions for further research.

In today's rapidly changing business environment, manufacturing organizations face challenges in adapting to disruptive developments. It is essential to have strategic leadership and foster intra-organizational talents to facilitate business model innovation. This research employs content analysis to gain a deeper understanding of the state of research in this field. It explores topics, key contributors, and the evolving body of knowledge related to business model innovation and strategic leadership in manufacturing organizations.

This study analyzed a comprehensive overview of the research on strategic leadership in disruptive innovations and business model innovation within manufacturing firms through content analysis. The results of this study, which are based on recurring themes, influential authors, and emerging trends in the field, provide valuable insights for researchers, practitioners, and policymakers interested in advancing knowledge in this critical area. Through analyzing a wide range of academic publications, this research has delivered essential insights into the dynamics of strategic leadership, disruptive innovation, and business model transformation in the manufacturing sector.

1. Strategic Leadership and Disruptive Innovations: Research indicates that strategic leadership plays a pivotal role in recognizing disruptive innovations. Influential leaders attentively monitor industry shifts and actively investigate emerging technologies and market trends (Tidd & Bessant, 2020). They cultivate an innovation-oriented culture, promoting employee involvement in idea generation and change acceptance. This aligns

with existing literature, underlining the significance of visionary leaders in responding to disruption.

2. Intra-organizational capabilities: Manufacturing companies prioritizing developing intra-organizational capabilities demonstrate better adaptability to disruptive innovations. The research reveals that these capabilities encompass flexible organizational structures, nimble decision-making processes, and a culture of experimentation (Gunasekaran, 1999). This corresponds with theories emphasizing the necessity for organizations to be agile and adaptive in the face of disruption.
3. Business Model Innovation: Studies establish a direct link between strong strategic leadership, well-established intra-organizational capabilities, and successful business model innovation. Companies led by visionary leaders who nurture an innovation-driven culture and possess agile structures are more likely to adjust their business models effectively in response to disruptive innovations (Burmeister et al., 2016).
4. Challenges and Obstacles: The study also acknowledges the challenges and obstacles confronting manufacturing companies when embracing disruptive innovations. Resistance to change, organizational inertia, and resource constraints can impede efforts to cultivate intra-organizational capabilities and innovate business models. Strategic leadership remains imperative for surmounting these challenges (Aksom, 2022).

Moreover, this content analysis study on "Strategic Leadership in Disruptive Innovations: Intra-organizational Capabilities for Business Model Innovation in Manufacturing Companies" has offered valuable insights into the evolving landscape of strategic leadership and its crucial role in propelling business model innovation in the manufacturing sector. Research analysis drawn from publications, citation patterns, and thematic trends has unveiled a number of significant findings:

1. The study emphasizes the increasing significance of disruptive innovation in the manufacturing sector, reshaping the competitive landscape and compelling companies to adapt and innovate their business models to remain relevant.

2. The content analysis underscores the pivotal role of strategic leadership in guiding organizations through phases of disruptive innovations. Effective leadership is essential for fostering intra-organizational capabilities that support business model innovation.
3. The study reveals emerging research trends, including the integration of digital technologies, sustainability, and global competitiveness within the context of manufacturing companies. These trends reflect the evolving opportunities and challenges in the industry.
4. It is evident that scholars from diverse fields, including management, innovation, and technology, are collaboratively addressing the multifaceted issues arising from disruptive advancements in the manufacturing industry. This interdisciplinary approach is imperative.
5. The extensive involvement of publishers and the widespread geographic distribution of citations illustrate the global impact of this field of study, highlighting the universal nature of challenges associated with disruptive innovation and the universality of their solutions.

Based on the previously mentioned ideas, this content study provides a comprehensive overview of the academic landscape regarding strategic leadership in the context of disruptive innovations within manufacturing organizations. The results underscore this sector's increasing importance, leadership's role, and the need for collaborative, interdisciplinary research to address the challenges and opportunities posed by disruptive innovation. Strategic leadership remains crucial for business models and innovation success as manufacturing industries adapt to market demands and technological advancements. Researchers, practitioners, and policymakers can use this knowledge to inform and guide their activities in this dynamic and revolutionary field.

The manufacturing sector is currently experiencing a significant transformation due to the ever-evolving demands of consumers and technological advancements. In order to remain competitive, manufacturing enterprises must adapt their business models and formulate strategic plans that incorporate these technological advancements. Effective leadership is imperative to guide these businesses through the process of adopting new technologies and developing innovative business models.

The introduction of Industry 4.0 and the Internet of Things into current production processes represents a substantial milestone. It underscores the imperative for manufacturing companies to modernize their business models and underscores the potential consequences of failing to do so. It is essential to identify the specific qualities of an exemplary leader that facilitate the development of cutting-edge company models, particularly emphasizing the significance of vision, adaptability, and strategic thinking.

Furthermore, the study's findings indicate a growing body of research in this area, highlighting the significance of strategic leadership in the context of disruptive technologies and the increasing interest in this subject. Additionally, the study identifies specific themes and trends in the literature, thoroughly analyzing the topic.

This study also underscores the importance of staying updated with the latest research and findings on strategic leadership and innovation in manufacturing organizations. Manufacturing firms must remain agile and adaptable in the ever-evolving business landscape while continuously enhancing their internal capabilities to foster innovation in their business models.

The consequences of this content analysis study are evident in a society where technological disruption and rapid change are the norm. Manufacturing businesses must cultivate innovative and flexible leaders who can leverage their organization's internal resources to drive innovation and effectively counter disruptive forces if they wish to thrive in this environment.

This content analysis study further advances our understanding of the critical relationship between innovative business models and strategic leadership within manufacturing organizations. It emphasizes the need for ongoing research and practical applications to provide these businesses with a competitive edge and long-term growth necessary to succeed in the era of disruptive breakthroughs.

In the face of disruptive technological change, the study underscores the essential role that intra-organizational capabilities play in fostering business model innovation.

A thorough examination of the current literature reveals that manufacturing organizations increasingly recognize the value of strategic leadership in addressing the challenges and opportunities brought about by disruptive innovations. To effectively manage and harness their organization's intra-organizational strengths, these leaders must possess vision, agility, and a forward-thinking perspective.

7.2 Implications and Recommendations

The findings of this study hold significant implications for academics and professionals in manufacturing, innovation, and strategic leadership. The research offers the following recommendations:

1. **Developing Leadership Capabilities:** Manufacturing businesses should invest resources in enhancing their leadership styles, focusing on proactive identification and response to disruptive developments.
2. **Foster Intra-Organizational Capabilities:** Organizations should nurture agility, experimentation, and adaptability within their ranks.
3. **Cultivate an Innovative Culture:** Manufacturing companies should prioritize promoting innovation, commencing with responsive organizational environments and robust managerial support.
4. **Resource Allocation:** To overcome barriers to innovation, like resource constraints and resistance to change, businesses must allocate resources judiciously.

This content analysis underscores the growing importance of strategic leadership as a key facilitator for navigating the challenging landscape of disruptive innovation. Manufacturing enterprises are recognizing that to stay competitive in rapidly changing markets, they must adapt and evolve their business models. The emerging significance of intra-organizational

competencies highlights the role of leaders in fostering an innovative, collaborative, and adaptable culture within their organizations.

Strategic leaders will play an increasingly vital and evolving role in manufacturing organizations as we enter the era of Industry 4.0 and the digital revolution. Representatives must shape their organizations and proactively adapt to disruptive technologies to leverage these breakthroughs for competitive advantage and sustained growth. For manufacturing organizations to remain at the forefront of disruptive innovation, this study emphasizes the importance of ongoing research and the formulation of new strategies.

This content analysis underscores the pivotal role that intra-organizational capabilities and strategic leadership play in disruptive innovation and business model transformation within manufacturing firms. This emphasizes the need for continual research and a proactive approach to strategic leadership, enabling these businesses to thrive in the face of disruptive forces and leverage them as opportunities for growth and innovation.

In summary, this content analysis sheds significant light on the crucial subject of strategic leadership in the context of disruptive innovations and its connection to internal organizational capacities for developing new business models in manufacturing firms. Examining various scholarly works, scholar has identified key patterns, areas of focus, and directions for future research in this domain.

According to the literature, there is a growing body of knowledge about how strategic leadership aids manufacturing companies in navigating the evolving landscape of disruptive innovation. Research indicates that companies require visionary executives who can oversee and promote organizational change. Furthermore, the emphasis on intra-organizational capabilities signifies the recognition that innovation relies heavily on the internal competencies and culture of the business rather than being solely driven by external factors.

The inclinations of the study underscore the importance of continuous research in the fields of disruptive innovation and strategic leadership. Given the dynamic nature of corporate settings

and technology, ongoing research is essential to stay abreast of changing opportunities and challenges.

In conclusion, the findings of the content study highlight the critical role that strategic leadership and intra-organizational talents play in assisting manufacturing organizations in crafting innovative business models that are responsive to disruptive developments. This study contributes to the body of knowledge in this field and provides a foundation for further research and practical applications that can support companies in an era of continuous innovation and change. This study offers valuable insights into the essential role that strategic leadership plays in fostering intra-organizational capabilities. As the manufacturing landscape evolves, strategic leaders and organizations prioritizing these critical factors will likely be better positioned to adapt and thrive in the face of disruptive innovation.

7.3 Research Gaps

The following research identifies gaps in the existing body of work:

1. **Contextualizing Leadership Styles:** While research acknowledges the value of strategic leadership in managing disruptive technologies, it lacks an explanation of the most suitable leadership philosophies within manufacturing firms (Henry, 2021). Further investigation is needed to determine these organizations' most appropriate leadership philosophies.
2. **Measuring Intra-Organizational Capabilities:** Although the literature emphasizes the significance of intra-organizational capabilities, there is a need for more comprehensive and standardized measurement tools or frameworks to assess these capabilities (Rafique et al., 2018). A primary research objective should be to establish a set of quantitative criteria to evaluate the maturity of these capabilities and their impact on business model innovation.

3. **Long-term Sustainability:** While much research explores how strategic leadership influences business model innovation in the short term, there is limited understanding of the long-term viability of these innovations in manufacturing firms (Doz & Kosonen, 2010). Studies should investigate the long-term effects and strategies that businesses employ to sustain and evolve their innovative business models over time.
4. **Manufacturing Firms:** The majority of research in this field primarily focuses on large service enterprises. Addressing the significant research gap, it is essential to study how manufacturing firms successfully utilize intra-organizational capabilities and strategic leadership to navigate disruptive technologies and adopt innovative business models (Bettiol et al., 2023).
5. **Cultural and Behavioral Factors:** Manufacturing companies' cultural and behavioral aspects are often overlooked in the literature. Further research is warranted to examine how strategic leadership influences employee behaviors and organizational culture and how these factors impact the performance of business model innovation within the context of market innovations (Anning-Dorson, 2021).
6. **Standardization of Leadership:** The literature lacks content on leadership studies that assess the effectiveness of various strategic leadership philosophies in manufacturing industries. Benchmarking could provide valuable insights into which strategies are most effective within specific industrial sub-sectors (Antony et al., 2021).
7. **Competitive Pressure and Ecosystem Dynamics:** Most studies omit research gaps related to supply chain disruptions, industry partnerships, regulatory changes, and other external factors, as well as how these factors interact with strategic leadership, intra-organizational competencies, and business model innovation (Weerabahu et al., 2022).

Addressing these research gaps will advance our understanding of the relationship between disruptive innovations in manufacturing organizations and the roles played by strategic leadership and intra-organizational competencies.

7.4 Future Research Directions

Keeping up with emerging trends is imperative as the business landscape continues to evolve. Future research in the field of strategic leadership in disruptive innovations for manufacturing firms should explore the impact of emerging technologies, sustainable practices, and global market dynamics. Future research should also prioritize interdisciplinary approaches that integrate leadership, innovation, and organizational capabilities.

In conclusion, this content analysis serves as a foundation for further research, illuminating the current state of knowledge and providing guidance to those looking to contribute to the evolving field of strategic leadership in disruptive innovations and business model innovation within manufacturing companies.

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