UNIVERSITI TEKNOLOGI MARA

THE INFLUENCE OF ENTREPRENEURIAL BRICOLAGE, GREEN ENTREPRENEURIAL ORIENTATION, ECOLOGICAL INNOVATION AND ENTREPRENEURIAL MINDSET ON DIGITAL ENTREPRENEURIAL INTENTION THROUGH ENTREPRENEURIAL SELF-EFFICACY IN SAUDI SME'S

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ABSTRACT

Sustainable and innovative entrepreneurship plays a key role in the success of any organisation in the current era of digitalisation. Saudi Arabia is actively working to transform its economy from an oil-based to a technology-based economy through the Vision 2030 framework, making entrepreneurship a crucial driver of this economic transformation. This study examined the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention, with entrepreneurial self-efficacy serving as a mediating variable. The Theory of Planned Behaviour (TPB) underpins the study's theoretical framework, within which the four independent variables are conceptualised within the attitude construct, entrepreneurial self-efficacy within the perceived behavioural control construct, and digital entrepreneurial intention within the intention construct. Data were collected from 390 SME entrepreneurs operating in Saudi Arabia through purposive sampling. The data were validated using IBM SPSS and analysed using the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique via SmartPLS 4. The results indicate that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset each have a significant positive impact on digital entrepreneurial intention. Entrepreneurial self-efficacy was also found to directly and significantly impact digital entrepreneurial intention. Furthermore, entrepreneurial self-efficacy significantly mediates the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and digital entrepreneurial intention. However, entrepreneurial self-efficacy did not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention. The findings contribute to the entrepreneurship literature by simultaneously examining these variables within the TPB framework in the Saudi Arabian context, a combination that has not been previously explored. The study offers practical implications for Saudi SME entrepreneurs, policymakers, and educators, emphasising the importance of fostering bricolage capabilities, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset to enhance digital entrepreneurial intention. The geographic scope limited to Saudi Arabia and the cross-sectional research design represent the principal limitations of this study.

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LIST OF ABBREVIATIONS

Abbreviations

DEI	Digital Entrepreneurial Intention
EB	Entrepreneurial Bricolage
EI	Ecological Innovation
EM	Entrepreneurial Mindset
ESE	Entrepreneurial Self-Efficacy
GEO	Green Entrepreneurial Orientation
SME	Small and Medium Enterprise
TPB	Theory of Planned Behaviour

CHAPTER 1
INTRODUCTION

1.1 Preamble

This introductory chapter comprehensively discusses the background information on the research topic presented, contextualising the research area and emphasising its significance. Further, a concise problem statement is presented, outlining the contextual, conceptual, and theoretical gaps of this study. Research objectives and questions are also provided that explain the reasons and motives throughout the thesis. The research significance highlights the potential contributions of the study to both theory and practice, whereas the scope and limitations section outlines the research's boundaries and identifies potential constraints. The chapter concludes with a summary that establishes a foundation for the subsequent chapters of the thesis.

1.2 Introduction

Entrepreneurial activity is becoming the primary engine around the globe that powers economic expansion and development, and Saudi Arabia's economic transformation policy is increasingly recognizing its significance. Despite recent rise in entrepreneurial endeavours, Saudi Arabian startups are confronted with challenges related to digital innovation and competitiveness. These challenges include regulatory restrictions, market concentration, international competition, and human capital shortages (Albarrak & Alokley, 2021). This study discusses the influence of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention (DEI) among small and medium enterprise (SME) startups in Saudi Arabia and it also investigates the mediation of entrepreneurial self-efficacy.

In the year 2015, the United Nations established the Sustainable Development Goals (SDGs), also known as the 17 Global Goals, as a comprehensive endeavour to eliminate poverty, protect the environment, and ensure that all nations enjoy peace and

prosperity by the year 2030. These 17 interrelated SDGs recognize that actions in one realm can influence outcomes in other domains, highlighting the need for a balanced approach to social stability, economic prosperity, and environmental sustainability. The world has committed to prioritizing the advancement of the most underprivileged individuals. The sustainable development goals seek to eradicate poverty, hunger and gender-based discrimination, especially against women and girls. The combination of society's creativity, expertise, technology, and financial resources is crucial to achieve the SDGs in various circumstances (United Nations, 2023). The eighth and ninth sustainable development goals (SDGs) of the United Nations aim to foster productive work and economic growth to boost industry, innovation, and infrastructure. Entrepreneurship is a critical component for each of these aims, contributing considerably to the attainment of the United Nations' overall goals for sustainable development.

Entrepreneurship plays a crucial role in fostering productive work and economic growth (Goal 8) by creating new job possibilities, encouraging economic activities, and enhancing global competitiveness. Entrepreneurs contribute to the development of a more equitable and sustainable economic environment that benefits everyone by building profitable businesses. Simultaneously, the emphasis on industry, innovation, and infrastructure (Goal 9) underlines the significance of entrepreneurship in driving technical developments and building resilient infrastructures (Dhahri et al., 2021). Entrepreneurs are frequently at the forefront of innovation, offering cutting-edge solutions to diverse societal and environmental problems. By doing so, they contribute to the development of sustainable industries, improve resource efficiency, and foster a successful future. Entrepreneurship is an essential component of SDG goals 8 and 9 respectively, playing a crucial role in achieving the United Nations' sustainable development objectives through promoting economic growth, creating decent work opportunities, and supporting innovative businesses and infrastructures (Apostolopoulos et al., 2018).

To combat climate change, green entrepreneurs promote biodiversity protection and set up environmentally sustainable businesses. Entrepreneurship can serve as a catalyst for green climate efforts. One of such practices demonstrated by India is termed as the Western Ghats programme which demonstrates the potential of eco-friendly entrepreneurship by encouraging the growth of sustainable firms that benefit local communities and the natural world. These initiatives demonstrate the potential of eco-

friendly entrepreneurship by encouraging the growth of sustainable firms that benefit local communities and the natural world (UNFCCC, 2023). Another example of it is the Paris Agreement which focused on motivating entrepreneurs to tackle climate change (UNFCCC, 2018). Similarly, Saudi Arabia has been encouraging entrepreneurial innovation by funding several organizations, having a common goal of promoting sustainable development to address climate change. The country acknowledges the vital role that creative and eco-friendly enterprises play in tackling environmental issues, and is committed to fostering a thriving entrepreneurial ecosystem (Vision 2030, 2023).

Under its Vision 2030, the Saudi Arabian green economic initiative focuses on reducing emissions and boosting environmental protection while simultaneously reducing the country's dependency on oil revenues and fossil fuel-based energy sources. Its purpose is to enhance life quality while safeguarding future generations (Vision 2030, 2023). In this regard, Saudi Arabia's small and medium-sized enterprise (SME) forum, functioned as a dynamic platform for the most innovative startups, entrepreneurs, and investors from around the world to cooperate and share ideas. This platform is intended to encourage global entrepreneurs to create sustainable growth and tackle critical challenges by fostering innovation, promoting knowledge-sharing behaviours, and providing a forum for the exchange of information (Vision 2030, 2023).

Entrepreneurs are taking the lead in Saudi Arabia by shifting their focus more to knowledge-based activities rather than oil-based activities (Al Naimi, 2022; Minevich, 2023). The Global Entrepreneurship Monitor study highlights that 76.3 per cent of Saudi Arabia's adult population considers entrepreneurship a good career choice (Roomi et al., 2020). The Saudi Vision 2030, which is comprised of three pillars (vibrant society, thriving economy, and ambitious nation), focuses on stimulating the economy and diversifying revenue streams. Focusing on small and medium-sized enterprises (SMEs) as key drivers of economic growth, innovation, and export promotion, the vision aspires to boost their GDP contribution from 20% to 35% by 2030 (Ashri, 2019; Vision 2030, 2023). These global and national commitments underscore the increasing importance of fostering entrepreneurial ecosystems which are digitally driven and also environmentally sustainable.

Based on the above-mentioned discussion, this study aims to contribute to Saudi Arabia’s Vision 2030 by measuring the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on DEI

through the mediation of entrepreneurial self-efficacy. This study provides insights to the entrepreneurs, policymakers, and business owners in Saudi Arabia about the impacts of explanatory factors on the DEI of SME entrepreneurs.

The global economy is undergoing a profound transformation driven by digital technologies, which are reshaping industries, creating new business models, and redefining the nature of work (Zaheer et al., 2019). In this context, entrepreneurship has emerged as a critical driver of economic growth, innovation, and job creation. Digital entrepreneurship, in particular, has gained significant attention as it leverages digital technologies to create, deliver, and capture value in ways that were previously unimaginable. Saudi Arabia, a nation historically reliant on oil revenues, is actively pursuing economic diversification through its Vision 2030 initiative, which places a strong emphasis on fostering entrepreneurship and innovation. Within this framework, understanding the factors that influence DEI and entrepreneurial self-efficacy is crucial for developing a vibrant entrepreneurial ecosystem.

Digital entrepreneurship refers to the creation of new ventures and the transformation of existing businesses through the use of digital technologies such as the internet, mobile applications, artificial intelligence, and blockchain. Unlike traditional entrepreneurship, digital entrepreneurship is characterized by lower barriers to entry, faster scalability, and the ability to reach global markets (Nambisan, 2017). The rise of digital entrepreneurship has been fuelled by the proliferation of digital tools and platforms, which enable entrepreneurs to innovate, collaborate, and compete in ways that were previously inaccessible to small businesses (Zaheer et al., 2019).

In Saudi Arabia, the digital economy is rapidly expanding, driven by high internet penetration rates, a young and tech-savvy population, and government initiatives aimed at promoting digital transformation. According to a report by the Communications, Space, and Technology Commission as cited by Alharbi (2019), Saudi Arabia's digital economy was projected to contribute 19.2% to the country's GDP by 2025. This growth presents significant opportunities for digital entrepreneurs to create value and contribute to the nation's economic diversification goals.

Entrepreneurial strategies are the deliberate actions and approaches that entrepreneurs adopt to identify opportunities, allocate resources, and achieve competitive advantage (Panicker & Manimala, 2015). These strategies can be broadly categorized into innovation-driven, market-driven, and resource-driven approaches. Innovation-driven strategies focus on developing novel products, services, or business

models that disrupt existing markets or create new ones. Market-driven strategies emphasize understanding and responding to customer needs and market trends, while resource-driven strategies involve leveraging available resources, such as financial capital, human talent, and networks, to achieve entrepreneurial success (Angel et al., 2018).

In the context of digital entrepreneurship, entrepreneurial strategies play a critical role in shaping the intentions and behaviours of entrepreneurs. For instance, innovation-driven strategies are particularly relevant in the digital space, where rapid technological advancements create opportunities for disruptive innovation. Similarly, market-driven strategies are essential for digital entrepreneurs to navigate the highly competitive and dynamic digital marketplace. Resource-driven strategies, on the other hand, enable entrepreneurs to overcome the challenges associated with limited resources, which are often a constraint for startups (Elia et al., 2020).

Entrepreneurial intentions are a precursor to entrepreneurial action and represent the conscious decision to start a new venture (Krueger & Carsrud, 1993). In the digital context, entrepreneurial intentions are influenced by a combination of personal, social, and environmental factors. Personal factors include attitudes toward entrepreneurship, perceived desirability, and feasibility, while social factors encompass social norms, cultural values, and peer influence. Environmental factors, such as access to resources, regulatory support, and market conditions, also play a significant role in shaping entrepreneurial intentions (Fernandes et al., 2022).

In Saudi Arabia, the intention to engage in digital entrepreneurship is influenced by the country's unique cultural, economic, and regulatory environment. For example, the Saudi government has launched several initiatives, such as the Monsha'at programme and the Saudi Venture Capital Company, whose role is primarily to support entrepreneurs and provide them with the necessary resources and funding (Aloulou, 2021). Additionally, the growing acceptance of entrepreneurship as a viable career path among Saudi youth has contributed to the rise in DEI (Alferaih, 2022). However, challenges such as limited access to funding, a lack of entrepreneurial education, and cultural barriers persist and need to be addressed to fully unlock the potential of digital entrepreneurship in the country.

Entrepreneurial self-efficacy (ESE) refers to an individual's belief in their ability to successfully perform the tasks and roles associated with entrepreneurship (Newman et al., 2019). ESE is a critical determinant of entrepreneurial intentions and

behaviours, as it influences an individual's motivation, persistence, and resilience in the face of challenges. Research has shown that individuals with high levels of ESE are more likely to identify opportunities, take risks, and pursue entrepreneurial ventures (McGee et al., 2009).

In the digital context, ESE is particularly important due to the unique challenges associated with digital entrepreneurship, such as rapid technological changes, intense competition, and the need for continuous innovation. Digital entrepreneurs must possess a strong belief in their ability to navigate these challenges and succeed in the digital marketplace. In Saudi Arabia, fostering ESE among aspiring entrepreneurs is essential for building a sustainable entrepreneurial ecosystem. This can be achieved through targeted interventions, such as entrepreneurship education, mentorship programmes, and exposure to successful role models (Elnadi & Gheith, 2021).

Saudi Arabia's Vision 2030 initiative has created a conducive environment for entrepreneurship by promoting innovation, reducing reliance on oil revenues, and encouraging private sector participation. The government has implemented several policies and programmes to support entrepreneurs, including the establishment of incubators, accelerators, and funding schemes (Amran et al., 2020). Additionally, the country's young and dynamic population, coupled with high internet penetration rates, provides a fertile ground for digital entrepreneurship.

However, several challenges remain that hinder the growth of digital entrepreneurship in Saudi Arabia. These include cultural barriers, such as the stigma associated with failure, a traditionally risk-averse business environment, limited access to venture capital, and a lack of entrepreneurial education and training (Alferaih, 2022; Mohammed et al., 2023). Furthermore, the regulatory environment, despite recent improvements, continues to pose challenges for startups, particularly in terms of licensing and compliance requirements. Addressing these challenges is critical for realizing the full potential of digital entrepreneurship in Saudi Arabia.

Entrepreneurship has become a key driver of economic growth and innovation, particularly in the digital age. Digital entrepreneurship, which involves creating and managing businesses using digital technologies, has gained significant traction due to advancements in information technology and changing consumer behaviours (Sahut et al., 2021). Entrepreneurial self-efficacy (ESE) and entrepreneurial intentions are critical factors influencing individuals' ability and willingness to engage in entrepreneurial activities (Schmutzler et al., 2019). In Saudi Arabia, the government's Vision 2030

initiative aims to transform the economy by fostering entrepreneurship and digital transformation (Olaopa & Alsuhaibany, 2023). However, understanding how entrepreneurial strategies impact DEI and ESE remains an underexplored area. This research aims to investigate the influence of entrepreneurial strategies on DEI and ESE within Saudi Arabia's evolving digital economy.

Entrepreneurial strategies refer to the approaches and tactics entrepreneurs use to create, develop, and sustain business ventures. These strategies include innovation-driven approaches, effectuation strategies, lean startup methodologies, and market-orientated strategies (Branco et al., 2021). In the digital landscape, entrepreneurial strategies often involve leveraging emerging technologies, digital marketing, and platform-based business models (Gans et al., 2021). In Saudi Arabia, the growth of digital entrepreneurship has been fuelled by government-backed initiatives such as the Small and Medium Enterprises General Authority (Monsha'at) and various incubators supporting digital startups (Aloulou, 2021). Prior studies suggest that entrepreneurial strategies focused on technological adoption and digital platform utilization can enhance digital entrepreneurial success (Elia et al., 2020). This research examines how these strategies shape DEI and ESE among aspiring entrepreneurs in Saudi Arabia.

DEI extends the concept of entrepreneurial intention to include the willingness to launch technology-based or digital businesses (Al-Mamary & Alraja, 2022). The Theory of Planned Behaviour (TPB) by Ajzen (1991) is often used to explain this, and research indicates that entrepreneurial strategies influence DEI by enhancing access to resources, networks, and business opportunities (Yi, 2021). In the Saudi Arabian context, Al-Mamary and Alraja (2022) found that digital entrepreneurship is on the rise, but cultural and structural challenges, such as risk aversion and limited access to venture capital, still exist. Therefore, examining how entrepreneurial strategies mitigate these challenges and foster DEI is essential.

Digital entrepreneurship requires specific competencies, such as digital literacy, online marketing skills, and platform-based business knowledge, which can influence ESE (Arifin et al., 2023). Studies suggest that exposure to entrepreneurial education, mentorship, and real-world entrepreneurial experiences can enhance ESE (Darmanto et al., 2022). In Saudi Arabia, initiatives like the Misk Foundation's entrepreneurship programmes and government-backed incubators aim to improve ESE among young entrepreneurs (Aloulou, 2021). However, research on how entrepreneurial strategies directly impact ESE in digital contexts remains limited.

Saudi Vision 2030 emphasizes economic diversification and reducing reliance on oil by fostering a knowledge-based economy (Amran et al., 2020). Digital entrepreneurship is a crucial element of this transformation, with the government investing in digital infrastructure, fintech, and e-commerce (Alhothali & Al-Dajani, 2022). Policies supporting digital businesses, such as streamlined business registration processes and financial incentives for startups, have created a favourable environment for digital entrepreneurs (Vision 2030, 2023). Understanding the relationship between entrepreneurial strategies, DEI, and ESE can provide valuable insights for policymakers and educators in fostering a more entrepreneurial society.

This study aims to bridge the gap in understanding how entrepreneurial strategies influence DEI and ESE within Saudi Arabia's digital entrepreneurship ecosystem. By examining these relationships, this research can provide actionable insights for policymakers, educators, and aspiring entrepreneurs. It will also contribute to the broader literature on digital entrepreneurship and entrepreneurial psychology by contextualizing these constructs within a rapidly transforming economy.

1.3 Background of Study

In modern times, entrepreneurship has particularly been given an economic perspective and is primarily attributed to business sensibility. It has been able to develop the concept of novelty and innovation in a commercial and practical sense (Ratten, 2023). Over the years, in their quest for novelty, entrepreneurs have been able to discover and invent different methods of production, which has vastly improved the capacity of businesses (Thurik et al., 2024). This improvement in capacity has further led to increased levels of outputs with the least inputs. The aspiration has helped nations increase their domestic products and assisted in the growth of their economies and technological advancements (Ranganai Matenda & Sibanda, 2023). Most of the developed economies of the world are the ones that have the highest number of entrepreneurs and where the culture of entrepreneurship prevails (Chowdhury et al., 2019).

Entrepreneurship can be defined as a source of the creation of economic value (Roos & Gaddefors, 2024). The other aspect of entrepreneurship is attributed to the person who starts the business i.e. the entrepreneur (Melin & Gaddefors, 2023). An entrepreneur is a person who initiates one or more businesses through their resources

such as money, time, skills, etc., and aligns in such a manner that the risk of failure is mitigated and the business grows at a rapid pace. Traditionally, an entrepreneur is an innovator who brings new inventions or ideas to the world. In an economic sense, the entrepreneur is an entity that has the ability and determination to transform inventions and technology into products and services and commercialize them for the use of the public (Dana, 2021). The study of Wadhwani et al. (2020) defines entrepreneurship as a combination of creating new products and services along with redesigning the production methods. Creating and expanding larger customer bases and markets is another component of entrepreneurship.

The global economic landscape is undergoing a profound transformation driven by rapid advancements in digital technologies. These technologies are not only reshaping traditional industries but also creating new opportunities for innovation and entrepreneurship. The rise of digital technologies has reshaped traditional industries and created new opportunities for innovation and entrepreneurship, emerging as a critical driver of economic growth, job creation, and societal development (Fernandes et al., 2022). In this context, understanding the factors that influence DEI and self-efficacy is essential for fostering a vibrant entrepreneurial ecosystem.

Digital entrepreneurship refers to the process of identifying, evaluating, and utilizing opportunities that arise from digital technologies to create new ventures or transform existing ones (Steininger et al., 2022). Unlike traditional entrepreneurship, digital entrepreneurship is characterized by lower barriers to entry, faster scalability, and the ability to reach global markets. The proliferation of digital tools and platforms, such as e-commerce platforms, social media, and cloud computing, has democratized access to entrepreneurial resources and enabled individuals to innovate and compete in ways that were previously inaccessible to small businesses (Antonizzi & Smuts, 2020).

The rise of digital entrepreneurship has been fuelled by the increasing digitization of economies worldwide. According to a report by the International Telecommunication Union (2022), global internet penetration reached 66% in 2022, with significant growth in developing regions. This digital transformation has created an enabling ground for digital entrepreneurs to innovate and create value. For instance, the success of digital platforms such as Amazon, Airbnb, and Uber has demonstrated the potential of digital entrepreneurship to disrupt traditional industries and create new markets.

Saudi Arabia, a nation historically reliant on oil revenues, is actively pursuing economic diversification through its Vision 2030 initiative. Launched in 2016, Vision 2030 aims to reduce the country's dependence on oil, promote private sector participation, and foster innovation and entrepreneurship. Digital entrepreneurship is a key pillar of this vision, as it aligns with the goals of economic diversification, job creation, and technological advancement (Vision 2030, 2016).

The Saudi government has implemented several policies and programs to support digital entrepreneurship. For example, the Monsha'at program, established by the Small and Medium Enterprises General Authority, provides funding, training, and mentorship to aspiring entrepreneurs (Vision 2030, 2023). Additionally, the Saudi Venture Capital Company (SVC) was launched to provide venture capital funding to startups and SMEs, thereby addressing the funding gap that often hinders entrepreneurial activity (Mathkur, 2023). These initiatives have created a conducive environment for digital entrepreneurship in Saudi Arabia.

Despite these efforts, several challenges remain that hinder the growth of digital entrepreneurship in the country. These include cultural barriers, such as the stigma associated with failure, limited access to venture capital, and a lack of entrepreneurial education and training (Alzamel, 2024). Furthermore, the regulatory environment, while improving, still poses challenges for startups, particularly in terms of licensing and compliance requirements. Addressing these challenges is critical for realizing the full potential of digital entrepreneurship in Saudi Arabia.

Entrepreneurial strategies are the deliberate actions and approaches that entrepreneurs adopt to identify opportunities, allocate resources, and achieve competitive advantage (Moyle et al., 2020). In the context of digital entrepreneurship, entrepreneurial strategies play a critical role in shaping the intentions and behaviours of entrepreneurs (Sahut et al., 2021). Particularly, the adoption of entrepreneurial strategies in the digital contexts has shown to enhance opportunity recognition, strengthen self-efficacy, and increase the possibility of venture creation among entrepreneurs (Elia et al., 2020). The strategic use of digital technologies empowers the entrepreneurs to identify and exploit market opportunities more effectively and thereby reinforcing both their confidence and their intention to pursue digital ventures (Fernandes et al., 2022).

In Saudi Arabia, fostering ESE among aspiring entrepreneurs is essential for building a sustainable entrepreneurial ecosystem which can be possibly achieved

through targeted interventions, such as entrepreneurship education, mentorship programmes, and exposure to successful role models (Mathkur, 2023; Mourato et al., 2023). Despite the growing interest in digital entrepreneurship, there is limited research on the factors that influence digital entrepreneurial intentions and self-efficacy in the Saudi context (Alferaih, 2022). Existing studies have primarily focused on traditional entrepreneurship, with little attention given to the unique characteristics and challenges of digital entrepreneurship. Moreover, the role of entrepreneurial strategies in shaping DEI and self-efficacy remains underexplored.

1.4 Problem Statement

Saudi Arabia has developed an ambitious long-term strategy referred to as Saudi Vision 2030 to promote innovation and resolve environmental concerns. This strategy seeks to foster a thriving economy, a dynamic society, and a prosperous nation. Supporting and promoting the SME sector and entrepreneurship is crucial to this vision. In Saudi Arabia, small and medium-sized enterprises (SMEs) are a critical pillar of the country's economy, with Vision 2030 targeting an increase in their contribution to GDP from 20% to 35% by 2030 (Monsha'at, 2022). The assistance provided to small and medium-sized enterprises to alleviate destitution, foster the development of innovative products and services, generate new employment opportunities, and empower individuals holds key importance. Moreover, SMEs play a crucial role in the transition of the economy, the promotion of innovation, and the development of eco-friendly manufacturing processes.

To achieve the ambitious goals enumerated in Saudi Vision 2030, fostering a conducive environment for innovative initiatives that protect the environment and promote business sustainability is essential. This endeavour depends on the development of entrepreneurial self-efficacy and digital entrepreneurship intentions of Saudi entrepreneurs. The establishment of such a supportive entrepreneurial ecosystem necessitates the development of essential infrastructures and actionable policy suggestions. Considering this context, this study aims to align and support the objectives of Saudi Vision 2030 by examining the key drivers of digital entrepreneurship intentions among Saudi entrepreneurs. Further, Elnadi and Gheith (2021) mention that the focus should be on developing an entrepreneurial ecosystem with robust

institutional infrastructure, extensive support systems, and a nurturing culture. This ecosystem should serve to strengthen and amplify entrepreneurial self-efficacy.

By examining the effects of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurship intentions, the study aims to align with the goals of Saudi Vision 2030. Firstly, the study proposes entrepreneurial bricolage, which is defined as the tendency of the entrepreneurs to recombine and utilize existing resources to create new and efficient ways of business such as products, processes, and services (Steffens et al., 2023). Bricolage requires the entrepreneurs to be ready for unusual and unfavourable circumstances in terms of resource availability (Xu et al., 2024). Moreover, the entrepreneurs need to be able to handle the risks associated with uncertain environments such as the one created after the worldwide pandemic of COVID-19. Resource shortage should not be able to stop the growth process, and the entrepreneurs must keep it going, even during adverse conditions. Entrepreneurs of small and medium enterprises (SMEs) are the ones most vulnerable to resource shortages as these firms are constantly battling for limited resources due to their smaller sizes and limited exposure (Steffens et al., 2023). Entrepreneurial bricolage, which means to use existing resources creatively and innovatively to grow and survive by creating new products and services, etc., plays a key role in the firms influencing their adoption and creation of digitally innovative practices and technologies as well (Tsilika et al., 2020).

Further, the study proposes the green entrepreneurial orientation which is the tendency or positioning of the firm towards adopting such activities which are eco-friendly and do not harm the environment, and the firm does not necessarily suffer economic loss (Shehzad et al., 2023). Green activities have been noticed to have burdened firms, and many economists consider them a hindrance to business growth. It is widely considered that green activities have added costs and are also very difficult to understand and implement effectively (Ameer & Khan, 2023). One of the reasons for such a belief is that entrepreneurs and other human resources are not well equipped with knowledge and expertise in this regard. Entrepreneurial difficulties arise due to the governmental regulations and high expectations from the customers. Furthermore, lack of governmental regulations does not provide enough motivation for green entrepreneurial orientation implementation (Nikolaou et al., 2018).

Further, ecological innovation is investigated, which firms apply while going for innovations and novelties in their business. The firms align their resources and

expertise with any new product, service, or process model to innovate without harming the environment (Afshan et al., 2022). The concept might sound similar to green entrepreneurial orientation, but it is different because its distinct application. The green entrepreneurial orientation is the intention and positioning of the firm towards green activities, and ecological innovation is the actual process by which the firm goes through to create ecologically innovative products or services (Shehzad et al., 2023). Ecological innovation is focused on creating eco-friendly products, processes, and services, whereas green entrepreneurial orientation is an overall inclination of the firm towards environment-friendly activities. Ecological innovation is also hard to implement because of the reasons identified for green entrepreneurial orientation previously, which are cost-benefit imbalance, advanced and complex technologies and lack of knowledge (Horbach, 2016). In this regard, the entrepreneurs need to be confident about their ability to possess or acquire the necessary skills and competencies which enable them to innovate ecologically. Thus, it is inferred that greater levels of ecological innovation are associated with higher entrepreneurial confidence which is reflected by higher ESE, as self-confidence and beliefs drive entrepreneurs to pursue ecologically risky innovations.

Further, the study stresses the need for an entrepreneurial mindset, which is described as the mental orientation of an individual or a firm which enables them to identify and capitalize on the opportunities as they are presented (Daspit et al., 2023). An entrepreneurial mindset is gained through experiences and other characteristics such as education, age, and cultural background etc. Individuals with an entrepreneurial mindset must be able to translate this mindset into entrepreneurial actions. Once they can do so, they can become entrepreneurs (Kuratko et al., 2021). Such individuals are characteristically risk-taking, adventurous and bold in decision-making (Pidduck et al., 2023). Their boldness and lack of fear for adverse outcomes makes them confident. This confidence turns into self-belief regarding the achievement of objectives and the fulfilment of tasks. Individuals not having an entrepreneurial mindset tend to show signs of fear and they are the ones who doubt their capabilities and ask more questions regarding the outcomes. Such individuals are more interested in outcomes than in action (Raimi & Kah, 2022). In contrast, individuals having an entrepreneurial mindset are more action oriented and prefer to “act” decisively rather than staying worried about results. This self-belief, which forms the basis of entrepreneurial self-efficacy, depends on an individual's entrepreneurial mindset. The more orientated a person’s mind is

towards entrepreneurship, the more confident they can be perceived. A weaker entrepreneurial mindset can be depicted through the lack of confidence and self-belief in one's abilities to achieve an objective or complete a task.

Haynie et al. (2010) highlight that an entrepreneurial mindset identifies opportunities for growth, competitive advantage, and elevated profits. Delineated from the discussion as above, it shows that digital and sustainable technologies provide excellent opportunities for firms and entrepreneurs to cut costs, increase revenues, and reach larger markets. It becomes the greatest opportunity for the entrepreneurs, and they would like to seize such opportunity and realize the related benefits (Kuratko et al., 2023). Notably, those who have a greater entrepreneurial mindset would be looking for innovations in the digital arena as new opportunities for growth and competitive advantage. Otherwise, those with a weaker entrepreneurial mindset may not be looking for such innovations or, if they come across one, will not be enthusiastic about implementing them.

Digital innovation is an ever-evolving concept, technological advancements are occurring at an unprecedented pace, with new innovations continuously emerging across industries. With countries and organizations spending more and more on research and development, scientists and inventors can come up with technological innovations quite frequently (Hund et al., 2021). Entrepreneurs are the individuals responsible for bringing innovation and change to the society through the digital revolution (Ramdani et al., 2022). The entrepreneurial skills of risk-taking, proactiveness, and adaptability must be put to their best. Entrepreneurs must be mentally, physically, and resourcefully equipped and exhibit strong digital entrepreneurial intent consistently if they or their firms are to survive and grow in such digitally innovative times. Moreover, it is also imperative that entrepreneurs should not only be equipped with digital entrepreneurial intention but should also be confident in their ability to transform their intention into action successfully. Self-belief is a pre-requisite for such a challenging task of digital entrepreneurial intention entrepreneurs constantly face new and unpredictable challenges. Any individual who lacks self-belief would fall behind and would be exhausted mentally and physically, too, even if they have external resources at their disposal. The study integrates entrepreneurial self-efficacy as a mediating factor for examining the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention.

One of the effects of the Saudi economy's transition from an oil-based to a knowledge-based economy is the rapid expansion of digital innovation, which presents a serious challenge for Saudi entrepreneurs who find it difficult to adjust and stay competitive in today's dynamic environment. Entrepreneurs must cultivate their abilities, self-assurance, and agility to overcome obstacles such as limited resources, environmental concerns, and ever-changing digital landscapes. This study examines the associations between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention of Saudi entrepreneurs, with entrepreneurial self-efficacy serving as a mediator. The issue at hand is identifying the critical components and mindset required for entrepreneurs to successfully adopt and utilize digital and sustainable technology, ultimately resulting in improved efficiency, sustainability, and excellence. By addressing this issue, the findings provide entrepreneurs, policymakers, and educators with significant insights for developing focused strategies that enable the entrepreneurs to manage the complex dynamics of sustainability and innovation.

1.5 Contextual Gap

There has been a growing interest in entrepreneurship recently, but there is a significant gap in the literature regarding the interaction between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention in the context of Saudi Arabia (Alferaih, 2022). This knowledge gap is exacerbated by the absence of research addressing the mediation role of entrepreneurial self-efficacy in these interactions. This shortcoming must be addressed to promote a more thorough understanding of the unique regional characteristics that influence sustainable and innovative entrepreneurship. Such an understanding plays a crucial role in bolstering the nation's efforts toward economic diversification, job growth, and environmental protection.

When faced with adversity, entrepreneurs often resort to "bricolage". The word comes from bricoleur, which refers to individuals who solve problems by using available resources. Therefore, bricolage is the creative adoption and amalgamation of human, social, financial, and material capital. This idea stresses the value of ingenuity, flexibility, and resourcefulness in entrepreneurship, especially in dealing with limitations (Baker & Nelson, 2005).

In Saudi Arabia, the concept of entrepreneurial bricolage is underexplored, as most of the studies focused on other Asian and Western countries (Iqbal et al., 2021; Tsilika et al., 2020). The Scopus database search for Saudi Arabia using the term "entrepreneurial bricolage" in titles, abstracts, or keywords produced no significant or relevant results, and the study considers it as a critical gap calling for further investigation. While the literature related to entrepreneurial bricolage is expanding, the majority of this research has been conducted in Western and Asian nations (Baier-Fuentes et al., 2023; Davidsson et al., 2017). Potential cultural, economic, and institutional distinctions between Western and non-Western contexts argue that the influence of entrepreneurial bricolage on digital entrepreneurial intention in Saudi Arabia could differ significantly. Consequently, this study seeks to address this gap in the literature and significantly contribute to understanding entrepreneurial bricolage in Saudi Arabia.

Furthermore, the concept of green entrepreneurial orientation, which draws from both green entrepreneurship and entrepreneurship orientation theory, is concerned with the progression of businesses. The green entrepreneurial orientation emphasizes the worth of incorporating sustainable and ethical business practices. It comprises two key concerns: an environmental focus, which seeks to lower negative effects on the environment via resource allocation and green innovation, and a social focus, which places an emphasis on beneficial results and contributions to society as a whole (Muangmee et al., 2021).

As evidenced by exploring reputable research databases, green entrepreneurial orientation has received considerable global attention. However, empirical research on green entrepreneurial orientation remains scarce specifically in the Saudi Arabian context, with very limited studies identified, and this research gap hinders comprehension of the relationship between environmentally conscious business practices and digital entrepreneurial intention among Saudi Arabian entrepreneurs. Considering the importance of Saudi Arabia's Vision 2030 policy, which prioritizes sustainable development and economic diversification, it is imperative to investigate this research gap further.

Further, the study investigates ecological innovation, which introduces novel approaches at any stage of the production and consumption processes that result in improved environmental performance. These developments could be made with or without the goal of improving environmental conditions in mind. Ecological innovation

is an emerging research paradigm that perceives environmental problems as openings for organizations to implement novel approaches that benefit the environment and society alike. Businesses can do their part for the environment, boost profits, and ensure long-term viability by embracing eco-innovations (Kanda et al., 2019). Despite the global emphasis on ecological innovation, exploring reputable research databases presents a significant research gap in Saudi Arabia. The limited number of studies specifically addressing ecological innovation in this one-of-a-kind context highlights a critical gap in the existing body of knowledge.

Moreover, an entrepreneurial mindset is a way of thinking that allows one to create value through the pursuit of opportunities, the evaluation of risks and benefits, the formulation of sound judgements despite uncertainty and complexity in the environment, and the maintenance of a high degree of flexibility and strength under pressure. Such a mindset is essential for business owners as it promotes originality and helps them find novel approaches to old challenges. Furthermore, it promotes taking the initiative to face challenges, being risk-tolerant, and having the resilience to grow from both achievements and setbacks. If business owners want to increase their chances of success, they need to develop the attitude of an entrepreneur so that they can adapt to the ever-changing business environment and overcome the many obstacles throughout the business journey (Daspit et al., 2023). In the context of the role of entrepreneurial mindset among Saudi Arabian entrepreneurs, there is a notable shortage of empirical research. While reputable research databases provide articles for an entrepreneurial mindset, a few of them specifically address Saudi Arabia. Addressing this knowledge deficit provides valuable insights into the factors that facilitate or impede digital entrepreneurial intention among Saudi entrepreneurs.

Entrepreneurs who are creative in the digital space are those who recognise the vast potential of digital technologies and use those technologies to launch new ventures, develop novel products, services, and strategies, and improve upon more established methods of doing business. This idea was proposed during the digital revolution, which altered multiple aspects of economic and social life and gave rise to cutting-edge digital technologies. Entrepreneurs with digital entrepreneurial intentions seek to leverage the latest technology to boost productivity, expand their businesses, and gain a competitive advantage. These business owners may thrive in today's dynamic market by adopting digital and sustainable technology, and encouraging a culture of innovation, which will

allow them to meet the needs of their clients and aid in the continuous digital revolution taking place across many different sectors (Sahut et al., 2021).

When the study explored the reputable research databases for "digital entrepreneurial intention," only a limited number of studies could be identified, and only a few were related to Saudi Arabia. Due to the vast gap in the literature, extensive research in this area is required and this study responds to fill this gap. Investigating the digital entrepreneurial intention is essential for business owners in Saudi Arabia, considering the country's cultural and economic aspects and the emphasis placed on the Vision 2030 agenda.

A person's confidence in their capacity to handle the difficulties of managing a business in the face of uncertainty and change is called entrepreneurial self-efficacy. Since it focuses more on confidence in one's business abilities, entrepreneurial self-efficacy in business differs from general self-efficacy. Self-efficacy for entrepreneurs is a dynamic idea that changes because of the several challenges they encounter (Newman et al., 2019). Business entrepreneurs learn from their mistakes and modify their plans because of their triumphs and failures. Developing entrepreneurial self-efficacy helps business owners cope with setbacks, maintain their passion, and adjust to the changing environment (To et al., 2020). There is a lack of in-depth research in the academic literature concerning the role of entrepreneurial self-efficacy as a mediator in the relationship between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention, specifically in Saudi Arabia.

The contextual gap is further highlighted by the lack of studies on integrating these factors to promote an environmentally sustainable digital economy in Saudi Arabia. Understanding how entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset interact to impact digital entrepreneurial intention provides policymakers, practitioners, and researchers with valuable insights as the nation places a greater emphasis on economic diversification and environmental sustainability. Filling this contextual gap would aid in creating effective strategies and interventions to promote innovative and sustainable entrepreneurship in the region.

1.6 Conceptual Gap

The purpose of this research is to fill the conceptual gap in the literature by investigating the associations between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention, focusing on the role of entrepreneurial self-efficacy as a mediator in Saudi Arabia. The conceptual gap is caused by the lack of an integrated framework that comprises investigated factors and elaborates on the processes via which these factors interact with one another and affect digital entrepreneurial intention (Desa, 2012; Guo et al., 2020; Hooi et al., 2016).

The gap in the literature is apparent in the relationships between the proposed entrepreneurial variables. Despite the increasing interest in entrepreneurship, there are still major gaps in understanding such complex interrelationships between these factors (Alferaih, 2022). A comprehensive search of reputable research databases revealed the lack of research examining entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, entrepreneurial self-efficacy, and digital entrepreneurial intention, and there are several calls for extensive exploration of these relationships (Hooi et al., 2016).

Although the concept of entrepreneurial bricolage has been widely recognized as a valuable strategy for entrepreneurs to overcome resource limitations and achieve competitive advantage, little is known about how entrepreneurial bricolage works with other factors, such as green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset to impact digital entrepreneurial intention. This conceptual gap demands a more complete framework connecting entrepreneurial bricolage with related concepts to better understand its function in driving digital and sustainable innovation for Saudi entrepreneurship.

The role of entrepreneurial self-efficacy as a mediator in the relationship between the independent variables and digital entrepreneurial intention has not been researched in depth. Self-efficacy in entrepreneurship has been shown to have a crucial role in shaping digital entrepreneurial intention (Elnadi & Gheith, 2021; Wu et al., 2022). The literature lacks a comprehensive understanding of how entrepreneurial self-efficacy mediates the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention. By addressing this conceptual gap, it this study enhances

understanding of the role of entrepreneurial self-efficacy in shaping the digital entrepreneurial intention of Saudi entrepreneurs. Studying the interrelations between these variables will provide useful insights into the diverse nature of entrepreneurship and its role in supporting innovation, sustainability, and economic growth in Saudi Arabia.

There is a growing body of research on digital entrepreneurship, entrepreneurial self-efficacy (ESE), and entrepreneurial intentions, yet significant contextual gaps remain, particularly in the Saudi Arabian context. While global studies have explored the factors influencing entrepreneurial intentions and self-efficacy in digital entrepreneurship, limited research has examined the specific impact of entrepreneurial strategies on digital entrepreneurial intentions (DEI) and ESE within emerging economies, including Saudi Arabia. The Kingdom's digital transformation, driven by Vision 2030, presents unique opportunities and challenges that have not been sufficiently addressed in existing literature. This research aims to bridge this gap by analysing how entrepreneurial strategies shape DEI and ESE in Saudi Arabia's evolving entrepreneurial landscape.

Entrepreneurial strategies are widely recognized as a key determinant of entrepreneurial success, yet their role in shaping digital entrepreneurial behaviour remains underexplored. Research on entrepreneurial strategies has traditionally focused on corporate entrepreneurship, innovation strategies, and resource allocation (Audretsch et al., 2023). However, in the digital age, new forms of entrepreneurial strategies have emerged, including lean startup methodologies, effectuation, and platform-based business models (Ghezzi, 2019). While studies have examined these strategies in Western economies, their applicability and effectiveness in the Saudi Arabian entrepreneurial ecosystem require further investigation. For instance, research on digital entrepreneurship in developed economies emphasizes the importance of venture capital, ecosystem support, and technological infrastructure (Fernandes et al., 2022), yet these factors may function differently in Saudi Arabia due to cultural and institutional differences.

Entrepreneurial intentions have been extensively studied within the framework of the Theory of Planned Behaviour (Ajzen, 1991) and the Entrepreneurial Event Model (Shapero & Sokol, 1982). These models suggest that personal attitudes, perceived behavioural control, and subjective norms influence an individual's intention to start a business. However, the majority of these studies have been conducted in Western and

Asian contexts, leaving a contextual gap in understanding how these factors operate within Saudi Arabia's unique economic and cultural environment. Existing research suggests that risk aversion, gender norms, and family expectations significantly influence entrepreneurial behaviour in the Middle East (Alrubaishi et al., 2021), yet it remains unclear how entrepreneurial strategies can help mitigate these cultural and structural barriers to foster digital entrepreneurship.

Entrepreneurial self-efficacy (ESE) is another critical factor influencing entrepreneurial behaviour, as it determines an individual's confidence in their ability to perform entrepreneurial tasks (Wu et al., 2022). Previous research has linked ESE to entrepreneurial success, resilience, and opportunity recognition (Santoro et al., 2020). Studies suggest that ESE can be enhanced through entrepreneurial education, mentorship, and experiential learning (Saoula et al., 2023), yet the role of entrepreneurial strategies in shaping ESE, particularly in digital entrepreneurship, remains an understudied area. Saudi Arabia's entrepreneurial ecosystem has seen significant investments in incubators, accelerators, and government-backed initiatives (Elnadi & Gheith, 2021), but how these efforts translate into increased ESE and digital entrepreneurial success is not well documented in existing literature.

Saudi Vision 2030 aims to foster an entrepreneurial and knowledge-based economy, promoting digital transformation through investments in technology, e-commerce, and fintech (Vision 2030, 2016). While studies have highlighted the economic impact of these initiatives (Akinwale et al., 2020), there is limited empirical research on how they influence individual-level factors such as DEI and ESE. Most studies on digital entrepreneurship in Saudi Arabia focus on macroeconomic policies, regulatory frameworks, and ecosystem development (Alferaih, 2022), leaving a gap in understanding how entrepreneurial strategies at the individual level interact with these broader policy initiatives.

Moreover, cultural and social barriers remain significant challenges for digital entrepreneurship in Saudi Arabia. Research indicates that societal attitudes toward entrepreneurship, particularly for women, impacts entrepreneurial participation (Aljarodi et al., 2022). While government policies have encouraged female entrepreneurship through initiatives like the Women's Business Park, studies show that cultural expectations and limited access to funding still pose barriers (Abdelwahed et al., 2022). Understanding how entrepreneurial strategies can empower under-

represented groups, including women and young entrepreneurs, to develop stronger DEI and ESE is an essential research gap.

Additionally, digital entrepreneurship requires different skill sets and competencies compared to traditional entrepreneurship, including digital literacy, platform management, and data-driven decision-making (Fernandes et al., 2022). While global studies emphasize the role of digital skills in entrepreneurial success (Elia et al., 2020), little research has examined whether Saudi entrepreneurs possess these skills and how entrepreneurial strategies can help bridge any skill gaps. Given the rapid technological advancements and the increasing reliance on digital business models, understanding the interplay between entrepreneurial strategies, digital skills, DEI, and ESE is crucial for fostering a more effective entrepreneurial ecosystem in Saudi Arabia.

Another critical gap in the literature is the impact of digital business models on entrepreneurial intentions and self-efficacy. Studies suggest that the rise of platform-based businesses, e-commerce, and gig economy opportunities has changed the nature of entrepreneurship (Sahut et al., 2021). However, there is limited research on how aspiring entrepreneurs in Saudi Arabia perceive these opportunities and whether entrepreneurial strategies focused on digital business models enhance their confidence and willingness to engage in entrepreneurship. Given the Saudi government's push toward a digital economy, it is essential to understand how different entrepreneurial strategies align with these emerging business models.

Furthermore, while research has explored entrepreneurial education and training programmes globally, there is little empirical evidence on the effectiveness of these programmes in Saudi Arabia's digital entrepreneurship sector. Studies show that entrepreneurship education positively influences ESE and entrepreneurial intentions (Nuseir et al., 2020), but it is unclear whether current training programmes in Saudi Arabia adequately prepare individuals for digital entrepreneurship. Further investigation is needed to assess whether entrepreneurial strategies taught in these programmes align with the skills required for digital startups and how they influence DEI and ESE.

This study addresses these contextual gaps by examining the relationship between entrepreneurial strategies, DEI, and ESE in Saudi Arabia. By exploring how different entrepreneurial strategies impact aspiring digital entrepreneurs' intentions and self-efficacy, this research provides valuable insights for policymakers, educators, and business leaders. It will also contribute to the broader literature on digital

entrepreneurship, entrepreneurial psychology, and emerging markets by contextualizing these constructs within Saudi Arabia's rapidly evolving economy.

1.7 Theoretical Gap

From the theoretical perspective, this study examines the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and entrepreneurial self-efficacy, specifically in Saudi Arabia. A knowledge gap exists regarding the investigation of these variables in this study. This gap results from the lack of a unified theoretical framework that incorporates these factors comprehensively, clarifying their interactions and impact on digital entrepreneurial intention (Hooi et al., 2016). Filling this gap is crucial for developing a deeper understanding of these complex factors, which is essential for nurturing an innovative and sustainable entrepreneurial ecosystem in Saudi Arabia.

The behavioural theory of entrepreneurial bricolage and the experiential learning theory are the primary focus of recent research on the topic of entrepreneurial bricolage (Aaouid et al., 2024). Although these theoretical perspectives have been extremely helpful in comprehending how entrepreneurs generate value by creatively combining and repurposing available resources, they do not consider the interactions between entrepreneurial bricolage and other aspects, such as entrepreneurial self-efficacy and digital entrepreneurial intention. To overcome this theoretical gap, a comprehensive framework is required.

The theory of entrepreneurial orientation has been the key concern of the green entrepreneurial orientation research (Ameer & Khan, 2023; Guo et al., 2020). Notably, the concept of entrepreneurial orientation does not explicitly contain environmental sustainability components; consequently, its relevance is limited when attempting to comprehend the connection between environmentally conscious business practices and digital entrepreneurial intention. Although scholars integrated green entrepreneurial orientation into the resource-based view theory, there is still a lack of research that examines the relationship between green entrepreneurial orientation, entrepreneurial self-efficacy, and digital entrepreneurial intention (Muangmee et al., 2021; Shehzad et al., 2023). It is necessary to broaden existing theories by incorporating sustainability considerations and researching the interaction between green entrepreneurial

orientation, entrepreneurial self-efficacy, and digital entrepreneurial intention to fill in this theoretical void.

Within the context of individual-level psychology theories such as the theory of planned behaviour (Ajzen, 1991) and the entrepreneurial mindset theory, there has been extensive research conducted on the influence that an entrepreneurial mindset has on the innovativeness of digital technologies (Daspit et al., 2023). Despite this, these theories are inadequate when explaining the intricate connections between an entrepreneurial mindset and other factors. To fill in this theoretical void, there is a need a more comprehensive and integrated theoretical framework to consider the interaction between an entrepreneurial mindset, entrepreneurial self-efficacy, and digital entrepreneurial intention.

When it comes to ecological innovation, a similar theoretical gap exists. The notion of ecological innovation has been extensively studied within the frameworks of resource-based view, institutional theory, stakeholder theory, and evolutionary theory (Hazarika & Zhang, 2019). However, these theories do not completely account for the complex linkages that exist between ecological innovation and other variables, such as entrepreneurial self-efficacy and digital entrepreneurial intention. To fill this theoretical void, it is necessary to build a conceptual framework that is both more comprehensive and integrative, which takes into account the relationship between ecological innovation and other important factors in the context of innovative and sustainable entrepreneurship.

The currently prevalent theoretical frameworks do not address the mediating role of entrepreneurial self-efficacy in the relationship between the aforementioned variables and digital entrepreneurial intention. Although most research on entrepreneurial self-efficacy has been conducted within the framework of social cognitive theory (Bandura, 1986), the literature does not provide a comprehensive theoretical framework that explains how entrepreneurial self-efficacy mediates the relationships between green entrepreneurial orientation, ecological innovation, entrepreneurial bricolage, entrepreneurial mindset, and digital entrepreneurial intention.

To advance the understanding of sustainable and innovative entrepreneurship, it is essential to bridge the theoretical gap between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention, with an emphasis on entrepreneurial self-efficacy. This study aims to develop an integrated theoretical framework that incorporates these constructs

and clarifies their interaction. Furthermore, the insights derived from this comprehensive framework provide valuable guidance to policymakers and practitioners in designing and implementing effective strategies to promote sustainable entrepreneurship in Saudi Arabia. By understanding the interplay between these components, stakeholders can promote an ecosystem that encourages the formation of environmentally friendly digital technologies.

Despite extensive research on entrepreneurial strategies, digital entrepreneurial intentions (DEI), and entrepreneurial self-efficacy (ESE), significant theoretical gaps remain, particularly in understanding how entrepreneurial strategies influence DEI and ESE within the context of Saudi Arabia's evolving entrepreneurial ecosystem. While existing theories provide foundational insights into entrepreneurship, they often fail to capture the unique dynamics of digital entrepreneurship, the role of strategic decision-making, and the impact of socio-cultural and institutional factors specific to emerging economies. Theoretical frameworks such as the Theory of Planned Behaviour (TPB), Entrepreneurial Event Model (EEM), and Social Cognitive Theory (SCT) have been widely used to study entrepreneurial intentions and self-efficacy, yet they have limitations when applied to the digital entrepreneurial landscape, where new business models, technological advancements, and government-driven digital transformation initiatives play a critical role.

The Theory of Planned Behaviour (Ajzen, 1991) is one of the most commonly used theories to explain entrepreneurial intentions. It posits that attitudes, subjective norms, and perceived behavioural control influence entrepreneurial behaviour. While TPB has been widely validated in various entrepreneurship studies (Al-Mamary & Alraja, 2022), it does not explicitly account for the role of entrepreneurial strategies in shaping digital entrepreneurship. The digital economy introduces new variables such as digital literacy, platform-based business models, and algorithmic decision-making, which TPB does not fully capture. Moreover, TPB assumes rational decision-making, whereas digital entrepreneurs often rely on iterative processes, experimentation, and effectuation logic (Elia et al., 2020; Sarasvathy, 2001), which suggests a need for a more dynamic theoretical framework.

Similarly, the Entrepreneurial Event Model (Shapero & Sokol, 1982) emphasizes the role of perceived desirability, feasibility, and the propensity to act in entrepreneurial decision-making. While this model provides insights into why individuals decide to pursue entrepreneurship, it does not consider the strategic choices

that entrepreneurs make in digital contexts. Digital entrepreneurs operate in environments characterized by rapid technological changes, network effects, and platform economies, which require adaptive strategic decision-making (Al-Mamary & Alraja, 2022). Therefore, applying the EEM without modifications to digital entrepreneurship may lead to incomplete conclusions.

Social Cognitive Theory by Bandura (1986) has been extensively used to explain entrepreneurial self-efficacy (ESE). SCT highlights the importance of personal agency, observational learning, and self-regulation in shaping entrepreneurial behaviour. Research has shown that self-efficacy influences entrepreneurial persistence, resilience, and opportunity recognition (Jiatong et al., 2021). However, SCT does not explicitly address the role of digital transformation in shaping entrepreneurial competencies. Digital entrepreneurship requires new forms of self-efficacy, including confidence in digital marketing, e-commerce operations, and data-driven decision-making (Malodia et al., 2023; Sharma & Rautela, 2022). Traditional self-efficacy constructs may not fully explain the capabilities required for digital entrepreneurship, suggesting a need for theoretical extensions.

Effectuation Theory provides a more dynamic perspective on entrepreneurial decision-making, emphasizing how entrepreneurs leverage available resources, form partnerships, and adapt to uncertainty (Sarasvathy, 2001). This theory is particularly relevant to digital entrepreneurship, where business models are often fluid, and strategic pivots are common. However, existing studies have primarily applied effectuation to traditional startups rather than digital ventures. There is a gap in understanding how effectuation processes interact with digital business models, technological innovation, and government-driven entrepreneurship initiatives in Saudi Arabia. Further research is needed to integrate effectuation within digital entrepreneurship frameworks to better capture the realities of the modern entrepreneurial landscape.

Another theoretical gap arises from the limited integration of digital transformation theories with entrepreneurship research. Digital entrepreneurship is fundamentally different from traditional entrepreneurship due to its reliance on digital technologies, platform-based business models, and network effects (Satalkina & Steiner, 2020). While research on digital transformation has highlighted the impact of technology adoption and digital ecosystems (Subramaniam et al., 2019), it has not been sufficiently linked to theories of entrepreneurial intentions and self-efficacy. This

disconnect suggests the need for a hybrid theoretical model that integrates digital transformation perspectives with entrepreneurial cognition theories.

Institutional theory has been widely used to explain how regulatory, cultural, and normative forces shape entrepreneurial behaviour (Scott, 1995). In the Saudi Arabian context, government policies such as Vision 2030 play a significant role in shaping the entrepreneurial ecosystem. While institutional factors have been studied in traditional entrepreneurship research (Sendra-Pons et al., 2022), their interaction with digital entrepreneurship strategies remains underexplored. There is a need to examine how institutional support, digital infrastructure, and regulatory frameworks influence the effectiveness of entrepreneurial strategies in fostering DEI and ESE in Saudi Arabia.

In conclusion, while existing theories provide valuable insights into entrepreneurial intentions and self-efficacy, they do not fully capture the complexities of digital entrepreneurship in emerging economies like Saudi Arabia. The limitations of TPB, EEM, SCT, and traditional entrepreneurship theories suggest the need for an integrated theoretical framework that incorporates digital transformation, effectuation logic, institutional influences. This study aims to address these theoretical gaps by developing a comprehensive model that explains how entrepreneurial strategies influence DEI and ESE in the Saudi Arabian digital entrepreneurship landscape. By bridging these gaps, this research contributes to the advancement of entrepreneurship theory and provide practical insights for policymakers, educators, and entrepreneurs.

1.8 Research Objectives

This research aims to investigate the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention in the context of Saudi Arabia. The study also explores the mediating role of entrepreneurial self-efficacy in these relationships. To achieve this goal, the following research objectives have been formulated:

i. To examine entrepreneurial bricolage’s impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
ii. To examine green entrepreneurial orientation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
iii. To examine ecological innovation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.

iv. To examine entrepreneurial mindset's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
v. To evaluate the mediating role of entrepreneurial self-efficacy in the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention of Saudi Arabian entrepreneurs.

1.9 Research Questions

To address the research objectives of this study regarding the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention under the mediating role of entrepreneurial self-efficacy in Saudi Arabia, the following research questions have been developed:

i. Does entrepreneurial bricolage affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
ii. Does green entrepreneurial orientation affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
iii. Does ecological innovation affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
iv. Does entrepreneurial mindset affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
v. Does entrepreneurial self-efficacy mediate the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention of Saudi Arabian entrepreneurs?

1.10 Significance of Study

The key purpose of this study is to investigate the intricate relationships that exist among Saudi Arabian entrepreneurs' entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention. This study has substantial implications for both theory and practice in the areas of entrepreneurship, sustainable development, and digital

innovation. It also investigates the mediating role that entrepreneurial self-efficacy plays in these relationships.

This research makes several important contributions to the literature on entrepreneurship and sustainability. Firstly, it broadens the understanding of entrepreneurial bricolage and its function in encouraging the digital entrepreneurial intention of Saudi Arabian entrepreneurs. It also emphasizes the significance of a green entrepreneurial orientation as well as ecological innovation as major drivers of digital entrepreneurial intention. This study also examines the impact of entrepreneurial mindset on digital entrepreneurial intention. Another contribution of this study is examining the role that entrepreneurial self-efficacy plays as a mediator in the link between the variables discussed earlier.

This research has important implications in the real world for a wide variety of stakeholders, including practitioners, policymakers, and academics. The findings can be used to inform tailored support mechanisms and policies that foster sustainable and innovative entrepreneurship in the region by identifying the key factors that drive the digital entrepreneurial intention of Saudi Arabian entrepreneurs. This research contributes to the overarching objectives of economic and social development for of Saudi Arabia by focusing on the elements that drive the digital entrepreneurial intention of Saudi entrepreneurs. The findings have the potential to support the creation of an entrepreneurial ecosystem that is more sustainable and innovation-driven, which is in accordance with Saudi Arabia's Vision 2030 goal. In the long run, this will lead to new jobs, increased GDP, and improved social welfare.

This research has significant implications for the formulation and execution of policies in the sustainable development and entrepreneurship field in Saudi Arabia. Policymakers can design focused measures to foster an environment that encourages sustainable and innovative entrepreneurial endeavours by identifying the important characteristics that contribute to forming the digital entrepreneurial intention of Saudi entrepreneurs. The insights on the mediating role that entrepreneurial self-efficacy plays might assist in designing policies that support capacity building and personal development for entrepreneurs, which will ultimately enhance their capacity to innovate and flourish in the digital landscape.

This study holds significant theoretical and practical implications, offering valuable insights into the interconnected roles of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital

entrepreneurial intention within the Saudi Arabian entrepreneurial ecosystem. By investigating these relationships, the study contributes to a comprehensive understanding of the factors that shape digital entrepreneurship in the region, thereby addressing gaps in the existing literature. Furthermore, it highlights the mediating role of entrepreneurial self-efficacy, emphasizing its importance in strengthening the link between these entrepreneurial dimensions and digital entrepreneurial intentions. This contribution enriches the theoretical discourse on entrepreneurship by expanding the application of the Theory of Planned Behaviour (TPB) to digital entrepreneurship and sustainability-driven entrepreneurial activities.

One of the most significant theoretical contributions of this study is its extension of entrepreneurial bricolage research into the digital entrepreneurship domain, which is particularly relevant in an emerging market like Saudi Arabia. While bricolage has been widely recognized in resource-constrained environments as a means for entrepreneurs to overcome limitations through creative problem-solving, its impact on digital entrepreneurial intentions has not been thoroughly explored. This study bridges this gap by demonstrating how entrepreneurial bricolage may enable entrepreneurs to leverage digital tools and technologies innovatively, thereby enhancing their likelihood of engaging in digital ventures. This insight is particularly relevant in the Saudi Arabian context, where digital transformation is a central component of the country’s economic diversification efforts under Vision 2030.

Additionally, this research aims to advance the understanding of green entrepreneurial orientation and ecological innovation in digital entrepreneurship. As sustainability becomes an increasingly critical factor in global business strategies, this study aims to provide empirical evidence that a strong commitment to green entrepreneurial practices and ecological innovation may positively influence digital entrepreneurial intentions. Entrepreneurs who prioritize sustainability may be more likely to leverage digital platforms to create eco-friendly business solutions, such as sustainable e-commerce ventures, digital platforms for environmental awareness, and green tech startups. This study contributes to the growing body of literature on sustainable entrepreneurship by linking green entrepreneurial orientation and ecological innovation to digital business creation.

The study's findings also have substantial real-world implications, particularly for policymakers and stakeholders involved in economic and entrepreneurial development in Saudi Arabia. Given the government's emphasis on fostering an

innovation-driven and sustainable economy, the insights generated from this research can inform policies aimed at enhancing digital entrepreneurship. Policymakers can use these insights to design programs that support resourceful and sustainability-driven entrepreneurs, encouraging them to embrace digital business models. By understanding the critical role of entrepreneurial self-efficacy in mediating these relationships, policymakers can develop initiatives that focus on skill development, training, and capacity building to enhance entrepreneurs' confidence in pursuing digital ventures.

From an educational perspective, this study aims to underscore the need for integrating entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation into entrepreneurship education curricula. Universities and business schools in Saudi Arabia can benefit from incorporating these concepts into their academic programmes, helping aspiring entrepreneurs develop the skills necessary for success in digital and sustainable business environments. Training programmes that focus on enhancing self-efficacy, digital competencies, and sustainability-driven business strategies can better prepare entrepreneurs for the evolving economic landscape.

Moreover, the study aims to provide valuable insights for business practitioners and entrepreneurs themselves. By understanding the significance of entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation, entrepreneurs can strategically align their business models with digital transformation and sustainability objectives. Investors and venture capitalists seeking to fund innovative startups can also use this study’s findings to assess the potential success of digital entrepreneurs who exhibit strong bricolage capabilities, a sustainability-driven mindset, and a commitment to ecological innovation.

In the broader economic context, this research aligns with Saudi Arabia’s Vision 2030 goals by emphasizing the role of digital entrepreneurship in driving economic diversification and reducing reliance on oil-based revenues. By fostering an entrepreneurial ecosystem that encourages digital and sustainable ventures, the country can create new employment opportunities, stimulate economic growth, and enhance social well-being. The findings from this study can support the design of incentive programmes that encourage entrepreneurs to pursue digital ventures with a sustainability focus, ultimately contributing to the creation of a more competitive and innovation-driven economy.

This study also has implications for international comparisons and future research. While the focus is on Saudi Arabian entrepreneurs, the findings can serve as

a foundation for exploring similar dynamics in other emerging economies where digital entrepreneurship and sustainability are gaining traction. Comparative studies could examine how different cultural, regulatory, and economic environments influence the relationships identified in this research. Additionally, future research can build on this study by exploring how emerging technologies such as artificial intelligence, blockchain, and the Internet of Things (IoT) intersect with entrepreneurial bricolage and ecological innovation in digital business models.

In summary, this study aims to provide a multifaceted contribution to the literature on digital entrepreneurship, sustainability, and innovation. By examining the complex relationships among entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention, while also highlighting the mediating role of entrepreneurial self-efficacy, it is expected to offer valuable insights that can shape future research, policy-making, and entrepreneurial practice. The findings have the potential to drive the development of a more sustainable, innovation-driven entrepreneurial ecosystem in Saudi Arabia, supporting economic growth and aligning with the nation's long-term strategic vision.

1.11 Definition of Terms

1.11.1 Digital Entrepreneurial Intention

"Digital entrepreneurial intention refers to the cognitive predisposition of an individual to actively opt for and pursue a career in digital entrepreneurship" (Aloulou et al., 2024). "Digital entrepreneurial intention extends beyond a mere inclination towards entrepreneurship, encompassing a proactive commitment to navigate the digital realm to pursue novel business initiatives and ventures" (Vu et al., 2024). This study defines digital entrepreneurial intention as an entrepreneur's intention to engage in innovative and sustainable business ventures that use digital technologies.

1.11.2 Entrepreneurial Self-efficacy

"Self-efficacy is the confidence that arises in individuals' ability to successfully perform various activities and apply concrete actions in daily routines" (Bandura, 1997). "Entrepreneurial self-efficacy describes a person's confidence in successfully

developing a business" (Soomro & Shah, 2022). This study defines entrepreneurial self-efficacy as an entrepreneur's confidence in successfully developing innovative and sustainable businesses that use digital technologies.

1.11.3 Entrepreneurial Bricolage

"Entrepreneurial bricolage refers to the creative recombination of available resources within the firm to address new problems and opportunities" (Davidsson et al., 2017). This study defines entrepreneurial bricolage as entrepreneurs' ability to effectively and efficiently use available resources to solve new problems or benefit from new opportunities.

1.11.4 Green Entrepreneurial Orientation

"Green entrepreneurial orientation facilitates the transition and implementation of responsible environmental practices in an organizational setting" (Muangmee et al., 2021). "Green entrepreneurial orientation refers to the tendency of an organization to capture potential opportunities that result in improved financial and environmental performance through the introduction of eco-friendly products and services" (Ameer & Khan, 2022). This study defines green entrepreneurial orientation as entrepreneurs' willingness to implement responsible environmental practices.

1.11.5 Ecological Innovation

"Innovations that have an environmental impact, and for this reason are named ecological innovations, or eco-innovations, encompass a wide range of initiatives. These include the development of environmentally friendly products, often called eco-products, and transformative ecological processes, known as eco-processes" (Zappalà et al., 2023). "A firm's capacity to develop new ideas, behaviours, products, and processes able to reduce environmental burdens or achieve environmental sustainability goals" (Hazarika & Zhang, 2019). This study defines ecological innovation as entrepreneurs' attitudes towards developing environmentally friendly sustainable products or processes.

1.11.6 Entrepreneurial Mindset

"Entrepreneurial mindset is linked to profound cognitive phenomena that demonstrate an exceptional dedication to entrepreneurial endeavours" (Saptono et al., 2020). "It enables individuals to promptly perceive, act, and mobilize resources, even in uncertain situations" (Shetty et al., 2024). This study defines entrepreneurial mindset as entrepreneurs' commitment to entrepreneurial activities to take advantage of opportunities even with limited resources.

1.12 Scope and Limitations

1.12.1 Scope

This study is within the specific context of Saudi Arabia's entrepreneurial environment with consideration of its distinctive cultural, socioeconomic, and political aspects that influence the entrepreneurial landscape in the nation. The sample population for this study consists of SME business owners operating in various industries, with an emphasis placed on those that have integrated environmentally conscious business practices and digital technologies into their operations. SMEs are chosen for this study because of Saudi Arabia's focus on moving towards a green economy relies heavily on entrepreneurial activities and the establishment of SMEs (Alshebami, 2023; Takla & Walid, 2023). The establishment of the Monsha'at Authority in 2016 demonstrates that the Saudi government is investing heavily on the entrepreneurial ecosystem in the country towards achieving Vision 2030 (Monsha'at, 2022).

To provide a thorough picture of digital and sustainable entrepreneurship throughout various stages of firm development, the sample comprises entrepreneurs who are in the initial stages of their entrepreneurship careers as well as those who have already established themselves. The study examines the correlations between a number of different variables, including entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention. In addition to this, the research investigates the role that entrepreneurial self-efficacy plays as a mediator in the interactions being studied. In this study, data collection and analysis are carried out using quantitative approaches, such as

questionnaires. This quantitative method enables a more robust and comprehensive knowledge of the interrelationships that exist between the variables.

This study is particularly relevant in the context of Saudi Arabia's rapid digital transformation, government-backed entrepreneurial initiatives, and increasing global awareness of sustainable business practices. This study seeks to provide deeper understanding of how entrepreneurial strategies influence digital entrepreneurial intentions (DEI) and entrepreneurial self-efficacy (ESE) while incorporating sustainability-driven factors. The study includes entrepreneurs at different stages of their careers, from those in the early stages of launching their ventures to those who have already achieved stability and growth. This broad inclusion allows for a more comprehensive analysis of the entrepreneurial journey, capturing both nascent and experienced digital entrepreneurs' perspectives.

The research examines several key variables that contribute to digital entrepreneurial success and sustainable entrepreneurship. These include entrepreneurial bricolage, which refers to an entrepreneur's ability to effectively and efficiently use available resources to solve new problems or benefit from new opportunities; green entrepreneurial orientation, which reflects the entrepreneurs' strategic orientation toward adopting and implementing responsible environmental practices; ecological innovation, which relates to the capacity and commitment to developing environmentally friendly products, processes, and services that reduce environmental burdens; and entrepreneurial mindset, which encompasses the entrepreneurs' commitment to entrepreneurial activities to take advantage of opportunities even with limited resources. The study further explores how entrepreneurial self-efficacy (ESE) acts as a mediator in the relationships between these variables and digital entrepreneurial intention (DEI), shedding light on the psychological and strategic factors that enhance entrepreneurial outcomes.

The research methodology follows a quantitative approach, utilizing structured questionnaires as the primary data collection tool. This method enables an objective and systematic evaluation of relationships between variables, ensuring reliability and statistical validity. A quantitative framework is particularly useful in entrepreneurship research as it allows for hypothesis testing and generalizability of findings across a larger sample size. Statistical techniques such as regression analysis and structural equation modelling (SEM) are employed to determine the significance and strength of these relationships. By adopting a data-driven approach, this study aims to provide

empirical evidence that can guide policymakers, business owners, and academic researchers in understanding the dynamics of digital entrepreneurship and sustainable business practices in Saudi Arabia.

Additionally, the study considers external factors such as regulatory policies, market competition, and digital infrastructure, which may influence entrepreneurial behaviours. While the focus remains on SMEs, the study acknowledges the role of larger market dynamics in shaping entrepreneurial decision-making. Given the increasing emphasis on digital entrepreneurship, factors like access to funding, technology adoption, and government incentives are considered in the analysis. By examining these elements, the research provides a nuanced understanding of the entrepreneurial ecosystem, bridging the gap between theory and practical business applications.

In summary, the scope of this research encompasses a diverse range of SMEs in Saudi Arabia that are integrating digital and sustainable practices into their operations. It investigates the strategic and psychological factors that shape digital entrepreneurial intentions and self-efficacy, utilizing a robust quantitative methodology to ensure empirical validity. The study contributes to the existing body of knowledge on digital entrepreneurship and provide actionable insights for entrepreneurs, policymakers, and scholars aiming to foster sustainable and technology-driven business growth in Saudi Arabia.

1.12.2 Limitations

Despite the comprehensive scope of this research, several limitations must be acknowledged. These limitations primarily stem from methodological, contextual, and practical constraints that may influence the study's generalizability and interpretation of findings. Recognizing these limitations is essential for ensuring the validity of conclusions and for guiding future research in this domain.

One of the primary limitations is the geographical focus of the study. The research is confined to Saudi Arabia, which has a unique cultural, economic, and regulatory environment that may not be directly applicable to other regions. Saudi Arabia's government-led initiatives, such as Vision 2030 and the establishment of Monsha'at, provide a supportive ecosystem for digital and sustainable entrepreneurship. However, these conditions may differ significantly in other countries with varying

levels of digital infrastructure, entrepreneurial policies, and sustainability priorities. As a result, the findings may not be fully generalizable to entrepreneurial ecosystems in other regions, particularly in economies with different levels of government intervention and market maturity.

Another significant limitation is the focus on SMEs, which excludes large corporations and startups operating outside the SME framework. While SMEs are a crucial driver of economic growth and sustainability efforts in Saudi Arabia, large enterprises may exhibit different entrepreneurial behaviours, strategic orientations, and responses to digital and green initiatives. Furthermore, startups that are not yet classified as SMEs could have distinct challenges and opportunities, particularly in terms of access to funding, scalability, and innovation adoption. By focusing exclusively on SMEs, the study may overlook insights from other business categories that could contribute to a more comprehensive understanding of digital and sustainable entrepreneurship.

The study also encounters methodological constraints associated with its quantitative research approach. While surveys and structured questionnaires allow for statistical analysis and hypothesis testing, they may not capture the deeper motivations, perceptions, and contextual nuances of entrepreneurial behaviour. A qualitative or mixed-methods approach, incorporating in-depth interviews or case studies, could provide richer insights into the lived experiences of entrepreneurs and the complexities of decision-making in a digital and sustainable business environment. Additionally, self-reported data collected through surveys may be subject to response biases, such as social desirability bias, where participants provide answers that they believe are more socially acceptable rather than reflecting their actual experiences or beliefs.

Another potential limitation is the cross-sectional nature of the study. The data is collected at a single point in time, which limits the ability to analyse how digital entrepreneurial intentions and self-efficacy evolve over time. Given that entrepreneurship is a dynamic process influenced by changing market conditions, technological advancements, and policy shifts, a longitudinal study would provide more robust insights into how entrepreneurial strategies and mindsets develop over time. However, due to time and resource constraints, this study relies on cross-sectional data, which may not fully capture long-term trends and causal relationships between the variables.

Moreover, the role of external environmental factors, such as economic fluctuations, regulatory changes, and technological disruptions, may not be fully accounted for in this study. The rapid development of artificial intelligence, blockchain, and other emerging technologies could significantly impact digital entrepreneurship in ways that are not entirely foreseeable within the study's timeframe. Additionally, unforeseen global events, such as economic crises or pandemics, could alter entrepreneurial behaviours in ways that are beyond the study's scope.

Lastly, sample representativeness poses another challenge. While efforts are made to ensure a diverse and representative sample of SME entrepreneurs, there is still a risk of selection bias, where certain industry sectors or demographics may be over-represented or under-represented. Differences in entrepreneurial experiences based on gender, educational background, or industry type may influence the results, and future studies could adopt more targeted sampling strategies to enhance inclusivity and diversity in the research.

In conclusion, while this study aims to provide valuable insights into the impact of entrepreneurial strategies on digital entrepreneurial intentions and self-efficacy in Saudi Arabia, it is subject to limitations related to geographical scope, methodological approach, cross-sectional design, external environmental influences, and sample representativeness. Acknowledging these limitations highlights the need for future research to adopt more diverse methodologies, explore comparative studies across different regions, and conduct longitudinal analyses to gain a deeper and more comprehensive understanding of digital entrepreneurship in evolving business landscapes.

1.13 Chapter Summary

This chapter introduced the research study, which investigates the relationships among entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention, with a focus on the mediating role of entrepreneurial self-efficacy in the context of Saudi Arabia. The chapter began by presenting the introduction and background of the study, highlighting the growing importance of entrepreneurship for economic development and environmental sustainability in Saudi Arabia. The study's motivation is to

understand how these factors interact and contribute to the development of innovative and sustainable entrepreneurship in Saudi Arabia.

The research problem is identified as a lack of comprehensive understanding of the factors influencing digital entrepreneurial intention and the role of entrepreneurial self-efficacy in the Saudi Arabian context. The chapter presents contextual, conceptual, and theoretical gaps in the existing literature that need to be addressed. The research objectives and research questions are then outlined, which include examining the effects of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention, and analysing the mediating role of entrepreneurial self-efficacy in these relationships. The chapter then discusses the significance of the study and its scope and limitations. Definitions of important terms are also provided.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This study examines several aspects and predictors of digital entrepreneurial intention of SME entrepreneurs in Saudi Arabia. Before proceeding to comprehend the dynamic relationship of the phenomenon with Saudi Arabia's business society, and economic circumstances, it is essential to understand the entrepreneurial concepts and related terms in the entrepreneurial environment. Therefore, this chapter provides intuitive drives to cover the gaps by providing the literature.

2.2 Entrepreneurship in the Context of Saudi Arabia

Entrepreneurship in Saudi Arabia is an old concept as the Arabs were known to be traders for ages. Most Arabs identify themselves as entrepreneurs and many individuals do not prefer to work for someone else. Many Saudi nationals have historically engaged in entrepreneurial activities, as entrepreneurship is deeply embedded in Arab cultural heritage. Although entrepreneurship has not been an alien concept in the Arab world especially in Saudi Arabia, there has been rare research performed about entrepreneurship in the Saudi context (Abdulghaffar & Akkad, 2021). One plausible reason for that may be that Saudis are dependent on an oil-based economy. Being the third-highest oil-producing country in the world, most of the entrepreneurship ventures in Saudi Arabia are also related to the oil and gas industry. Secondly, the hospitality industry is taking a big part in entrepreneurship in Saudi Arabia. Being one of the most significant destinations for Islamic pilgrimage due to its religious history and having the holiest places for Muslims around the world, Saudi Arabia also is the host to the Islamic pilgrimage that attracts almost 2.5 million pilgrims from around the world (AlJazeera, 2023). Apart from that, Saudi Arabia is known to be the place where the Prophet Muhammad (SAW) was born and spent his whole life; therefore, other holy places also make Saudi Arabia an attractive site for Islamic

tourists. Apart from such potential in the market, few entrepreneurship-related studies have explored Saudi context (Alferaih, 2022).

However, this has changed a lot after the announcement of the 2030 vision by Saudi Arabia's Crown Prince Muhamad bin Salman in 2016 (Abbas, 2020). According to Vision 2030, Saudi Arabia vows to build a thriving economy that would be based on innovation. This developmental vision aims to reduce the country's dependence on the oil-based industry and create a vibrant society in the future. The underlined phenomenon of Vision 2030 is a shift from an oil-based economy to a knowledge-based economy. This vision has become a gateway for entrepreneurs of Saudi Arabia to explore the multi-billion-dollar economy from a different perspective.

In this study regarding entrepreneurship in Saudi Arabia, it was found that most of the prior studies were based on the concept of Islamic entrepreneurship. Saudi Arabia, perceived as the Islamic capital of the world, has always been an attraction for Islamic scholars, and this proves to be true in the case of entrepreneurship as well. Many of the studies have taken the case study of Saudi Arabia as being representative of the Islamic world. A study by Mebroui and Mosbah (2020) highlighted the difference between Islamic entrepreneurship and Muslim entrepreneurship also known as Muslipreneurship. According to the study, Islamic entrepreneurship considers and obeys the Islamic principles of Sharia while planning and executing entrepreneurship. On the other hand, Muslim entrepreneurship only refers to the religious beliefs of the owner and does not necessarily consider shariah. The study aimed at identifying the challenges faced by Islamic entrepreneurship. The study claimed that there are two views regarding Islamic entrepreneurship in the world. One view considers Islam to be a barrier towards innovative development while the other thinks of it as a catalyst and supporter of the entrepreneurial concept.

A pioneer study highlighting the Saudi context of entrepreneurship was conducted by Kayed and Hassan (2010). The study aimed at reviewing the relationship between Islamic values and entrepreneurial activity. A self-written questionnaire was used to collect data from Saudi entrepreneurs based in the Saudi city of Riyadh. Views and thoughts of these entrepreneurs were collected regarding their attitudes and response towards Islamic and conventional entrepreneurship. It was discovered that Saudi entrepreneurs considered themselves to be Muslim entrepreneurs and considered entrepreneurship to be an Islamic and national obligation. It is also believed that because of the fact that Prophet Muhamad (SAW) and many of his companions were traders or

entrepreneurs themselves, entrepreneurship is also a holy profession. Muslim entrepreneurs firmly consider the saying of Prophet Muhammad (SAW) according to which 9/10 of sustenance is in business. The results further represented the classic views of Islamic entrepreneurs who considered that their business should be based on halal (lawful) means and businesses that involved haram (forbidden) activities such as gambling, interest, alcohol etc. should be strictly avoided. Moreover, most respondents held the view that through entrepreneurship they are contributing towards falah (well-being) of the Muslims by providing others with employment and means to earn for their family. This study helped to negate the common perception that Islamic and Saudi cultures are anti-development and discourage entrepreneurship.

Another very famous aspect of Saudi entrepreneurship which has been immensely popular among the researchers is the concept of female entrepreneurship. As Saudi Arabia is perceived to be a very conservative state that doesn't allow women to participate in social activities, the entrepreneurship scholars have had a special interest in determining the legitimacy of this perception by measuring it through entrepreneurial activity. There are numerous studies on this topic. Danish and Smith (2012) examined the opportunities and challenges faced by female entrepreneurs in the Kingdom. Using responses collected from 33 female entrepreneurs in the Saudi city of Jeddah, they concluded that though in the past the concept of female entrepreneur was not encouraged in the Saudi Arabia, the trend is however changing and an ever-increasing number of female entrepreneurs are joining the industry. These female entrepreneurs also considered to be much more supported now than they were in the past. Nieva (2015) considered training and development to be the key factor that needs to be addressed to promote female entrepreneurship in the kingdom. Moreover, regulatory framework and technical support were demanded by most of the female Saudi entrepreneurs. Culture was considered to be a hindrance by the female entrepreneurs in the growth of the industry; however, the number of such respondents was very low as compared to other challenges.

A handful of recent studies have explored the link between economic and sociocultural development of Saudi Arabia with growing entrepreneurship trends. Akinwale et al. (2020) investigated the role of entrepreneurship and innovation on the economic development of Saudi Arabia. Taking entrepreneurship and economic data for 12 years i.e. 2005-2016, they concluded that entrepreneurship had a significant

positive relationship with Saudi economic development and that with the increase in entrepreneurial activity, the economy prospered.

Finally, few studies have also been carried out on green entrepreneurship in the Saudi context. Alwakid et al. (2021) explored the influence of green entrepreneurial activity in Saudi Arabia on sustainable development. Gathering data from 13 Saudi cities spanning from 2012 to 2017, it was found that green entrepreneurial activity positively affected the economic, social and environmental aspects of development in Saudi Arabia. It was also found that the Saudi government is showing keen interest and efforts in developing and supporting green entrepreneurial activities. Alwakid et al. (2021) with another study, collected data from 21 Saudi cities and explored the connection between cultural antecedents of environmental actions, environmental consciousness and temporal intentions with green entrepreneurial activity in the kingdom. It was concluded that green entrepreneurial activity was enhanced because of these cultural antecedents. Most of these studies show that the future of entrepreneurship in Saudi Arabia is a bright one and that the government is also encouraging entrepreneurship at the policy level.

Entrepreneurship in Saudi Arabia has undergone a significant transformation over the past decade, driven by economic diversification initiatives, policy reforms, digitalization, and the increasing influence of globalization. The Kingdom's Vision 2030 strategic framework emphasizes the development of a robust entrepreneurial ecosystem to reduce reliance on oil revenues and promote private sector growth (Vision 2030, 2023). This literature review examines the key aspects of entrepreneurship in Saudi Arabia, focusing on its evolution, government policies, digital entrepreneurship, female entrepreneurship, sustainability, challenges, and future prospects.

Historically, entrepreneurship in Saudi Arabia has been shaped by its oil-dependent economy, where business opportunities were often cantered around trade, construction, and government contracts (Aloulou & Al-Othman, 2021). However, in recent years, there has been a paradigm shift toward fostering a knowledge-based economy, with a greater emphasis on innovation, technology, and SMEs. The Saudi Arabia has significantly improved its entrepreneurial environment, ranking among the top Middle Eastern countries in terms of startup activity and government support.

One of the key factors driving this transformation is the increasing acceptance of entrepreneurship as a viable career option among young Saudis. Research by Aloulou & Algarni (2022) indicates that societal attitudes toward entrepreneurship have

evolved, with many young professionals considering it an attractive alternative to traditional employment. This shift has been influenced by educational programmes, incubators, and business accelerators that promote entrepreneurial thinking. The Saudi government has played a central role in fostering entrepreneurship through various policy measures and institutional frameworks. Monsha'at, the Small and Medium Enterprises General Authority, was established in 2016 to oversee SME development and enhance the business environment (Monsha'at, 2022). It provides financial incentives, regulatory support, and training programmes to facilitate the growth of startups and SMEs.

Another major initiative is the National Transformation Program (NTP), which aims to enhance economic productivity by encouraging private sector participation. The Saudi Venture Capital Company (SVC) and Saudi Industrial Development Fund (SIDF) provide financial assistance and investment opportunities to entrepreneurs, particularly in high-growth sectors like technology, manufacturing, and renewable energy (Siddiqui et al., 2021). Furthermore, the Kafalah Programme, a credit guarantee scheme, helps SMEs access financing by reducing risks for banks and financial institutions. According to Siddiqui et al. (2021), access to funding remains a key barrier to entrepreneurship in Saudi Arabia, and initiatives like Kafalah have played a crucial role in bridging the financing gap.

The rise of digital entrepreneurship is a defining feature of Saudi Arabia's modern business landscape. With high internet penetration (over 98%) and a tech-savvy population, the country has witnessed rapid growth in e-commerce, fintech, and digital services (CST, 2024). Platforms like HungerStation, Jahez, and Noon have revolutionized the online business environment, demonstrating the potential for digital startups in the region.

Government-led initiatives such as Misk Innovation and Saudi Digital Academy support tech entrepreneurs through training, mentorship, and funding opportunities. Additionally, the eCommerce Law (2019) provides a regulatory framework to protect digital businesses and consumers, which further accelerates the growth of the digital economy (Algarni, 2020). Research by Nuseir et al. (2020) highlights that Saudi entrepreneurs are increasingly leveraging artificial intelligence (AI), blockchain, and cloud computing to enhance business efficiency and customer experience. However, challenges such as cybersecurity threats, regulatory compliance, and competition from

international tech firms remain significant barriers to the sustained growth of digital entrepreneurship.

Women's participation in entrepreneurship has grown significantly following legal and social reforms that support female empowerment. According to the World Bank's Women, Business, and the Law Report, Saudi Arabia has implemented a number of reforms to expand women's economic rights, including provisions enabling women to start businesses and access to financial resources, achieving an overall score of 71.3 out of 100 which is above the Middle East and North Africa regional average of 53.2 (World Bank, 2023). The proportion of SMEs owned by women entrepreneurs in Saudi Arabia reached 45% by the first half of 2022 which is double the percentage recorded in 2017, reflecting a shift in gender dynamics within the business sector (Monsha'at, 2022). Programmes like the Women's Business Park (Riyadh) and FemTech Accelerator provide targeted support for female entrepreneurs, encouraging their participation in traditionally male-dominated industries. Despite this progress, gender-based challenges persist. Cultural expectations, limited networking opportunities, and difficulties in accessing venture capital continue to hinder female entrepreneurship (Abdelwahed et al., 2022). Literature suggests that increasing mentorship programmes and financial inclusion initiatives for women-led businesses could further enhance their contribution to Saudi Arabia's economic diversification.

Sustainability has become an integral part of Saudi Arabia's entrepreneurial landscape, particularly and global environmental goals. Green entrepreneurship focuses on developing businesses that reduce carbon footprints, promote circular economies, and adopt eco-friendly innovations (Zabelin, 2024). Studies by Isher & Gangwar (2024) emphasize the role of sustainable startups in sectors like renewable energy, waste management, and agritech. Companies such as Naqaa Solutions and Red Sea Farms exemplify the success of green entrepreneurship by integrating solar energy, water conservation, and organic farming techniques into their business models.

However, green entrepreneurship in Saudi Arabia is still in its early stages. Challenges such as high initial costs, regulatory hurdles, and consumer awareness gaps limit the widespread adoption of sustainable business practices. Scholars (Abdelwahed et al. 2023) recommend stronger policy incentives that include tax breaks and sustainability-linked financing, to encourage eco-friendly entrepreneurship. While entrepreneurship is growing in Saudi Arabia, several challenges continue to affect the sector. Access to funding remains a significant barrier, especially for early-stage

startups without established financial histories. Although government programmes like Monsha'at and SVC provide funding opportunities, private venture capital and angel investment networks are still underdeveloped compared to global startup hubs (Aloulou, 2021).

Another major challenge is the regulatory landscape. While Saudi Arabia has made significant reforms to simplify business registration, tax policies, and licensing including the 2022 Companies Law which streamlined incorporation procedures and also reduced minimum capital requirements, bureaucratic complexities and compliance requirements still pose difficulties for entrepreneurs (World Bank, 2020). Additionally, market competition from international organizations, particularly in the digital and e-commerce sectors, creates pressure on local startups to differentiate and sustain competitive advantages.

The entrepreneurial culture in Saudi Arabia is still evolving. While more young people are considering entrepreneurship, risk aversion and societal pressure for stable employment remain significant concerns (Elnadi & Gheith, 2021). Education systems are gradually incorporating entrepreneurship training, but scholars argue that a stronger emphasis on experiential learning, startup incubators, and mentorship programmes is needed to cultivate an entrepreneurial mindset (Ahmad et al., 2023).

The future of entrepreneurship in Saudi Arabia is promising, driven by Vision 2030, technological advancements, and increasing global integration. Experts predict that Saudi Arabia will continue to position itself as a regional entrepreneurial hub, with significant investments in smart cities, fintech, artificial intelligence, and green technologies.

To further enhance the entrepreneurial ecosystem, researchers recommend greater collaboration between universities, industry, and government to foster innovation-driven startups (Wurth et al., 2022). Expanding venture capital networks, improving financial literacy among entrepreneurs, and streamlining regulatory processes will also be crucial in sustaining long-term growth.

Moreover, a stronger focus on socio-cultural entrepreneurship, including initiatives that support youth, women, and marginalized communities, will ensure inclusive economic development. Public-private partnerships, along with increased international collaborations, can further accelerate the transformation of Saudi Arabia's entrepreneurial sector.

Entrepreneurship in Saudi Arabia has made remarkable strides, driven by economic diversification efforts, digitalization, and government support. The rise of SMEs, digital startups, and female entrepreneurs highlights the dynamic nature of the country's business environment. However, challenges such as funding constraints, regulatory complexities, and cultural perceptions of risk-taking continue to affect the entrepreneurial landscape. By addressing these challenges through policy enhancements, financial support, and education, Saudi Arabia can further solidify its position as a leading entrepreneurial hub in the Middle East. Future research should explore longitudinal studies on entrepreneurial success rates and the evolving impact of digital and green entrepreneurship in the Kingdom.

2.3 Entrepreneurship as a Term

Entrepreneurship has been defined by different languages; however, most of them mean the same thing. For example, in the French language, "entreprendre" means developing a plan that requires an effort to achieve its objectives. Similarly, the Italian word "Intrapendre" and German word "Unternehmen" also means the fulfilment of a plan by using resources. One of the earliest definitions can be attributed to the Greek language which defined entrepreneurship as a systematic effort which uses resources such as abilities, time, knowledge, skills etc. to achieve a particular target. Since then, the concept of entrepreneurship has been evolving and yet there has been no concrete or unanimous definition. There has also been a controversy regarding the misunderstandings surrounding entrepreneurship. Self-employed individuals and sole proprietors, for instance, may have discovered, perhaps shockingly, that they are only small business owners rather than entrepreneurs (Carland et al., 1984). Distinguishing entrepreneurial activity from non-entrepreneurial business provides academic challenges to define, similarly in defining corporate entrepreneurship and individual entrepreneurship (Wortman, 1987).

Literature has been able to determine few criterions that help us distinguish entrepreneurship from small businesses. These include innovation, creativity, risk-taking, management style, economic or societal contribution and personality traits. All these criteria have been used by the scholars to define entrepreneurship according to the academic standards and understanding. The word entrepreneur has often been used for someone who starts a new venture (Yetisen et al., 2015). This means that anyone who

inherited a business or bought an existing one and also someone who manages a reconstruction of the business automatically is being excluded from the ranks of entrepreneurship. Some define entrepreneurship as only the initiator of creativity and novelty (Schumpeter & Backhaus, 2003). Other researchers see entrepreneurship as an exploitation of opportunity in a way that resources are used most efficiently and effectively. People who address a societal need or solve a social problem through their ventures are also termed 'entrepreneur' (Bornstein, 2004). On the other hand, some scholars have identified an entrepreneur as someone who boosts the economy (Akinwale et al., 2020). All of these aspects of the definition of entrepreneurship are discussed further in the literature review.

Key challenges in defining entrepreneurship is distinguishing it from other business activities, particularly sole proprietorships and self-employment. Carland et al. (1984) argued that not all small business owners qualify as entrepreneurs, despite their assumption that they are. This distinction is critical because it challenges traditional perceptions of business ownership and necessitates a more refined classification of who qualifies as an entrepreneur. In response to this, scholars have further divided entrepreneurship into corporate entrepreneurship and individual entrepreneurship (Wortman, 1987), emphasizing the role of innovation, risk-taking, and strategic vision in differentiating entrepreneurs from mere business managers.

A significant aspect of entrepreneurship is its association with innovation and creativity. Backhaus (2003) viewed entrepreneurship as a force that disrupts market equilibrium by introducing novel products, services, or business models. This perspective highlights the role of entrepreneurs as pioneers who drive economic progress through innovation rather than mere business operation. In contrast, other scholars have focused on the exploitation of opportunities as the defining characteristic of entrepreneurship. They argue that entrepreneurs identify and leverage market inefficiencies, utilizing resources in the most efficient and effective manner to create value. This perspective aligns with opportunity-based definitions of entrepreneurship, emphasizing strategic decision-making and resourcefulness as core attributes of entrepreneurial success.

Entrepreneurship is also increasingly associated with social impact. Bornstein (2004) expanded the definition to include individuals who address societal needs or solve social problems through their ventures. Social entrepreneurships focus not just on profit but on creating a positive impact on society, often through sustainable business

models that tackle issues such as poverty, education, or environmental sustainability. This broadens the scope of entrepreneurship beyond traditional business settings and underscores its role in social and economic development. Similarly, Akinwale et al. (2020) highlighted the economic contributions of entrepreneurs, emphasizing their role in job creation, industry growth, and economic diversification. This aligns with the notion that entrepreneurs play a crucial role in economic stability and expansion by introducing competition, enhancing productivity, and driving technological advancements.

Given these diverse perspectives, scholars have attempted to identify key characteristics that define entrepreneurship. These include innovation, risk-taking, management style, economic and societal contributions, and personality traits that distinguish entrepreneurs from traditional business owners. Shepherd et al. (2021) argued that entrepreneurship should primarily be linked to those who initiate new ventures, implying that individuals who inherit businesses, purchase existing firms, or engage in business restructuring does not necessarily qualify one as an entrepreneur. This definition further refines the distinction between entrepreneurs and business managers, reinforcing the notion that entrepreneurship is fundamentally about creation rather than continuation.

The debate over the definition of entrepreneurship is not merely theoretical; it has significant implications for policymaking, education, and economic development. By establishing a clear distinction between entrepreneurs and other business owners, policymakers can design targeted support programmes that foster innovation, risk-taking, and entrepreneurial growth. Clarification of the entrepreneurial definition is particularly relevant in economies that aim to promote entrepreneurship as a driver of economic transformation, such as Saudi Arabia's Vision 2030 initiative, which seeks to diversify the economy and reduce reliance on oil revenues through entrepreneurship and innovation.

From an academic perspective, understanding entrepreneurship as a distinct field of study allows researchers to develop frameworks that capture its complexities. Theories such as Schumpeter's innovation theory, Kirzner's opportunity recognition theory, and the resource-based view of entrepreneurship provide valuable insights into how entrepreneurs identify and exploit opportunities. These theories help in shaping entrepreneurship education programmes that prepare aspiring entrepreneurs with the

skills, knowledge, and mindset needed to navigate dynamic business environments successfully.

The practical implications of defining entrepreneurship extend to the business world, where investors, business leaders, and policymakers rely on these definitions to allocate resources and support entrepreneurial initiatives. A clear understanding of what constitutes entrepreneurship allows venture capitalists and funding institutions to identify high-potential startups that exhibit true entrepreneurial traits, such as innovation and scalability. Moreover, training programs designed for entrepreneurs can be more effective when tailored to the unique challenges and opportunities that define entrepreneurial ventures, rather than applying generic business management principles.

As entrepreneurship continues to evolve in response to technological advancements and global market changes, the definition of entrepreneurship may further expand to incorporate new dimensions. The rise of digital entrepreneurship, for instance, has introduced new ways of conceptualizing entrepreneurial activity, where online platforms, digital transformation, and artificial intelligence play a crucial role in business creation. This has implications for future research, as scholars must explore how traditional entrepreneurial theories adapt to the digital age and whether new frameworks are needed to capture emerging trends.

In conclusion, entrepreneurship is a multifaceted concept that has been defined in various ways across different cultures and academic disciplines. While early definitions focused on planning and resource utilization, modern interpretations emphasize innovation, opportunity exploitation, social impact, and economic contribution. The ongoing debate over the definition of entrepreneurship underscores its dynamic nature and its relevance in shaping economies, societies, and business ecosystems. Understanding these different perspectives allows for a more comprehensive approach to supporting and fostering entrepreneurship in both developed and emerging markets, ensuring that it continues to be a driving force for innovation and economic progress.

2.4 Digital Entrepreneurial Intention

2.4.1 Definition

This section begins the description of variables by explaining the sole dependent variable of the study i.e. digital entrepreneurial intention. As defined previously in the first chapter, digital entrepreneurial intention means "the cognitive predisposition of an individual to actively opt for and pursue a career in digital entrepreneurship" (Aloulou et al., 2024). Digital entrepreneurial intention extends beyond a mere inclination towards entrepreneurship, encompassing a proactive commitment to navigate the digital realm to pursue novel business initiatives and ventures (Vu et al., 2024). There are many definitions of the concept of digital entrepreneurial intention but in this study, digital entrepreneurial intention is defined as an entrepreneur's intention towards engaging in innovative and sustainable business ventures that use digital technologies.

Digital entrepreneurial intention represents the cognitive state of an individual in which they desire to establish a digital business, and a stronger inclination towards digital entrepreneurial intention transforms into actual behaviour (Wibowo et al., 2023). The rapid development in digital technologies is transforming the nature of entrepreneurship and reshaping the economy. Digitalization has transformed the economic behaviour from an offline to an online activity using a digital platform. Therefore, the digital entrepreneurial intentions also increase due to the growing demand of digital products and services (Wibowo et al., 2024). As digital entrepreneurship facilitates the production and selling of digital products, it not only helps in transforming existing conventional businesses but it also provides new business opportunities for entrepreneurs (Kollmann et al., 2022).

2.4.2 Previous Studies on Digital Entrepreneurial Intention

Many researchers have studied the digital entrepreneurial intention for examining the factors that impact digital entrepreneurial intention. Market dynamics have changed in recent times, especially after the Covid-19 pandemic. Most of the businesses had to use digital resources for communication and product development. The businesses that developed after the pandemic are mostly relying on digital resources. In the wake of this digital transformation, it is important to understand which

factors drive the digital entrepreneurial intentions of business owners and entrepreneurs. Xu et al. (2023) examined the factors that impact digital entrepreneurial intention in China. The authors explored many factors that impact the digital entrepreneurial intention of entrepreneurs in China including the needs for capacity building, changes in social norms after the pandemic, and exploring new markets that are eco-friendly. All these factors that impact digital entrepreneurial intention are underpinned by the theory of planned behaviour.

Capacity building, social norms, and eco-friendly market dynamics aren't the only factors that impact the digital entrepreneurial intention of entrepreneurs, digital literacy, creativity, entrepreneurship education, innovativeness, and digital entrepreneurial self-efficacy are also important factors that influence digital entrepreneurial intention (Akhter et al., 2022). In order for the entrepreneurs or soon-to-be entrepreneurs, it is important to develop these qualities to be successful in the market. With digital revolution, especially after the Covid-19 pandemic and with the emergence of generative artificial intelligence, it is of utmost importance for the entrepreneurs to get a good grasp of digital resources to enhance their abilities.

Apart from the aforementioned factors, digital entrepreneurial knowledge, digital competence, and risk propensity of businesses can also impact the digital entrepreneurial behaviour of potential entrepreneurs in Indonesia (Darmanto et al., 2023). However, the results of the study showed that digital entrepreneurial knowledge and digital competence have a direct influence on digital entrepreneurial behaviour and an indirect influence through the mediating role of digital entrepreneurial self-efficacy. Risk propensity did not show a significant direct impact on digital entrepreneurial behaviour but showed impact through the mediation of digital entrepreneurial self-efficacy. Apart from identifying the determinants of digital entrepreneurial intention, this study also highlighted the importance of entrepreneurial self-efficacy as a mediator. Entrepreneurial self-efficacy plays a valuable mediation role for the examining the impact of exogenous factors on digital entrepreneurial intention.

In another study, Wibowo et al. (2023) examined the impact of entrepreneurial education, social media, and entrepreneurial intuition on the digital entrepreneurial intention among Indonesian students who would soon become entrepreneurs. Their study didn't only examine the impact of exogenous variables on digital entrepreneurial intention, it also examined the mediating roles of social media and entrepreneurial

intuition. The results of this unique study showed that all of the above-mentioned variables show significant relationships.

The theory of planned behaviour is important for understanding the concept and determining factors for digital entrepreneurial intention as attitude and perceived behavioural control impact digital entrepreneurial intention (Nguyen et al., 2024). Apart from the impact of attitude and perceived behavioural control on digital entrepreneurial intention, entrepreneurs' literacy regarding crowdfunding, AI, and blockchain also impact digital entrepreneurial intention directly and indirectly through the mediation role of attitude and perceived behavioural control. This study sheds light on the importance of the theory of planned behaviour and the attitude and perceived behavioural control for digital entrepreneurial intention. Perceived feasibility, propensity to act, perceived desirability, and entrepreneurial self-efficacy also impact digital entrepreneurial intention (Nguyen & Nguyen, 2024). All the exogenous variables showed significant positive impact on digital entrepreneurial intention.

The theory of planned behaviour is the most suitable and vital theory for understanding the concept of digital entrepreneurial intention. Al-Ayed (2024) examined the impact of digital opportunity recognition through the mediation of attitude, subjective norms, and perceived behavioural control under the theoretical support of theory of planned behaviour. Attitude, subjective norms, and perceived behavioural control showed significant impact on digital entrepreneurial intention and digital opportunity recognition also showed significant impact on digital entrepreneurial intention through the mediation of attitude, subjective norms, and perceived behavioural control.

The mediating role of entrepreneurial self-efficacy can also be understood by the study conducted by Wibowo et al. (2024). This study examined the mediating role of entrepreneurial self-efficacy in the relationships between entrepreneurial education, perceived usefulness, and perceived ease of use. The results showed that self-efficacy mediates the relationships between entrepreneurial education and perceived ease of use, and digital entrepreneurial intention, but it does not mediate the relationship between perceived usefulness and digital entrepreneurial intention. The importance of entrepreneurial self-efficacy as a mediator has again been emphasized.

From a review of these and other studies, it can be concluded that studies regarding digital entrepreneurial intention do exist but much needs to be done for understanding the relationship of innovative and sustainable entrepreneurship with

digital entrepreneurial intention. There is a need to identify innovation and sustainability variables that influence digital entrepreneurial intention because in these rapidly changing technological environments, firms need to act swiftly and environmentally friendly. In this study, a few of the variables in the entrepreneurial context that influence digital entrepreneurial intention have been identified, and most of these variables are themselves very little explored. Moreover, rare studies regarding digital entrepreneurial intention were found in the Saudi Arabian entrepreneurship context; thus, this study would be a breakthrough in this regard. From a review of literature and observation of the latest entrepreneurial activities and scenarios, entrepreneurial bricolage (EB), green entrepreneurial orientation (GEO), ecological innovation (EI) and entrepreneurial mindset (EM) have been identified as exogenous variables that affect digital entrepreneurial intention (DEI). Moreover, the mediating role of entrepreneurial self-efficacy (ESE) is also considered in this study.

Digital entrepreneurial intention (DEI) has emerged as a significant research area in the field of entrepreneurship, particularly as digital transformation reshapes business landscapes worldwide. Digital entrepreneurship is distinct from traditional entrepreneurship in that it leverages digital technologies, platforms, and online business models to create and manage ventures (Bensaid & Azdimousa, 2021). Understanding the factors that influence individuals' intentions to pursue digital entrepreneurship is crucial, particularly in emerging economies like Saudi Arabia, where economic diversification policies encourage digital innovation.

Digital entrepreneurial intention refers to an individual's inclination or willingness to engage in digital entrepreneurship, including starting or managing an online business, creating digital products, or leveraging technology for business innovation (Al-Mamary & Alraja, 2022). The Theory of Planned Behaviour (TPB) by Ajzen (1991) is widely used to explain entrepreneurial intention, suggesting that attitudes, subjective norms, and perceived behavioural control influence an individual's intention to become an entrepreneur. Researchers have examined the digital entrepreneurial intentions through a capital theory perspective, emphasizing the role of digital entrepreneurial competence as a key antecedent in shaping digital entrepreneurial intentions (Mir et al., 2023). Several studies have explored the determinants of DEI, identifying psychological, technological, social, and environmental factors that influence an individual's likelihood of pursuing digital entrepreneurship.

Entrepreneurial self-efficacy (ESE) plays a critical role in shaping an individual's confidence in their ability to succeed in entrepreneurship (Mozahem & Adlouni, 2021). Studies show that digital self-efficacy, or an individual's confidence in their ability to use digital tools effectively, significantly impacts DEI (Xin & Ma, 2023). In Saudi Arabia, where digital transformation is a national priority, initiatives like Misk Innovation and Saudi Digital Academy provide training programmes to enhance digital readiness among aspiring entrepreneurs.

Moreover, research by von Arnim and Mrozewski (2020) highlights that individuals with high digital competence, which is defined as knowledge and skills in using digital tools, are more likely to develop digital entrepreneurial intentions. Similarly, technological affinity, or the personal interest and comfort in adopting new technologies, significantly influences digital entrepreneurship participation (Abubakre et al., 2022). In Saudi Arabia, the integration of digital education into university curricula has contributed to an increase in digital entrepreneurial initiatives (Alferaih, 2022).

Furthermore, social influence plays a key role in shaping DEI, particularly through exposure to digital role models and peer networks (Wibowo et al., 2023). Studies suggest that individuals who frequently interact with successful digital entrepreneurs are more likely to develop positive attitudes toward digital entrepreneurship. Platforms like LinkedIn, Twitter, and local entrepreneurial communities provide avenues for digital networking and knowledge exchange, which are crucial for digital business success (Zhao et al., 2022).

Studies show that digital entrepreneurial intention is also influenced by perceived market opportunities and business model viability. The rise of e-commerce, fintech, and gig economy platforms has expanded opportunities for digital entrepreneurs in Saudi Arabia. The Saudi e-commerce market continues to grow at a strong pace, creating new opportunities for digital startups (Nkwei et al., 2023).

Further, studies indicate that government support mechanisms, such as funding schemes, regulatory ease, and infrastructure development, play a significant role in fostering DEI (Schade & Schuhmacher, 2022). In Saudi Arabia, policies under Vision 2030 have created a favourable environment for digital entrepreneurs through investment in smart cities, fintech regulations, and SME incentives.

A significant body of literature focuses on university students as a key demographic for digital entrepreneurship. Research by Almansour (2022) found that

digital education, business incubation programmes, and entrepreneurial exposure positively impact university students' DEI. In Saudi Arabia, initiatives such as entrepreneurship units in universities and business incubators have encouraged students to explore digital business opportunities (Aloulou, 2021).

While digital entrepreneurial intention research has gained traction, challenges remain in fully understanding the factors that drive digital entrepreneurship in emerging markets. Scholars argue that existing models often fail to account for cultural influences, digital infrastructure disparities, and cybersecurity concerns (von Briel et al., 2021). Future research should explore longitudinal studies to track how digital entrepreneurial intentions translate into actual business ventures, particularly in the context of Saudi Arabia.

Digital entrepreneurial intention is influenced by varieties of factors, including entrepreneurial self-efficacy, digital competence, social influence, market opportunities, and government support. In Saudi Arabia, where digital transformation is a national priority, fostering digital entrepreneurial intentions through education, policy incentives, and networking opportunities can significantly contribute to economic diversification. Future studies should explore how emerging technologies like AI, blockchain, and the metaverse impact digital entrepreneurship trends and whether digital entrepreneurial intention leads to sustainable business success in the long term.

DEI refers to an individual's intention to start and manage a business using digital tools, platforms, and technologies. Numerous studies have explored the factors influencing DEI, including psychological, educational, environmental, and technological determinants. Research has also emphasized the importance of self-efficacy, entrepreneurial education, and the digital entrepreneurial ecosystem in shaping entrepreneurial intentions in the digital era.

Several scholars have examined the role of entrepreneurial education in fostering DEI. Entrepreneurship education has been identified as a critical factor in shaping entrepreneurial mindset and motivation, particularly in the digital economy. Studies have shown that exposure to entrepreneurial education enhances students' confidence in using digital tools for business creation. For instance, Alferaih (2022) conducted a study among university students and found that digital entrepreneurship courses significantly increased their DEI by equipping them with relevant skills, knowledge, and digital competencies. Similarly, Sánchez Vera and López Vicent (2024) highlighted that digital entrepreneurship education enhances students' ability to

identify online business opportunities, leverage e-commerce platforms, and integrate technology into business models. Furthermore, Kim (2020) conducted a meta-analysis on the impact of entrepreneurship education and found that it positively influences students' entrepreneurial self-efficacy and willingness to engage in business ventures, with increasing importance to digital and online business contexts. These findings suggest that integrating digital skills and entrepreneurial training in educational curricula can foster DEI among young entrepreneurs.

The role of digital self-efficacy in influencing DEI has also been extensively studied. Self-efficacy, particularly in the digital context, is a strong predictor of entrepreneurial intentions, as individuals with high confidence in their digital abilities are more likely to engage in digital business ventures. Ridwan et al. (2024) found that digital self-efficacy significantly mediates the relationship between intrinsic and extrinsic motivation and DEI. Their study demonstrated that individuals with strong digital self-efficacy perceive fewer technological barriers and are more willing to experiment with online business models. Similarly, Asdar & Hasbiah (2024) examined the impact of digital self-efficacy on entrepreneurial behaviour and found that individuals who believe in their ability to navigate digital platforms, such as social media, online marketplaces, and fintech solutions, exhibit higher DEI. These findings align with Bandura's (1997) self-efficacy theory, which posits that individuals with high self-efficacy are more likely to take action in uncertain and challenging environments. In digital entrepreneurship, where technology and market trends evolve rapidly, digital self-efficacy plays a crucial role in encouraging entrepreneurial pursuits.

Another stream of research has focused on the impact of external environmental factors on DEI. The digital entrepreneurial ecosystem, which includes government policies, technological infrastructure, and digital market accessibility, has been recognized as a key determinant of entrepreneurial intention. A study by Beliaeva et al. (2020) found that a supportive digital ecosystem, including access to high-speed internet, digital payment systems, and startup incubators, significantly influences individuals' decision to pursue digital entrepreneurship. Similarly, Cao and Shi (2021) emphasized the role of digital ecosystems in fostering innovation-driven entrepreneurship, particularly in emerging economies. Their findings indicate that individuals operating in technologically advanced environments are more likely to perceive digital entrepreneurship as feasible and desirable. Moreover, research by Mir et al. (2023) highlighted that institutional support, such as digital funding initiatives and

technology-driven startup policies, positively influences DEI by reducing the financial and technological barriers associated with digital business creation. These studies suggest that fostering a supportive digital ecosystem through policy interventions and infrastructure development can enhance DEI at both individual and societal levels.

The influence of personality traits and psychological factors on DEI has also been widely explored. Studies have shown that personality traits such as innovativeness, risk-taking propensity, and proactiveness are positively associated with DEI. For instance, Heinemann et al. (2022) found that individuals with high levels of innovativeness and digital curiosity are more likely to pursue digital entrepreneurship. Their study suggested that personality traits shape individuals' perceptions of digital business opportunities and influence their willingness to take risks in digital ventures. Similarly, Arijanto (2023) examined the role of risk tolerance in DEI and found that individuals with a high risk-taking propensity are more inclined to start online businesses, as digital entrepreneurship often involves experimentation and uncertainty. Furthermore, research by Huang and Kee (2024) indicated that proactiveness, which reflects an individual's tendency to seek new opportunities and take initiative, is a key predictor of DEI. These findings highlight the importance of psychological characteristics in shaping digital entrepreneurial behaviour.

Social influence and digital networking have also been identified as crucial determinants of DEI. Social networks, including online communities, mentorship programmes, and peer support, play a vital role in shaping entrepreneurial aspirations. Research by Zhao et al. (2022) found that digital entrepreneurs who engage in online networking and receive mentorship from experienced entrepreneurs exhibit higher DEI. Their study emphasized that digital networking facilitates knowledge sharing, reduces uncertainty, and provides access to resources, all of which contribute to stronger entrepreneurial intentions. Similarly, Wibowo et al. (2023) examined the impact of social media on DEI and found that individuals who actively participate in digital entrepreneurial communities, such as LinkedIn groups and startup forums, develop higher confidence in launching online businesses. These findings suggest that fostering digital networking opportunities and mentorship programmes can enhance DEI by providing aspiring entrepreneurs with valuable guidance and support.

Another important area of research has focused on the impact of technological advancements on DEI. The rise of artificial intelligence (AI), blockchain technology, and digital automation has created new opportunities for digital entrepreneurs. Research

by Upadhyay et al. (2023) indicated that digital entrepreneurship and entrepreneurial orientation significantly influences family businesses' intention to adopt artificial intelligence (AI), through the mediation of business innovativeness. This suggests that the entrepreneurs with stronger digital entrepreneurial orientations are more inclined to adopt AI-driven tools to enhance their business operations. Similarly, research by Owen et al. (2019) highlighted that emerging technologies, such as blockchain and decentralized finance (DeFi), have revolutionized digital entrepreneurship by enabling secure transactions and financial inclusion. According to Owen et al. (2019), developments in digital technology boost people's confidence in launching digital businesses in addition to opening up new business options.

Despite the growing body of literature on DEI, several research gaps remain. First, while numerous studies have examined the factors influencing DEI in developed economies, there is limited research on how DEI develops in emerging markets, particularly in regions with limited digital infrastructure. Second, existing studies primarily focus on university students and young entrepreneurs, leaving a gap in understanding how mid-career professionals and individuals from diverse backgrounds engage in digital entrepreneurship. Third, there is a need for more longitudinal studies to examine how DEI evolves over time and how different interventions, such as digital entrepreneurship training and policy support, influence long-term entrepreneurial behaviour. Addressing these research gaps can provide a more comprehensive understanding of the dynamics of DEI and inform policies aimed at promoting digital entrepreneurship.

In conclusion, previous studies on DEI have highlighted the significant role of entrepreneurial education, self-efficacy, digital ecosystems, personality traits, social influence, and technological advancements in shaping entrepreneurial intentions. Empirical evidence suggests that fostering a supportive digital environment, enhancing digital self-efficacy, and leveraging emerging technologies can significantly enhance DEI. As digital entrepreneurship continues to reshape global economies, further research is needed to explore DEI across different contexts, demographics, and technological landscapes.

2.5 Entrepreneurial Self-Efficacy

2.5.1 Definition

The first variable to be discussed in this study is the mediating variable of entrepreneurial self-efficacy (ESE). It is based on the concept of believing in one's own skills and capabilities and having confidence that one can control their actions, behaviours and environment. Self-efficacy also refers to a person's self-assessment about their level of knowledge and proficiency needed to carry out a task (Bandura, 1977). Self-efficacy helps people define their goals. People set their goals keeping in mind their strengths and weaknesses. Moreover, self-efficacy also determines the level of effort someone needs to put in the form of filling the skill gap required by the task and skill level possessed by the person doing it (Bandura, 1997). The process of self-efficacy starts with self-evaluation. It then inspires most of the characteristics of human experiences. Starting from the intention and purpose of doing something, to the enthusiasm and zeal for performing a task, to decide for the resources needed, and effort needed to achieve objectives (Ho et al., 2018). All are influenced by self-efficacy. From this, it can be understood that entrepreneurial self-efficacy is the application of the self-efficacy concept in entrepreneurship, measuring the level of confidence an entrepreneur has in their entrepreneurial skills to achieve entrepreneurial goals (Chen et al., 1998).

The literature presents multiple definitions of entrepreneurial self-efficacy and that too from differing perspectives. According to most of the studies, entrepreneurial efficacy is the self-belief of the entrepreneurs regarding their skills and expertise in achieving a particular objective (Boyd & Vozikis, 1994). Some of the studies have defended entrepreneurial self-efficacy as a task-specific belief. According to Markman et al. (2005), entrepreneurial self-efficacy is the confidence an entrepreneur has in their skills and knowledge which enables them to complete specific entrepreneurship tasks. The task-specific definition includes one's own assessment of oneself and also the environment in which they are operating. This implies that both internal and external inspection takes place which results in the confidence levels of the entrepreneur. Most of the studies see entrepreneurial self-efficacy as a robust predictor of digital entrepreneurial intention.

Neck et al. (1999) define entrepreneurial self-efficacy as the ability to master cognitive, memory processing, and behavioural facilities to meet the challenges faced

by internal and external environments. These skills will determine the manner in which the firm would be run. Moreover, the entrepreneurial self-efficacy is the principal determinant of the entrepreneurial intentions of the individuals or the employees of the organizations. To develop such intentions, the entrepreneur must be clear about the opportunities, risks and benefits associated with the firm (Wilson et al., 2007). It is indicated that to develop entrepreneurial intentions, the entrepreneur must be able to identify the risk and opportunity factor and then analyse their personal capabilities and resources available to come to a conclusion as to whether they will be able to run the venture or not. Therefore, apart from being confident about just the skills and capabilities of their own selves, the entrepreneur is also confidently aware of the risks and returns associated (Chen et al., 1998). On the other hand, some of the scholars have described entrepreneurial self-efficacy as the ability of the entrepreneur to develop the necessary skills and behaviours required to perform entrepreneurial activities.

A review of the literature reveals variable definitions for ESE. As mentioned above, one aspect establishes ESE as an entrepreneur's task-related confidence and the other defines it as mastering as well as managing the skills relevant with starting a new venture. However, few scholars have tried to merge both concepts in a comprehensive statement. Baron (2004) did the same and defined entrepreneurial self-efficacy as the belief of an individual in their ability to master the skills necessary to start and manage a venture. Krueger et al. (2000) posed a similar definition for entrepreneurial self-efficacy by calling it as the perceived ability to execute a target behaviour. The basic difference among these definitions centres around the source of confidence. Task-confidence definitions, such as Krueger et al. (2000), focus on an individual's belief in their ability to execute a specific behaviour, regardless of whether the underlying skill has been mastered, and are therefore performance-related. Skill-mastery definitions, such as Baron (2004), focus on belief grounded in the actual possession of the skills needed to start and manage a venture, and are therefore outcome-related.

2.5.2 Conceptualization of Entrepreneurial Self-Efficacy

Over the past few years, it has been observed that the concept of entrepreneurial self-efficacy has emerged as an important construct in entrepreneurial research. Moreover, the literature cites it as a critical factor determining the success or failure of the venture (Tsai et al., 2016). Entrepreneurial self-efficacy revolves around the socio-

cognitive approach. Particularly, the concept of entrepreneurial self-efficacy examines the interaction of the entrepreneur with the environment and that this interaction is influenced by the cognitive or mental characteristics of the entrepreneur. Entrepreneurial self-efficacy may be task specific which means the self-confidence of the entrepreneurs to achieve a task (Krueger et al., 2000). Secondly, it may also mean the mastering of skills that are required for startup processes. It is for this reason that many scholars have considered it to be a key feature in the success of new businesses. Some industry-specific researchers have identified it to be the most important construct determining firm performance. Another perspective of entrepreneurial self-efficacy studies it as the basis of decision-making for entrepreneurs. This implies that most of the decisions of entrepreneurs are directly or indirectly influenced by entrepreneurial self-efficacy more than any other entrepreneurship variable. Literature recommends having strong entrepreneurial self-efficacy as it keeps the entrepreneurs motivated and is one of the most important tool for entrepreneurial planning (Naktiyok et al., 2010). Some studies argue that higher entrepreneurial efficacy leads to greater effort being put in by the entrepreneur. Moreover, the persistence and resilience of entrepreneurs with high entrepreneurial self-efficacy have also been observed. Furthermore, entrepreneurial self-efficacy helps the entrepreneur to develop better plans as these individuals are more aware of their skills and the resources in hand.

Bird (1988) studied entrepreneurial intentions and discovered the factors that resulted in the actions of the entrepreneurs based on their intentions. Boyd and Vozikis (1994) extended Bird's work by considering entrepreneurial self-efficacy as one of the mediating variables between entrepreneurial intentions and entrepreneurial actions. They concluded that entrepreneurial self-efficacy is an important predictor of actions for entrepreneurs. Gatewood et al. (2002) also backed these findings by determining entrepreneurial self-efficacy as one of the characteristics posed by entrepreneurs. They concluded that for a business activity to start, entrepreneurial self-efficacy was a crucial factor. By going through literature, it is also indicated that entrepreneurial self-efficacy directly influences the formation of entrepreneurial intentions which in turn are necessary for entrepreneurial behaviour.

It can also be inferred from literature that entrepreneurial self-efficacy has different intensity of application in different markets and countries. The geographic factors also contribute towards difference in personality characteristics, living conditions, education levels and cultural orientations. These factors vary from place to

place. For example, differences in access to education, economic stability, and social support systems across different regions may also contribute to variation in entrepreneurs' risk tolerance and levels of confidence, although these relationships are complex and context-dependent in their nature. de Pillis and Reardon (2007) investigated entrepreneurial self-efficacy in terms of different cultures and found significant differences across cultures. Another study by Luthans and Ibrayeva (2006) discovered variable results for entrepreneurial self-efficacy in differing economies. As this study is based on Saudi firms, some contextual differences in results compared to findings from other cultural or economic settings may exist.

While going through the process of starting up a business, an entrepreneur might go through different feelings and emotions (Boyd & Vozikis, 1994). They can be positive as well as negative (Cardon & McGrath, 1999).This is because of the high stakes they have put in the business, including their personal wealth, hopes and aspirations, time etc. Fear of failure always looms over the heads of the entrepreneurs. It is then when they need to control the negative thoughts and don't let them motivate them. Entrepreneurial self-efficacy is the factor that can help them achieve this (Shepherd, 2003). As entrepreneurial self-efficacy is the belief in one's qualities and skills to complete a task, entrepreneurs who master this attribute can easily get out of the effects of negative thoughts. However, it is also observed that sometimes too much optimism can lead to the failure of new ventures.

Brockner et al. (2004) have defined the two thought processes which help entrepreneurs counter positive and negative effects of emotions during startup. The promotion-focused process orients entrepreneurs toward pursuing growth and potential gains, while the prevention-focused process orients them toward avoiding losses and managing risk. Therefore, it can be concluded that entrepreneurial self-efficacy is not only believing one is confident in one's abilities by controlling negative thoughts, but also the controlling of overly positive beliefs as well. It can also be said that it is confidence in one's abilities and not overconfidence to achieve certain outcomes related to starting new businesses.

2.6 Entrepreneurial Bricolage

2.6.1 Definition

After defining the dependent variable of digital entrepreneurial intention and mediating variable of entrepreneurial self-efficacy, this section conceptually examines the independent variables of this study. The first independent variable which needs to be discussed in this study is entrepreneurial bricolage. Bricolage has been defined differently by various scholars. Mostly it has been associated with the small and medium enterprises (SME) around the world.

Bricolage is a term used in almost all disciplines including business and entrepreneurship. It means to construct or create something from available resources (Baker & Nelson, 2005). The word bricolage is derived from the French verb bricoler, meaning to fiddle or tinker, and a bricoleur is the noun for one who does so. Broadly it means to make creative and innovative use of resources available. In French it has been described as the alternate meaning to the English phrase of "doing it yourself". Specifically, instead of getting external help, a bricoleur would use their expertise and resources in such a way that problems are solved or objectives achieved (Stinchfield et al., 2013). Bricolage as mentioned earlier is a French word derivation referring to the skill by which an entrepreneur uses whatever is in hand to create something new (Senyard et al., 2014). For example, a mechanic making a new car by joining spare parts they have already available in their workshop. The person who is involved in bricolage is called a bricoleur (tinkerer). The English meaning of bricolage is related to the concept of Do-it-yourself (DIY).

Entrepreneurial Bricolage has been defined as inventing something new from old things. The product, service or process created is totally novel with new features which are different from its individual constituents (Baker & Nelson, 2005). Creating something new by using current resources, achieved by recombining or rearranging the previous components is known as Bricolage. Garud and Karnøe (2001) define bricolage as the process of making something new by utilizing different combinations and arrangements of resources never done before. Three components of this definition can be extracted. Firstly, the entrepreneurs who use bricolage as their strategy and plan use existing materials, products, resources etc. which include finances, human resources, markets etc. They do not explore or go after creating new resources (Stinchfield et al.,

2013). For example, a bricoleur, a name given to entrepreneurs who use the concept of bricolage, would use finances present at hand and also won't be hiring new human resources for the project of new creation. Secondly, such entrepreneurs are experts in working under conditions of resource limitations. They are extremely efficient at resource utilization and use their present resources to the fullest (Baker & Nelson, 2005). Thirdly, for things required for production, they do not seek to work with substitutes. The arrangement of processes would be such that resources available are able to create something new and in instances of non-availability of any resource required; the bricoleur would not consider using an alternate option. Instead, they would rearrange the resources again and again until the desired outcome is achieved (Senyard et al., 2014).

The process of bricolage extends from the initiation phase also known as making do. Second is the survival stage which involves actual usage of the resources. Finally, the growing stage completes the process with the recombining of the resources (Baker et al., 2003). Apart from these three main stages of bricolage, there are three more sub-stages identified in literature. Scavenging is one of those subprocesses which starts even before the making-do. It involves searching among the unwanted resources, the ones which may be used again to create new products. Another of these subprocesses is buttressing, which occurs during the surviving phase. In this phase, the bricoleur starts arranging the useful resources which were identified in the scavenging and making-do stage by providing the logics and reasoning to do so. Finally, the growth process is complemented with a subprocess of refining. Here the entrepreneurs, after completing the recombination and alignment of existing resources, filter out the less useful combinations or resources which do not prove to be contributing much to the process of bricolage (Senyard et al., 2014).

2.6.2 Conceptualization of Entrepreneurial Bricolage

The concept of bricolage was originated into academic discourse by French anthropologist Strauss (1962), who used the term to describe the process of creating meaning and structure through available materials and resources. Strauss (1962) defined it as working with a fixed but varied set of materials, using whatever is already available rather than seeking new resources tailored to each task. According to Strauss, bricolage is something that can be said to be the French concept of what a worker should be:

someone who uses their abilities inventively to achieve or make things that others don't. He considered a bricoleur to be the jack of all trades and denied that they require any extraordinary skill set or specializations. Instead, the bricoleur is someone flexible enough to try different possibilities within the same situation. Levi-Strauss argued that both the civil mind and the uncivil or "savage" mind had the same structure and all humans had the same cognitive features. This argument was used in promotion of the concept of bricolage as it inferred to the fact that every human has an instinct of survival. To ensure survival, the human is ready to use all things available in all possible ways.

Entrepreneurship in literature and also in practice has always consisted mostly of the smaller firms or at least started small. Thus, resources were always a constraint for entrepreneurs and that too perhaps the biggest of limitations. Entrepreneurs are always on the hunt to create a competitive advantage over their rivals by using the given resources which are initially or even during most of the life of entrepreneurship, are scarce. The solution to this resource dilemma has been attempted by many studies in the past. The most famous of these attempts was the bricolage theory by Garud and Karnøe (2001). It was further elaborated by Baker et al. (2003) who applied it in the entrepreneurial context.

In literature, scholars have identified different types of bricolages. An institutional bricolage is defined as a process which intentionally or unintentionally recombines social and cultural resources of an institution to create a different setup. Such different arrangements are a response to the changing business conditions or environments (Cleaver, 2017). Another form of bricolage is the social one. It refers to innovative methods which the social corporations deploy in times of scarce resources to create a social value for their customers. Alternatively, social bricolage can also be defined as a form of spontaneous collective action in which existing networks and everyday routines are combined and locally adapted to respond rapidly to emergencies (Johannisson & Olaison, 2007).

Productive bricolage is another type of bricolage that is related to the livelihoods of people. It is considered to be the system by which the poorer rural people design their livelihood in response to lack of resources and opportunities to crate those resources (Batterbury, 2001). Alternatively, it is the dynamic alignment of resources from different livelihoods and their impact on the functioning of the society (Ros-Tonen, 2012). Finally, the last type of bricolage being discussed is actually the one being taken forward in this study which is known as entrepreneurial bricolage. Baker and Nelson

(2005) conceptualised entrepreneurial bricolage as the process through which entrepreneurs generate value from limited resources by closely examining and creatively applying whatever is already available to them, rather than seeking new or ideal resources. In this study, the focus would be on entrepreneurial bricolage and whenever there is a mention of bricolage, it should be understood as entrepreneurial bricolage and the term bricoleur shall be used for the entrepreneur.

Bricolage might be internal; or external as well. Internal bricolage refers to the entrepreneur's own characteristics and qualities that help them use resources in an effective way (Shane, 2000). These include the entrepreneur's personal traits such as education, intelligence, personality, etc., and also their professional qualities such as market knowledge, experience, customer or supplier relations, etc. This shows that internal bricolage originates within the entrepreneur, though its effects become visible through their actions and decisions. Internal bricolage helps the entrepreneur to analyse critically, using their experience and intelligence, different combination of resources and their possible effects (Liu et al., 2021). On the other hand, external bricolage is the set of characteristics of the external environment in which entrepreneurs are operating. These may include contacts of entrepreneurs, other stakeholders, manufacturing capabilities, markets etc. Both types of bricolages are equally important for the existence and growth of entrepreneurship.

Entrepreneurs frequently struggle to compete with larger, well-established businesses due to limited financial, human, or technological resources. To overcome these limitations, entrepreneurs adopt innovative strategies to maximize the value of available resources, an approach that aligns closely with the principles of bricolage. The idea of bricolage as a solution to entrepreneurial resource constraints has been explored in various studies, with one of the most influential contributions being the bricolage theory by Garud & Karnøe (2001) . This theory was later expanded upon by Baker et al. (2003) , who contextualized it within entrepreneurship, providing a framework for understanding how entrepreneurs leverage resourcefulness in uncertain and resource-scarce environments.

Institutional bricolage refers to the process by which individuals or organizations recombine social and cultural resources within institutions to create new arrangements. These adaptations often arise as responses to changing business conditions or market environments (Cleaver, 2017). Entrepreneurs engaging in institutional bricolage navigate regulatory constraints and existing industry structures

to innovate and create new business models. Social bricolage, on the other hand, is observed in social enterprises and nonprofit organizations, which creatively deploy limited resources to generate social value. In this context, bricolage enables social entrepreneurs to develop impactful solutions in response to pressing societal challenges.

Batterbury (2001) describes productive bricolage as a system through which impoverished populations use whatever is available to sustain themselves. Similarly, Ros-Tonen (2012) conceptualizes it as the dynamic alignment of resources across different livelihoods to sustain societal functions. Entrepreneurial bricolage, which is the focus of this study, refers to the innovative and resourceful actions of entrepreneurs in environments characterized by scarcity.

Bricolage can be further categorized into internal and external forms. Internal bricolage refers to the entrepreneur's personal characteristics, capabilities, and knowledge that enable them to maximize the utility of available resources. Liu et al. (2021) highlight that internal bricolage includes an entrepreneur's education, intelligence, personality, experience, and market knowledge. These attributes allow the entrepreneur to critically analyse different resource combinations and assess their potential impact (Padilla-Meléndez et al., 2020). In other words, internal bricolage is an inherent quality within the entrepreneur, influencing their ability to think creatively and adaptively. External bricolage, on the other hand, refers to the external factors that shape an entrepreneur's ability to leverage available resources. These may include business networks, market opportunities, stakeholder relationships, and industry collaborations. Entrepreneurs practising external bricolage rely on partnerships, strategic alliances, and their ability to repurpose external resources to create value in resource-scarce settings. The interaction between internal and external bricolage is crucial for entrepreneurial success, as entrepreneurs must balance their internal competencies with external opportunities to sustain and grow their ventures.

The concept of entrepreneurial bricolage is particularly relevant in today's dynamic business environment, where rapid technological advancements and market uncertainties require entrepreneurs to be highly adaptive. By employing bricolage, entrepreneurs can navigate constraints, repurpose existing resources, and develop innovative solutions that enable them to remain competitive. The study of entrepreneurial bricolage, therefore, provides valuable insights into how entrepreneurs operate under resource scarcity and how they can create value through ingenuity and strategic resourcefulness.

2.6.3 Previous Studies on Entrepreneurial Bricolage

This section reviews prior research studies on entrepreneurial bricolage in order to grasp a better understanding of the concept, current trend and research gap to be addressed. Foremost, Steffens et al. (2023) investigated the existence of a balance between positive and negative influences of entrepreneurial bricolage and determined a threshold for entrepreneurial bricolage behaviour, as well as the cost and benefits to the business enterprises. Steffens et al. (2023) examined the boundary conditions shaping the effectiveness of entrepreneurial bricolage, while focusing on two key moderators: a venture's stage of development, and its growth expectations. Their findings revealed that for nascent ventures, bricolage increased competitiveness regardless of growth expectations. However, for operational ventures, the effect depended on growth expectations whereas bricolage was more beneficial for high-growth-expectation ventures, and it had a negative effect on the competitiveness of operational ventures with low growth expectations. These results were consistent with Kickul et al. (2018), where they studied a sample of 113 social entrepreneurs and collected data using a self-administered questionnaire. Their findings suggested that the positive impact of bricolage not only lessens but also reverses back in a quadratic way after a level of bricolage behaviour.

Yu and Wang (2021) highlighted the importance of entrepreneurial bricolage for newly established firms using evidence from Chinese industry. Data from 207 Chinese organizations was analysed and results suggest that new ventures can enjoy great benefits from entrepreneurial bricolage in terms of growth and flexibility. Organizations who are more inclined to use existing resources creatively are the ones who can adapt to different situations better, and therefore, grow more than the firms who cannot. However, the success of this strategy is dependent on the quality of the resources available too. If the firms have outdated or obsolete resources, even bricolage wouldn’t be that helpful. Therefore, to fulfil the benefits of entrepreneurial bricolage, the firms must also enhance the resource quality.

Kwong et al. (2019) examined the effectiveness of bricolage behaviour on firm performance during the times of war and conflict, a context which is increasingly relevant given the frequency of armed conflicts and their devastating impact on entrepreneurial ecosystems. Wars and conflicts, whether with external forces or within national borders, result in serious scarcity of resources for organizations operating in

the affected area, country, or region. The study examined such resource limitations and explored the entrepreneurial characteristics that help organizations survive under these conditions. Through examining the experiences of six internally displaced entrepreneurs in Pakistan, Kwong et al. (2019) found that both internal and external bricolage were the key survival strategies applied. Rather than relying on local knowledge and resources which were largely unavailable to the displaced entrepreneurs, they drew on their pre-existing competencies, skills, and established networks to re-establish or develop new ventures. In such extreme conditions, bricolage proved to be the most critical strategy for entrepreneurial survival.

Yu et al. (2019) studied entrepreneurship in the context of emerging economies to find the effects of entrepreneurial bricolage on the growth of newly established firms. The context of emerging economies suggested that such developing economies because of the fact that they are in the building up stage, lack most of the resources that entrepreneurs have in developed economies. The study also examined the variable of adaptability along with growth prospects and in relation to entrepreneurial bricolage. Results depict a positive relationship between firm growth and entrepreneurial bricolage. Adaptability and entrepreneurial bricolage also showed a direct relationship with each other. This implies that the firms who are in their initial stages can grow rapidly with better bricolage orientation.

Yu and Wang (2021) while examining the factors effecting the development of new products investigated entrepreneurial bricolage as one of the factors that enhanced the performance of firms for new product creation. It was argued that new ventures face resource constraints for the development of new products. They then turn to bricolage to overcome this problem. However, as they indulge in bricolage behaviour, this might backfire because the entrepreneurial team might not be diverse enough to implement innovative ideas. The study used data from 320-plus Chinese new firms and concluded that entrepreneurial bricolage plays a vital role in the growth of these firms. However, it was found that firms with more diverse teams or workforces were more likely to succeed and grow than firms with homogeneous teams offering limited variety of characteristics. A similar study was later conducted by Xiaobao et al. (2022) who investigated the impact of entrepreneurial bricolage on entrepreneurial orientation. They used the mediation of top management diversity and top management behavioural integration as mediating variables. The results suggest that bricolage greatly influences

the entrepreneurial orientation; however, the more diverse the top management is, the greater is that influence.

Ma and Yang (2022) explored the mediating role of entrepreneurial bricolage and opportunity recognition in the relationship of entrepreneurial orientation and firm performance in dynamic environments. Responses from 274 new ventures were collected and analysed through regression and bootstrapping analysis. The findings of Ma and Yang's (2022) study portray that the entrepreneurial bricolage and opportunity recognition both played an important and significant mediation between entrepreneurial orientation and performance and growth of new business ventures. Similarly, Fu et al. (2020) measured the effect of entrepreneurial bricolage of new venture firm performance in the mediation of ambidexterity. Collecting information from 350 hospitality new ventures and applying regression analysis, it was concluded that entrepreneurial bricolage directly affects the new venture firm performance in the mediation of ambidexterity.

From these and other studies, it can be suggested that entrepreneurial bricolage is an important indicator of entrepreneurial performance. It was also noted that bricolage was rarely studies in the context of digitalization. There is a scarcity of studies in literature regarding entrepreneurial bricolage in the context of Saudi Arabia. Hence, this study would be an exploratory one in this regard.

Entrepreneurial bricolage is a concept that describes how entrepreneurs use available resources creatively and flexibly to navigate uncertainty, overcome constraints, and develop innovative business solutions. Rooted in the theory of resourcefulness, entrepreneurial bricolage highlights the ability of entrepreneurs to repurpose and recombine existing materials, knowledge, and networks to create value. Studies on entrepreneurial bricolage emphasize its importance in resource-constrained environments, particularly in emerging economies and startup ecosystems where access to capital, technology, and skilled labour is limited. Scholars such as Baker and Nelson (2005) introduced the concept as a critical strategy for firms operating under resource scarcity, suggesting that entrepreneurs who engage in bricolage can effectively leverage what they have rather than focusing on what they lack.

Empirical research supports the notion that entrepreneurial bricolage enhances firm resilience and adaptability, particularly in volatile market conditions. Studies by Scuotto et al. (2023) demonstrate that social entrepreneurs often use bricolage to address pressing societal challenges by mobilizing community assets and repurposing existing

infrastructure. This approach is particularly relevant in the context of sustainability and green entrepreneurship, where entrepreneurs must innovate with limited financial and technological resources. In Saudi Arabia, where the entrepreneurial landscape is rapidly evolving under Vision 2030, bricolage plays a significant role in enabling SMEs and startups to navigate challenges related to market entry, funding limitations, and regulatory complexities. Entrepreneurs in the region frequently leverage informal networks, government support programmes, and digital technologies to develop cost-effective and scalable business models.

The relationship between entrepreneurial bricolage and innovation has been widely explored in the literature, with studies indicating that bricolage fosters creative problem-solving and experimentation. Research by Servantie and Rispal (2020) suggests that bricolage is particularly beneficial in the early stages of venture development, allowing entrepreneurs to test ideas, iterate business models, and adapt to changing market conditions with minimal resources. However, the effectiveness of bricolage depends on the entrepreneur's ability to identify and utilize resources efficiently. In some cases, excessive reliance on bricolage may limit long-term scalability, as firms may struggle to transition from makeshift solutions to structured growth strategies. In Saudi Arabia, where entrepreneurship is being promoted as a key driver of economic diversification, understanding how bricolage contributes to sustainable business growth is crucial for policymakers and investors.

The digital economy has further expanded the scope of entrepreneurial bricolage by providing access to online resources, global networks, and digital platforms. Studies by Crupi et al. (2022) highlight that digital entrepreneurs engage in bricolage by leveraging open-source technologies, crowdsourcing platforms, and social media to build and market their ventures with minimal upfront investment. This trend is particularly relevant in Saudi Arabia's entrepreneurial ecosystem, where digital transformation initiatives are creating new opportunities for startups to innovate with limited physical infrastructure. Entrepreneurs in e-commerce, fintech, and digital marketing sectors frequently utilize online marketplaces, cloud-based solutions, and digital collaborations to optimize resource utilization and accelerate business growth.

Another significant aspect of entrepreneurial bricolage is its role in crisis management and business continuity. Research by Sivathanu and Pillai (2020) emphasizes that bricolage is a critical survival strategy for entrepreneurs operating in unpredictable environments, such as economic downturns, political instability, or global

pandemics. During the COVID-19 crisis, many businesses relied on bricolage to pivot their operations, repurpose resources, and explore alternative revenue streams. In Saudi Arabia, businesses in the hospitality, retail, and service industries rapidly adopted digital solutions, contactless delivery models, and virtual service offerings to sustain operations. The adaptability demonstrated by these businesses highlights the resilience-enhancing effects of bricolage in times of crisis.

Despite its benefits, entrepreneurial bricolage is not without limitations. Some studies argue that while bricolage enables short-term problem-solving, it may hinder the development of systematic processes, professionalization, and strategic planning. Research by Busch & Barkema (2021) suggests that firms relying heavily on bricolage may struggle to attract formal investment, as investors often seek structured business models with clear growth trajectories. In the Saudi Arabian context, where government funding and private investment are crucial for startup scalability, entrepreneurs must balance bricolage with structured financial planning and long-term strategy development.

Entrepreneurial bricolage particularly underscores its significance as a resourcefulness strategy that enables entrepreneurs to innovate, adapt, and survive in resource-constrained environments. Bricolage is particularly relevant in emerging economies, sustainability-driven businesses, and digital entrepreneurship, where limited access to capital and infrastructure necessitates creative problem-solving. In Saudi Arabia, where entrepreneurship is being actively promoted as part of Vision 2030, understanding how bricolage contributes to business success can provide valuable insights for policymakers, investors, and aspiring entrepreneurs. However, future research should explore how bricolage can be effectively integrated with structured business growth strategies to ensure long-term scalability and competitiveness.

Entrepreneurial bricolage remains a critical strategy for resource-constrained entrepreneurs seeking to navigate challenges in dynamic and uncertain business environments. Research continues to emphasize that bricolage is not merely about using available resources but involves a mindset of improvisation, experimentation, and adaptability. Scholars argue that successful entrepreneurs engage in bricolage by creatively repurposing existing assets, leveraging social capital, and identifying unconventional solutions to emerging business problems (Baker & Nelson, 2005). This approach allows entrepreneurs to bypass traditional barriers such as financial constraints, lack of formal education, and limited technological infrastructure. In the

Saudi Arabian entrepreneurial ecosystem, where government initiatives such as Vision 2030 are fostering a startup-friendly environment, bricolage has become an essential strategy for early-stage businesses striving to compete in both local and global markets.

One of the most significant advantages of entrepreneurial bricolage is its ability to drive grassroots innovation. Research has shown that entrepreneurs who engage in bricolage often develop novel solutions that challenge established industry norms. A study by Servantie and Rispal (2020) highlights that bricolage fosters an experimental culture within startups, encouraging risk-taking and iterative problem-solving. Which is particularly relevant in Saudi Arabia, where the entrepreneurial landscape is evolving rapidly, and businesses must continuously innovate to align with the country's economic transformation goals. Entrepreneurs operating in technology, e-commerce, and sustainability-driven sectors rely on bricolage to create low-cost prototypes, test market demand, and refine their business models before securing formal investments.

Additionally, bricolage enables entrepreneurs to leverage non-traditional networks and collaborations. Studies by Liao et al. (2021) suggest that entrepreneurs who practice bricolage often rely on informal relationships, partnerships, and community resources to compensate for financial and operational limitations. In Saudi Arabia, this phenomenon is evident in the growing role of business incubators, co-working spaces, and digital platforms that facilitate peer-to-peer support and resource-sharing among entrepreneurs. The presence of institutions such as Monshaat and KAUST Innovation Hub further strengthens the entrepreneurial ecosystem by providing mentorship, funding, and strategic guidance to startups engaged in bricolage. These organizations help entrepreneurs transform makeshift solutions into scalable business models by integrating digital tools, market insights, and industry expertise.

The application of entrepreneurial bricolage is also prominent in the green entrepreneurship sector, where businesses must balance economic viability with environmental sustainability. Research by Iqbal et al. (2021) highlights that green entrepreneurs often employ bricolage to develop eco-friendly products and services using recycled materials, renewable energy sources, and circular economy principles. In Saudi Arabia, where sustainability initiatives are gaining momentum under the Saudi Green Initiative, entrepreneurial bricolage plays a crucial role in driving low-cost and impactful environmental solutions. Startups focusing on waste management, sustainable agriculture, and eco-friendly manufacturing frequently adopt bricolage to

optimize resource efficiency, minimize environmental impact, and appeal to socially conscious consumers.

Despite its many advantages, entrepreneurial bricolage also presents challenges that entrepreneurs must navigate. One of the main criticisms of bricolage is that it can lead to suboptimal resource allocation and inefficiencies in business operations. Studies by Busch & Barkema (2021) argue that while bricolage is beneficial in the short term, over-reliance on improvisation and informal structures can hinder the professionalization and scaling of a business. In the Saudi Arabian market, where entrepreneurship is being positioned as a key driver of economic diversification, businesses that rely solely on bricolage may struggle to transition into fully structured enterprises capable of competing at an international level. Furthermore, access to venture capital, strategic partnerships, and government funding often requires entrepreneurs to demonstrate formalized business processes, financial discipline, and clear growth strategies, which are the factors that may not align with the ad-hoc nature of bricolage.

Another potential limitation of bricolage is the challenge of maintaining long-term sustainability. Research by Abid et al. (2023) indicates that while bricolage is effective in enabling firms to survive in resource-scarce environments, it does not always support sustained competitive advantage. Entrepreneurs who continuously rely on makeshift solutions may find it difficult to establish strong brand positioning, differentiate themselves in the market, and develop a scalable operational model. This concern is particularly relevant for Saudi entrepreneurs operating in competitive industries such as fintech, logistics, and e-commerce, where firms need to transition from early-stage improvisation to systematic business planning and execution.

Nonetheless, scholars have proposed strategies to integrate bricolage with structured business development practices. Studies by Vasconcelos Scazziota et al. (2020) suggest that entrepreneurs can combine bricolage with effectuation, a decision-making approach where entrepreneurs focus on leveraging existing resources while simultaneously seeking strategic partnerships and external funding. This hybrid approach enables businesses to maintain flexibility and adaptability while ensuring long-term scalability. In the Saudi Arabian context, where the government is investing heavily in innovation-driven enterprises, entrepreneurs who balance bricolage with strategic foresight are more likely to attract investors, expand their operations, and contribute to the broader economic transformation agenda.

Moreover, digital transformation has reshaped the way entrepreneurial bricolage is practiced. In the past, bricolage primarily involved physical resources and local networks, but the rise of digital platforms has expanded the scope of entrepreneurial improvisation. Research by Vadana et al. (2022) highlights that digital bricolage allows entrepreneurs to access global knowledge, crowdsourced innovation, and virtual collaboration opportunities. This is particularly advantageous for Saudi entrepreneurs looking to scale their businesses beyond national borders. Through online marketplaces, cloud computing, and artificial intelligence-driven business solutions, digital entrepreneurs can leverage bricolage in new ways, creating low-cost and high-impact ventures that align with Saudi Arabia's aspirations of becoming a technology and innovation hub.

Entrepreneurial bricolage plays a pivotal role as a critical survival and growth strategy, particularly in resource-limited environments. Bricolage enables entrepreneurs to innovate, adapt, and sustain their businesses despite financial, operational, and technological constraints. In Saudi Arabia, where entrepreneurship is being actively promoted as part of Vision 2030, understanding how bricolage contributes to business success is essential for policymakers, investors, and aspiring entrepreneurs. However, while bricolage offers significant advantages in terms of flexibility and problem-solving, it is not without challenges. Entrepreneurs must strike a balance between improvisation and structured planning to ensure long-term sustainability, scalability, and competitiveness. It is pertinent to explore how Saudi entrepreneurs can integrate bricolage with emerging digital tools, strategic alliances, and formal business development frameworks to enhance their chances of success in an increasingly competitive global marketplace.

Entrepreneurial bricolage continues to be a fundamental aspect of resource-constrained entrepreneurship, especially in emerging economies where access to traditional funding and structured business support is often limited. The literature suggests that bricolage is not just a survival mechanism but a strategic approach that enables entrepreneurs to exploit market opportunities creatively and efficiently. Scholars argue that the ability to leverage existing resources in unconventional ways gives businesses a competitive edge, particularly in industries where innovation and adaptability are key success factors (Baker & Nelson, 2005). This perspective is increasingly relevant in Saudi Arabia, where entrepreneurship is being positioned as a driver of economic diversification under Vision 2030. With the government's focus on

fostering an innovation-driven ecosystem, the role of entrepreneurial bricolage in shaping resilient and sustainable businesses is gaining significant attention.

One of the defining characteristics of entrepreneurial bricolage is its reliance on improvisation. Research by Yu and Wang (2021) indicates that entrepreneurs who practice bricolage do not wait for ideal resources to become available; instead, they repurpose what they already have to create functional solutions. This ability to "make do" with available materials and knowledge is particularly useful in emerging markets where access to financial capital, skilled labour, and advanced technology can be limited. In Saudi Arabia, many startups and SMEs have adopted bricolage strategies to navigate regulatory constraints, build cost-effective business models, and reach underserved markets. For instance, in the digital economy, entrepreneurs leverage free online tools, social media platforms, and open-source software to develop minimum viable products (MVPs) before securing formal investments.

Empirical studies have highlighted the importance of bricolage in industries that are inherently volatile and unpredictable. Research by Sivathanu and Pillai (2020) found that bricolage is particularly prevalent in early-stage startups, where entrepreneurs must operate under extreme uncertainty and limited resources. This aligns with the experiences of many Saudi entrepreneurs who are entering new and disruptive industries such as fintech, e-commerce, and renewable energy. The ability to creatively combine existing assets, whether in the form of knowledge, human capital, or technology, allows these entrepreneurs to experiment with innovative business models that might not be viable under conventional resource allocation frameworks.

The role of bricolage in green entrepreneurship is also noteworthy. As environmental concerns gain prominence, businesses are under increasing pressure to adopt sustainable practices while maintaining profitability. Research by Musona et al. (2020) suggests that many green entrepreneurs rely on bricolage to develop environmentally friendly products and services with minimal financial input. In Saudi Arabia, where sustainability is a national priority under the Saudi Green Initiative, entrepreneurial bricolage is being used to develop eco-friendly alternatives in industries such as construction, agriculture, and manufacturing. For example, startups focusing on sustainable packaging often use locally available biodegradable materials, repurposing agricultural waste into commercially viable products. By employing bricolage strategies, these businesses can reduce production costs, minimize waste, and cater to the growing demand for sustainable consumer goods.

Another key dimension of entrepreneurial bricolage is its impact on social entrepreneurship. Scholars have observed that bricolage is frequently used by social entrepreneurs who aim to address societal challenges without relying on extensive financial backing (Scuotto et al., 2023). In Saudi Arabia, the rise of social enterprises aligns with the broader goal of creating a knowledge-based economy that prioritizes social impact alongside economic growth. Many social entrepreneurs in the Kingdom leverage bricolage to implement low-cost community programmes, educational initiatives, and healthcare solutions, especially in remote and underserved regions. For instance, some startups have used digital platforms to provide affordable online education and vocational training, addressing gaps in the traditional education system without requiring substantial capital investments.

Despite its advantages, entrepreneurial bricolage is not without limitations. Scholars such as Korsgaard et al. (2021) caution that while bricolage enables short-term problem-solving, it may hinder long-term scalability and operational efficiency. Businesses that rely excessively on improvisation may struggle to establish standardized processes, secure large-scale investments, or compete in highly structured industries. This challenge is particularly relevant in Saudi Arabia, where the entrepreneurial landscape is transitioning from informal, small-scale enterprises to structured, high-growth ventures that contribute to national economic development. While bricolage is an effective strategy in the early stages, businesses aiming for long-term success must eventually integrate formal business practices, robust financial planning, and strategic partnerships.

Another potential drawback of bricolage is its tendency to result in fragmented or suboptimal solutions. Research by Ladstaetter et al. (2020) suggests that while bricolage encourages innovation, it can sometimes lead to inefficiencies, particularly when businesses rely on makeshift solutions that are not scalable. In the Saudi Arabian context, this means that entrepreneurs who rely heavily on bricolage must be mindful of transitioning towards more structured operations as their businesses grow. For example, while a tech startup may initially build its product using free or low-cost tools, it must eventually invest in proprietary technology and skilled personnel to sustain long-term growth and competitiveness.

To address these limitations, scholars propose a hybrid approach that combines bricolage with strategic planning and effectuation. Effectuation theory, as developed by Sarasvathy (2001), suggests that entrepreneurs should work with the resources they

have while simultaneously seeking new opportunities to expand their capabilities. This effectuation theory seems to align well with Saudi Arabia's entrepreneurial ecosystem, where startups have access to a growing number of incubators, accelerators, and funding programs. By integrating bricolage with structured business development strategies, entrepreneurs can maximize flexibility while ensuring that their ventures are scalable and investment ready.

Furthermore, digital transformation has significantly expanded the scope of bricolage, enabling entrepreneurs to access global markets and collaborate with a diverse range of stakeholders. Research by Bowen & Morris (2024) highlights that digital bricolage allows businesses to leverage cloud computing, artificial intelligence, and blockchain technology to create innovative solutions without substantial financial investments. In Saudi Arabia, the rise of digital platforms has facilitated the emergence of online marketplaces, fintech solutions, and remote work opportunities, all of which are driven by entrepreneurial bricolage. Startups in the Kingdom are increasingly using digital tools to prototype new products, conduct market research, and engage with customers, demonstrating how bricolage is evolving in the digital age.

In conclusion, entrepreneurial bricolage remains a vital strategy for resource-constrained entrepreneurs, particularly in rapidly evolving economies like Saudi Arabia. It enables businesses to innovate, adapt, and sustain operations despite financial and structural challenges. The literature emphasizes that while bricolage is essential for fostering creativity and resilience, it must be complemented with structured business development practices to ensure long-term scalability and competitiveness. In the Saudi Arabian context, where entrepreneurship is a cornerstone of Vision 2030, understanding how bricolage interacts with emerging trends such as digitalization, sustainability, and social entrepreneurship is crucial. It is noteworthy to explore how Saudi entrepreneurs can integrate bricolage with formal business strategies, government support programmes, and digital transformation initiatives to build sustainable and globally competitive enterprises.

2.7 Green Entrepreneurial Orientation

2.7.1 Definition

Green entrepreneurial orientation (GEO) involves actions that are related to green innovation and proactively searching for risk-taking opportunities to capitalize on green opportunities: actions that are beneficial to the environment (Pratono et al., 2019). In order to define green entrepreneurial orientation, it is necessary to first examine the meaning of entrepreneurial orientation and green entrepreneurship. Most of the green entrepreneurial orientation has been derived from the combination of entrepreneurial orientation and green entrepreneurship. The definition of entrepreneurial orientation has been contentious in the literature. In the past, scholars have substituted entrepreneurial orientation with terms such as corporate entrepreneurship, intrapreneurship and internal entrepreneurship etc. (Wales et al., 2013).

Most of these terms, however, define entrepreneurial orientation as the firm's overall inclination towards innovation and developing new ways of doing business or even creating new products. It is also defined as a decision-making framework which enables entrepreneurial activities within a firm to flourish. Entrepreneurial orientation is also defined as the process by which a firm chases innovation and entrepreneurial activity without creating new resources. This means to discover or pursue new ways of working, there is no need to introduce new resources as well (Dickel, 2018). The combination of firm characteristics that constitute the entrepreneurial orientation include innovativeness, competitive aggression, risk-taking and proactivity (Covin & Lumpkin, 2011).

Green entrepreneurship on the other hand refers to the firm's consideration of the impact of its business activities on the natural environment. There are two approaches to green entrepreneurial orientation; firstly, to design the activities in such a manner that the environment is not harmed (Nikolaou et al., 2018). Examples would include using chemicals or machinery that keeps CO_2 emissions under acceptable levels and, secondly, indulging in activities which actually improve the environment. Green entrepreneurship is also defined as a business model that considers profitability as well as the environment (Kirkwood & Walton, 2010). In literature, it is found find similar terms are used to define green entrepreneurship. These include ecopreneurship, environmental entrepreneurship, sustainable entrepreneurship, and a recent term triple

bottom line entrepreneurship (Spence et al., 2011). Green entrepreneurship can be defined as a firm or business set up with the motive of contributing to a sustainable society either by adapting innovative processes and producing products which do not have a negative impact on the environment or firms which have adapted innovative processes and/or products over time, which reduce their impact on the environment (Haldar, 2019).

2.7.2 Conceptualization of Green Entrepreneurial Orientation

Global environmental crises such as climate change have started to show their devastating effects, such as severe floods, forest fires, melting of the glaciers etc. This has called on the environmental activists all around the world to increase pressure on the governments to impose stricter environmental regulations (Odeyemi et al., 2024). Most of the governments along with the WTO and other international financial bodies have now started to not only consider passing such regulations but have actually devised them. Strict implementation of these governmental legislations and also an increased pressure from the customers have forced the organizations to consider the effect of their business activities on the environment, and now, green orientation has become an integral part of almost all business strategies of firms around the world (Muangmee et al., 2021). Moreover, with the increase of prominence on environmental issues, the concept of sustainable development has emerged. The UN has defined 17 sustainable development goals which were finalized in the UN summit on Sustainable development in 2015. These goals aim to encompass economic, social and also environmental aspects of development (United Nations, 2015). Then in 2020, at the UN General Assembly, environmental issues were highlighted with emphasis and leaders of most of the nations vowed to adhere to strict actions if needed to preserve the natural environment. The UN, along with some other powerful nations is now struggling to raise the issue of the environmental footprints of business activities all around the globe. Climate summits are now being frequently held. Legislations are pushing organizations to reduce carbon emissions. All this refers to the fact that green orientation for businesses has now become a necessity (Das et al., 2020). Green products are becoming popular gradually. For example, there has been a manifold increase in the number of electric vehicles in many developed countries. In this new environmental era, green entrepreneurship is a

concept that has become much more popular recently. Terms such as green or organic have become increasingly prevalent around the corporate world.

Intense competition has led the organizations into exploring new and innovative ideas to gain a competitive advantage over others. As part of the strategy, the businesses proactively get involved in finding ways to satisfy their customers before their competitors (Altinay et al., 2016). Entrepreneurship literature is full of studies that identify risk-taking, innovation and proactiveness as the key for entrepreneurial spirit (Syrjä et al., 2019). The same concepts have led the entrepreneurs to develop an understanding and a need for establishing green entrepreneurship commonly known as ecopreneurship or environmental entrepreneurship (Dean & McMullen, 2007). Many scholars have considered entrepreneurship to be a means of revolutionizing the world instead of profits (Forouharfar et al., 2019). This holds true for green entrepreneurs as their main objective is changing the way things are done in a more environmentally friendly manner.

Increasing environmental hazards have the potential of causing grave consequences for human existence. Ecological as well as economic concerns are imminent (Leonidou et al., 2017). Due to these elevated environmental issues, the governments as well as businesses around the world have shifted their focus to the creation of more sustainable practices that are economically as well as ecologically viable (Das et al., 2020). Many of the studies have identified GEO as a potential saviour for these businesses. Green entrepreneurial orientation has the potential to improve the environmental and social performance of the firms that do so by not compromising much on the economic aspect (Asadi et al., 2020).

Although green entrepreneurial orientation has been widely considered to be an integral component of future business strategies, there hasn't been a consensus on its description. Entrepreneurial orientation is considered to be a blend of business intention and competitive aggression that enables the organizations to initiate novel and innovative practices (Lumpkin & Dess, 1996). Isaak defines green entrepreneurial orientation as a mixture of creativity and environmental concern (Arruda, 1999). Literature identifies social and environmental orientation as two components of green entrepreneurial orientation (B. Cohen & Winn, 2007). Recent studies have considered green entrepreneurial orientation to be systematically rooted in an organization's activities. The green entrepreneurial orientation is proactively followed by the businesses, which enables them to make decisions which allow them to initiate and

follow green projects and hence, improve financial performance as well (Makhloufi et al., 2022).

The increasing severity of environmental crises, including climate change, deforestation, pollution, and biodiversity loss, has accelerated global efforts to adopt sustainable business practices. Governments, international regulatory bodies, and financial institutions have responded to growing environmental concerns by implementing stricter policies aimed at reducing carbon emissions and minimizing the ecological footprint of business activities (Odeyemi et al., 2024). With rising consumer awareness and demand for eco-friendly products, businesses are pressured to integrate sustainability into their strategic frameworks. The adoption of green entrepreneurial orientation (GEO) has thus emerged as a crucial response to these environmental and regulatory shifts. GEO refers to an organization's proactive approach towards incorporating sustainability into its core business practices while maintaining economic viability (Muangmee et al., 2021).

The importance of sustainable development has gained global recognition, particularly with the establishment of the United Nations Sustainable Development Goals (SDGs) in 2015. These 17 goals emphasize the interconnectedness of economic, social, and environmental progress, highlighting the need for businesses to balance profitability with sustainability (United Nations, 2015). Subsequent climate summits and international agreements have further reinforced the urgency for businesses to adopt green strategies. For instance, the European Green Deal and similar initiatives worldwide are pushing organizations toward carbon neutrality through incentives and regulatory mandates. The transition toward sustainability is evident in the rapid growth of green markets, including the electric vehicle industry, renewable energy sector, and eco-friendly consumer goods. As a result, businesses are increasingly aligning their entrepreneurial efforts with environmental concerns, integrating green innovation, risk-taking, and proactive market strategies into their operations (Yi, 2021).

Entrepreneurial orientation has traditionally been characterized by attributes such as innovativeness, risk-taking, and proactiveness, the qualities that are now being redefined in the context of sustainability (Meekaewkunchorn et al., 2021). The emergence of green entrepreneurship, also referred to as ecopreneurship, or environmental entrepreneurship, reflects the evolving role of entrepreneurs in addressing global environmental challenges (Mondal et al., 2023a). Unlike conventional entrepreneurs, green entrepreneurs prioritize environmental impact

alongside financial performance. They seek to revolutionize industries by introducing sustainable business models that minimize ecological harm while maximizing economic and social value (Gupta & Dharwal, 2022). The shift toward green entrepreneurship is not merely a response to regulatory requirements but also a strategic move to gain a competitive advantage in an increasingly sustainability-conscious market.

The concept of GEO has been widely discussed in the literature, yet scholars have presented varying definitions and frameworks. Some studies view entrepreneurial orientation as a combination of business intent and competitive aggressiveness that enables firms to initiate innovative and novel practices (Gomes et al., 2022). While others studies, such as Khan et al. (2023), define GEO as a fusion of creativity and environmental concern, emphasizing the need for businesses to integrate sustainability into their core strategic vision. According to Muangmee et al. (2021), a green entrepreneurial approach encompasses both social and environmental aspects, i.e., businesses should generate positive social value while lessening their environmental impact.

Recent studies suggest that GEO is deeply embedded in organizational decision-making and long-term business strategies. Organizations with a strong green entrepreneurial orientation proactively seek sustainable opportunities, implement eco-friendly innovations, and engage in environmentally responsible projects (Makhloufi et al., 2022). This orientation enables firms to pursue green initiatives while maintaining profitability, demonstrating that sustainability and financial success are not mutually exclusive. The integration of green entrepreneurial practices enhances an organization's reputation, strengthens customer loyalty, and opens access to new markets that prioritize sustainability.

Furthermore, the effectiveness of GEO depends on several internal and external factors. Internally, leadership commitment, organizational culture, and investment in sustainable research and development (R&D) plays a significant role in shaping an organization's green orientation (Makhloufi et al., 2022). Firms that actively foster a sustainability-driven culture and allocate resources to green innovation are more likely to succeed in implementing GEO. Externally, regulatory frameworks, market demand for eco-friendly products, and stakeholder pressure influence the organization's ability to adopt and sustain green entrepreneurial practices. Businesses that align their strategies with emerging environmental trends and consumer preferences are better

positioned to leverage the opportunities created by the shift toward sustainability (Muangmee et al., 2021).

While GEO offers substantial benefits, challenges remain in its implementation. One of the primary obstacles is the financial burden associated with adopting sustainable technologies and practices. Many businesses, particularly small and medium-sized enterprises (SMEs), face resource constraints that limit their ability to invest in green initiatives. Additionally, the lack of standardized sustainability metrics and regulatory inconsistencies across different regions create barriers for firms seeking to expand their green strategies globally. Overcoming these challenges requires a collaborative effort between businesses, governments, and financial institutions in providing beneficial incentives, funding opportunities, and supportive policies that facilitate the transition toward green entrepreneurship.

Ultimately, green entrepreneurial orientation represents a transformative approach to business that integrates sustainability with innovation, risk-taking, and proactive market engagement. As environmental challenges continue to intensify, the need for businesses to embrace GEO has become even more critical. Organizations that successfully adopt and embed green entrepreneurial practices not only contribute to global sustainability efforts but also enhance their competitiveness and long-term viability in an increasingly eco-conscious marketplace.

2.7.3 Previous Studies on Green Entrepreneurial Orientation

The green entrepreneurial orientation is a relatively fresh concept in the field of entrepreneurship and is less researched. The study of Ye et al. (2022) investigated the impact of green entrepreneurial orientation on the sustainable performance of enterprises. The population of their study was restricted to managers of manufacturing SMEs and through a self-administered questionnaire, and internal and external influences of green entrepreneurial orientation were recorded. The findings strongly endorsed the existence of a positive relationship between green entrepreneurial orientation and a firm's sustainable performance which included financial as well as social and environmental indicators. This relation implied that the firms which showed green entrepreneurial orientation were likely to have an advantage over the ones that didn't exhibit green entrepreneurial orientation. This advantage was not only an environmental advantage but also a financial one, thus, conforming to the literature.

Another recent study by Ameer and Khan (2022) investigated the impact of green entrepreneurial orientation on a firm's environmental performance. According to the findings, both micro and macro factors influence the firm's tendency and ability to adopt green entrepreneurial orientation practices. Moreover, a mediation of firm-specific characteristics was endorsed for the relationship between green entrepreneurial orientation and firm environmental performance. This means that some organizational characteristics such as size, industry, etc., also impact the adoption of green entrepreneurial orientation. Overall, it is established that though adoption of green entrepreneurial orientation varied for the organizations, yet there is a positive impact of green entrepreneurial orientation on the firm's environmental performance.

Muangmee et al. (2021) conducted an extensive study on a sample size of 226 managers of SMEs related to the automotive industry of Thailand. They aimed at studying the relationship between the independent variable of green entrepreneurial orientation and the firm's financial, social, and environmental performance. Green innovation was given the role of mediation between these variables. The study incorporated the resource-based view in its methodology. The results extracted through PLS-structured equation modelling determined that green entrepreneurial orientation influenced the green innovation positively which in return had a positive impact on all three parameters of performance, i.e., financial, social, and environmental.

A similar study by Makhloufi et al. (2022) also investigated the relationship of green entrepreneurial orientation and a firm's environmental performance. Based on the natural resource-based theory, the study investigated the effect of green entrepreneurial orientation on green innovation performance and the firm's environmental performance. A moderating role of firm-specific characteristics such as management environmental concerns, green absorption capacity and environmental cooperation was also considered. The results confirmed the presence of a direct relationship between firm specific characteristic and green entrepreneurial orientation. Therefore, in order for the firm to show enhanced environmental performance, green entrepreneurial orientation must be encouraged through firm-specific green variables.

Luu (2021) explored the tourism industry of the Asia-Pacific region to discover the impact of green entrepreneurial orientation on the green creative behaviour of firm employees. The study also incorporated the role of two mediating variables namely green creative self-efficacy and harmonious environmental passion. Moderation of green communication was also considered. Analysing the variables through multi-level

structural equation modelling, it was concluded that green communication affected the relationship of green entrepreneurial orientation with green creative self-efficacy and harmonious environmental passion. This impact however was moderate. The sample for the study was managers of tour management organizations operating in the Asia-pacific region. The results implied that the tourism industry should focus on inculcating green creativity in employees through green entrepreneurial orientation.

Guo et al. (2020) also investigated the impact of green entrepreneurial orientation on green innovation with a mediating role of supply chain learning. Using responses from 416 Chinese companies, a conceptual framework including green entrepreneurial orientation, green incremental innovation and radical green innovation and supply chain learning was tested empirically. The results indicated that green entrepreneurial orientation positively influenced both forms of green innovation: incremental and radical. Supply chain learning also depicted a sturdy positive relationship with these two innovation variables. The mediation of supply chain learning was also accepted for the relationships between green entrepreneurial orientation and incremental innovation as well as green entrepreneurial orientation and radical innovation. The study offered great insights for managers to understand the role of supply chain in the implementation of green practices in the firm.

Green entrepreneurial orientation (GEO) has gained increasing recent attention as businesses and entrepreneurs shift toward sustainability-driven business models. Studies define GEO as an entrepreneurial mindset that integrates environmental concerns into business strategy, fostering innovation and competitive advantage through eco-friendly initiatives. Several studies have examined the role of GEO in shaping business sustainability, economic performance, and market differentiation. In the context of entrepreneurship, GEO extends beyond traditional profit-driven motives to include ecological responsibility, resource efficiency, and long-term sustainability goals. The concept is particularly relevant in emerging economies such as Saudi Arabia, where the government has been actively promoting green initiatives under Vision 2030, encouraging businesses to adopt sustainable practices while fostering economic diversification.

The literature suggests that firms with a strong green entrepreneurial orientation demonstrate proactive environmental strategies, which lead to long-term competitive advantages. Studies by Wang et al. (2023) indicate that organizations with higher GEO levels tend to invest in green innovation, eco-friendly production processes, and

sustainable supply chains, allowing them to differentiate themselves in the market. These businesses are often driven by external regulatory pressures as well as intrinsic motivations to contribute to environmental sustainability. Scholars such as Asad et al. (2023) argue that entrepreneurial firms with a green focus are more likely to exploit opportunities in sustainability-related markets, addressing environmental challenges while maintaining profitability. This aligns with findings from Luu (2022), who emphasize that green entrepreneurial ventures often lead to higher levels of environmental compliance, enhanced brand reputation, and increased consumer trust.

Several factors influence the adoption of green entrepreneurial orientation. One of the primary drivers is government policy and regulation. Studies indicate that environmental regulations and government incentives play a critical role in encouraging firms to embrace GEO. Policies such as tax benefits, green funding programmes, and sustainability certifications have been found to motivate entrepreneurs to develop eco-friendly products and services. In Saudi Arabia, initiatives such as the Saudi Green Initiative and the Circular Carbon Economy framework have been instrumental in pushing businesses toward greener operational models. Empirical research by Tuan (2023) suggests that firms operating in regions with strong environmental policies are more likely to integrate sustainability into their business models compared to those in regions with weak regulatory enforcement.

Another significant factor affecting green entrepreneurial orientation is consumer awareness and demand for sustainable products. Research highlights that consumers, particularly younger generations, are increasingly inclined to support businesses that demonstrate commitment to environmental responsibility. Studies by Majali et al. (2022) suggest that firms responding to these market demands tend to achieve better financial performance and stronger customer loyalty. In Saudi Arabia, growing environmental awareness has driven several industries, including food, fashion, and manufacturing, to incorporate sustainable practices into their operations. Green branding and eco-labelling have become essential marketing tools that not only enhance the organization’s reputation but also influence purchasing decisions.

Entrepreneurial self-efficacy and managerial commitment also play a crucial role in driving green entrepreneurial orientation. Research indicates that business leaders with strong environmental consciousness and sustainability-driven visions are more likely to implement green strategies within their organizations. A study by Hällerstrand et al. (2023) found that green-orientated entrepreneurs often exhibit a

higher level of strategic adaptability and long-term vision compared to their conventional counterparts. Similarly, Bu (2023) emphasize that the mindset of an entrepreneur significantly determines the extent to which a business prioritizes environmental responsibility over short-term profit maximization. Saudi Arabia's startup ecosystem has witnessed the emergence of green entrepreneurs who integrate sustainability into their business models, particularly in industries such as renewable energy, green construction, and sustainable agriculture.

Despite the growing interest in green entrepreneurial orientation, several challenges hinder its widespread adoption. One of the main obstacles is financial constraints, as green entrepreneurship often requires significant initial investment in sustainable technologies and resource-efficient processes. Research by Rajkamal et al. (2022) points out that many small and medium enterprises (SMEs) struggle to secure funding for green initiatives due to limited access to financial support or investor scepticism regarding the profitability of sustainable ventures. In Saudi Arabia, government-backed programmes such as the SME Bank and the Monsha'at Authority have been established to provide financial assistance to green startups. However, more comprehensive policies and increased private sector involvement are needed to further encourage green entrepreneurial activities.

Another challenge is the lack of technical expertise and knowledge regarding green innovation. Studies suggest that many entrepreneurs lack the necessary skills and awareness to implement sustainable business strategies effectively. According to Chandel (2022), organizations that fail to invest in environmental training and R&D activities often struggle to keep up with evolving sustainability trends. The education system and academic institutions play a crucial role in fostering green entrepreneurial mindsets among future business leaders. Universities in Saudi Arabia have increasingly incorporated sustainability-focused entrepreneurship courses to equip students with the necessary skills to launch and manage green businesses.

Green entrepreneurial orientation is also influenced by industry-specific factors. Some sectors, such as renewable energy and sustainable fashion, naturally align with GEO due to their business models, while others, such as traditional manufacturing, face more difficulties in transitioning to green practices. Empirical research suggests that industries with high environmental impact, such as oil and gas, are under increasing pressure to adopt sustainability strategies, but progress remains slow due to entrenched business practices and the costs associated with shifting toward eco-friendly operations.

However, Saudi Arabia's investment in clean energy, such as the NEOM city project and large-scale solar energy projects, demonstrates a national commitment to fostering a greener economy.

Overall, the literature highlights that green entrepreneurial orientation plays a critical role in shaping sustainable business practices, improving environmental outcomes, and driving long-term competitive advantage. While regulatory support, consumer demand, and entrepreneurial vision act as key enablers of GEO. Financial barriers, technical limitations, and industry-specific challenges continue to hinder its full adoption. In Saudi Arabia, where economic diversification and sustainability are national priorities, fostering green entrepreneurial orientation requires an integrated approach that combines government incentives, private sector engagement, academic support, and increased environmental awareness. It is worth to explore industry-specific green entrepreneurship models and measuring the long-term impact of GEO on business sustainability and economic growth.

Green entrepreneurial orientation (GEO) is an evolving concept that intertwines traditional entrepreneurship with sustainable business practices, emphasizing the importance of environmental responsibility alongside economic performance. The growing global concern over climate change, resource depletion, and ecological degradation has intensified the need for businesses to adopt green strategies. This shift is particularly evident in the entrepreneurial landscape, where innovative business models are being developed to address environmental challenges. Researchers such as Gupta and Dharwal (2022) argue that green entrepreneurship plays a pivotal role in transitioning industries towards sustainability by promoting eco-innovation, resource efficiency, and circular economy principles. These principles are increasingly embedded in policy frameworks and market expectations, making green entrepreneurial orientation a key determinant of long-term business success.

The adoption of GEO is often driven by external environmental pressures, including government regulations, market demand, and international sustainability standards. Governments worldwide have implemented policies to encourage green business practices through financial incentives, carbon taxes, and environmental compliance requirements. Studies by Makhloufi et al. (2022) indicate that businesses in regions with strong regulatory frameworks are more likely to develop a green entrepreneurial orientation, as compliance with environmental laws becomes a necessity rather than an option. In Saudi Arabia, the Vision 2030 framework has placed

sustainability at the centre of its economic transformation efforts, promoting initiatives such as renewable energy investments, green financing programmes, and eco-friendly industrial practices. This national strategy aligns with global sustainability goals and creates an enabling environment for green entrepreneurs to thrive.

Consumer behaviour is another critical factor shaping GEO, as modern consumers increasingly prefer products and services that align with ethical and environmental values. Research by Mook et al. (2023) highlights that green branding and eco-certifications significantly influence purchasing decisions, as consumers perceive environmentally responsible businesses as more trustworthy and forward-thinking. In Saudi Arabia, there is a growing awareness of sustainable consumption, particularly among younger generations who actively search for eco-friendly products. This trend has led to the emergence of green startups in industries such as sustainable fashion, organic food, and renewable energy. Organizations that proactively integrate sustainability into their branding strategies often experience competitive advantages, including stronger customer loyalty and improved brand equity.

Entrepreneurial self-efficacy and leadership play a crucial role in fostering GEO, as business owners with high confidence in their ability to implement green strategies are more likely to embrace sustainable practices. Research by Zhao et al. (2021) suggests that green entrepreneurs tend to exhibit a higher level of risk tolerance, creativity, and long-term vision compared to traditional entrepreneurs. These individuals recognize the financial and reputational benefits of sustainability and leverage innovative approaches to minimize their environmental impact. In Saudi Arabia, green entrepreneurial ventures have gained momentum in various sectors, with startups exploring sustainable agriculture, biodegradable packaging, and eco-tourism. However, the success of these ventures largely depends on the entrepreneur's ability to navigate challenges such as funding constraints and technological limitations.

Financial challenges remain a major barrier to the widespread adoption of GEO. Green entrepreneurship often requires substantial upfront investment in sustainable technologies, energy-efficient infrastructure, and research and development (R&D) for eco-friendly innovations. According to Rajkamal et al. (2022), many SMEs struggle to secure financing for green initiatives due to limited investor confidence and unclear return-on-investment metrics. In Saudi Arabia, government-backed programmes such as the SME Bank and Monsha'at Authority provide financial assistance to green startups, yet access to funding remains a challenge for early-stage entrepreneurs.

Additionally, private sector involvement in green financing is still relatively low, highlighting the need for stronger partnerships between financial institutions, investors, and sustainability-driven businesses.

Another significant limitation in the adoption of green entrepreneurial orientation is the lack of technical expertise and knowledge about sustainable business practices. Many entrepreneurs lack the necessary training to implement effective environmental strategies, leading to suboptimal execution of green initiatives. Chandel (2022) argues that continuous investment in sustainability education and skill development is crucial for fostering a green entrepreneurial mindset. In Saudi Arabia, universities and educational institutions have increasingly incorporated sustainability-focused entrepreneurship courses to equip students with the knowledge and skills needed to launch and manage green businesses. However, there is still a gap in industry-specific sustainability training, particularly in sectors that have traditionally operated with minimal environmental considerations, such as construction, manufacturing, and logistics.

Industry-specific factors also influence the extent to which GEO can be successfully implemented. Some sectors, such as renewable energy and organic agriculture, naturally align with green entrepreneurship due to their inherent sustainability focus. However, traditional industries such as petrochemicals, construction, and heavy manufacturing face greater challenges in transitioning to green practices due to high dependency on non-renewable resources and legacy infrastructure. Studies suggest that industries with high environmental impact are under increasing pressure to adopt sustainability measures, but progress remains slow due to entrenched business models and the significant costs associated with transitioning toward greener operations. In Saudi Arabia, the shift toward a circular carbon economy, as outlined in Vision 2030, aims to mitigate these challenges by promoting clean energy solutions, waste reduction strategies, and sustainable resource management.

The role of digital transformation in advancing GEO is another emerging area of research. Digital technologies, such as artificial intelligence, blockchain, and the Internet of Things (IoT), are increasingly being leveraged to enhance sustainability efforts across industries. Studies by Mondal et al. (2023b) suggest that digital entrepreneurship and green entrepreneurship are becoming increasingly interconnected, as technological advancements enable businesses to track carbon footprints, optimize resource usage, and implement smart waste management systems. In Saudi Arabia,

digital innovation is a key component of the country's sustainability strategy, with initiatives such as smart cities, digital logistics, and AI-driven energy management contributing to the growth of green entrepreneurial ventures. The integration of digital technologies not only improves operational efficiency and provides data-driven insights that support evidence-based sustainability decision-making.

Despite the progress in promoting GEO, there remains a gap in empirical research on the long-term impact of green entrepreneurship on business performance and environmental outcomes, particularly in emerging economies like Saudi Arabia. While existing studies highlight the benefits of green orientation in terms of brand reputation, customer loyalty, and regulatory compliance, there is limited data on the financial sustainability of green startups over extended periods. Additionally, more research is needed to explore the effectiveness of the government policies and financial incentives in driving GEO adoption across various industries.

In conclusion, the literature emphasizes that green entrepreneurial orientation is a critical factor in shaping sustainable business practices, enhancing competitive advantage, and addressing global environmental challenges. The adoption of GEO is influenced by regulatory frameworks, consumer demand, entrepreneurial mindset, financial resources, and industry-specific constraints. In Saudi Arabia, where economic diversification and sustainability are key national priorities, fostering entrepreneurial green programmes requires a multi-faceted approach involving government support, private sector engagement, financial incentives, educational programmes, and technological advancements. It is pertinent to focus on industry-specific GEO models, the financial viability of green startups, and the integration of digital solutions to enhance sustainability efforts in the entrepreneurial ecosystem.

2.8 Ecological Innovation

2.8.1 Definition

Another independent variable of this study is the recently emerging concept of ecological innovation (EI). Ecological innovation also widely known as eco-innovation or green innovation is a relatively new concept in the context of entrepreneurship. Though it has been well researched for scientific topics and subjects, in the context of business and especially entrepreneurship, it is still in an evolving stage. Ecological

innovation, also known as eco-innovation can be comprehensively defined the production, application or utilisation of a good, service, production process, organizational structure, or management or business method, that is novel to the firm or user and which results, throughout its life cycle, in a reduction of environmental risk, pollution and the negative impacts of resource use (Kemp & Pearson, 2008).

Ecological innovation is further defined as an innovation that aims at achieving sustainable development of an organization or the society as a whole. This sustainability can be achieved by reducing the negative impact of products or processes of the organization on the natural environment. Such innovations are achieved through efficient and responsible management and utilization of natural resources (Hazarika & Zhang, 2019).

Ecological innovation has also been defined using many different terms in literature. Such innovations include environmental innovation, green innovation, sustainable innovation and as mentioned above, eco-innovations. Ecological innovation has revolutionized the concept of innovation among the organizations recently. Business organizations now seek eco-innovation rather than only innovation. Such innovations not only help protect the environment but also help the firms garner economic benefits as well (Carrillo-Hermosilla et al., 2010). Ecological innovation focuses on a better use of resources. The resources which were once only used or applied for profits are now being consumed in such a way that the environmental effects are minimized (Figge & Hahn, 2012). The scholars may not have agreed upon one definition of ecological innovation but all of them emphasize that the organizations must be developing systems within that encourage innovation with a green perspective.

2.8.2 Conceptualization of Ecological Innovation

In particular, innovation is a prerequisite of entrepreneurship and thus, an integral part of it (Hébert, 2009). Green entrepreneurship has gained significant attention among researchers, particularly as global leaders and policymakers emphasize the urgency of environmental protection and climate change mitigation. While the evolution of green entrepreneurship has been extensively discussed, one critical aspect that remains underexplored is ecological innovation. As a powerful tool for green entrepreneurship, ecological innovation enables businesses to develop sustainable solutions that reduce environmental footprints while maintaining profitability. To fully

grasp its role, it is essential to first understand the broader relationship between innovation and entrepreneurship.

Innovation and entrepreneurship, although distinct, are deeply interconnected. Entrepreneurship is inherently about introducing something novel into the business landscape, whether it be a product, service, or process. Similarly, innovation refers to the introduction of new or significantly improved ideas, methods, or technologies that enhance efficiency and effectiveness (Carrillo-Hermosilla et al., 2010). As innovation is a prerequisite for entrepreneurship, it naturally follows that ecological innovation is integral to green entrepreneurship. By embedding innovation within their strategies, businesses can drive sustainable development while simultaneously enhancing their market position.

Ecological innovation, often referred to as eco-innovation, focuses on developing products, processes, and business models that minimize environmental impact while fostering economic growth. By reducing environmental footprints, organizations contribute to sustainability efforts and secure long-term access to natural resources, ensuring business continuity (Mahapatra et al., 2021). In an era of dynamic market conditions and intensified competition, ecological innovation provides a strategic advantage, enabling firms to differentiate themselves from competitors and appeal to environmentally conscious consumers (Barforoush et al., 2021). Furthermore, businesses that invest in ecological innovation are essentially securing their long-term growth, as regulatory frameworks and consumer preferences increasingly favour sustainable practices (Mahmood et al., 2022).

Ecological innovation can be classified into three primary categories: product innovation, process innovation, and business model innovation (Carrillo-Hermosilla et al., 2010). Product innovation involves designing and developing sustainable products that have a reduced environmental impact throughout their lifecycle. Ecological innovation comprises the use of biodegradable materials, the development of energy-efficient appliances, the introduction of electric and hydrogen-powered vehicles, and sustainable food production methods such as lab-grown meat and plant-based alternatives. By pioneering such innovations, businesses align themselves with sustainability goals and attract eco-conscious consumers who prioritize green purchasing decisions.

Process innovation, on the other hand, refers to the development of new or improved production and operational processes that lead to better resource efficiency

and reduced environmental harm. Examples include adopting circular economy principles, implementing renewable energy sources like solar and wind power, utilizing water conservation technologies, and reducing waste and emissions through cleaner production methods. Innovating processes not only helps firms comply with strict environmental regulations but also significantly cuts operational costs, making sustainability economically viable in the long run.

Another important category is business model innovation, which revolves around rethinking traditional business models to integrate sustainability at the core of the organization's operations. Businesses adopting this approach may shift to a subscription-based model for product reuse, implement peer-to-peer sharing economies such as ride-sharing platforms, adopt supply chain transparency initiatives for ethical sourcing, or create zero-waste business models focused on sustainability throughout the entire product lifecycle. These innovative business models challenge traditional industry norms and contribute to long-term competitiveness by positioning organizations as leaders in sustainability-driven markets.

With rapid advancements in green technology and increasing global awareness of sustainability issues, ecological innovation is becoming more critical across industries. As governments continue to tighten environmental policies, businesses that fail to integrate ecological innovation risk falling behind in compliance and market relevance (Mahmood et al., 2022). Organizations investing in R&D for sustainable solutions positively contribute to the planet and also reap long-term financial rewards through cost savings, enhanced brand reputation, and access to eco-conscious consumer markets. Hence, ecological innovation represents a fundamental pillar of green entrepreneurship, bridging the gap between sustainability and profitability. By adopting product, process, and business model innovations, businesses can drive the transition toward a more sustainable economy while maintaining a competitive advantage in a rapidly evolving global landscape. In the dynamic and changing business environment of the world and stringent competition, ecological innovation is a way in which competitive advantage may be gained (Barforoush et al., 2021). By investing in ecological innovation, the organizations are actually financing its long-term growth as well (Vargas-Hernández & López-Lemus, 2021). Ecological innovation has been classified into three different types of innovations:

Table 2.1
Types of Ecological Innovation

Type of Ecological Innovation	Description
Product Innovation	Invention of a totally new product or even improvement of an existing product that incorporates eco-friendly design and other aspects of the product. These innovations help develop a product which can prove to be a viable alternative of the less ecological options currently available. For example, the manufacturing of paper straws or cloth bags instead of previously used plastic options.
Process Innovation	Use of ecological production techniques and processes that cause no or minimum harm to the natural environment to manufacture products or deliver services. The primary objective is to increase eco-efficiency.
Business Model Innovation	This type of innovation is achieved by embedding in the firm, the systems and structures that support environmentally friendly activities. Managerial orientation, employee mindset, and skills and work arrangements are being innovated through this.

Ecological innovation can be classified into green processes and green products (Fussler & James, 1996). It also includes any part of technology required in the making of the product or the product itself (Chen et al., 2006). The design of the product and innovative technological innovations help reduce the consumption of energy. They also help reduce wastage and encourage recycling. Some of the product or process designs help minimize pollution and its effects. Such technologies and innovations help develop new products and services which provide environmental benefits and contribute towards the sustainable development of the organization (Ar, 2012). Nowadays more and more organizations are proactively investing in ecological innovation and this would ultimately help resolve the battle between economic and environmental benefits, creating simultaneous benefits for both (Figge & Hahn, 2012).

2.8.3 Previous Studies on Ecological Innovation

This section discusses the findings of recent studies conducted on the variable of ecological or green innovation. This would help to understand better the concept and also to explore the latest issues regarding ecological innovation so that for this study,

thereby identifying the research gaps. Shehzad et al. (2022) studied green innovation in the context of knowledge management. They investigated the relationship between knowledge management indicators of enablers and processes on green innovation. Using Smart PLS and Fuzzy set analysis on data collected from more than 300 respondents from the Pakistani SME sector, it was concluded that knowledge management enablers positively affected both aspects of the ecological innovations, product and process. Moreover, a similar result was extracted for the knowledge management processes with both innovation types. Hence, knowledge management shows significant relationship with green innovation and in order to enhance product and process innovations, knowledge management should be made more effective.

Fang et al. (2022) conducted a very comprehensive study in the Chinese context to investigate the effect of internet development on green innovation efficiency. The aim of this study was to measure the positive effects of China's broadband policy on the level of green innovation in the country. China aims to improve its internet facilities across the country through the China's broadband policy and ecological innovation promotion is one of the spillover effects of that. This fact was endorsed by the findings of the study which reveal that the districts where the internet had developed showed more tendency towards ecological innovation and also that the innovation efficiency increased for such areas. The study was conducted using data from 196 Chinese districts.

Muangmee et al. (2021) conducted an extensive study on a sample size of 226 managers of SMEs related to the automotive industry of Thailand. hey aimed at studying the relationship between the independent variable of green entrepreneurial orientation and the firm's financial, social and environmental performance. Green innovation was given the role of mediation between these variables. The study incorporated the resource-based view in its methodology. The results extracted through PLS-structured equation modelling determined that green entrepreneurial orientation influenced the green innovation positively which in turn had a positive impact on all three parameters of performance i.e. financial, social and environmental.

Huong et al. (2021) examined the relationship between ecological innovation and firms' overall performance. Collecting mostly secondary data from Chinese listed organizations, the results obtained suggest that green innovation positively impacts the overall performances of Chinese firms. Moreover, the moderation of environmental management was also demonstrated, which implies that with efficient environmental

management, organizations can achieve efficient green innovation which in turn can result in better performance of firms.

Singh et al. (2022) examined the effect of green innovation and other variables such as stakeholder pressure and green dynamic capabilities on the performance of SMEs. Data collected from questionnaires was tested using partial least square equation modelling. It was found that stakeholder pressure influenced on the green dynamic capabilities of a firm. These capabilities then directly influence the green innovation which ultimately has a positive effect on the performance of the 250 sample firms. The stakeholder pressure also influences the ecological innovation in the mediation of green dynamic capabilities. Moreover, the ecological innovation mediates the relationship between green dynamic capabilities and company performance.

Harini et al. (2020) conducted research on the "batik" (small scale clothing) industry of Indonesia. The study aimed at identifying the relationship between marketing performance and ecological innovation. According to the findings from 120 Indonesian batik makers surveyed, ecological innovation has a favourable effect on green marketing effectiveness. Better marketing performance, which was measured through market share growth and sales volume, meant that willingness to implement ecological innovation was also higher, where the firms that grow market share and sales are more likely to implement eco-friendly practices.

Meanwhile, Ahmed et al. (2020) conducted research with the aim of identifying the impact of ecological innovation, green entrepreneurial orientation and entrepreneurial self-efficacy on the organization's environmental performance and energy efficiency. The SME sector of Malaysia was chosen as the area of study. With the help of results derived through structural equation modelling, it was concluded that all independent variables which included ecological innovation, green entrepreneurial orientation, and entrepreneurial self-efficacy positively contributed towards the firm's environmental performance and energy efficiency. This implies that in order to make an organization more energy efficient and to boost their environmental performance, ecological innovation along with green entrepreneurial orientation and entrepreneurial self-efficacy must also be enhanced.

Few studies can be found in literature which have attempted to study ecological innovation in the Saudi Arabian context. Though they are not much in number, they provide valuable understanding of the Saudi firm's perspective regarding the ecological innovation. Musaad et al. (2020) used the fuzzy criteria analysis to identify barriers to

green innovation adoption in the Saudi SME sector. They also identified 6 key and more than 20 sub-barriers that hinder ecological innovation for Saudi SMEs. However, the study also suggested strategies that can be adopted to overcome these barriers. This study also identified political issues as the main barrier to ecological innovation implementation. Another key barrier was considered to be lack of technology awareness, and cultural restraints were also considered to be major barriers.

Another study by Musaad et al. (2020b) examined the firm preference for ecological innovation through their decision of choosing a supplier who has the ability to deliver ecological innovation. The study also gathered data from the Saudi SME sector. Using grey methodology and also a fuzzy integrated approach, the study analysed the preferences of the Saudi SMEs in considering suppliers with green innovative abilities. It was revealed that such firms actually preferred greatly the suppliers who were able to provide them sufficient green innovation ability. Specifically, the ecological innovation is slowly taking preference in procurement decisions of Saudi firms. These studies suggest that though ecological or green innovation was not a very popular consideration for Saudi firms in the past, it has started to take prominence now while decision-making for these firms.

Ecological innovation, also known as eco-innovation, has been widely studied in the literature as a key driver of sustainable development and competitive advantage in businesses. Scholars define ecological innovation as the development and application of new products, processes, or business models that contribute to environmental sustainability while maintaining or enhancing economic performance (Shang et al., 2023). Unlike conventional innovations, which primarily focus on improving efficiency and productivity, ecological innovations specifically aim to reduce negative environmental impacts, conserve natural resources, and promote circular economy principles. In Saudi Arabia, where sustainability has become a national priority under Vision 2030, ecological innovation is gaining momentum as businesses seek to align with green policies and consumer demand for eco-friendly solutions.

Several studies highlight the role of ecological innovation in shaping sustainable business practices. Research by Li & Shi (2022) highlighted that both formal and informal environmental regulations promote green technology innovation in enterprises, highlighting the importance of regulatory frameworks in encouraging ecological innovation adoption. This distinction is crucial in understanding why firms engage in ecological innovation despite the potential financial and operational

challenges. In Saudi Arabia, the government has introduced various incentives for green businesses, and organizations are increasingly motivated to adopt ecological innovations to align with regulatory frameworks, such as the Saudi Green Initiative and National Renewable Energy Program.

Empirical studies suggest that firms adopt ecological innovation due to a combination of regulatory pressures, market demand, and corporate social responsibility (CSR) considerations. Wang et al. (2021) found that government policies, such as environmental regulations and subsidies for green technologies, play a significant role in encouraging businesses to invest in eco-friendly solutions. In the Saudi context, regulatory frameworks such as energy efficiency standards and waste management policies have pushed businesses to integrate ecological innovations into their operations. For example, the construction sector has witnessed a rise in green building technologies, including energy-efficient materials, smart water management systems, and solar panel integration, driven by both government mandates and consumer demand for sustainable infrastructure.

The role of technological advancements in ecological innovation has also been extensively studied. Scholars argue that digitalization and Industry 4.0 technologies, such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT), have accelerated the adoption of ecological innovations by improving efficiency and reducing resource consumption (Javaid et al., 2022). In Saudi Arabia, the push for smart cities and sustainable urban development has led to increased investments in clean energy, electric vehicles, and water desalination technologies. For instance, NEOM, the futuristic megacity project, incorporates ecological innovations in its infrastructure by integrating renewable energy, AI-driven resource management, and circular economy principles. These large-scale projects serve as a testament to how ecological innovation is being embedded into the country's long-term economic strategy.

Another important aspect of ecological innovation is its impact on small and medium-sized enterprises (SMEs). While large corporations often have the financial and technical resources to invest in sustainable technologies, SMEs face greater challenges in adopting ecological innovations due to budget constraints and limited access to expertise. However, research by Sarango-Lalangui et al. (2023) suggests that SMEs can successfully implement ecological innovations by leveraging open innovation networks, collaborating with research institutions, and accessing government grants. In Saudi Arabia, SMEs in the food, agriculture, and manufacturing

sectors are gradually embracing ecological innovation through initiatives such as biodegradable packaging, organic farming practices, and sustainable supply chain management. Government-backed programmes, such as Monshaat's SME support initiatives, have provided funding and mentorship opportunities to encourage small businesses to adopt green practices.

Consumer behaviour and market demand also play a crucial role in driving ecological innovation. Research by Nylund et al. (2021) suggests that organizations that prioritize ecological innovation often benefit from increased consumer trust, brand differentiation, and higher market share. Saudi Arabia's growing middle-class population, coupled with increasing environmental awareness, has led to a rise in demand for sustainable products and services. The retail and hospitality industries have responded by offering eco-friendly alternatives, such as organic food products, sustainable fashion, and green tourism experiences. The increasing preference for sustainable consumer goods has incentivized businesses to integrate ecological innovations into their product development strategies.

Despite the numerous benefits of ecological innovation, challenges remain. Scholars such as Purwandani & Michaud (2021) argue that while adopting eco-friendly business solutions, firms may encounter organisational, technological, and financial obstacles. High initial investment costs, lack of skilled personnel, and resistance to change are some of the common obstacles that hinder ecological innovation adoption. In Saudi Arabia, while government incentives and policy frameworks support green business initiatives, many organizations still struggle with the transition due to a lack of technical expertise and infrastructure readiness. Addressing these challenges requires a multi-stakeholder approach, involving collaboration between government agencies, private sector players, and academic institutions to create a more conducive environment for ecological innovation.

The highly increasing importance of ecological innovation emphasizes the need for industry-specific studies that explore the effectiveness of green technologies in different business sectors. Scholars also highlight the need of investigating the role of digital transformation in enhancing ecological innovation capabilities, particularly in emerging economies. In the Saudi Arabian context, understanding how businesses can integrate ecological innovation into their long-term sustainability strategies is crucial in achieving national economic and environmental goals. As the country continues to invest in green initiatives, it is very important to explore the impact of ecological

innovation on job creation, economic diversification, and environmental conservation efforts.

In conclusion, ecological innovation has emerged as a critical factor in driving sustainable business growth and environmental responsibility. The literature highlights various drivers, including regulatory policies, technological advancements, consumer demand, and corporate social responsibility, that influence the adoption of ecological innovation. While challenges such as financial constraints and technological barriers persist, the increasing global and local emphasis on sustainability provides businesses with significant incentives to embrace eco-friendly solutions. In Saudi Arabia, where Vision 2030 aims to create a more sustainable and diversified economy, ecological innovation is expected to play a central role in shaping the future of entrepreneurship and business development. Further research on the impact of ecological innovation on different industries, along with strategies to overcome adoption barriers, is essential in fostering a green and competitive economy.

2.9 Entrepreneurial Mindset

2.9.1 Definition

The fourth and final independent variable of this study is the entrepreneurial mindset. In the literature, some generalised concepts related to entrepreneurial mindset can be found, and many scholars have only provided some general insights. These insights include qualities and workings of the entrepreneurial mindset; however, most of them are not clear about the definition of this recently flourishing concept. Krueger (2007) provides a comprehensive definition of entrepreneurial mindset. It defines an entrepreneurial mindset as a set of skills and abilities gained by the entrepreneurs that help them recognize the opportunities systematically and then help capitalize on them. The process also involves learning from the mishaps (Nqoko & Chiweshe, 2022). Therefore, an entrepreneurial mindset is the outcome of a learning process where the entrepreneur uses their experience, positive or negative, to become able to identify and make the most of market opportunities. Another entrepreneurial mindset definition describes it as an outbound personality by search of fruitful opportunities. This characteristic of always searching is constant and the person pursuing it is not inspired

by someone but only their own self. Such an entrepreneur is a quick reactor and usually shows dynamic thinking and acting abilities (Tshishonga, 2022).

An entrepreneurial mindset is a combination of characteristics and skills through which people are able to identify early, the opportunities that may benefit them. They also predict the problems and challenges they are going to face and thus, are able to prepare for them beforehand (Raimi & Kah, 2022b). Such a skill or mindset is achieved usually with the help of past setbacks and adversities. An entrepreneurial mindset can be described as the orientation of identifying challenges and opportunities which is achieved through experience (Rana & Chopra, 2019). A similar definition describes an entrepreneurial mindset as a frame of mind that is seeking for opportunities, innovation and value creation. This definition brings the concept of innovation too for an entrepreneurial mindset. Creativity and innovation are also components of an entrepreneurial mindset. Some definitions also include the characteristics of open mindedness and risk management as features of the entrepreneurial mindset (Dantas et al., 2021).

With the advent of the modern entrepreneurship and the surfacing of highly successful entrepreneurs such as Jeff Bezos, Steve Jobs, Mark Zuckerberg etc., studies have tried to explore the characteristics of these people so that the public can learn from their examples. Many studies have put in an effort to explore the entrepreneurial mindset that these successful people might be having. The mindset can be also seen as something that these people are born with and might not achieve in life. It is also argued that the orientation towards entrepreneurship is inborn in most of the individuals. Characteristics such as being opportunistic and risk-seeking have been argued by some scholars to have personality and cognitive roots, though scholars continue to debate the extent to which such traits are innate versus learned (Haynie et al., 2010). It is also to be noted that the entrepreneurial mindset is not all positive and there are some negative characteristics too that make up the entrepreneurial mindset (Kuratko et al., 2021). For example, cashing in the opportunities on the expense of others might be considered entrepreneurial by some but is also ethically questionable. In this study, there is no differentiation between the positive and negative features of an entrepreneurial mindset, and it refers to a particular state of mind that directs or influences human behaviour to take up entrepreneurial activities. People having an entrepreneurial mindset are attracted towards adventurous opportunities (McGrath & MacMillan, 2000). Innovation and creativity are considered to be another aspect of the entrepreneurial mindset. Another

perspective of entrepreneurial mindset that has been reported in literature numerous times is the orientation towards taking risks.

Entrepreneurs are the first people to identify opportunities which others might not realize until later. Moreover, they are not just able to identify them, they also are the first movers to exploit those opportunities, which separates an entrepreneurial mindset from simply the concept of thoughts. A person with an entrepreneurial mindset would not only cognitively get the idea before other people, but they are also the ones to react accordingly in order to reap the benefits. People who detect the opportunities and fail to react accordingly are not considered entrepreneurs.

2.9.2 Conceptualization of Entrepreneurial Mindset

An entrepreneurial mindset is considered to be the state of mind that differentiates the entrepreneur from an ordinary individual. It is the mindset that creates an entrepreneur by allowing them to think about the environment as a place of opportunities and probabilities (Kuratko et al., 2021). The whole concept of entrepreneurship is driven by the way an individual sees the world as a place of opportunities and the possibilities in which those opportunities may be exploited so that the person is able to contribute to the social and economic uplift of the society. This concept leads to another notion: the entrepreneurial mindset is the collection of social and emotional skills of an individual which contribute to their overall orientation towards catching opportunities and acting accordingly to exploit them (Valerio et al., 2014). The entrepreneurial mindset is based on three factors: ability to sense, ability to act, and ability to gather and arrange resources in times of uncertainties (McGrath & MacMillan, 2000). An entrepreneurial mindset can also be considered to be an orientation for growth by an individual. A person who is always looking to grow is someone who is always looking for opportunities to seize them. Therefore, an entrepreneur must have a mind frame of growth. It implies that success is a motivation for entrepreneurs and is an important aspect of the entrepreneurial mindset.

Cromie (2000) linked entrepreneurial mindset to personality. The study identified some personality traits that are usually present in an entrepreneur. It was concluded that the existence of such characteristics in any person determines whether they have an entrepreneurial mindset or not. The traits that are identified by the study include sense of achievement, self-confidence, creativity, risk-taking, and locus of

control. Many of the studies referred to the Big Five personality trait model as well to understand the mindset of entrepreneurs (Awwad & Al-Aseer, 2021). Almost all of the theories have linked personality with the determination of entrepreneurial mindset. This denotes that apart from the mind-related aspect, an entrepreneurial mindset also has a connection with a behavioural perspective (Haynie et al., 2010).

The first task in creating an entrepreneurial mindset is to establish clearly the goals of the organization. Having established the goals of the organization, managers can then promote an entrepreneurial mindset among their employees (Morris et al., 2023). Such an entrepreneurial mindset would be more goal orientated and would benefit the organization and not only individuals. Once these goals are established, strategies to achieve them are formulated. The firms would then align their resources in such a way that their employees are able to take actions required from the tasks. Some guidance from the external or internal experts is also key to frame the thoughts of the employees (Chotipurk et al., 2023).

To understand the concept of entrepreneurial mindset it is also important to understand the concept of habitual entrepreneurs. They are people who throughout their lives have tried to establish new businesses. Either successful or failed, the starting of a business by considering an opportunity is what makes someone entrepreneurial (Davis et al., 2016). Moreover, habitual entrepreneurs have an urgency of exploiting opportunities before anyone else. They believe in the fact that sooner or later, someone else would pounce in to grab the opportunity so it is up to them to react quickly and seize it. Habitual entrepreneurs tend to identify complex situations and with their experience and expertise, try to simplify them for action. All these characteristics of habitual entrepreneurs are the summary of an entrepreneurial mindset. Anyone having all or some of these qualities is considered to possess an entrepreneurial mindset. Following table helps to summarize the underlying characteristics of habitual entrepreneurs.

Table 2.2
Characteristics of Habitual Entrepreneurs

Characteristic	**Explanation**
Alert	Passionately seeking new opportunities which can benefit them
Disciplined	Carefully plan the resources beforehand so that opportunities are exploited
Critical	The opportunities which deliver greater benefits are chosen only

Characteristic	Explanation
Action-oriented	Don't only detect or perceive the opportunities but also instantly act
Networking	Using networks in a manner that new opportunities are exploited
Innovative	Always looking for new ideas and methods by seeing them as opportunities
Risk-taking	Carefully analysing the risks associated with opportunities and mitigating them

The entrepreneurial mindset is a distinctive cognitive framework that differentiates entrepreneurs from ordinary individuals. It is the ability to perceive the environment as a space filled with opportunities and possibilities, rather than obstacles or limitations (Kuratko et al., 2021). Entrepreneurship, at its core, stems from how an individual interprets their surroundings, identifying potential avenues for economic and social contribution through innovation and value creation (Larsen, 2022). This perspective extends beyond mere business acumen; it encompasses a collection of social and emotional skills that enable individuals to seize and exploit opportunities effectively (Pidduck et al., 2023).

A well-developed entrepreneurial mindset is built upon three fundamental abilities: the ability to sense opportunities, the ability to act on them, and the ability to gather and allocate resources, even in times of uncertainty (McGrath & MacMillan, 2000). Entrepreneurs operate with a growth-orientated outlook, constantly seeking avenues for expansion and improvement. This growth orientation is what fuels motivation and persistence, as entrepreneurs thrive on the pursuit of success and progress. Consequently, an entrepreneurial mindset is not solely about risk-taking or innovation but also about maintaining an intrinsic desire for continuous learning, adaptation, and improvement.

The connection between entrepreneurial personality and mindset has been widely explored in academic literature. Al-Ghazali et al. (2022) suggested that specific personality traits are commonly found in entrepreneurs, including a strong sense of achievement, self-confidence, creativity, risk-taking, and an internal locus of control. Many studies have leveraged the Big Five Personality Trait Model to analyse the psychological makeup of entrepreneurs (Awwad & Al-Aseer, 2021). These findings emphasize that an entrepreneurial mindset is not purely cognitive but also behavioural, shaped by individual traits and decision-making tendencies. Entrepreneurs are often

characterized by high openness to experience, conscientiousness, and emotional resilience, enabling them to navigate complex business landscapes.

For organizations, cultivating an entrepreneurial mindset within employees is a strategic priority. The first step in this process is clearly defining organizational goals, which provides a directional framework for employees to align their efforts with the organization's vision (Morris et al., 2023). Once goals are established, strategies are developed to ensure that resources, both financial and human strategies are effectively utilized. Encouraging employees to think innovatively, take initiative, and approach challenges with a solution-orientated mindset fosters a workplace culture of entrepreneurship. In particular, guidance from internal or external experts plays a critical role in shaping employees' perspectives and enhancing their entrepreneurial thinking abilities (Chotipurk et al., 2023).

A significant concept within entrepreneurial mindset research is the notion of habitual entrepreneurs. These individuals repeatedly engage in the process of starting businesses throughout their careers, regardless of whether their past ventures have succeeded or failed (Davis et al., 2016; Griffin-EL & Olabisi, 2024). Their defining characteristic is urgency; they operate under the belief that if they do not seize an opportunity, someone else inevitably will. This sense of proactiveness and swift decision-making makes habitual entrepreneurs particularly effective at navigating uncertainty and competition. Their ability to identify complex business situations, break them down into actionable steps, and execute their strategies efficiently, is a testament to their entrepreneurial mindset (Krueger, 2007).

In essence, an entrepreneurial mindset is not merely about possessing an innovative idea, but it is about having the cognitive flexibility, resilience, and resourcefulness to bring those ideas to life. It requires a combination of creativity, risk tolerance, persistence, and strategic vision. Whether an individual is a start-up founder, an executive, or an employee within a large corporation, an entrepreneurial mindset is a powerful tool for driving change, solving problems, and creating lasting impact in an increasingly dynamic global economy.

2.9.3 Previous Studies on Entrepreneurial Mindset

This section reviews some of the latest studies about entrepreneurial mindset in literature. This helps to gain insight on the latest trends regarding entrepreneurial

mindset and help identify research gaps for this study. It should be noted that the majority of the recent studies based on the concept of an entrepreneurial mindset were related to education and teaching. They focus on inculcating an entrepreneurial mindset in the students so that they become skilful entrepreneurs in the future. Some of the studies found from a business perspective were focused on explaining this novel concept rather than applying it to different business-related variables. In this regard, this study would fill in the research gap as this study examines the entrepreneurial mindset in the organizational perspective and studying its relationship with other corporate variables.

Diaka et al. (2018) investigated the effect of an entrepreneurial mindset on the performance of small and medium (SME) firms in the Benue State of Nigeria. The study aimed at measuring the entrepreneurial mindset through already discussed characteristics of innovation, creativity, risk-taking and business alertness. 250 SMEs situated in Benue were targeted using stratified sampling and data was collected from them using self-administered questionnaires. Data was analysed using descriptive and inferential statistics. Correlation and regression analysis were used to generate results. According to the findings, all variables of entrepreneurial mindset were positively affecting the firm performance. A lack of such a mindset denotes poor performance. It implies that in order to boost the economy through firm performance, the government as well as the organizations should develop the entrepreneurial mindset within the industry. The research related to entrepreneurial mindset in the Saudi Arabian context was also related to the education of students. These studies include the research by Vahidnia et al. (2019) and Al-Ghazali et al. (2022).

Entrepreneurial mindset has been widely explored in the literature as a key determinant of entrepreneurial success, innovation, and resilience. It is often defined as a set of cognitive beliefs, attitudes, and behaviours that enable individuals to recognize and exploit opportunities, take calculated risks, and persist in the face of challenges (Krueger Jr, 2007). Scholars emphasize that an entrepreneurial mindset is not limited to business founders but extends to corporate entrepreneurs, social entrepreneurs, and individuals seeking to drive innovation within organizations (Becker et al., 2021). The development of an entrepreneurial mindset has been linked to personal traits, environmental influences, and educational exposure, making it a dynamic and evolving concept.

The literature highlights several key characteristics of an entrepreneurial mindset, including opportunity recognition, resilience, proactiveness, and adaptability. Research on entrepreneurial alertness emphasizes that successful entrepreneurs possess cognitive abilities that allow them to identify gaps in the market and transform ideas into viable business ventures, continuously scan their environment for new opportunities (Lanivich et al., 2022). In the Saudi Arabian context, the rise of digital entrepreneurship and government-backed startup initiatives has fostered an environment where individuals with strong entrepreneurial mindsets can thrive. Vision 2030's emphasis on economic diversification has encouraged young entrepreneurs to explore opportunities in technology, e-commerce, and sustainable businesses.

Several studies suggest that entrepreneurial education plays a crucial role in shaping an entrepreneurial mindset. Pereyra et al. (2021) argue that exposure to entrepreneurship courses, training programmes, and mentorship can significantly influence an individual's confidence in starting and managing a business. In Saudi Arabia, universities and business incubators have introduced programs aimed at fostering an entrepreneurial culture among students and professionals. Institutions such as KAUST and Monshaat have developed structured entrepreneurship programmes to equip individuals with the necessary skills to navigate the challenges of running a business. The increasing number of entrepreneurship competitions and accelerator programs further supports the notion that fostering an entrepreneurial mindset is a strategic priority for national economic development.

Risk-taking and resilience are also key components of the entrepreneurial mindset. Research by Peschl et al. (2021) highlights that entrepreneurs often embrace uncertainty and learn from failure, which distinguishes them from traditional business managers. In markets such as Saudi Arabia, where entrepreneurship is gaining traction, studies suggest that cultural attitudes towards risk-taking are evolving. Traditionally, risk aversion has been a common characteristic in conservative societies, but with the government's push towards entrepreneurship, there is a growing acceptance of business experimentation and failure as part of the entrepreneurial journey. The introduction of funding opportunities, such as the Saudi Venture Capital Company and the PIF-backed investment initiatives, has further encouraged risk-taking behaviour among aspiring entrepreneurs.

The role of digital transformation in shaping the entrepreneurial mindset has also been explored in the literature. Kollmann et al. (2022) argue that the digital

economy has expanded the entrepreneurial landscape, enabling individuals to start businesses with fewer resources and reach global markets more easily. Digital platforms, such as social media, e-commerce websites, and online learning tools, have empowered entrepreneurs with access to knowledge, funding, and customer networks. In Saudi Arabia, the rapid adoption of technology and the increasing reliance on digital business models have played a significant role in cultivating a tech-savvy entrepreneurial class. The rise of online businesses, fintech startups, and digital marketing ventures reflects how the entrepreneurial mindset is being shaped by digitalization.

Moreover, studies suggest that an entrepreneurial mindset is closely linked to psychological factors such as self-efficacy and motivation. Bandura's (1986) theory of self-efficacy states that individuals with high self-confidence in their abilities are more likely to take entrepreneurial actions and persist in overcoming obstacles. In line with this theory, research by Ferreira-Neto et al. (2023) found that self-efficacy is a strong predictor of entrepreneurial intentions and behaviour. In Saudi Arabia, where entrepreneurship is increasingly being promoted as a viable career path, government initiatives such as the Prince Mohammed bin Salman College of Business and Entrepreneurship (MBSC) are focused on enhancing self-efficacy among young entrepreneurs through experiential learning and mentorship.

Social and cultural influences also play a vital role in shaping the entrepreneurial mindset. Hofstede's (1980) cultural dimensions theory suggests that societies with high individualism and low uncertainty avoidance tend to produce more entrepreneurs. However, in collectivist societies like Saudi Arabia, family expectations and social norms have traditionally influenced career choices. Recent studies indicate that cultural shifts are occurring, with more individuals, especially women embracing entrepreneurship as a means of achieving economic independence and social mobility (Bullough et al., 2022). The introduction of policies supporting women entrepreneurs, such as easier access to business registration and funding, has encouraged female participation in business, reflecting a broader transformation in entrepreneurial mindset.

Despite the growing research on entrepreneurial mindset, several challenges and research gaps remain. The absence of longitudinal data that monitors the evolution of entrepreneurial mindsets over time is a significant shortcoming in the studies that are currently available. While many studies focus on short-term educational interventions and their immediate impact on entrepreneurial attitudes, fewer studies examine how

individuals maintain and adapt their entrepreneurial mindset throughout their careers. Additionally, research on entrepreneurial mindsets in emerging economies, particularly in the Middle East, is still developing. While Western-centric models provide valuable insights, they may not fully capture the unique sociocultural and economic factors influencing entrepreneurship in Saudi Arabia.

It is noteworthy to explore how institutional frameworks, digital transformation, and policy initiatives continue to shape the entrepreneurial mindset in Saudi Arabia. Understanding how different demographic groups, such as women entrepreneurs, young graduates, and SME owners, develop their entrepreneurial mindset in response to changing economic conditions can provide valuable insights. Additionally, comparative studies between Saudi Arabia and other countries with similar economic ambitions could offer lessons on best practices for fostering a strong entrepreneurial ecosystem.

In conclusion, the entrepreneurial mindset is a dynamic and multi-dimensional concept that plays a crucial role in driving innovation, business creation, and economic growth. The literature highlights various factors that influence entrepreneurial mindset, including opportunity recognition, risk-taking, resilience, education, self-efficacy, and cultural attitudes. In Saudi Arabia, the rapid transformation towards an entrepreneurial economy, supported by Vision 2030 initiatives, has created new opportunities for individuals to develop and apply entrepreneurial thinking. However, it is pertinent to explore how these mindsets evolve over time, the barriers entrepreneurs face, and the long-term impact of government policies on fostering a sustainable entrepreneurial culture.

2.10 Theoretical Underpinning

2.10.1 Theory of Planned Behaviour

Ajzen (1985) developed the theory of planned behaviour by extending Fishbein's (1979) theory of reasoned action. In his theory of reasoned action, Fishbein (1979) introduced two concepts, attitudes and subjective norms, which influence a person's intentions and behaviour when making decisions. Fishbein (1979) stated that a person's decision-making is influenced by attitudes and subjective norms, or the perceptions and actions of significant others, including family, friends, and colleagues.

As a result, a person will make decisions based on both constructs, attitudes and subjective norms. Attitudes and subjective norms influence a person's behaviour by way of their intentions to execute it. Below is a diagrammatic representation of the theory of reasoned action by Fishbein (1979):

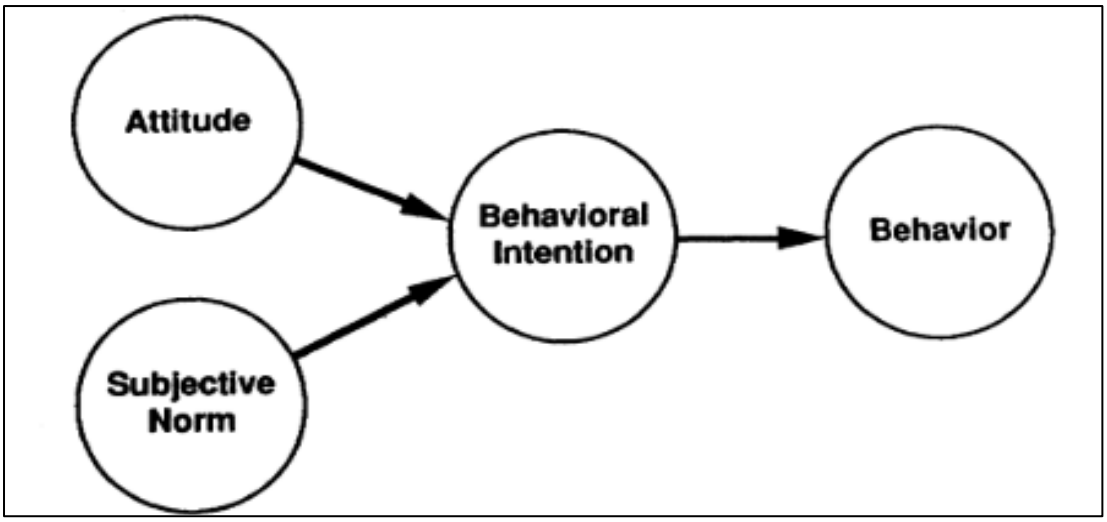

Figure 2.1 Theory of Reasoned Action (Fishbein, 1979)

As an extension of the theory of reasoned action, Ajzen introduced the theory of planned behaviour in 1985. While the theory of planned behaviour states that a person's behaviour is influenced by their attitudes and subjective norms, Ajzen asserts that a person's perception of their behavioural control also has a significant impact on that person's behaviour. Influencing behaviour are intentions, attitudes, subjective norms, and perceived behavioural control (Ajzen, 2015).

Since its publication, numerous studies on the application of the theory of planned behaviour have been conducted. Ajzen (1991) added justifications for each construct to the theory of planned behaviour. In his work, the author describes the theory of planned behaviour and contributes significantly to the concepts of attitudes, subjective norms, and perceived behavioural control. According to Ajzen, there are 'beliefs' underlying all three exogenous constructs. A person's attitudes toward any undertaking or activity are influenced by the behavioural beliefs they hold. The variables that explain subjective norms are normative beliefs and perceived behavioural control is preceded by control beliefs.

A person's intention can be predicted by their attitude toward the behaviour, subjective norms, and perceived behavioural control. Attitude toward the behaviour

refers to the extent to which a person perceives a specific behaviour positively or negatively. Subjective norms, the second factor, are social factors that refer to perceived social pressure to engage in or refrain from engaging in the behaviour. Self-efficacy, or the belief in one's capacity to perform the desired behaviour, is the third perceived behavioural control factor (Ajzen, 1991).

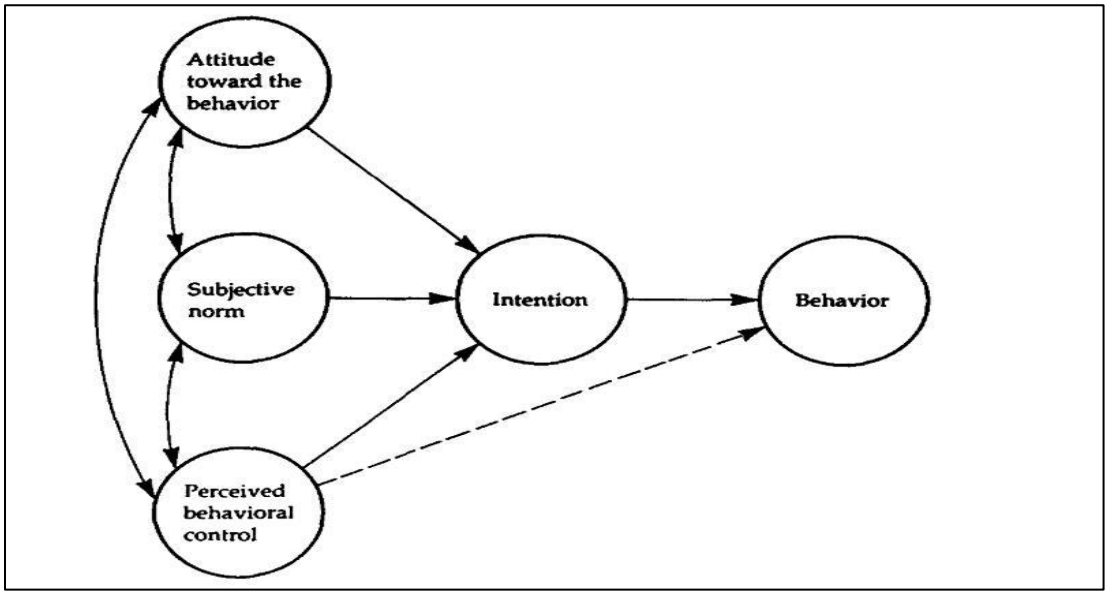

Figure 2.2 Theory of Planned Behaviour (Ajzen, 1991)

Intentions are an integral part of the theory. It is assumed that the intentions factor encompasses motivational factors and mediates their effect on the investigated behaviour. Intention to execute a behaviour refers to the intensity with which an individual intends to perform the behaviour. Greater intention increases the willingness to engage in the desired behaviour. Behavioural intention only influences one's behaviour when the behaviour is under volitional control, meaning the person may decide whether or not to carry out the behaviour (Ajzen, 1991). Although several behaviours are influenced by motivational factors, not all behaviours are solely influenced by motivational factors. Many behaviours are influenced by non-motivational exogenous constructs, such as time, money, and abilities, etc. (Ajzen, 2005, 2015; Ajzen et al., 2011).

The non-motivational factor influencing an individual's behaviour falls under the concept of perceived behavioural control. These are the factors that the individual believes they can control. In conjunction with motivational factors, perceived behavioural control determines the extent to which an individual is willing to perform

a behaviour. Actual behavioural control differs from perceived behavioural control. Actual control has a distinct effect on behaviour, but perceived control has a greater psychological impact. The perception of behavioural control influences both intentions and behaviour. Only perceived behavioural control distinguishes the theory of planned behaviour from the theory of reasoned action (Fishbein & Ajzen, 2010).

In this study, the digital entrepreneurial intention variable comes from the theory of planned behaviour. Darmanto et al. (2022) used digital entrepreneurial intention as a dependent variable underpinned by the theory of planned behaviour. In another study, Xu et al. (2023) found that the digital entrepreneurial intention is impacted by attitude and perceived behavioural control, which are constructs of the theory of planned behaviour.

Bricolage is the process of utilizing available resources to solve problems and attain desired results (Baker & Nelson, 2005). Rather than relying on long-term strategic planning, bricolage is an action strategy that prioritizes the utilization of existing resources and improvisation. It entails maximizing available resources by recombining them creatively to serve new purposes while pursuing substantial goals. This strategy entails that entrepreneurs identify, evaluate, and capitalize on opportunities by creatively repurposing or reprocessing readily available resources to create and implement innovative products or services. Resources include materials, labour, and skills (Frese & Gielnik, 2023).

Previous studies have used bricolage and the theory of planned behaviour together in entrepreneurial context (Kariv et al., 2022). Bricolage is a tool that helps entrepreneurs become innovative and solve problems with available resources. There is a positive association between bricolage and innovativeness in the literature (Senyard et al., 2014). Within the framework of the theory of planned behaviour, this study conceptualises entrepreneurial bricolage as an attitude, specifically the positive evaluative belief that entrepreneurs hold toward creative resource utilisation and also investigates its role as a predictor of digital entrepreneurial intention. While bricolage and TPB have been explored in related contexts, their specific application to digital entrepreneurial intention in the Saudi Arabian entrepreneurial ecosystem remains limited. This study therefore addresses this research gap by establishing a link between entrepreneurial bricolage and digital entrepreneurial intentions within the framework of the theory of planned behaviour.

In the attitude variable of the theory of planned behaviour, green entrepreneurial orientation plays a crucial function. It shapes a person's beliefs and evaluations of the significance and value of sustainability, thereby influencing their overall attitude toward environmentally friendly behaviour. A strong green orientation results in a positive attitude in which green actions are viewed as favourable and desirable. Their perception of the environmental impact and benefits associated with green practices is influenced by their orientation toward green practices. Consequently, individuals with a strong green orientation are more likely to develop a positive attitude toward engaging in green actions, which influences their behavioural intentions and likelihood of adopting environmentally friendly behaviours (Chekima et al., 2023).

A critical aspect of the attitude variable in the theory of planned behaviour is its focus on the future. It influences individuals' perceptions of green behaviour by emphasizing the significance of contemplating the long-term effects of their actions (Ajzen, 1991). This study uses green orientation variable in the framework under the attitude variable of the theory of planned behaviour.

The term "ecological innovation" refers to the creation of new products or procedures that have favourable effects on the environment while also having the potential to generate economic value. It includes ideas like minimal pollution, sustainability, and high efficiency, which have the potential to boost economic growth in addition to having positive effects on the environment. By emphasizing these principles, ecological innovation seeks to establish a balance between environmental preservation and economic growth (Yang et al., 2022). While there is limited direct reference to the relationship of ecological innovation with the theory of planned behaviour in existing literature, ecological innovation can nonetheless be conceptualised within the attitude construct of TPB. Specifically, an organisation's commitment to developing eco-friendly products, processes, and business models reflects a collective evaluative belief, which is an organisational attitude toward environmentally responsible behaviour. This attitude toward ecological innovation shapes the organisation's intentions to pursue sustainable entrepreneurial activities (Song et al., 2023). This study therefore incorporates ecological innovation as part of attitude (an organizational attitude) into the framework of theory of planned behaviour.

Incorporating the entrepreneurial mindset into the theory of planned behaviour influences entrepreneurial intentions and behaviours. Individuals' attitudes toward entrepreneurship, including the process of establishing and operating a business, are

influenced by this factor. Researchers acquire insight into the cognitive factors that drive entrepreneurial decision-making by analysing the entrepreneurial mindset within the framework of the theory of planned behaviour. Many studies used entrepreneurial mindset as a part of the theory of planned behaviour as a sub-factor of attitude (Al-Ghazali et al., 2022; Ashari et al., 2021; Damodharan & Ahmed, 2022; Y. Liao et al., 2022). It is worth mentioning that the theory of planned behaviour comprises three antecedents of intention, which are attitude, subjective norms, and perceived behavioural control. While subjective norms remain an important component of the theory as they reflecting the influence of social pressure from significant others on individual behaviour, the current study concentrates on attitude and perceived behavioural control as the constructs most directly relevant to the variables under investigation. This focused application of the theory is consistent with prior entrepreneurship studies that have similarly adopted select constructs of the theory of planned behaviour based on the nature of their research context and objectives (Ajzen, 1991).

Ajzen (1985) formed the theory of planned behaviour by extending the theory of reasoned action proposed by Fishbein (1979), incorporating a new construct of perceived behavioural control that drew on Bandura's (1977) concept of self-efficacy. The theory of reasoned action proposed that attitudes and subjective norms impact a person’s intentions and behaviours whereas social cognitive theory proposed that self-efficacy impacts intentions and behaviours. Ajzen (1985) took the attitude and subjective norms factors from the theory of reasoned action and combined them with a new variable of perceived behavioural control, which consists of motivations and self-efficacy, to form the theory of planned behaviour. Under this theoretical background, the entrepreneurial self-efficacy variable in the current study is also underpinned by the theory of planned behaviour as a sub-factor of perceived behavioural control.

2.11 Conceptual Framework

Based on the above literature and theoretical background, this study uses entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset as independent variables. This study also uses entrepreneurial self-efficacy as the mediator for the relationships between independent variables and digital entrepreneurial intention as the dependent variable. All of the study variables are

grounded in the theory of planned behaviour. Entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset are underpinned by the attitude construct of the theory of planned behaviour. Entrepreneurial self-efficacy is underpinned by the perceived behavioural control constructs of the theory of planned behaviour whereas the digital entrepreneurial intention is underpinned by the intention component of the theory of planned behaviour. The following diagram shows the relationships between the study variables:

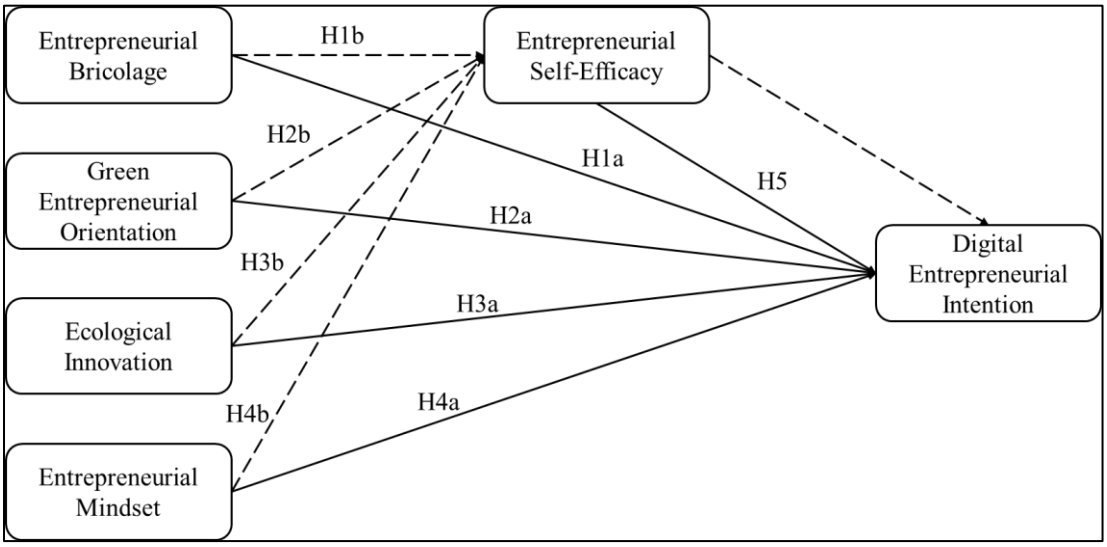

Figure 2.3 Conceptual Framework

2.12 Hypotheses Development

The objective of the section on the development of hypotheses is to propose and elaborate a set of research hypotheses that guides the investigation into the relationships between various factors in the context of entrepreneurship. This section formulates specific hypotheses that explore the relationships between variables such as entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and entrepreneurial self-efficacy, using existing literature and theoretical frameworks such as the theory of planned behaviour (TPB). These hypotheses serve as a basis for the empirical investigation, allowing for the examination of the complex interplay between these factors and their influence on individuals' digital entrepreneurial intention.

2.12.1 Entrepreneurial Bricolage

Yuan (2022) investigated the relationship between bricolage and entrepreneurial intention in the context of increased competition resulting from COVID-19-caused limited resources. The research instrument includes 27 items and four factors: social capital, entrepreneurial attitude, resource bricolage, and entrepreneurial intent. Multiple regression was used to analyse data gathered from 692 valid samples collected via an online survey in China and Taiwan. Results indicate that social capital predicts entrepreneurial attitude and intent positively. Additionally, entrepreneurial attitude substantially influences entrepreneurial intention. The ability to repurpose resources moderates the relationship between entrepreneurial attitude and intention. It does not moderate the relationship between social capital and intention, however. The findings suggest that resource bricolage moderates the relationship between entrepreneurial attitude and intention, amplifying the impact of a strong entrepreneurial attitude on entrepreneurial intent.

Mudalige (2023) investigates the motivations of social entrepreneurs in Sri Lanka, concentrating on the relationship between entrepreneurial bricolage and perceived desirability in relation to social entrepreneurial intent. A purposively selected sample of social entrepreneurs was analysed using partial least squares structured equation modelling (PLS-SEM). The study reveals a gender bias, with male social entrepreneurs constituting the plurality. Empirical findings indicate that entrepreneurial bricolage and perceived desirability have a significant and positive effect on the intention to engage in social entrepreneurship, jointly accounting for 29% of its variance.

Chen et al. (2020) examined the connection between bricolage and intention within the context of social entrepreneurship. Practitioners, policymakers, and academics have shown considerable interest in social entrepreneurship, a novel form of entrepreneurship that aims to address social issues. This study investigates the relationship between Chinese social entrepreneurs and entrepreneurs interested in social entrepreneurship by constructing a theoretical model that incorporates social capital and social entrepreneurial intention. Social capital influences entrepreneurial bricolage and social entrepreneurial intention positively, according to the findings. Moreover, entrepreneurial bricolage has a positive effect on social entrepreneurial intention and functions as a mediator between social capital and intention.

Chen (2023) examined the relationship between entrepreneurial bricolage and self-efficacy in firms with limited resources that seek to improve innovative performance. The study investigated how self-efficacy mediates the relationship between experiential resource-learning experience and human resource endowment as predictors of entrepreneurial bricolage. Utilizing a questionnaire survey and structural equation modelling, the research framework is validated. The findings demonstrated that experiential learning has a positive correlation with human resource endowment, which in turn has a positive effect on entrepreneurial bricolage. In addition, creative self-efficacy is identified as a key mediator between human resource endowment and entrepreneurial bricolage confirming the significant interconnection between self-efficacy and bricolage in entrepreneurial contexts and providing theoretical grounding for examining how these two constructs interact in shaping entrepreneurial outcomes.

Entrepreneurial bricolage is a concept that describes how entrepreneurs leverage existing but often scarce resources to create innovative solutions, particularly in uncertain or constrained environments. Originating from the work of Lévi-Strauss, the notion of bricolage has been adapted in entrepreneurship studies to explain how individuals and firms creatively recombine available resources to navigate challenges and seize opportunities (Strauss, 1962). Bricolage is particularly relevant in contexts characterized by resource limitations, such as startups, social enterprises, and emerging economies, where entrepreneurs must work with what they have rather than waiting for ideal conditions. The ability to improvise, repurpose, and recombine resources effectively allows entrepreneurs to sustain and grow their businesses despite financial, material, or human capital constraints.

The literature on entrepreneurial bricolage highlights several key dimensions. First, resource bricolage involves the creative use of tangible and intangible resources. Entrepreneurs often repurpose materials, reconfigure existing technologies, and leverage social networks to overcome resource scarcity. By doing so, they reduce dependency on traditional supply chains and optimize cost structures. Second, social bricolage refers to how entrepreneurs utilize networks, relationships, and community support to access critical resources and knowledge. Many entrepreneurs rely on informal partnerships, shared expertise, and community collaboration to develop and scale their businesses. Third, cognitive bricolage focuses on the entrepreneur's ability to think flexibly and reframe problems creatively. Entrepreneurs with a bricolage

mindset exhibit resilience, adaptability, and the capacity to turn constraints into competitive advantages.

Research indicates that entrepreneurial bricolage is strongly linked to innovation and business performance. Entrepreneurs who adopt a bricolage approach tend to develop unique products, services, and business models that differentiate them from competitors. Instead of following conventional market strategies, they identify alternative solutions that often lead to breakthrough innovations. Studies suggest that bricolage contributes to strategic agility, enabling firms to pivot quickly in response to market changes, economic downturns, or technological disruptions. This adaptability is particularly crucial in volatile industries where rapid shifts in consumer preferences, regulatory frameworks, and economic conditions require constant innovation.

The relationship between entrepreneurial bricolage and firm performance is also influenced by external factors, such as institutional environments and industry dynamics. In emerging markets and resource-scarce settings, bricolage can be a survival strategy that enables entrepreneurs to navigate uncertain regulatory landscapes, weak infrastructure, and financial constraints. For example, in developing economies, small businesses often engage in bricolage by repurposing outdated machinery, utilizing informal distribution networks, and leveraging non-traditional funding sources, such as microfinance and peer-to-peer lending. However, in highly structured industries with strict regulations, bricolage may face limitations, as compliance requirements can restrict unconventional resource use.

Entrepreneurial bricolage is also closely linked to social entrepreneurship and sustainable business practices. Many social entrepreneurs adopt bricolage strategies to address societal challenges, such as poverty alleviation, education access, and environmental sustainability. By repurposing unwanted materials, utilizing volunteer networks, and developing frugal innovations, social enterprises can deliver impactful solutions with minimal resources. Bricolage-based approaches align with circular economy principles, as they emphasize resource efficiency, waste reduction, and sustainable value creation. Additionally, digital entrepreneurship has expanded the role of bricolage in business creation. Entrepreneurs now leverage digital tools, open-source technologies, and online communities to build ventures with minimal capital investment. Crowdsourcing, cloud computing, and digital collaboration platforms provide entrepreneurs with new ways to access resources and scale their businesses.

Despite its benefits, entrepreneurial bricolage has limitations. Busch & Barkema (2021) highlighted that while bricolage fosters creativity and resilience, excessive reliance on existing resources may hinder long-term scalability. Firms that focus too heavily on makeshift solutions may struggle to transition into structured growth phases that require significant investments in infrastructure, technology, and human capital. Additionally, bricolage may not always lead to optimal efficiency, as improvised solutions can sometimes be suboptimal compared to purpose-built alternatives. Entrepreneurs must balance bricolage with strategic resource acquisition to ensure long-term sustainability.

It is worth exploring the intersection of entrepreneurial bricolage with emerging technologies, digital transformation, and artificial intelligence as recommended by scholars (Alford & Jones, 2025; Obschonka et al., 2025). Understanding how entrepreneurs use bricolage in data-driven decision-making, platform-based businesses, and innovation ecosystems could provide new insights into sustainable entrepreneurship. Additionally, cross-cultural studies are important to examine how cultural values and institutional differences shape bricolage behaviours in different regions. Investigating how bricolage interacts with strategic entrepreneurship, lean startup methodologies, and business model innovation is pivotal to further enhance understanding of its role in modern entrepreneurship.

Entrepreneurial bricolage is a crucial strategy for navigating resource constraints and fostering innovation. By creatively leveraging available resources, entrepreneurs can develop competitive advantages, drive social impact, and build resilient businesses. As economic uncertainties, environmental challenges, and digital disruptions continue to reshape the business landscape, the importance of entrepreneurial bricolage will remain significant in shaping the future of entrepreneurship.

Furthermore, Bhardwaj et al. (2024) demonstrated that entrepreneurial bricolage is a dynamic and adaptive approach that enables entrepreneurs to create value by creatively assembling and repurposing available resources, particularly in resource-constrained environments. The concept, rooted in the work of Strauss (1962), has gained significant attention in entrepreneurship research as it explains how individuals and firms navigate uncertainty and scarcity by making do with what is at hand. Bricolage is particularly relevant in startups, small businesses, and emerging markets where access to financial capital, skilled labour, and advanced technology may be limited. Instead of

being deterred by constraints, entrepreneurs employing bricolage transform obstacles into opportunities, fostering innovation, resilience, and business growth.

A key aspect of entrepreneurial bricolage is resourcefulness, which involves reconfiguring existing materials, tools, and knowledge to develop novel solutions. Unlike conventional business strategies that emphasize long-term planning and structured resource allocation, bricolage thrives on improvisation, flexibility, and problem-solving in real time. Entrepreneurs practicing bricolage often leverage unconventional sources of input, such as discarded equipment, second-hand materials, or repurposed technology, to construct viable products and services. This adaptive mindset is especially beneficial in crisis situations, as demonstrated during the COVID-19 pandemic when many small businesses and startups adopted bricolage strategies to pivot their operations, optimize costs, and sustain their ventures (Pongtanalert & Assarut, 2022).

Another critical dimension of bricolage is social bricolage, which involves leveraging relationships, networks, and community resources to overcome resource scarcity. Social capital plays a vital role in this process, as entrepreneurs build strategic partnerships, collaborate with stakeholders, and engage in knowledge-sharing networks. Studies indicate that entrepreneurs with strong social capital are better positioned to mobilize support, secure informal funding, and access mentorship opportunities (Pathan, 2022). This aspect of bricolage is particularly prevalent in social entrepreneurship, where mission-driven ventures address pressing societal issues through collaborative efforts and community-driven innovation. For instance, social enterprises in developing countries often rely on community-based labour, volunteer networks, and shared infrastructure to deliver impact-driven solutions with minimal financial investment.

Empirical research highlights the positive impact of entrepreneurial bricolage on firm performance and innovation. Entrepreneurs who embrace bricolage are more likely to develop unique business models, unconventional market strategies, and disruptive innovations. By creatively recombining resources, they can differentiate their offerings from competitors, penetrate niche markets, and establish sustainable competitive advantages. Bricolage also enables firms to achieve strategic agility, allowing them to adapt quickly to changing market conditions, regulatory shifts, and technological advancements. This agility is particularly valuable in industries

characterized by rapid innovation cycles, such as technology startups, digital platforms, and creative industries.

Furthermore, bricolage has been linked to entrepreneurial self-efficacy, a key psychological trait that influences an entrepreneur's belief in their ability to achieve business success. Entrepreneurs who engage in bricolage develop problem-solving skills, resourcefulness, and confidence in their capacity to navigate uncertainty. Studies suggest that individuals with high self-efficacy are more likely to take entrepreneurial risks, persist in the face of challenges, and explore innovative business opportunities (Renko et al., 2021). This body of evidence supports the notion that bricolage enhances the entrepreneurial attitude, promoting resilience and long-term success, in addition to producing observable business results.

Despite its many advantages, entrepreneurial bricolage is not without limitations. While bricolage fosters adaptability and innovation, excessive reliance on improvised solutions can sometimes hinder long-term scalability. Makeshift solutions, although effective in the short term, may lack the efficiency, durability, and standardization required for business expansion. Entrepreneurs who depend solely on bricolage may struggle to transition from an ad hoc approach to a structured growth strategy that involves systematic resource planning, formal investments, and professionalized operations. Moreover, bricolage may be constrained by institutional barriers, such as regulatory restrictions, industry standards, and access to formal financing. In highly regulated industries, where compliance and quality assurance are critical, bricolage-based solutions may face limitations in terms of legality, safety, and market acceptance.

The role of digital transformation in entrepreneurial bricolage is an emerging area of research. With the rise of digital tools, online platforms, and open-source technologies, entrepreneurs have new opportunities to engage in digital bricolage. Digital platforms enable entrepreneurs to access global resources, collaborate remotely, and experiment with innovative business models at a lower cost. For example, crowdfunding platforms, open-source software, and online marketplaces provide entrepreneurs with non-traditional ways to develop and scale their businesses without significant upfront capital investment. The integration of artificial intelligence, blockchain, and big data analytics further expands the scope of bricolage by enabling entrepreneurs to optimize decision-making, enhance customer experiences, and improve operational efficiency.

Additionally, cultural and contextual factors influence how bricolage is practised in different regions and industries. In developing economies, bricolage is often a necessity due to resource scarcity, weak institutional support, and infrastructure gaps. Entrepreneurs in these contexts exhibit a high degree of improvisation, leveraging informal networks, traditional craftsmanship, and frugal innovation to sustain their ventures. In contrast, in developed economies with more established support systems, bricolage may be driven by a desire for sustainability, creativity, or cost-efficiency rather than necessity.

It is pertinent to explore entrepreneurial bricolage's intersection with emerging business models, sustainable entrepreneurship, and corporate innovation as proposed in the prior research. Understanding how large firms adopt bricolage principles to drive intrapreneurship, foster organizational agility, and respond to market disruptions could offer new perspectives on its applicability beyond startups and small businesses. Additionally, investigating how gender, industry norms, and policy frameworks influence bricolage adoption could provide more nuanced insights into its impact on entrepreneurship.

To sum up, entrepreneurial bricolage is a powerful strategy that enables entrepreneurs to overcome resource constraints, foster innovation, and build resilient businesses. By creatively repurposing resources, leveraging social capital, and embracing digital tools, entrepreneurs can navigate uncertainty and create value in diverse contexts. While bricolage offers significant advantages in terms of adaptability and problem-solving, it is essential to balance its use with structured growth strategies to ensure long-term sustainability. As entrepreneurship continues to evolve in response to technological advancements, economic shifts, and global challenges, the relevance of bricolage in shaping entrepreneurial success will remain a crucial area of study.

Based on the discussion above, this study proposes that that bricolage has a considerable impact on digital entrepreneurial intention and entrepreneurial self-efficacy. Based on prior research identifying bricolage as a resourceful and adaptable strategy, this study hypothesizes that entrepreneurs with higher levels of bricolage skills will exhibit greater self-efficacy and greater digital entrepreneurial intention. The established links between entrepreneurial bricolage, innovative behaviour, and sustainable practices in the existing literature support the proposition that entrepreneurial bricolage will play a crucial role in shaping digital entrepreneurial intention in the Saudi Arabian context.

Based on the above studies, this study hypothesizes that:

H1a: Entrepreneurial bricolage significantly impacts digital entrepreneurial intention.

H1b: Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention.

2.12.2 Green Entrepreneurial Orientation

The study of Hugo and Nuringsih (2020) investigated the relationship between green entrepreneurial orientation and intention among students at Tarumanagara University in West Jakarta. The study also examined the influence of entrepreneurial education and green values on entrepreneurial intention. For data acquisition, a sample of 100 Tarumanagara University students served as respondents. For data analysis, the study employed smart partial least square (PLS) software, version 3.0. The findings indicate that green orientation and green value substantially influence entrepreneurial intention. However, entrepreneurial education has no discernible effect on the intention. The results cast light on the significance of green orientation and values in shaping the entrepreneurial intentions

Soomro et al. (2020) investigated the relationship between green orientation and intention among the younger generation, particularly those pursuing degrees in business management and entrepreneurship has been. The study collected cross-sectional data from 284 undergraduate and graduate students using a deductive methodology. The study utilized structural equation modelling (SEM) to analyse the data, revealing a positive and statistically significant relationship between sustainability orientation and sustainability education and the propensity for green entrepreneurship. The significance of promoting sustainability orientation and education in fostering a green entrepreneurial mindset is highlighted by these findings.

Choi et al. (2009) examined the relationship between green orientation and behavioural intention in the hospitality sector, finding that consumers with stronger green orientation showed greater intention to support environmentally responsible practices. Analyses of data from both Greece and the United States investigate consumer attitudes and behavioural intentions regarding hotel ERP. Specifically, the research investigates how ERP affects consumers' willingness to pay (WTP) for such environmentally friendly practices. The findings indicate that consumers in both nations prefer hotels with ERP, indicating a strong propensity to pay for such sustainable

initiatives. In addition, the results indicate that Greek consumers have greater environmental concerns and WTP than their American counterparts, indicating that cultural and social differences impact consumers' green orientation and their willingness to invest in environmentally responsible practices. These findings established an early empirical foundation for understanding how green orientation shapes behavioural intentions, a relationship that subsequent researchers have extended to the entrepreneurial context.

Polas et al. (2022) investigated the relationship between green orientation and intention in the context of the impact of blockchain technology on green innovation and economic sustainability. The study surveyed 184 small and medium-sized businesses (SMEs) in Lima, Peru, and analysed the data using the partial least squares structural equation modelling (PLS-SEM) framework. The findings highlight that green orientation positively influences the adoption of green innovation practices, with blockchain technology serving as an enabling mechanism in this relationship, contributing to a sustainable green economy in the SME context.

In the context of sustainable development goals (SDGs), the entrepreneurial sector plays a vital role in aligning economic and environmental objectives through green entrepreneurship practices. Study by Aurellia and Nuringsih (2023) examined a model that incorporated green entrepreneurial orientation and entrepreneurial self-efficacy in order to increase students' intention to pursue green entrepreneurship. Regression was applied to data from 180 Economics & Business Faculty students at Universitas Tarumanagara Jakarta. The results indicated that green entrepreneurial orientation had a greater influence on green entrepreneurship intention than entrepreneurial self-efficacy alone.

Green Entrepreneurial Orientation (GEO) has emerged as a critical concept in sustainable business practices, reflecting an entrepreneur's proactive approach to integrating environmental concerns into business strategies. It extends traditional entrepreneurial orientation by emphasizing ecological sustainability, resource conservation, and environmental innovation (Mao et al., 2021). In a rapidly evolving business environment where sustainability is a key driver of competitive advantage, GEO has gained substantial academic and practical attention (Andersén, 2022).

Entrepreneurial orientation (EO) traditionally comprises three core dimensions: innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989). When applied to green entrepreneurship, these dimensions take on a sustainability-orientated focus.

Innovativeness in GEO involves developing eco-friendly products, implementing sustainable production processes, and adopting circular economy principles (Majali et al., 2022). Research suggests that businesses with a high level of green innovativeness tend to outperform competitors in terms of brand reputation and customer loyalty (Kim et al., 2021).

Proactiveness in the green entrepreneurial context refers to an entrepreneur's ability to anticipate and respond to environmental regulations, consumer preferences, and sustainability trends before competitors (Shafique et al., 2021). Organizations with strong green proactiveness often invest in sustainable technologies and collaborate with stakeholders to drive eco-friendly initiatives (Bhatia, 2021). This strategic foresight enables firms to maintain compliance with evolving environmental policies while seizing market opportunities (Salamzadeh et al., 2022).

Risk-taking in GEO involves making substantial investments in green technologies, sustainable product development, and environmentally responsible supply chain practices (Wang et al., 2023). While green investments often require significant financial and organizational commitment, they yield long-term benefits such as regulatory advantages, cost savings from resource efficiency, and enhanced market differentiation (Ning & Shen, 2024). Despite potential financial risks, firms that exhibit strong GEO are more likely to achieve long-term sustainability goals and enhance corporate social responsibility (CSR) outcomes (Ekins & Zenghelis, 2021).

The impact of green entrepreneurial orientation on business performance has been widely discussed in the literature. Empirical studies indicate that firms with a strong GEO tend to experience higher financial performance, particularly when green strategies align with consumer demand and regulatory frameworks (Tan et al., 2022). In addition to financial gains, GEO positively influences environmental performance, reducing waste, carbon emissions, and energy consumption (Makhloufi et al., 2022). Furthermore, GEO fosters competitive advantage, as environmentally conscious consumers increasingly prefer businesses that demonstrate sustainability leadership (Li et al., 2022).

Moreover, research highlights the role of external pressures such as government regulations, stakeholder expectations, and environmental movements in shaping GEO adoption (Zhang et al., 2024). Institutional pressures, including legal frameworks and sustainability reporting requirements, push firms toward integrating green entrepreneurial strategies (Golsefid-Alavi et al., 2021). Additionally, consumer

awareness and changing societal values act as key motivators for businesses to align their entrepreneurial orientation with green principles (Al-Mamary, 2025).

The relationship between green entrepreneurial orientation and innovation has also been extensively explored. Research suggests that GEO drives eco-innovation, leading to the development of green products, sustainable business models, and energy-efficient technologies (Ameer & Khan, 2023). Green entrepreneurs are more likely to experiment with sustainable materials, renewable energy solutions, and environmentally friendly packaging, thereby contributing to the broader goal of sustainable development (Veleva, 2021).

In the context of small and medium-sized enterprises (SMEs), GEO presents unique challenges and opportunities. SMEs frequently encounter obstacles when attempting to adopt sustainability-focused business strategies, whereas large firms have the financial and technological means to support their green efforts (Akomea et al., 2023). However, studies suggest that SMEs with a strong GEO can leverage agility, innovation, and niche market positioning to create impactful green solutions (Kiranantawat & Ahmad, 2023). Entrepreneurial SMEs that proactively integrate sustainability into their business models benefit from enhanced stakeholder trust, customer loyalty, and market differentiation (Frare & Beuren, 2022).

Despite the growing body of research on GEO, scholars emphasize the need for further investigation into its long-term impact on business sustainability, economic growth, and environmental conservation (Feng et al., 2022). It is crucial to explore the role of digital transformation, artificial intelligence, and emerging green technologies in enhancing GEO adoption across industries (Vrontis et al., 2022). Additionally, cross-cultural research is also pertinent to gain insights into how different regulatory environments and consumer behaviours shape the effectiveness of GEO strategies worldwide (Rahman & Luomala, 2021).

In conclusion, green entrepreneurial orientation represents a critical shift in the entrepreneurial landscape, aligning business strategies with environmental sustainability. By integrating innovativeness, proactiveness, and risk-taking with ecological responsibility, green entrepreneurs contribute to sustainable development while achieving competitive advantages. As businesses increasingly prioritize environmental concerns, GEO is expected to play a pivotal role in shaping the future of entrepreneurship and corporate sustainability.

Green entrepreneurial orientation (GEO) has gained substantial attention recently as businesses face increasing pressure to adopt sustainable practices. It represents an entrepreneur's strategic commitment to integrating environmental sustainability into business operations through innovation, proactiveness, and risk-taking. The shift toward green entrepreneurship is driven by multiple factors that include climate change concerns, regulatory frameworks, consumer demand for sustainability, and corporate social responsibility (CSR) expectations. As global economies transition toward sustainable development, GEO serves as a strategic framework enabling firms to achieve economic performance while minimizing environmental degradation. Green-orientated entrepreneurs adopt eco-innovations strategy where they may engage in responsible resource management initiatives and develop circular economy models to ensure environmental sustainability.

The concept of entrepreneurial orientation (EO), originally proposed by Covin and Slevin (1989), consists of three primary dimensions: innovativeness, proactiveness, and risk-taking. Over time, researchers have expanded EO to incorporate environmental sustainability, leading to the development of green entrepreneurial orientation. Innovativeness in the context of GEO refers to an entrepreneur's ability to develop sustainable products, eco-friendly technologies, and environmentally responsible business models. Green innovation plays a pivotal role in reducing waste, improving resource efficiency, and addressing environmental challenges. Proactiveness enables businesses to anticipate and respond to environmental regulations, shifting consumer preferences, and emerging sustainability trends before competitors. Organizations that adopt a proactive stance engage in sustainable supply chain practices and leverage first-mover advantages in green markets. Risk-taking is another essential component, as investing in green technologies, sustainable materials, and eco-friendly production methods requires significant financial commitment and strategic decision-making. While green investments entail uncertainties, they generate long-term benefits such as regulatory compliance, cost savings from resource efficiency, and improved corporate reputation.

The relationship between GEO and business performance has been widely investigated. Empirical studies suggest that GEO positively impacts financial, environmental, and competitive performance. Businesses with strong GEO often experience increased profitability, market share, and cost efficiency due to sustainable product differentiation and regulatory incentives. Green branding strategies enable

organizations to attract environmentally conscious consumers and secure premium pricing advantages. Additionally, GEO plays a crucial role in enhancing corporate sustainability outcomes, including reduced carbon footprints, lower emissions, and efficient waste management. Many firms implement ISO 14001 standards and life-cycle assessment methodologies to measure and improve their environmental impact. A proactive GEO strategy provides businesses with a sustainable competitive edge, particularly in industries where environmental regulations and consumer expectations are evolving rapidly. Organizations investing in green innovation and circular economy principles outperform competitors in securing government contracts, investment capital, and strategic partnerships.

Institutional pressures, market trends, and societal values significantly influence a firm's adoption of GEO. Several external drivers contribute to the increasing relevance of green entrepreneurship. Governments worldwide have introduced stringent environmental regulations, carbon pricing policies, and green tax incentives to encourage businesses to adopt sustainable practices. Compliance with these regulations often motivates entrepreneurs to integrate green strategies into their business models. A growing segment of environmentally conscious consumers prefers eco-friendly products, ethical supply chains, and transparent corporate sustainability efforts. Businesses with strong GEO benefit from enhanced customer loyalty and positive brand perception. Technological advancements in renewable energy, green materials, and digital sustainability solutions have made it easier for firms to adopt green entrepreneurial strategies. Green technologies, such as energy-efficient manufacturing and AI-driven sustainability analytics, support businesses in reducing operational costs while improving environmental outcomes.

While GEO benefits businesses of all sizes, small and medium-sized enterprises (SMEs) and large corporations face different challenges and opportunities. Due to limited financial and technological resources, SMEs often struggle to implement large-scale sustainability initiatives. However, SMEs can leverage agility, innovation, and niche market positioning to develop impactful green solutions. Entrepreneurial SMEs that proactively integrate GEO into their operations build trust among stakeholders, attract investors, and access sustainability grants. On the other hand, multinational organizations and large firms integrate GEO into their corporate social responsibility strategies, environmental, social, and governance (ESG) frameworks, and global supply

chains. Many corporations have implemented green procurement policies, sustainable logistics, and net-zero emission targets to align with international sustainability goals.

Despite extensive research on GEO, scholars emphasise the need for further investigation into its long-term impact on sustainability, economic resilience, and global competitiveness. It is worth to explore the integration of artificial intelligence, blockchain, and big data analytics in sustainable entrepreneurship. Additionally, it is important to further explore how GEO contributes to circular business models, zero-waste strategies, and sustainable value chains.

Green entrepreneurial orientation is a pivotal concept in sustainable business strategy, combining entrepreneurial traits with ecological responsibility. By fostering green innovation, strategic proactiveness, and calculated risk-taking, businesses can achieve both economic success and environmental stewardship. As regulatory frameworks tighten and consumer preferences evolve, GEO will continue to shape the future of entrepreneurship and corporate sustainability.

Farliana et al. (2023) investigated the role of environmental consciousness and university support in enhancing self-efficacy and green consumption behaviour among students. Low environmental consciousness has been linked to apathy, behavioural alterations, and dependence. The investigation took a quantitative approach, with a sample of 220 active students at Universitas Negeri Semarang (UNNES). Data analysis employed structural equation modelling (SEM) with the WarpPLS 5.0 software. The findings suggest that environmental consciousness directly influences motivation, self-efficacy, and green consumption behaviour. In addition, university support has a direct influence on motivation and self-efficacy, but not on green consumption behaviour. This study highlighted the significance of green orientation and self-efficacy in promoting environmentally responsible consumption behaviours, highlighting the potential role of university support in motivating such behaviours.

On the basis of the findings of the studies reviewed above, it is hypothesized that green entrepreneurial orientation is positively associated with both entrepreneurial self-efficacy and the digital entrepreneurial intention. Individuals with a stronger green entrepreneurial orientation are more likely to develop higher levels of entrepreneurial self-efficacy in their capacity to engage in green entrepreneurial practices. In addition, the hypothesis asserts that a higher level of green entrepreneurial orientation will result in higher digital entrepreneurial intention. The findings of these studies emphasize the

importance of green entrepreneurial orientation in shaping entrepreneurial self-efficacy and digital entrepreneurial intention.

H2a: Green entrepreneurial orientation significantly impacts digital entrepreneurial intention.

H2b: Entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention.

2.12.3 Ecological Innovation

The study of Ahmed et al. (2020) investigated the impact of ecological innovation, entrepreneurial self-efficacy, and entrepreneurial orientation on environmental performance and energy efficiency in the Malaysian SME sector. Using structural equation modelling on data collected from Malaysian SMEs, the study found that the ecological innovation positively contributed to both environmental performance and energy efficiency. Study's findings demonstrated that ecological innovation, when combined with entrepreneurial self-efficacy, significantly enhances a firm's capacity to achieve sustainable outcomes, providing empirical support for the relationship between ecological innovation and entrepreneurial behaviour.

Ecological innovation, also known as eco-innovation, has emerged as a crucial area of research due to increasing environmental concerns, climate change, and resource scarcity. It is defined as the development and application of new products, processes, or business models that contribute to environmental sustainability while fostering economic growth. Scholars argue that ecological innovation plays a significant role in promoting sustainable development by reducing environmental degradation and enhancing resource efficiency. Various theoretical frameworks have been proposed to understand ecological innovation, including the evolutionary theory of innovation, institutional theory, and the resource-based view. The evolutionary theory suggests that firms continuously adapt their strategies in response to environmental challenges, positioning ecological innovation to enhance their competitive advantage. Institutional theory, on the other hand, emphasizes the influence of regulations, norms, and societal expectations in shaping corporate sustainability efforts. Meanwhile, the resource-based view posits that firms with unique resources and capabilities are better equipped to develop and implement ecological innovations.

Several determinants influence the adoption of ecological innovation. Government policies and regulations play a vital role by enforcing environmental standards and incentivizing green practices through mechanisms such as subsidies, tax breaks, and emissions trading. Consumer demand for eco-friendly products also drives firms to invest in sustainability-orientated innovations, as organizations recognize the economic benefits of catering to environmentally conscious consumers. Additionally, corporate social responsibility and ethical considerations motivate businesses to integrate ecological innovation into their strategic initiatives. Technological advancements further contribute by enabling the development of cleaner production processes, renewable energy solutions, and waste reduction techniques.

Despite the advantages, ecological innovation faces multiple barriers. High initial costs associated with research, development, and implementation often deter firms, particularly small and medium-sized enterprises, from adopting green technologies. Many organizations also lack the technical knowledge and expertise required to transition to sustainable practices. Organizational resistance to change poses another challenge, as businesses may be reluctant to modify existing processes due to uncertainty and perceived risks. Furthermore, weak policy enforcement can reduce firms' motivation to invest in eco-innovation, particularly in regions where regulatory frameworks are not strictly implemented (Li et al., 2019).

The impact of ecological innovation extends across environmental, economic, and social dimensions. Environmentally, it helps reduce carbon emissions, waste generation, and resource consumption, contributing to climate change mitigation and biodiversity conservation. Economically, firms that adopt ecological innovation often experience cost savings, enhanced brand reputation, and improved competitiveness in the market. Socially, sustainable business practices contribute to public health, ethical responsibility, and overall well-being. Given its significance, it is noteworthy to explore the role of digital transformation in ecological innovation and assess its long-term implications for global sustainability.

Ecological innovation has gained substantial attention in recent years as industries and governments seek sustainable solutions to mitigate environmental challenges while maintaining economic growth. It encompasses the development and implementation of environmentally friendly technologies, processes, products, and business models to reduce ecological footprints and contribute to sustainable development. Unlike conventional innovation, which primarily focuses on efficiency

and profitability, ecological innovation integrates environmental considerations into the core of business strategies, emphasizing long-term benefits over short-term gains. This shift is driven by increasing environmental regulations, rising consumer awareness, and the growing recognition of corporate social responsibility.

One of the primary drivers of ecological innovation is regulatory pressure. Governments worldwide have introduced stringent environmental policies, such as carbon taxation, emissions caps, and pollution control standards, compelling firms to adopt green practices. Compliance with these regulations helps businesses avoid legal penalties and positions them as responsible corporate citizens. Additionally, financial incentives such as green subsidies, grants, and low-interest loans encourage organizations to invest in sustainable technologies. For instance, policies supporting renewable energy adoption have led to significant advancements in the solar, wind, and bioenergy sectors, fostering a more sustainable energy landscape.

Beyond regulatory frameworks, market forces play a crucial role in driving ecological innovation. Consumers are increasingly prioritizing sustainability in their purchasing decisions, prompting firms to develop eco-friendly products and services. Organizations that successfully integrate green practices into their value propositions gain a competitive edge by appealing to environmentally conscious consumers. Brands that emphasize sustainability, such as Tesla in the automotive industry and Patagonia in fashion, have demonstrated that ecological innovation can lead to brand loyalty and market differentiation. Furthermore, investors are showing a growing preference for environmentally responsible organizations, leading to the rise of sustainable finance initiatives and green investment portfolios (Song et al., 2023).

Technological advancements serve as another catalyst for ecological innovation. The emergence of smart manufacturing, artificial intelligence, and digitalization has enabled firms to optimize resource efficiency and minimize waste. Technologies such as blockchain and the Internet of Things (IoT) enhance transparency in supply chains, ensuring that sustainable practices are adhered to throughout the production and distribution processes. Additionally, breakthroughs in materials science have facilitated the development of biodegradable packaging, energy-efficient appliances, and alternative materials that replace environmentally harmful substances. Innovations in circular economy models, where waste is minimized through recycling, repurposing, and reusing materials, further illustrate how technology drives sustainability (Javaid et al., 2022).

Despite its numerous benefits, ecological innovation faces considerable challenges. High implementation costs remain a significant barrier, particularly for small and medium-sized enterprises (SMEs) with limited financial resources. The transition to sustainable practices often requires substantial investment in research and development, infrastructure, and workforce training. Moreover, the lack of standardized metrics for measuring ecological impact creates difficulties in assessing the effectiveness of sustainability initiatives. Resistance to change within organizations is another obstacle, as some firms perceive ecological innovation as a risk rather than an opportunity. Additionally, weak enforcement of environmental regulations in certain regions reduces the urgency for businesses to prioritize sustainability.

The impact of ecological innovation extends beyond environmental benefits to economic and social dimensions. Environmentally, it contributes to reduced carbon emissions, improved air and water quality, and enhanced biodiversity conservation. Economically, firms that invest in green innovation often experience long-term cost savings, increased efficiency, and improved reputation, leading to higher profitability and stakeholder trust. Socially, sustainable business practices enhance public health by minimizing pollution-related diseases, promoting ethical labour practices, and fostering community engagement. Furthermore, ecological innovation can create new employment opportunities in sectors such as renewable energy, sustainable agriculture, and green construction.

Going forward, the future of ecological innovation is expected to be shaped by global commitments to sustainability, technological advancements, and evolving consumer preferences. The integration of digital transformation with green initiatives is expected to accelerate sustainable development, as artificial intelligence, big data, and automation optimize resource utilization. Collaborative efforts between governments, businesses, and civil society are essential in overcoming barriers to ecological innovation and scaling up sustainable solutions. Moreover, education and awareness campaigns also play a vital role in fostering a culture of sustainability among individuals and organizations. Given its critical role in addressing climate change and ensuring a sustainable future, ecological innovation continues to be a key driver of environmental and economic progress in the coming years (Shang et al., 2023).

Li et al. (2019) investigated the connection between ecological innovation (green innovation) and the intentions of scientific researchers. The purpose of their study was to examine the internal and external factors that have the greatest influence

on the green innovation behaviour of researchers, as well as their interaction. Utilizing behavioural and innovation theories, a model for the formulation of green innovation behaviour among researchers was developed. Extensive data from China's multiple industries and industrial cities was gathered, and hierarchical regression analysis techniques were used to validate the model. Green innovative intention was substantially and positively influenced by endogenous attitude, exogenous attitude, the injunctive norm of green innovative behaviour, and the perceived behavioural control over green innovation, according to the findings. The study provides valuable insights into the mechanisms that motivate researchers to engage in green innovation and emphasizes the significance of both internal and external drivers in influencing their intentions toward ecological innovation practices.

Based on the findings of above reviewed studies, this study proposes that ecological innovation has a substantial impact on digital entrepreneurial intention and entrepreneurial self-efficacy. Prior studies consistently demonstrate that firms and individuals engaged in ecological innovation develop greater confidence in their abilities to pursue innovative and sustainable entrepreneurial activities, thereby enhancing their self-efficacy and entrepreneurial intentions. The established links between ecological innovation, sustainable business practices, and entrepreneurial outcomes support the proposition that ecological innovation will play a crucial role in shaping digital entrepreneurial intention in the Saudi Arabian context

Based on the literature review above, this study hypothesizes that:

H3a: Ecological innovation significantly impacts digital entrepreneurial intention.

H3b: Entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intention.

2.12.4 Entrepreneurial Mindset

Cui and Bell (2022) investigated the relationship between entrepreneurial education activity and entrepreneurial behaviour, examining the influence of entrepreneurial education on both entrepreneurial intention and entrepreneurial behaviour. The study also highlighted the role of behavioural entrepreneurial mindset as a mediator in this relationship. The findings indicate that effective entrepreneurial education activity positively influences entrepreneurial behaviour, in part via entrepreneurial intention. Furthermore, entrepreneurial education activity has a positive

influence on behavioural entrepreneurial mindset, which in turn mediates the relationship between entrepreneurial education activity to entrepreneurial intention, highlighting behavioural entrepreneurial mindset as a key driver of students' entrepreneurial intentions. This study enhances the understanding of the crucial link between entrepreneurial mindset and intention.

Liao et al. (2022) employed the theory of planned behaviour and the social cognitive career theory to investigate the relationship between entrepreneurial mindset and intention. The study examined the influence of entrepreneurial education, entrepreneurial mindset, and cognitive mediators on entrepreneurial intention and competencies. Using a cross-sectional design, data from 290 university students with diverse academic backgrounds were analysed using partial least squares structural equation modelling in order to test multiple hypotheses. The results demonstrated the importance of entrepreneurial education and cognitive mediators in fostering entrepreneurial behaviour. In addition, the study revealed that an entrepreneurial mindset is fostered through entrepreneurial education and plays a significant role in fostering entrepreneurial intent. Furthermore, the results indicated that entrepreneurial passion acted as a moderator, influencing entrepreneurial self-efficacy and attitudes. These findings shed light on the intricate relationship between entrepreneurial mindset and intention, highlighting the significance of entrepreneurial education and cognitive factors in fostering entrepreneurial behaviour and intentions.

Mukhtar et al. (2021) examined the relationship between entrepreneurship education, culture, and the entrepreneurial intention of college students, with an emphasis on the moderating function of the entrepreneurial mindset. A total of 376 university students enrolled in an entrepreneurship course participated in the investigation. The findings disclosed that the entrepreneurial mindset significantly contributed to the enhancement of the university students' entrepreneurial intent. Furthermore, entrepreneurial culture had some influence on entrepreneurial education and intent. In addition, entrepreneurship education and entrepreneurial culture demonstrated a strong correlation with the entrepreneurial mindset of students. These findings of Mukhtar et al. (2021) contribute to a greater understanding of the role of the entrepreneurial mindset in shaping students' entrepreneurial intentions, as well as the impact of entrepreneurship education and culture on the development of an entrepreneurial mindset among college students.

The entrepreneurial mindset has gained increasing attention in academic research due to its crucial role in fostering innovation, risk-taking, and adaptability in dynamic business environments (Daspit et al., 2023). Defined as a cognitive framework that enables individuals to identify opportunities, embrace uncertainty, and take calculated risks, the entrepreneurial mindset is essential for both entrepreneurs and intrapreneurs. It influences decision-making, opportunity recognition, and resilience, all of which contribute to business success and sustainability (Kuratko et al., 2023).

A fundamental characteristic of the entrepreneurial mindset is opportunity recognition, which refers to an individual's ability to identify gaps in the market and transform unmet needs into viable business ideas (Bernardus et al., 2023). Research suggests that opportunity recognition is closely tied to creativity and problem-solving skills, enabling entrepreneurs to think outside conventional boundaries (Kuratko et al., 2021). Entrepreneurs scan their environment, utilizing analytical thinking and intuition to develop innovative solutions (Sassetti et al., 2022).

Another key trait associated with the entrepreneurial mindset is resilience, which determines an entrepreneur's ability to persist through setbacks and uncertainty (Daspit et al., 2023). Entrepreneurship is inherently uncertain, and many ventures face financial constraints, regulatory challenges, and market competition. However, those with a strong entrepreneurial mindset demonstrate perseverance, learning from failures rather than being discouraged by them (Larsen, 2022). Resilience is closely linked to self-efficacy, as individuals with a higher belief in their abilities are more likely to persist despite difficulties (Bandura, 1997).

Entrepreneurs also exhibit a high level of autonomy and internal locus of control, meaning they take responsibility for their actions rather than attributing success or failure to external factors (Rotter, 1966). Research suggests that individuals with an internal locus of control are more likely to take initiative, remain proactive, and exhibit confidence in their ability to navigate challenges (Tekeli & Özkoç, 2022). This self-driven approach fosters independence and a strong motivation to achieve entrepreneurial goals (Gugnani, 2022).

Another essential component of the entrepreneurial mindset is calculated risk-taking. Unlike traditional employees who prioritize job security, entrepreneurs embrace uncertainty and make strategic decisions in dynamic environments. However, research indicates that successful entrepreneurs do not take blind risks; rather, they engage in calculated risk-taking by assessing potential rewards and downsides before making

decisions (Zayadin et al., 2023). This ability to balance risk and reward contributes to business growth and sustainability (Edwards, 2021).

Moreover, adaptability and continuous learning are crucial for maintaining an entrepreneurial mindset. Given the fast-changing nature of the global business environment, entrepreneurs must stay updated with industry trends, technological advancements, and evolving consumer preferences (Khurana et al., 2022). Studies show that successful entrepreneurs demonstrate a learning-orientated approach, continuously refining their skills and adapting their strategies to maintain competitiveness (Gomes et al., 2022). This adaptability is particularly critical in digital entrepreneurship, where technological shifts and market disruptions are frequent.

Furthermore, research highlights the importance of collaboration and networking in fostering an entrepreneurial mindset. Entrepreneurs actively seek relationships with mentors, investors, and industry peers to gain access to valuable resources, knowledge, and growth opportunities (Bergman & McMullen, 2022). Networking is linked to increased innovation, as diverse perspectives contribute to creative problem-solving and strategic decision-making (Poskanzer, 2022). Social capital, which encompasses an entrepreneur's network and relationships, has been found to positively influence opportunity recognition and business performance (Shao & Sun, 2021).

The entrepreneurial mindset also plays a broader role in economic and social development. Entrepreneurs contribute to job creation, technological advancements, and economic growth, making entrepreneurship a key driver of national development (Tao et al., 2022). In the digital age, the demand for entrepreneurial thinking has increased, as businesses require agility, digital literacy, and innovation to remain competitive (Chotipurk et al., 2023).

Educational institutions and organizations are actively promoting entrepreneurial mindsets through training programmes, workshops, and experiential learning. Research suggests that entrepreneurship education positively impacts individuals' ability to recognize opportunities, develop resilience, and take initiative (Cui & Bell, 2022). Experiential learning approaches, such as startup incubators and accelerators, provide practical exposure to entrepreneurial challenges, equipping aspiring entrepreneurs with the necessary skills and confidence to navigate business complexities (Lantu et al., 2022).

Overall, the entrepreneurial mindset is a critical determinant of business success, characterized by opportunity recognition, resilience, autonomy, risk-taking, adaptability, and networking. Whether launching a startup, leading a corporate team, or driving innovation within an organization, individuals with an entrepreneurial mindset are better equipped to thrive in uncertain and competitive environments. As the global economy continues to evolve, fostering entrepreneurial thinking will be essential for ensuring sustainable business growth and innovation.

According to Roeslie and Arianto (2022), the significance of entrepreneurial aspirations among college students resides in their potential to create more jobs and address Indonesia's unemployment problem. Their study aimed to examine the relationship between entrepreneurial culture, entrepreneurship education, and entrepreneurial mindset, and entrepreneurial intention. Students from Universitas Pelita Harapan (UPH) in Karawaci, Banten, Indonesia, comprised the study's population. Structural equation modelling (SEM) with SmartPLS was employed as the analytical method. Both entrepreneurial education and entrepreneurial mindset were found to significantly and positively influence entrepreneurial intention. However, entrepreneurial culture only affected entrepreneurial intentions through the mediation of other variables. These results shed light on the relationship between entrepreneurial mindset and intention among university students, highlighting the role of entrepreneurial education and culture in influencing their entrepreneurial intentions.

Jiatong et al. (2021) examined the direct effect of entrepreneurial education, entrepreneurial mindset, and creativity on entrepreneurial intention, with an emphasis on the indirect effect of entrepreneurial self-efficacy. Validation of hypothesized relationships was conducted using the structural equation modelling technique and the AMOS program. 365 university students in China's Jiangsu and Zhejiang provinces responded to a self-administered survey. The results indicated that entrepreneurial education, an entrepreneurial mindset, and creativity have a positive and significant effect on entrepreneurial intent. In addition, the results demonstrated that entrepreneurial self-efficacy partially mediated the relationship between entrepreneurial education, entrepreneurial mindset, and creativity, as well as entrepreneurial intention.

Based on the above review, this study further hypothesizes that:

H4a: Entrepreneurial mindset significantly impacts digital entrepreneurial intention.

H4b: Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial mindset and digital entrepreneurial intention.

2.12.5 Entrepreneurial Self-Efficacy

Maheshwari and Kha (2022) examined the role of entrepreneurial self-efficacy and the components of the theory of planned behaviour model (personal attitude, subjective norm, perceived behavioural control) as mediators in the relationship between entrepreneurial educational support and entrepreneurial intentions among university students in Vietnam. The results indicated that entrepreneurial educational support did not have a direct impact on entrepreneurial intentions, but did have a positive indirect influence, which was mediated by the three components of the theory of planned behaviour and entrepreneurial self-efficacy. Although entrepreneurial education may not directly influence entrepreneurial intentions, it has a significant positive impact on theory of planned behaviour components and self-efficacy, which in turn influence entrepreneurial intentions.

Zhang and Huang (2021) examined the impact of the COVID-19 pandemic on the entrepreneurial intentions of college students. In order to examine the relationship between the entrepreneurial environment, entrepreneurial self-efficacy, and entrepreneurial intentions in the post-pandemic era, 913 college students completed a questionnaire. For data analysis, structural equation models were utilized. In the post-pandemic era, the findings indicated that college students maintained an entrepreneurial mindset. Entrepreneurial aspirations were influenced by a number of factors, including gender, a familial history of entrepreneurship, major, and educational background. Notably, entrepreneurial self-efficacy mediated the post-pandemic entrepreneurial environment's influence on entrepreneurial intentions.

Entrepreneurial self-efficacy (ESE) is a critical psychological construct that reflects an individual’s belief in their ability to successfully execute entrepreneurial tasks and overcome challenges. Numerous studies have emphasized the significant role of ESE in shaping entrepreneurial intentions, particularly in the digital business landscape. Individuals with higher self-efficacy tend to view entrepreneurship as a feasible and desirable career option, increasing their likelihood of engaging in entrepreneurial activities.

Empirical research has consistently demonstrated that entrepreneurial self-efficacy positively influences an individual’s decision to pursue entrepreneurship. Bandura (2023) argues that individuals with strong self-efficacy are more confident in their ability to start and sustain a business. This confidence is particularly relevant in

digital entrepreneurship, where entrepreneurs must navigate complex technological environments, develop innovative business models, and effectively leverage digital tools. Entrepreneurs with high self-efficacy are more likely to perceive digital business opportunities as attainable and are better equipped to overcome obstacles associated with digital transformation (Arifin et al., 2023).

Similarly, Doanh et al. (2021) studied the impact of the COVID-19 pandemic on entrepreneurial intention and found that entrepreneurial self-efficacy played a mediating role between the entrepreneurial environment and entrepreneurial intention. Their findings suggest that even in uncertain or disruptive environments, individuals with strong self-efficacy maintain a high level of entrepreneurial intention. This is particularly relevant for digital entrepreneurship, where the fast-paced nature of technology and market disruptions require resilience and adaptability.

The influence of self-efficacy on digital entrepreneurial intention can be explained through several psychological mechanisms. First, self-efficacy enhances an individual's perceived feasibility and desirability of entrepreneurship, which are key determinants of entrepreneurial intention according to the Entrepreneurial Event Model (Shapero & Sokol, 1982). Individuals with strong entrepreneurial self-efficacy believe in their ability to succeed in digital ventures, increasing their likelihood of pursuing such opportunities (Caliendo et al., 2023). Second, self-efficacy fosters risk-taking and opportunity recognition, two essential traits in digital entrepreneurship. Digital entrepreneurs operate in dynamic and uncertain environments, requiring a proactive approach to recognizing and capitalizing on emerging opportunities (Khurana et al., 2022). Those with higher self-efficacy are more willing to take calculated risks and invest in innovative digital business models. Third, self-efficacy contributes to persistence and resilience, which are crucial for sustaining a digital business. Entrepreneurs with strong self-efficacy are more likely to remain committed to their ventures despite setbacks, continuously adapting to technological advancements and shifting market demands (Ferreira-Neto et al., 2023). Lastly, self-efficacy influences technological adaptability and digital skills acquisition. In an era of rapid digital transformation, entrepreneurs must constantly update their skills and knowledge. High self-efficacy individuals are more likely to embrace digital learning, experiment with new technologies, and implement innovative digital solutions (Arifin et al., 2023).

Prior research has provided substantial empirical support for the relationship between self-efficacy and entrepreneurial intention. Anwar et al. (2021) found that self-

efficacy is a stronger predictor of entrepreneurial intention than other personality traits, such as risk-taking propensity. A meta-analysis by Glosenberg et al. (2022) further confirmed that self-efficacy significantly influences entrepreneurial behaviour across different cultural and economic contexts. In the digital domain, Audretsch et al. (2024) emphasized that digital entrepreneurship requires a high degree of adaptability and learning agility, both of which are strengthened by self-efficacy. Alferaih (2022) studied digital entrepreneurship in Saudi Arabia and found that entrepreneurs with high self-efficacy were more likely to engage in e-commerce, fintech, and digital service startups. Their confidence in managing digital businesses, utilizing online marketing strategies, and adopting technological innovations played a crucial role in shaping their digital entrepreneurial intentions. These findings are particularly relevant in the context of Saudi Arabia's Vision 2030, which promotes digital transformation and entrepreneurship as key drivers of economic growth.

Entrepreneurial self-efficacy plays a crucial role in shaping digital entrepreneurial intention. Individuals with higher self-efficacy are more likely to recognize digital business opportunities, take calculated risks, and persist in their entrepreneurial endeavours despite challenges. The evidence reviewed above reinforces the importance of self-efficacy as a key determinant of digital entrepreneurial intention. By fostering entrepreneurial self-efficacy through education, mentorship, and supportive policies, stakeholders can contribute to the development of a robust digital entrepreneurial ecosystem, particularly in emerging economies such as Saudi Arabia.

Entrepreneurial self-efficacy (ESE) is a fundamental psychological construct that significantly influences entrepreneurial intention, particularly in the digital entrepreneurship landscape. Self-efficacy, derived from Bandura's social cognitive theory, refers to an individual's belief in their ability to execute specific tasks and achieve desired goals. Within entrepreneurship, ESE represents the confidence entrepreneurs have the capacity to identify opportunities, acquire resources, and successfully launch and sustain a business. The role of ESE has been widely acknowledged in shaping entrepreneurial intentions, behaviours, and performance outcomes, making it a key predictor of entrepreneurial success. In the context of digital entrepreneurship, where rapid technological advancements and market disruptions are prevalent, ESE plays an even more critical role by equipping individuals with the confidence to navigate uncertainties and leverage digital tools effectively.

The influence of ESE on entrepreneurial intention can be understood through various theoretical lenses, including the Theory of Planned Behaviour (TPB), Social Cognitive Theory (SCT), and the Entrepreneurial Event Model (EEM). According to TPB, entrepreneurial intention is driven by three key components: personal attitude, subjective norms, and perceived behavioural control. ESE is closely linked to perceived behavioural control, which reflects an individual's perception of their ability to successfully engage in entrepreneurial activities. Studies have shown that individuals with high ESE exhibit stronger entrepreneurial intentions because they believe they possess the skills and capabilities required to start and manage a business. Similarly, social cognitive theory emphasizes the role of self-efficacy in determining human behaviour, particularly in decision-making under uncertainty. Entrepreneurs with high ESE are more likely to take initiative, persist in the face of challenges, and proactively seek solutions to problems. In digital entrepreneurship, where technological uncertainty and market volatility are common, ESE provides entrepreneurs with the resilience and adaptability necessary to experiment with new business models and digital solutions. The Entrepreneurial Event Model further supports this view by positing that entrepreneurial intention is shaped by an individual's perceived feasibility and desirability of entrepreneurship. ESE enhances perceived feasibility by reinforcing confidence in one's ability to successfully engage in entrepreneurial activities, ultimately increasing digital entrepreneurial intention.

Several empirical studies have demonstrated a strong positive relationship between ESE and entrepreneurial intention across different contexts. Maheshwari & Kha (2022) examined the mediating role of ESE in the relationship between entrepreneurial education and entrepreneurial intention among university students in Vietnam. Their findings revealed that while entrepreneurial education did not directly influence entrepreneurial intention, it significantly enhanced ESE, which in turn positively impacted entrepreneurial intention. This suggests that educational interventions aimed at fostering self-efficacy can be an effective strategy to encourage entrepreneurial aspirations, particularly in digital entrepreneurship. Similarly, Wang and Huang (2022) investigated the impact of the post-traumatic growth during the COVID-19 pandemic on college students' entrepreneurial intentions. Their study found that ESE played a crucial mediating role in linking the entrepreneurial environment with entrepreneurial intention. In the digital context, where online businesses and remote work have become more prevalent, high ESE enables entrepreneurs to perceive digital

opportunities as viable and implementable. Their study reinforces the notion that self-efficacy is a key driver of entrepreneurial behaviour, particularly in uncertain and rapidly evolving environments. In the context of digital entrepreneurship, this means that entrepreneurs with strong self-efficacy are more inclined to experiment with digital platforms, adopt innovative business models, and leverage technology to scale their ventures.

The positive impact of ESE on digital entrepreneurial intention can be attributed to several key mechanisms. Digital entrepreneurship requires the ability to recognize and exploit opportunities in an ever-changing technological landscape. Individuals with high ESE are more likely to identify emerging trends, such as e-commerce, blockchain technology, and artificial intelligence, and integrate these innovations into their business strategies. Research has highlighted that digital entrepreneurs with strong self-efficacy are more proactive in adopting and leveraging new technologies to gain a competitive advantage. Digital entrepreneurs often operate in uncertain environments where technological disruptions and market fluctuations are common. High ESE equips entrepreneurs with the confidence to take calculated risks, experiment with innovative solutions, and persist despite setbacks. Entrepreneurs with high self-efficacy exhibit greater resilience, allowing them to overcome digital business challenges and sustain long-term success. Moreover, digital entrepreneurship requires continuous learning and adaptation to technological advancements. Entrepreneurs with high self-efficacy are more likely to engage in digital skill development, such as learning coding, digital marketing, and data analytics, which are essential for scaling online businesses. Successful digital entrepreneurs also rely on strong networks and partnerships to access resources, mentorship, and market insights. Individuals with high self-efficacy are more confident in their ability to build and maintain professional relationships, which can lead to valuable collaborations and business growth. Research has found that self-efficacious entrepreneurs are more proactive in networking and securing investment opportunities, further enhancing their digital entrepreneurial intentions (Bergman & McMullen, 2022).

Given the critical role of ESE in fostering digital entrepreneurial intention, policymakers, educators, and business support organizations have increasingly recognised the need to implement strategies to enhance self-efficacy among aspiring digital entrepreneurs. Business schools and training institutes have incorporated digital entrepreneurship courses that focus on skill development, problem-solving, and real-

world business simulations to build confidence in entrepreneurial abilities. Policymakers have established digital incubators, accelerators, and funding programmes that provide financial and mentorship support to emerging digital entrepreneurs. Exposure to successful digital entrepreneurs and mentors can significantly enhance self-efficacy by providing guidance, inspiration, and practical insights into digital business operations. Encouraging digital skills training and innovation-driven initiatives can strengthen the confidence of aspiring entrepreneurs in leveraging technology for business success (Alferaih, 2022).

The relationship between self-efficacy and intention has been extensively investigated in numerous fields, such as entrepreneurship, education, and health behaviour. Self-efficacy, which is defined as a person's belief in their ability to perform a specific task or achieve a specific objective, has been found to play a crucial role as a mediator between independent variables and intention (Bandura, 2023). In the context of entrepreneurship, for instance, self-efficacy functions as a mediator between factors such as entrepreneurial education, environmental support, and personal attitudes toward entrepreneurship, and the intention to start a business. Similarly, in the field of education, the self-efficacy beliefs of students can mediate the effect of teacher support and academic performance on their educational intentions and career aspirations. Understanding the mediating role of self-efficacy in the process of intention formation can provide valuable insights for the development of interventions and strategies aimed at promoting positive intentions and behaviours across multiple domains.

Based on the above review, this study further hypothesizes that:

H5: Entrepreneurial self-efficacy significantly impacts digital entrepreneurial intention.

2.13 Chapter Summary

This chapter firstly explained the basic concepts of entrepreneurship which are to be used throughout this study. After a comprehensive description of entrepreneurship and entrepreneurs, an explanation of the variables including four independent and one dependent and one mediating variable was given. For each of the variables, a few recent studies were discussed to develop a better understanding of the research trends and streams currently being carried out regarding that variable. This helped in formulating the study hypotheses by identifying the research gaps. Studies in the Saudi Arabian

context were also presented where available in the literature. However, the review revealed that the variables of the study were underexplored academically. Some variables, such as entrepreneurial mindset were less frequently studied in the context of businesses and were found predominantly in studies related to education and students. Moreover, limited studies were identified in the Saudi Arabian context, with variables such as digital entrepreneurial intention and entrepreneurial self-efficacy receiving particularly limited academic attention. The review therefore concluded that the variables of this study were relatively underexplored.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

The third chapter of this study details the formal procedures for addressing the aforementioned research questions. It describes in-depth the diverse methodological decisions made in pursuit of empirical findings. In addition, ample space a thorough explanation of the data collection methodologies employed is provided. Subsequently, a detailed description of the data analysis procedures is presented.

The overarching objective of this study is to investigate the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention. This study is conducted within the context of Saudi Arabia. However, this research goes beyond simply assessing these direct relationships by examining the role of entrepreneurial self-efficacy as a mediator. In doing so, it utilizes the theory of planned behaviour as its underpinning theory. This approach not only expands the boundaries of the comprehension of digital entrepreneurial intention but also contributes to the refinement of the theory of planned behaviour itself.

3.2 Objective of Research Methodology

This chapter's objective is to describe the sampling, data acquisition, and data analysis methods utilized in this study. In this section, the study describes the methodology that is used to answer the research questions and achieve the research objectives. Saudi entrepreneurs, who serve as the primary respondents in this investigation, provided the data required for this research.

This study administered a comprehensive survey questionnaire to collect quantitative data to accomplish the study objectives. This dataset is instrumental in examining the impact of exogenous variables on their endogenous counterparts. This chapter elaborates on the temporal constraints, geographical scope, and financial limitations associated with the data collection phase. An in-depth examination is

conducted for the research strategies that are congruent with the chosen philosophical stance and research philosophy.

This chapter provides not only a roadmap but also detailed instructions and clarifications on how to conduct this research in a way that most effectively addresses the research questions and achieves the overarching research objectives. Using the research onion technique described in the following section, research methodology was systematically planned and executed.

3.3 Research Onion

The choice between commencing data collection through questionnaires or interviews depends on the researcher's understanding and the requirements of the study. The research onion framework illustrates the processes underlying the data collection method and techniques, as well as data analysis, providing a structured approach to resolving methodological decisions (Saunders et al., 2019). Each stratum of the research onion was addressed systematically to ensure the rigour of the research process.

3.3.1 Research Philosophy

Research philosophy is a system of beliefs and assumptions concerning knowledge development, i.e. developing knowledge in a particular field or solving a particular organizational problem. At each stage of the research process, philosophical assumptions must be accounted for, whether consciously or unconsciously (Burrell & Morgan, 1978).

Three fundamental philosophical underpinnings are ontology, epistemology, and axiology, which serve as distinguishing characteristics between various research philosophies. Ontology investigates the substance of reality, including the essence of the world (Leavy et al., 2014; White, 2011) and beings as well as how one perceives and interact with it (Kivunja & Kuyini, 2017). This philosophical pillar facilitates reasoning and understanding of the observed reality or phenomena (Kivunja & Kuyini, 2017). Epistemology is concerned with the acceptability, reliability, and legitimacy of knowledge, whether it be numerical data, visual representations, textual information, facts, or narratives. This aspect of research philosophy is profoundly concerned with acquiring and disseminating knowledge (Burrell & Morgan, 1978). Epistemology

describes the complex relationship between the researcher and the reality they are attempting to comprehend, as well as the processes by which they comprehend that reality (Lee, 2012). Furthermore, axiology focuses on the influence of a researcher's values, assumptions, and ethical considerations on the scientific research process. It highlights the values held by both the researcher and those participating in the study. Axiology acknowledges the possibility of researcher bias and emphasizes the critical significance of considering how a researcher's influence can impact the research process and ultimately alter research outcomes (Tamminen & Poucher, 2020).

Philosophy influences research and must be acknowledged in practice despite being generally obscured in the scientific community. Thoroughly discussing significant philosophical concepts is essential when composing a research proposal or project. Philosophy is also known as paradigms and broadly conceived research methodologies (Tamminen & Poucher, 2020).

The positivism research philosophy produces lawlike generalizations of existing reality by generating plain and accurate knowledge. For accurate results, the positivist research philosophy emphasizes the use of scientific methods for data acquisition and interpretation. Emphasis is placed on identifying the measurable facts that will result in credible and meaningful data by identifying causal relationships in the quantifiable data (Crotty, 1998). Interpretivism focuses solely on the qualitative human interpretation of events. According to interpretive thinkers, humans who observe phenomena can best describe and create meanings for what they see or experience (Sanchez et al., 2023). Pragmatism advocates a combination of the subjective and objective aspects of philosophy (Jayasuriya, 2023).

The primary objective of this study is to examine the influence of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention, with a particular emphasis on the mediating role of entrepreneurial self-efficacy in the context of Saudi Arabia. Consequently, an objective perspective is necessary for a quantitative research methodology. Therefore, the use of pragmatism and interpretivism research philosophies were not appropriate for this study. Positivism was identified as the most appropriate research philosophy for the current investigation. This philosophical approach adheres to established theories and interprets new phenomena by building on these theoretical foundations (Crotty, 1998).

3.3.2 Research Design

A research design functions as a blueprint for addressing research questions and achieving research objectives while maintaining a consistent methodology throughout the study. The design of a study can be compared to the planning of a voyage, in which optimal routes, modes of transportation, and budgetary constraints are selected with care to reach a desired destination. In the research process, the first two layers of the "research onion" established the underlying philosophy and method by laying the foundation. The research design comprises three distinct layers: methodological choice, research strategies, and time horizon. Collectively, these strata constitute the research design framework, which plays a crucial role in guiding the investigation and answering research questions (Saunders et al., 2019).

The research methodology operates within a dynamic space between the quantitative and qualitative extremes. The nature of research may be quantitative, qualitative, or hybrid, combining elements of both approaches. Often, the distinction between quantitative and qualitative research hinges on whether the data are numerical or not. These two methodologies are frequently equated with their respective data acquisition and analysis techniques. For instance, quantitative research most accurately describes studies that employ instruments like questionnaires or rely on secondary numerical data subjected to statistical analysis. In contrast, interviews that yield non-numerical insights through thematic analysis are more consistent with the qualitative research paradigm. It is crucial to recognize that research does not strictly adhere to the quantitative or qualitative camps; it can also employ a mixed methods approach in which both quantitative and qualitative methods coexist. In mixed-methods research, qualitative methodology can precede quantitative methodology, or vice versa, or both can be employed simultaneously. This adaptable strategy enables researchers to leverage the benefits of both extremes to achieve a more comprehensive understanding of the topic of study (Creswell, 2014).

Using a quantitative research methodology, a significant amount of research has already been conducted on this study's variables. Using the foundations of the theory of planned behaviour, these variables have been extensively investigated, and their interrelationships established through a comprehensive literature review. Consequently, this study adopted a deductive methodology consistent with quantitative research and this decision was influenced by the study's objective (Bryman, 2016).

3.3.3 Research Strategy

A research strategy is a comprehensive plan for addressing research concerns. It serves as the link between the data collection and analysis and the selected research philosophy. Within the realm of research, quantitative, qualitative, and mixed-method studies are associated with various methodologies. These research strategies may exist independently or in close association with a particular research design. In practise, one research design can integrate multiple approaches to address the multifaceted aspects of the research inquiry (Denzin & Yvonna, 2013).

A survey strategy is a common approach in quantitative research. This research strategy is commonly used in disciplines such as business and management studies, especially for descriptive or explanatory studies. Survey strategies rely on questionnaires to efficiently capture data from a substantial population, allowing for straightforward comparisons. Furthermore, this approach has gained a reputation for credibility among the public, as it can be readily explained and understood. Within the framework of the survey strategy, quantitative data were systematically obtained through the administration of questionnaires and then analysed quantitatively using descriptive and inferential statistics and partial least squares structural equation modelling (PLS-SEM). This method gives researchers greater control over the research process, and the use of purposive sampling allows for the selection of respondents who best represent the target population (Saunders et al., 2019).

It is essential to recognize that careful consideration must be given to the selection of the sample population, the design, administration of a pilot test, and the preparation and analysis of the data, all of which can be time-consuming but are dependent on the researcher's productivity (Bryman, 2016). The data for this investigation were collected using the survey questionnaire technique. To collect data, a survey containing Likert scale questions with a 7-point scale was distributed to respondents.

3.3.4 Time Horizon

This study adopted a cross-sectional time horizon, as data were collected from all respondents at a single point in time. In cross-sectional research, data are collected at a specific moment owing to time constraints. This form of study may employ

qualitative, quantitative, or a combination of these research methods (Saunders et al., 2019). In this study, the cross-sectional time horizon was appropriate because data were collected only once, at a single point in time, and no additional data were collected thereafter.

3.3.5 Population and Sampling

Data collection methods in research can vary. In certain instances, collecting and analysing data from each group member or respondent is possible, a procedure known as a census. However, many research studies are unable to obtain data from every individual due to practical constraints. Therefore, researchers select a subset of respondents from a larger population and use their findings to generalize about the entire population (Zickar & Keith, 2023). The term "population" alludes to the large group under study from which a sample is drawn. A well-selected sample can yield accurate data for analysis and generalization, obviating the need to acquire information from every respondent.

Sampling becomes necessary when reaching the entire population is impractical, time-consuming, or excessively expensive. These pragmatic considerations led researchers to choose a sample that allows them to investigate the characteristics of the larger population. Due to the magnitude and diversity of a population, it can be difficult to select a representative sample size. To overcome this obstacle, researchers frequently employ the concept of a target population. This involved narrowing and defining a larger population based on its constituent elements' specific characteristics.

The population for this study was the SMEs in Saudi Arabia, and the unit of analysis was individual entrepreneur of Saudi SMEs. Entrepreneurship in Saudi Arabia has seen a considerable upswing, with a particular emphasis on the SMEs sector. Recent data from the SMEs General Authority, also known as Monsha'at, highlights the importance of analysing this thriving entrepreneurial environment. As of the first quarter of 2023, the total number of SMEs in Saudi Arabia surpassed 1.2 million, representing an astounding increase of 4.8% compared to the preceding quarter of 2022. Geographically, SMEs are not distributed uniformly across the nation. Riyadh, the capital, leads with 41.4% of the total population of SMEs, followed by Makkah with 18.1% and the Eastern Province with 11.1%. The remaining cities account for 29.4% of SMEs collectively. More than 88,000 new SMEs were established in Saudi Arabia

during the first quarter of 2023, ushering in diverse products and services (Monsha'at, 2023; Takla & Walid, 2023) The table below shows the population of SMEs according to the regions.

Table 3.1
Small and Medium Enterprises in Saudi Arabia

Total Population		**1,200,000**
Riyadh	41.40%	496,800
Makkah	18.10%	217,200
Eastern Province	11.10%	133,200
Other Cities	29.40%	352,800

3.3.6 Sampling Techniques

Probability sampling and non-probability sampling are the two primary categories of sampling techniques. In probability sampling, every member of the population has an equal chance of being selected for inclusion. An exhaustive list of all population elements is required to execute probability sampling. During the data collection procedure, non-probability sampling does not provide an equal chance of selection to all elements of the target population (Pace, 2021).

Probability sampling is most prevalent in survey research, where inferences must be derived from the data to answer research questions and achieve research objectives. The probability sampling procedure consists of four steps: identifying an appropriate sampling frame, determining an appropriate sample size, selecting the sample using the most appropriate sampling technique, and ensuring that the sample is representative of the population. A sampling frame is an exhaustive inventory of all population elements from which a sample is drawn. A sampling frame is required for probability sampling. Probability sampling cannot be used if no sampling frame exists (Sandstrom-Mistry et al., 2023). The total population of this study could not be accessed, so the probability sampling was not possible.

For many businesses and market surveys, obtaining a list of the sampling frame's elements may be impossible. Non-probability sampling provides alternative sampling techniques when a sample frame cannot be created. In non-probability sampling, the probability of selecting each member of the study's target population is unequal. Due to

the inaccessibility of the sampling frame, non-probability sampling was the most suitable method for conducting this investigation. Therefore, non-probability sampling was employed for this investigation (Pace, 2021).

Purposive sampling refers to selecting respondents based on their suitability for the study to answer research questions and achieve research objectives. The decision to include or exclude cases from the analysis is therefore crucial. There are various types of purposive sampling. Extreme case sampling is utilized when respondents are selected based on their unusual characteristics and their ability to provide the best answers to research inquiries. Heterogeneous or maximum variation is employed when participants with dissimilar characteristics are chosen to provide maximum data variation. In contrast to homogeneous sampling, heterogeneous sampling exists. In homogeneous sampling, the focus is on a limited group of individuals with similar characteristics. The critical case sampling method selects important critical cases for research. Focus is placed on comprehending what is happening in each critical instance, and generalizations are drawn from specific cases (Campbell et al., 2020).

Probability sampling was not feasible because there was insufficient data on the target population. Therefore, the decision was made to employ non-probability sampling. To determine which non-probability sampling technique best fits this study, the techniques for non-probability sampling was examined. Purposive sampling was found to be the best method for this kind of research. Purposive sampling was selected because data were collected from entrepreneurs who founded SMEs in Saudi Arabia, all sharing similar characteristics such as founding an SME, using technology in their business, and being based in Saudi Arabia.

3.4 Sample Size Measurement

The total number of SMEs in Saudi Arabia exceeds 1.2 million. There are 847,200 small and medium-sized enterprises in Riyadh, Makkah, and the Eastern Province. For the objectives of this study, these three regions comprise the target population, primarily due to their collective representation of over 70% of all SMEs in Saudi Arabia and the practical considerations of accessibility and financial constraints associated with data collection. In accordance with the recommendations of Krejcie and Morgan (1970), a sample size of 384 was regarded as adequate to represent this population of SMEs.

In survey research, the response rate is crucial because it directly influences the ability to draw conclusions that accurately reflect the target population's characteristics. Before disseminating the questionnaires, it is necessary to account for the possibility of non-response. Non-response can occur at different levels, including complete refusal (when no questions are answered), break-off (when fewer than fifty percent of questions are answered), partial response (when fifty to eighty percent of questions are answered), and complete response (when all or more than eighty percent of questions are answered). Respondent refusal to answer all queries is the most frequently cited reason for non-responsiveness. Saunders et al. (2019) provide the formula n = (sample size/response rate) for determining the optimal number of questionnaires to disseminate when a response rate of 80 percent is anticipated. According to this formula, 480 questionnaires would be required to obtain an 80% response rate for this study. Table 3.2 below presents the sample size per region.

Table 3.2
Sample Size per Region

Total Population		**1,200,000**	**Target Population**	**Sample Size per Region**
Riyadh	41.40%	496800	58.64%	281
Makkah	18.10%	217200	25.64%	123
Eastern Province	11.10%	133200	15.72%	76
Total		847,200		480

A number of 281 people were contacted in Riyadh city. 123 people are contacted in Makkah city, and a total of 76 people are contacted in the Eastern Province.

3.5 Data Collection Instrument

This research employed a cross-sectional study design, which was reflected in the choice of research instruments. This study's data collection procedure comprised of two distinct phases. Initially, a pilot questionnaire study was conducted to confirm that participants understood all survey questions. Subsequently, rigorous data collection was conducted to collect information for both descriptive and inferential statistical analyses.

3.5.1 Questionnaire

According to Vaus (2014), the most effective method for conducting surveys is to use questionnaires. In this procedure, each participant is presented with a predetermined set of questions in a specific order. The telephone questionnaires and online surveys are examples of data collection methods that can occur with or without the researcher's physical presence. This method assures that each respondent answers the same number of questions, making it the most popular data collection technique in the context of survey strategies. Nonetheless, it is crucial to exercise caution during data collection, as there is usually no opportunity for the researcher to acquire data from the same participants a second time.

This study aimed to collect data from SME founders in Saudi Arabia using interviewer-completed questionnaires and self-completed questionnaires. Data collection was administered by the researcher personally. This decision was based on logistical considerations, as scheduling appointments with candidates may prove difficult. Therefore, the researcher contacted and visited the respondents in person. However, it was worth noting that many founders had hectic daily schedules, so the self-completed questionnaire technique was also utilized where necessary.

3.5.2 Questionnaire Form

The questionnaire items for this study were adapted from previous studies, as summarised in Table 3.4. The questions for the entrepreneurial bricolage were adapted from the study of Senyard et al. (2014). The questions for the green entrepreneurial orientation were adapted from the study of Muangmee et al. (2021). The study of Cai and Li (2018) was used to adapt the questions related to ecological innovation. The questions for the entrepreneurial mindset were taken and adapted from the study of Li et al. (2016). The questions for entrepreneurial self-efficacy were adapted from the study of Wang et al. (2020) and finally, the questions for digital entrepreneurial intention were taken and adapted from the study of Nguyen and Nguyen (2024).

The results of the study of Eutsler and Lang (2015) indicate that the design of a scale has a substantial effect on the statistical properties of response data, highlighting the vital importance of designating all scale points. When all points on a scale are labelled, response bias is effectively reduced, variance is maximized, statistical power

is increased, and error is decreased. In addition, the analysis of the same study indicates that variance tends to be greatest when the scale is set to seven points. Although researchers commonly believe that increasing the number of scale points will increase variance, their findings refute this notion. It does not appear that increasing the number of scale points beyond seven will further increase variance. In conclusion, using a completely labelled 7-point scale may provide the greatest benefits in optimizing data quality and statistical properties for researchers. The 7-point Likert scale was also used by Ramayah et al. (2013), as it is fairly representative of respondents' feedback (Lo et al., 2013), and is the optimal scale type (Fauzi et al., 2019). The following table 3.3 presents the questionnaire form for this study:

Table 3.3
Questionnaire Form

Please tick (/) the best box according to your information.		
Email/mobile (optional)		
Gender	a) Male ☐	b) Female ☐
Age	18 years to 25 years	☐
	26 years to 35 years	☐
	36 years to 45 years	☐
	Above 45 years	☐
Marital Status	Married	☐
	Unmarried	☐
	Widowed	☐
Education Level	Below Matric	☐
	Intermediate	☐
	Bachelors	☐
	Masters or above	☐

Please answer all the questions and tick (/) on the number that best reflects your opinion.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

Entrepreneurial Bricolage (Senyard et al., 2014)								
Code	Items	1	2	3	4	5	6	7
EB1	We are confident of our ability to find workable solutions to new challenges by using our existing resources.							
EB2	We gladly take on a broader range of challenges than others with available resources.							
EB3	We use any existing resource that seems useful to responding to a new problem or opportunity.							
EB4	We deal with new challenges by applying a combination of existing and new resources available to us.							
EB5	When dealing with new problems or opportunities we take action by assuming that we will find a workable solution.							
EB6	By combining our existing resources, we take on a surprising variety of new challenges.							
EB7	When we face new challenges, we put together workable solutions from our existing resources.							
EB8	We combine resources to tackle new challenges that the resources weren't originally intended to tackle.							
Green Entrepreneurial Orientation (Muangmee et al., 2021)								
GEO1	Our organization uses less or non-polluting/toxic materials.							
GEO2	Our organization has a strong tendency for high-risk green product development projects which have a chance for very high returns.							
GEO3	Our organization strongly emphasizes on green R&D.							
GEO4	Our organization tends to initiate green actions for competitors to respond to.							
GEO5	Our organization has a tendency to be a market leader, always first in introducing green products, services, or technologies.							
Ecological Innovation (Cai & Li, 2018)								
EI1	We use low energy consumption such as water, electricity, gas, and petrol during production/use/disposal.							
EI2	We recycle, reuse, and remanufacture material.							
EI3	We use cleaner technology to create savings and prevent pollution.							

Entrepreneurial Bricolage (Senyard et al., 2014)	
EI4	The manufacturing process in our organization effectively reduces the emissions of hazardous substances and waste.
EI5	The manufacturing process in our organization reduces the use of raw material.
Entrepreneurial Mindset (Li et al., 2016)	
EM1	My career goal is to become excellent at my job.
EM2	My career goal is to become excellent with an entrepreneurial mindset.
EM3	I'd like to take some entrepreneurship courses whenever feasible for me.
Entrepreneurial Self-Efficacy (Wang et al., 2020)	
ESE1	I possess the ability to be a leader.
ESE2	I can make others agree with my thoughts.
ESE3	I can find work partners who complement my ability.
ESE4	I can have pleasant conversations with my work partners.
ESE5	I have the ability to make decisions after deliberation.
Digital Entrepreneurial Intention (Nguyen & Nguyen, 2024)	
DEI1	I am ready to do anything to be a digital entrepreneur.
DEI2	I will make every effort to start and run my own digital business.
DEI3	I am determined to create a digital business venture in the future.
DEI4	My professional goal is to be a digital entrepreneur.

The reliability values of the above variables with given items in previous studies are presented in Table 3.4 below:

Table 3.4
Reliability Values of Variables from Previous Studies

Variable	Reference	Reliability Value	Number of Items
Entrepreneurial Bricolage	Senyard et al. (2014)	0.82	8
Green Entrepreneurial Orientation	Muangmee et al. (2021)	0.732	5
Ecological Innovation	Cai and Li (2018)	0.722	5

Variable	Reference	Reliability Value	Number of Items
Entrepreneurial Mindset	Li et al. (2016)	0.692	3
Entrepreneurial Self-Efficacy	Wang et al. (2020)	0.83	5
Digital Entrepreneurial Intention	(Nguyen & Nguyen, 2024)	0.773	4

3.6 Validity and Reliability

Design and structure of the questionnaire have a significant impact on the internal validity and reliability of the data collected for analysis. A valid questionnaire permits the precise accumulation of data that precisely measures the variables of interest. As detailed by Saunders et al. (2019), it indicates that the questionnaire items pertaining to a specific variable accurately measure that variable and that responses are collected consistently.

The formulation of questions and subsequent responses has a direct impact on the reliability of data. According to Foddy (1993), it is crucial that respondents comprehend the queries as intended by the researcher and that the researcher interprets the responses as intended by the respondent. This emphasizes the significance of adhering to four crucial measures to ensure the reliability and validity of a questionnaire. First, the researcher must first have a firm grasp of the data requirements and formulate questions accordingly. Second, the respondent must interpret the questions the same way the researcher intended. Third, the respondent provides accurate responses to the questions. Lastly, the researcher interprets the respondent's responses in the manner intended by the respondent (Foddy, 1993).

3.6.1 Pre-Testing

The questionnaire form was sent to a panel of experts to assess the potential issues in the questionnaire regarding its readability, relevancy, and expected feedback. The experts validated the questionnaire and ensured there were no potential validity and reliability issues in the questionnaire.

3.6.2 Pilot Testing

After questionnaire validation, a pilot test on 10 to 20 percent of the original sample should be conducted to further enhance the validity and reliability of the questionnaire (Baker, 1994). So, a pilot test was performed on 30 usable questionnaires after distributing 35 questionnaires. After collecting pilot data, a preliminary evaluation was conducted to determine the questionnaire's validity and reliability, allowing for any necessary improvement of the survey instrument. The pilot test results suggested that the research measures were reliable and valid to measure the observed research constructs. The Cronbach's alpha values of all research constructs in the pilot test exceeded the threshold of 0.70 (Hair et al., 2019), with all values above 0.8. The reliability statistics of the pilot test are presented in Table 3.5. As the pilot test results indicated acceptable reliability and validity across all constructs, no modifications to the questionnaire were required prior to the main data collection. Validity and reliability evaluations were conducted again after collecting the data for the actual data collection for this study.

Table 3.5
Reliability statistics of Pilot Test

Constructs	**Cronbach's Alpha**
Entrepreneurial Bricolage	0.837
Green Entrepreneurial Orientation	0.859
Ecological Innovation	0.875
Entrepreneurial Mindset	0.841
Entrepreneurial Self-Efficacy	0.908
Digital Entrepreneurial Intention	0.890

3.7 Data Analysis Tools

Using Microsoft Excel, the data underwent an initial cleaning procedure. The Statistical package for the social sciences (SPSS) was utilized for demographic and descriptive analysis (Nie et al., 1968). Using SmartPLS 4, Structural Equation Modelling (SEM) was used to conduct inferential analysis (Kline, 2016; Ringle et al., 2005). Thus, the hypothetical analyses using the SmartPLS procedure were used in this

study, which provided two distinct test sets. The evaluation of outer loadings, internal consistency reliability, convergent validity, and discriminant validity were included in the first group. In the second phase, the structural model evaluation was conducted. In accordance with the methods defined by Ramayah et al. (2018), this phase involved examining multicollinearity, coefficient of determination, predictive relevance, predictive accuracy, effect sizes, model fit, and employing the bootstrapping method for relationship testing.

3.8 Chapter Summary

This chapter conducted a comprehensive examination of the research methodology underlying this study. Beginning with an introduction, the stage was set for a comprehensive examination of the employed research methods and instruments. The purpose of this chapter was to outline precisely how the research was conducted. The research onion was presented and discussed, which helped to structure the research methodology's various components. Within this framework, chosen research philosophy was further explored, and outlined the guiding principles for this study. Research strategy and methodology were described to illustrate their alignment with the research aims. In addition, the time frame was discussed within which the research was conducted. To shed light on the selection of study participants, population and sampling considerations were addressed. The design and selection of the data collection instrument were explained, emphasizing on the instrument's relevance to the research objectives. The format and content of the used questionnaire were also described in detail. Ensuring the validity and reliability of the data was a key priority, so the measures taken to achieve this were discussed. Finally, the data analysis tools and methods that were used were introduced, providing the groundwork for subsequent chapters in which conclusions were drawn from the collected data.

CHAPTER 4
DATA ANALYSIS AND FINDINGS

4.1 Introduction

The fourth chapter of this study discussed different statistical data analysis techniques employed in this research. Based on these statistical data analyses, findings and their interpretations were presented in this research. Statistical data analyses were divided into two parts, data validation procedures, and hypotheses testing using PLS-SEM. Data validation procedures were performed on IBM SPSS. The data validation procedure involved data cleaning, response rate analysis, data normality analysis, and a demographic profile of the sample. Then, PLS-SEM was performed to examine the hypothesized structural relationship paths. The PLS-SEM framework of this research was reflective, and it was performed on SmartPLS 4. The PLS-SEM analysis was then conducted in two stages through its measurement model and structural model. The measurement model was assessed through internal consistency reliability and convergent and discriminant validity statistics of research constructs and their respective indicators. The structural model was assessed through analysing multicollinearity between constructs, predictive accuracy of the research model, effect size of independent variables on dependent variables, predictive relevance of the research model through blindfolding and PLS-predict, overall model fit, and structural path coefficients. The hypothesized relationship paths were tested through a bootstrapping procedure, by observing beta coefficients, t values, significance levels, and lower and upper confidence intervals of direct and indirect path coefficients.

4.2 Data Validation Procedure

Data validation is a crucial step to ensure data quality before performing statistical analysis. It helps to filter out problematic responses that can affect the accuracy, consistency, and reliability of collected data and its statistical analyses. These data inconsistencies and inaccuracies can arise at any stage of data collection or data entry. If they are not treated properly, they can ruin the statistical analyses by generating

misleading and erroneous results. Hence, it is important to undergo certain data validation procedures to ensure data integrity. These procedures involve careful data monitoring and evaluation analyses to eliminate biased, extremely non-normal, and outlying responses from the dataset (Hair et al., 2019). Some of these analyses were also performed in this research to evaluate response bias and data quality. Data validation procedures of this research included cleaning of incomplete responses, checking missing values, analysing descriptive statistics, and observing data normality. All of these analyses have been discussed in detail in the following sub-sections.

4.2.1 Data Cleaning and Response Rate

Research data were collected from entrepreneurs of SMEs of Saudi Arabia operating in regions of Riyadh, Makkah, and Eastern Province. 480 questionnaires were distributed in these regions based on purposive sampling. The samples distribution and their response rates are provided in Table 4.1.

Table 4.1
Response Rate

Region	Questionnaires Distributed	Questionnaires Received	Questionnaires Removed	Final Sample	Response Rate
Riyadh	281	256	16	240	85.41%
Makkah	123	110	7	103	83.74%
Eastern Province	76	50	3	47	61.84%
Total	480	416	26	390	81.25%

Results presented in Table 4.1 indicate that the highest response rate was in Riyadh (85.41%) followed by Makkah (83.74%), and then Eastern Province (61.84%). In Riyadh, 256 questionnaires were received out of 281 distributed questionnaires, and after removing 16 improperly filled questionnaires, 240 were included in the final sample. In Makkah, 110 questionnaires were received out of 123 distributed questionnaires, and after removing 7 improperly filled questionnaires, 103 were included in the final sample. In Eastern Province, 50 questionnaires were received out of 76 distributed questionnaires, and after removing 3 improperly filled questionnaires,

47 were included in the final sample. Overall, 416 questionnaires were received out of 480 distributed questionnaires, and after removing 26 improperly filled questionnaires, 390 were included in the final sample, generating an overall response rate of 81.25%, which exceeds the acceptable threshold of 80% (Saunders et al., 2019).

4.2.2 Descriptive Analysis

Descriptives were analysed to assess Saudi Arabian entrepreneurs' tendency of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, entrepreneurial self-efficacy, and digital entrepreneurial intention. IBM SPSS was used to analyse the descriptive statistics of research constructs in terms of number of observations, minimum response value, maximum response value, mean and standard deviation from mean values. Table 4.2 provides descriptive analysis statistics of this research.

Table 4.2
Descriptive Analysis

Constructs	Observations	Min.	Max.	Mean	Standard Deviation
Entrepreneurial Bricolage	390	1	7	4.50	1.375
Green Entrepreneurial Orientation	390	1	7	4.85	1.151
Ecological Innovation	390	1	7	4.52	1.318
Entrepreneurial Mindset	390	1	7	5.11	1.379
Entrepreneurial Self-Efficacy	390	1	7	4.43	1.483
Digital Entrepreneurial Intention	390	1	7	4.85	1.283

Note. Mean values: 1: lowest; 2-3: lower; 4: neutral; 5-6: higher; 7: highest

Results presented in Table 4.2 indicate that the total number of observations in all research variables was 390. Hence, there were no missing values in the collected dataset. Minimum and maximum values of each construct indicate that cases with the lowest and highest possible levels of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, entrepreneurial self-efficacy, and digital entrepreneurial intention were part of the research sample. Mean values further indicate that the majority of respondents exhibited largely neutral levels

of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial self-efficacy, and digital entrepreneurial intention. Only responses of an entrepreneurial mindset were towards the higher end.

4.2.3 Normality Analysis

Normality analysis was performed to analyse data symmetry and outliers through skewness and kurtosis statistics respectively. IBM SPSS was used to analyse univariate skewness and kurtosis statistics and respective standard errors of research constructs. Theoretically in an ideal situation, skewness statistics of a normally distributed dataset should be 0, and kurtosis statistics should be 3. Practically, skewness and kurtosis statistics from -1.00 to +1.00 are desired for an equally distributed and symmetrical bell curve. If kurtosis statistics are less than 3 then the dataset is considered platykurtic, and if kurtosis statistics are more than 3 then the dataset is considered leptokurtic (Tabachnick et al., 2007). A platykurtic dataset highlights the absence of outliers, and a leptokurtic dataset highlights the presence of outliers in a dataset. Univariate normality analysis of this research is presented in Table 4.3.

Table 4.3
Univariate Normality Analysis

Constructs	**Skewness**		**Kurtosis**	
	Statistics	SE	Statistics	SE
Entrepreneurial Bricolage	-.588	.124	-.440	.247
Green Entrepreneurial Orientation	-.609	.124	.139	.247
Ecological Innovation	-.479	.124	-.467	.247
Entrepreneurial Mindset	-.888	.124	.359	.247
Entrepreneurial Self-Efficacy	-.442	.124	-.555	.247
Digital Entrepreneurial Intention	-.552	.124	-.250	.247

Note. SE: Standard Error.

Statistics presented in Table 4.3 indicate that univariate skewness statistics of all research variables fall within the desired range of ±1. However, all of these research variables were negatively skewed. Statistics further indicate that kurtosis statistics of all research variables were within the desired range of ±1. Therefore, the dataset of this

study is platykurtic, as all the kurtosis statistics are less than 3, and there is no issue of outliers in the dataset. Moreover, kurtosis statistics of green entrepreneurial orientation and entrepreneurial mindset were positive, and kurtosis statistics of entrepreneurial bricolage, ecological innovation, entrepreneurial self-efficacy, and digital entrepreneurial intention were negative. Overall, skewness and kurtosis statistics suggest that the distribution of this research's dataset was symmetrical and univariate normal.

4.2.4 Demographic Profile

In the respondents' demographic profile, their gender, age, marital status, and education level of Saudi Arabian entrepreneurs were observed. A detailed demographic profile is provided in Table 4.4 in terms of frequency and percentage of respondents in each demographic category. Results presented in Table 4.4 indicate that the majority of respondents were men (n=368, 94.36%), and most of them were married (n=298, 76.41%). In terms of age, the majority of respondents were between 26 and 35 years old (n=222, 56.92%), followed by those between 36 and 45 years old (n=117, 30.00%). The majority of respondents held bachelor's degrees (n=316, 81.04%), followed by those with masters or above (n=46, 11.79%).

Table 4.4
Demographic Profile

Demographics	**Categories**	**Frequency**	**Percentage**
Gender	Men	368	94.36
	Women	22	5.64
Age	18 - 25 years	16	4.10
	26 - 35 years	222	56.92
	36 - 45 years	117	30.00
	Above 45 years	35	8.98
Marital Status	Unmarried	53	13.59
	Married	298	76.41
	Widowed	39	10

Demographics	Categories	Frequency	Percentage
Education Level	Below Matric	7	1.79
	Intermediate	21	5.38
	Bachelors	316	81.04
	Masters or above	46	11.79

4.3 Partial Least Squares Structural Equation Modelling

There were several reasons to apply PLS-SEM in this study. Firstly, mediation was examined in the conceptual framework of this research, so either covariance-based structural equation modelling (CB-SEM) or PLS-SEM can be applied. Each of these techniques has its own set of assumptions to be fulfilled before their application. It is recommended that CB-SEM should be applied if the research goal is to test, confirm, or compare existing theories (Hair et al., 2014; Hair et al., 2011). However, PLS-SEM should be applied if the research is exploratory, its aim is to extend an existing theory; or if the research goal is either to predict variables or to identify predictor variables. In consideration of these assumptions, PLS-SEM was deemed most suitable for testing the research framework of this study. Particularly, this study was exploratory of the complex interrelationships between existing predictors of digital entrepreneurial intention rather than confirmatory (not designed to test the theory of planned behaviour).

The SmartPLS 4 was used to perform PLS-SEM of this research. PLS algorithm, bootstrapping, blindfolding, and PLS-predict were conducted to assess the research model. Bootstrapping was based on the 'percentile bootstrap confidence interval' method, 5000 bootstrap samples and the two-tailed significance level. The PLS algorithm was based on a path weighting scheme and 3000 iterations. PLS-SEM results were then divided into measurement model and structural model and are discussed in detail in their respective sections. Figure 4.1 presents a summary of key measurement model and structural model statistics.

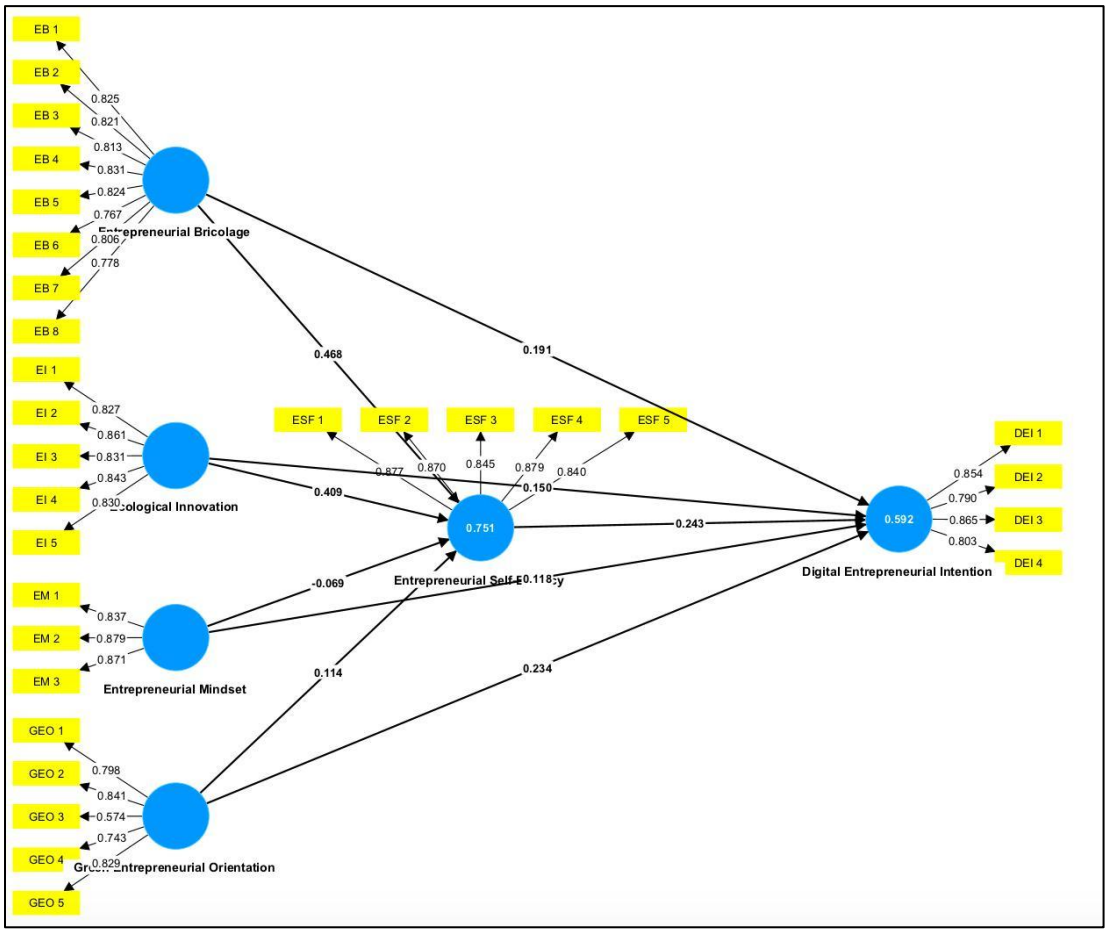

Figure 4.1 PLS-SEM Measurement and Structural Model

4.3.1 Evaluation of Measurement Model

The measurement model or outer model in PLS-SEM is comprised of items or indicators of research constructs (Garson, 2016). The measurement model is assessed through analysing reliability and validity statistics of research constructs. As the constructs of this research were reflective in nature, the measurement model of this research was assessed through confirmatory factor analysis. Confirmatory factor analysis generates various statistics to assess the reliability and validity of research instruments, and to analyse the relationship between observed research constructs and their reflective indicators. Therefore, the accuracy of the measurement model of this research was assessed through analysing internal consistency reliability (Cronbach's alpha and composite reliability), convergent validity (outer loadings and AVE), and discriminant validity (HTMT) of research constructs (Hair et al., 2017).

4.3.1.1 Internal Consistency Reliability

Internal consistency reliability was checked through Cronbach's alpha and composite reliability statistics. Confirmatory factor analysis in SmartPLS 4 provides three statistics to analyse internal consistency reliability: Cronbach's alpha, Rho_A, and Rho_C. Both Rho_A and Rho_C are indicators of composite reliability. Specifically, Rho_A is a reliability coefficient that accounts for the actual weights of indicators, while Rho_C represents composite reliability based on the construct's shared variance (Hair et al., 2017). The threshold limits of all these reliability parameters are the same. Ideally in exploratory research, the reliability statistics of research constructs should be above 0.6 and less than 0.9 (Nunnally & Bernstein, 1994) The internal consistency reliability statistics below 0.6 are highly undesirable (Hair Jr et al., 2014). Because a reliability statistic below 0.6 indicates that the research construct is not fully measured by its observed indicators (Sekaran & Bougie, 2016).

Table 4.5
Internal Consistency Reliability

Constructs	**Cronbach's Alpha**	**Rho_A**	**Rho_C**
Entrepreneurial Bricolage	0.924	0.926	0.938
Green Entrepreneurial Orientation	0.814	0.818	0.873
Ecological Innovation	0.894	0.896	0.922
Entrepreneurial Mindset	0.829	0.844	0.897
Entrepreneurial Self-Efficacy	0.914	0.914	0.936
Digital Entrepreneurial Intention	0.848	0.859	0.897

Internal consistency reliability statistics of this research are provided in Table 4.5. Results presented in Table 4.5 highlight that Cronbach's alpha, and composite reliability (Rho_A and Rho_C) statistics of research constructs are above 0.7. While some values exceed 0.9, they remain below 0.95, indicating no redundancy among indicators (Hair et al., 2014). Hence, all constructs of this research are reliable, and they are adequately represented by their respective indicators.

4.3.1.2 Convergent Validity

Correlation between indicators of a research construct was assessed through analysing convergent validity of research constructs (Hair et al., 2014; Sekaran & Bougie, 2016). Confirmatory factor analysis provides two statistics to analyse convergent validity: indicators' outer loadings and average variance extracted (AVE) of research constructs. Outer loadings facilitate in analysing convergent validity on the indicator level of a research construct. However, AVE facilitates analysing convergent validity on the construct level (Hair et al., 2014). Therefore, convergent validity in this research was analysed through outer loadings of indicators, and AVE of research constructs.

Convergent validity at an indicator's level, also known as individual indicator reliability, can be assessed through analysing outer loadings of a construct's indicators. An item will be considered a reliable indicator of a construct if its outer loading is above 0.7. The higher the outer loading achieved, the better the indicator the item will be. However, the outer loadings below 0.7 and above 0.4 are also acceptable, if removing that item does not increase AVE and composite reliability, and current AVE and composite reliability statistics are already satisfactory enough (Hair et al., 2014). Following this parameter, items with outer loadings less than 0.7 and more than 0.5 were also retained.

Convergent validity at a construct level can be assessed through analysing the AVE statistic of a construct. An AVE of a construct should be above 0.5 to for convergent validity to be established. If an AVE of a particular construct is below 0.5, items with poor outer loadings will be removed from that construct until the AVE of the construct improves. During the item deletion it should also be ensured that the reliability statistics of that construct remain satisfactory (Hair et al., 2014). Convergent validity statistics of all research constructs are provided in Table 4.6.

Results presented in Table 4.6 indicate that the individual indicator reliability is satisfactory. As outer loadings of all research constructs are above 0.7 except one item in green entrepreneurial orientation, GEO3. It is still acceptable, because it is above 0.5 and AVE of green entrepreneurial orientation is also above 0.5 (Hair et al., 2014). Hence, none of the items were deleted and all were retained. Results in Table 4.6 further indicate that the AVE of all research constructs was above 0.5 and satisfactory. Hence,

convergent validity of the measurement model was established both at the indicator and construct level.

Table 4.6
Convergent Validity

Constructs and Indicators	**Loadings**	**AVE**
Entrepreneurial Bricolage		0.654
EB1	0.825	
EB2	0.821	
EB3	0.813	
EB4	0.831	
EB5	0.824	
EB6	0.767	
EB7	0.806	
EB8	0.778	
Green Entrepreneurial Orientation		0.583
GEO1	0.798	
GEO2	0.841	
GEO3	0.574	
GEO4	0.743	
GEO5	0.829	
Ecological Innovation		0.703
EI1	0.827	
EI2	0.861	
EI3	0.831	
EI4	0.843	
EI5	0.830	
Entrepreneurial Mindset		0.744
EM1	0.837	
EM2	0.879	
EM3	0.871	
Entrepreneurial Self-Efficacy		0.744
ESE1	0.877	

Constructs and Indicators	Loadings	AVE
ESE2	0.870	
ESE3	0.845	
ESE4	0.879	
ESE5	0.840	
Digital Entrepreneurial Intention		0.687
DEI1	0.854	
DEI2	0.790	
DEI3	0.865	
DEI4	0.803	

4.3.1.3 Discriminant Validity

Discriminant validity can be defined as the absence of a strong correlation between two constructs. It ensures that constructs within an observed framework are distinct from each other (Sekaran, 2003). Confirmatory factor analysis in SmartPLS 4 provides three indicators to analyse discriminant validity: the Fornell-Larcker criterion, cross loadings, and the heterotrait-monotrait ratio of correlations (HTMT). HTMT is a relatively recent parameter to analyse discriminant validity. Henseler et al. (2015) consider it as a superior parameter to assess the discriminant validity of a measurement model. Hence, in consideration of its superiority, HTMT was employed in this research to assess the discriminant validity of research constructs. HTMT results of this research are provided in Table 4.7. It is advised that to establish discriminant validity of a research model, HTMT value should not be more than 0.9 (Roemer et al., 2021). If any HTMT value is above 0.9, it indicates the issue of multicollinearity between those two constructs. Results presented in Table 4.7 suggest that none of the HTMT values were above 0.9, with the majority of values remaining well below the threshold. Hence, discriminant validity between all research constructs was established.

Table 4.7
Discriminant Validity

Constructs	HTMT					
	EB	GEO	EI	EM	ESE	DEI
Entrepreneurial Bricolage (EB)	-					
Green Entrepreneurial Orientation (GEO)	0.565	-				
Ecological Innovation (EI)	0.884	0.622	-			
Entrepreneurial Mindset (EM)	0.576	0.400	0.528	-		
Entrepreneurial Self-Efficacy (ESE)	0.890	0.623	0.900	0.445	-	
Digital Entrepreneurial Intention (DEI)	0.764	0.696	0.770	0.540	0.779	-

4.3.2 Evaluation of Structural Model

In SmartPLS 4, the interrelationships between research constructs or variables can be assessed through the structural model (also known as the inner model) of PLS-SEM (Garson, 2016). Therefore, the overall model fit and research hypotheses were tested in view of the PLS-SEM's structural model statistics. SmartPLS 4 provides several statistics to assess model fit of the research framework. SmartPLS 4 also provides several statistics of direct paths and specific indirect effects to assess the interrelationships between research constructs. Accordingly, research hypotheses were tested in light of the direct and indirect beta coefficient values, t statistics, significance level, and confidence interval limits of a particular relationship path.

4.3.2.1 Multicollinearity

Multicollinearity is the very first parameter to assess in the research's structural model (Hair et al., 2014). SmartPLS 4 provides inner variance inflation factor (VIF) statistics to assess the multicollinearity of reflective PLS-SEM. A VIF statistic should be between 1 and 5 to affirm the absence of any probable multicollinearity between observed constructs (Hair et al., 2014). A VIF statistic above 5 can be problematic in small samples, as it indicates the presence of multicollinearity between research constructs. But in large samples, VIF statistics between 5 and 10 can also be accepted (Hair et al., 2014). Inner VIF statistics of this research are provided in Table 4.8. Results

presented in Table 4.8 highlight that VIF statistics of all research constructs are between 1 and 5 for entrepreneurial self-efficacy and digital entrepreneurial intention.

Table 4.8
Inner VIF Statistics

Constructs	Entrepreneurial Self-Efficacy	Digital Entrepreneurial Intention
Entrepreneurial Bricolage	3.101	3.980
Green Entrepreneurial Orientation	1.436	1.488
Ecological Innovation	3.085	3.757
Entrepreneurial Mindset	1.376	1.395
Entrepreneurial Self-Efficacy		4.016

4.3.2.2 Predictive Accuracy

Predictive accuracy of a research model is universally calculated through the model's coefficient of determination or R^2. R^2 is an absolute indicator of assessing the predictive power of all independent constructs in predicting their respective dependent constructs. Though R^2 statistics can range from 0 to 1, higher statistics indicate better predictive accuracy of the research model (Hair et al., 2014). The appropriate R^2 statistics usually vary depending on the research context. However, generally R^2 statistics of 0.25 are considered weak, 0.5 are considered moderate, and 0.75 are considered substantial (Hair et al., 2011; Henseler et al., 2009). Predictive accuracy statistics of the structural model of this research are presented in Table 4.9.

Table 4.9
Predictive Accuracy of Structural Model

Constructs	R^2	R^2 Adjusted	Predictive Accuracy
Entrepreneurial Self-Efficacy	0.751	0.748	Substantial
Digital Entrepreneurial Intention	0.592	0.586	Moderate

Results presented in Table 4.9 suggest that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset collectively explain 75.1% of the variance in the levels of entrepreneurial self-efficacy.

Furthermore, all these variables along with entrepreneurial self-efficacy explain 59.2% of the variance in levels of digital entrepreneurial intention. Overall, the predictive accuracy of the structural model of this research was in the acceptable range.

4.3.2.3 Effect Size (f^2)

Effect sizes or f^2 statistics of independent constructs help to assess their contribution in determining predictive accuracy of dependent constructs. Effect sizes or f^2 statistics of 0.02, 0.15, and 0.35 are considered small, medium, and large respectively (Cohen, 1988). Effect sizes of independent constructs on predictive accuracy of dependent constructs of this research are presented in Table 4.10.

Table 4.10
Effect Size of Independent Constructs on Predictive Accuracy of Dependent Constructs

Constructs	**Entrepreneurial Self-Efficacy**	**Digital Entrepreneurial Intention**
Entrepreneurial Bricolage	0.283	0.022
Green Entrepreneurial Orientation	0.037	0.090
Ecological Innovation	0.218	0.015
Entrepreneurial Mindset	0.014	0.025
Entrepreneurial Self-Efficacy		0.036

Note. Effect size: Small: 0.02; Medium: 0.15; Large: 0.35

Results presented in Table 4.10 highlight that entrepreneurial bricolage (f^2=0.283) and ecological innovation (f^2=0.218) had medium contributions, and green entrepreneurial orientation (f^2=0.037) had small contribution in determining predictive accuracy of entrepreneurial self-efficacy. The entrepreneurial mindset was found not to contribute much (f^2=0.014) in determining predictive accuracy of entrepreneurial self-efficacy. Moreover, entrepreneurial bricolage (f^2=0.022), green entrepreneurial orientation (f^2=0.090), entrepreneurial mindset (f^2=0.025), and entrepreneurial self-efficacy (f^2=0.036) had small contributions in determining predictive accuracy of digital entrepreneurial intention. Ecological innovation had a negligible effect (f^2=0.015) on the predictive accuracy of digital entrepreneurial intention.

4.3.2.4 Predictive Relevance through Q^2

Predictive relevance of the PLS-SEM structural model can be assessed through Stone-Geisser's Q^2 or PLS-Predict (Geisser, 1974; Stone, 1974). Stone-Geisser's Q^2 is also considered as an alternate indicator of goodness-of-fit index (GoF) in SmartPLS 4, as other GoF indicators are not appropriate model fit measures of PLS-SEM (Henseler & Sarstedt, 2013). Stone-Geisser's Q^2 is calculated through blindfolding in SmartPLS 4. Blindfolding is a sample reuse procedure that generates Q^2 statistics by excluding the data points from dependent constructs at a fixed interval and running the predictive relevance analysis with the remaining data points. Data points can be excluded at a distance of 5 to 10, ensuring that the sample size is not an integer after being divided by the exclusion distance. Predictive relevance of a PLS-SEM's structural model is established when Q^2 statistics generated through blindfolding are higher than 0. The higher the Q^2 value, the better the predictive relevance of the research model will be. Q^2 statistics of 0.02 indicate small, 0.15 indicate medium, and 0.35 indicate large predictive relevance of the research model (Hair et al., 2014). Predictive relevance statistics of the structural model of this research are provided in Table 4.11.

Table 4.11
Predictive Relevance of Structural Model through Q^2

Constructs	**SSO**	**SSE**	**Q^2 (=1-SSE/SSO)**	**Predictive Relevance**
Entrepreneurial Self-Efficacy	1950.000	871.458	0.553	Large
Digital Entrepreneurial Intention	1560.000	946.087	0.394	Large

Blindfolding in this research was performed at an exclusion distance of 7. Results presented in Table 4.11 highlight that the Q^2 statistics of entrepreneurial self-efficacy and digital entrepreneurial intention were more than 0, and the predictive relevance of both entrepreneurial self-efficacy (Q^2=0.553) and digital entrepreneurial intention (Q^2=0.394) was large. Hence, the predictive relevance of the structural model of this research was established and excluded data points were well accounted for in the path model of this research.

4.3.2.5 Predictive Relevance through PLS-Predict

PLS-predict was proposed by Shmueli et al. (2019) as an alternative measure to analyse predictive relevance of a research model. PLS-predict utilises holdout samples to generate case-wise predictions and to evaluate the predictive relevance of a research model. The procedure provides PLS prediction errors and LM (Linear model) prediction errors of all indicators of a dependent construct. Predictive relevance of a research model will be strong if PLS errors of all indicators are lower than their LM errors. Conversely, there will be no predictive relevance if PLS errors of all indicators are higher than LM errors. Moreover, predictive relevance of a research model will be moderate if PLS errors of the majority of indicators are lower than their LM errors, and it will be small if PLS errors of fewer indicators errors are lower than their LM errors (Shmueli et al., 2019). The predictive relevance of this research was analysed through a 10-fold PLS-predict. The results of predictive relevance of this research though PLS-predict are provided in Table 4.12. Results presented in Table 4.12 highlight that the PLS errors of all indicators of digital entrepreneurial intention were lower than their LM errors. Therefore, the predictive relevance of digital entrepreneurial intention and was strong, and the predictive relevance of this research model was not only established through blindfolding but also through PLS-predict.

Table 4.12
Predictive Relevance of Structural Model through PLS-Predict

Indicators	**PLS RMSE**	**LM RMSE**	**PLS-LM**	**Q^2_predict**
DEI1	1.263	1.288	-0.026	0.433
DEI2	1.299	1.324	-0.025	0.271
DEI3	1.144	1.159	-0.015	0.485
DEI4	1.450	1.484	-0.034	0.337

4.3.2.6 Model Fit

SmartPLS 4 provides several exact and approximate model fit indices, including: chi square, normed fit index (NFI), standardized root mean square residual (SRMR), and exact fit indices d_ULS and d_G. However, only NFI and SRMR were analysed in this research, as they are well-established and reliable indices of

approximate model fit in PLS-SEM, while other indices in SmartPLS 4 still require further testing and should be used cautiously (Hair et al., 2017).

NFI can appropriately measure the fitness of large and complex models, and its statistic should be above 0.90 for a better model fit (Bentler & Bonett, 1980). SRMR is a Goodness-of-Fit (GoF) indicator in SmartPLS 4, because it facilitates in avoiding misspecifications in a research model (Hensler et al., 2014). The standardized root mean square residual (SRMR) statistic should be below 0.08 for an acceptable model fit (Hu & Bentler, 1998). Model fit statistics of these indices are provided in Table 4.13 to assess the fitness of the structural model of this research.

Table 4.13
Fitness of Structural Model

Model Fit Indices	Saturated Model	Estimated Model
NFI	0.842	0.842
SRMR	0.061	0.061

Results presented in Table 4.13 indicate that the NFI statistics of both saturated and estimated models are below 0.9. These NFI statistics are below the 0.90 threshold. However, given that NFI is sensitive to model complexity and sample size in PLS-SEM, and the SRMR statistic confirms acceptable model fit, the overall model fit of this research is considered acceptable. However, SRMR statistics of both saturated and estimated models are below 0.08. The SRMR statistics are within the acceptable threshold and indicative of an acceptable model fit. These statistics further suggest that there was no issue of model misspecification, and all relationship paths were accurately specified in the observed model.

4.3.2.7 Hypothesis Testing

Research hypotheses were tested through analysing beta coefficients, t statistics, and significance levels of direct and specific indirect relationship paths. Notably, the significance levels are not sufficient for testing hypotheses (Hahn & Ang, 2017). All of these key direct and indirect path statistics of this research are presented in Table 4.14, and research hypotheses were accepted and rejected accordingly. Results of all research hypotheses are discussed in detail in their respective sections.

Table 4.14
Direct and Specific Indirect Relationship Paths

Hs	Relationships	B	SD	*t*	*p*
H1a	Entrepreneurial Bricolage → Digital Entrepreneurial Intention	0.191	0.074	2.573	0.010
H1b	Entrepreneurial Bricolage → Entrepreneurial Self-Efficacy → Digital Entrepreneurial Intention	0.114	0.035	3.277	0.001
H2a	Green Entrepreneurial Orientation → Digital Entrepreneurial Intention	0.234	0.052	4.469	0.000
H2b	Green Entrepreneurial Orientation → Entrepreneurial Self-Efficacy → Digital Entrepreneurial Intention	0.028	0.012	2.262	0.024
H3a	Ecological Innovation → Digital Entrepreneurial Intention	0.150	0.070	2.138	0.033
H3b	Ecological Innovation → Entrepreneurial Self-Efficacy → Digital Entrepreneurial Intention	0.099	0.032	3.062	0.002
H4a	Entrepreneurial Mindset → Digital Entrepreneurial Intention	0.118	0.042	2.832	0.005
H4b	Entrepreneurial Mindset → Entrepreneurial Self-Efficacy → Digital Entrepreneurial Intention	-0.017	0.009	1.894	0.058
H5	Entrepreneurial Self-Efficacy → Digital Entrepreneurial Intention	0.243	0.071	3.409	0.001

Note. β: Beta Coefficient; SD: Standard Deviation; *t*: T Statistic; *p*: Significance Statistic

Two relationship paths were hypothesized to test the direct and indirect relationships between entrepreneurial bricolage and digital entrepreneurial intention.

H1a: Entrepreneurial bricolage significantly impacts digital entrepreneurial intention.

H1b: Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention.

Results presented in Table 4.14 indicate entrepreneurial bricolage has a significantly positive relationship with digital entrepreneurial intention (β=0.191, *t*=2.573, *p*=0.010). Results further indicate that entrepreneurial self-efficacy significantly and positively mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention (β=0.114, *t*=3.277, *p*=0.001). Moreover, t values were ideal. Hence, both H1a and H1b were supported. These results suggest that entrepreneurial bricolage increases the digital entrepreneurial intentions of Saudi

Arabian entrepreneurs, and entrepreneurial self-efficacy strengthens this positive relationship.

Two relationship paths were hypothesized to test the relationship between green entrepreneurial orientation and digital entrepreneurial intention.

H2a: Green entrepreneurial orientation significantly impacts digital entrepreneurial intention.

H2b: Entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention.

Results presented in Table 4.14 indicate that green entrepreneurial orientation has a significantly positive relationship with digital entrepreneurial intention (β=0.234, *t*=4.469, *p*=0.000). Results further indicate that entrepreneurial self-efficacy significantly and positively mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention (β=0.028, *t*=2.262, *p*=0.024). Moreover, t values were ideal. Hence, both H2a and H2b were supported. These results suggest that green entrepreneurial orientation increases the digital entrepreneurial intentions of Saudi Arabian entrepreneurs, and entrepreneurial self-efficacy strengthens this positive relationship.

Two relationship paths were hypothesized to test the relationship between ecological innovation and digital entrepreneurial intention.

H3a: Ecological innovation significantly impacts digital entrepreneurial intention.

H3b: Entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intention.

Results presented in Table 4.14 indicate that ecological innovation has a significantly positive relationship with digital entrepreneurial intention (β=0.150, *t*=2.138, *p*=0.033). Results further indicate that entrepreneurial self-efficacy significantly and positively mediates the relationship between ecological innovation and digital entrepreneurial intention (β=0.099, *t*=3.062, *p*=0.002). Moreover, t values were ideal. Hence, both H3a and H3b were supported. These results suggest that ecological innovation increases the digital entrepreneurial intentions of Saudi Arabian entrepreneurs, and entrepreneurial self-efficacy strengthens this positive relationship.

Two relationship paths were hypothesized to test the relationship between entrepreneurial mindset and digital entrepreneurial intention.

H4a: Entrepreneurial mindset significantly impacts digital entrepreneurial intention.

H4b: Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial mindset and digital entrepreneurial intention.

Results presented in Table 4.14 indicate that entrepreneurial mindset has a significantly positive relationship with digital entrepreneurial intention (β=0.118, t=2.832, p=0.005). Results further indicate that the mediating effect of entrepreneurial self-efficacy on the relationship of entrepreneurial mindset and digital entrepreneurial intention was negative and not statistically significant (β=-0.017, *t*=1.894, *p*=0.058), and t values were lower than required. Hence, H4a was supported and H4b was not supported. It is also noteworthy that the indirect effect was negative (β=-0.017), suggesting that in the Saudi Arabian entrepreneurial context, entrepreneurial self-efficacy may function as a suppressor rather than a facilitator in the relationship between entrepreneurial mindset and digital entrepreneurial intention. These results suggest that an entrepreneurial mindset increases the digital entrepreneurial intentions of Saudi Arabian entrepreneurs, and entrepreneurial self-efficacy does not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention.

One relationship path was hypothesized to test the relationship between entrepreneurial self-efficacy and digital entrepreneurial intention.

H5**:** Entrepreneurial self-efficacy significantly impacts digital entrepreneurial intention.

Results presented in Table 4.14 indicate that entrepreneurial self-efficacy has a significantly positive relationship with digital entrepreneurial intention (β=0.243, t=3.409, p=0.001). Hence, H5 was supported. These results suggest that entrepreneurial self-efficacy increases the digital entrepreneurial intentions of Saudi Arabian entrepreneurs. The findings of this study provide strong empirical evidence that various entrepreneurial constructs, including entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and entrepreneurial self-efficacy, significantly influence digital entrepreneurial intention. The results align with prior literature and theoretical perspectives that emphasize the role of resourcefulness, sustainability, innovation, cognitive orientation, and confidence in driving digital entrepreneurial behaviours.

The study's findings indicate that entrepreneurial bricolage significantly enhances digital entrepreneurial intention (β=0.191, t=2.573, p=0.010), with entrepreneurial self-efficacy acting as a significant mediator in this relationship (β=0.114, t=3.277, p=0.001). These results are consistent with bricolage theory, which

suggests that entrepreneurs rely on existing resources and improvisational strategies to navigate uncertainties and pursue business opportunities (Baker & Nelson, 2005). This also aligns with effectuation theory (Sarasvathy, 2001), which emphasises means-driven logic in entrepreneurial decision-making. Bricolage, as a problem-solving approach, allows entrepreneurs to leverage available resources creatively, facilitating the development of digital ventures with minimal dependence on external capital.

Previous research supports these findings. Korsgaard et al. (2021) describe entrepreneurial bricolage as an essential strategy for overcoming resource constraints, which is particularly relevant in digital entrepreneurship, where agility and adaptability are crucial for success. Similarly, Ciambotti et al. (2023) found that entrepreneurial bricolage fosters innovation and opportunity recognition, which aligns with the study's results that entrepreneurs in Saudi Arabia leverage bricolage to develop digital business models.

Moreover, the mediation role of entrepreneurial self-efficacy further strengthens the argument that confidence in one's abilities is a key mechanism through which bricolage fosters digital entrepreneurial intention. Bandura (1986) posits that self-efficacy enhances an individual's ability to transform constraints into opportunities, and this aligns with research by Broccia et al. (2022), who found that entrepreneurial self-efficacy is a critical determinant of entrepreneurial behaviour. Therefore, the results confirm that bricolage alone is not sufficient; rather, entrepreneurs must also possess strong self-efficacy to translate resource improvisation into digital business intentions.

The study also found a strong positive relationship between green entrepreneurial orientation and digital entrepreneurial intention ($\beta=0.234$, $t=4.469$, $p=0.000$), with entrepreneurial self-efficacy acting as a significant mediator ($\beta=0.028$, $t=2.262$, $p=0.024$). These results align with the growing body of literature emphasizing sustainability-driven entrepreneurship as a pathway to innovation and competitiveness (Sargani et al., 2021). Entrepreneurs with a green orientation prioritize environmental concerns and integrate sustainable practices into their business models, which is becoming increasingly important in the digital economy.

Previous research by Zhao et al. (2021) highlight that green entrepreneurship is driven by both market opportunities and regulatory pressures. In Saudi Arabia, the Vision 2030 framework has placed sustainability at the core of its economic reforms, which may explain why entrepreneurs with a strong green orientation are more likely to pursue digital entrepreneurial ventures. Studies by Martínez-Peláez et al. (2023)

further reinforce the idea that businesses with sustainability goals often leverage digital technologies to enhance efficiency, reduce costs, and attract environmentally conscious consumers.

The significant mediation effect of entrepreneurial self-efficacy in this relationship is also supported by prior literature. Research by Alshebami (2023) indicates that green entrepreneurs with high self-efficacy are more likely to develop innovative solutions and create sustainable digital enterprises. This suggests that while a green entrepreneurial orientation provides motivation, self-efficacy acts as the confidence-building factor that transforms motivation into action.

The results indicate that ecological innovation significantly impacts digital entrepreneurial intention (β=0.150, t=2.138, p=0.033), with entrepreneurial self-efficacy acting as a significant mediator (β=0.099, t=3.062, p=0.002). These findings align with previous research emphasizing the role of ecological innovation in shaping digital and sustainable business practices (Xu et al., 2023). Ecological innovation refers to the development of new processes, products, or business models that minimize environmental impact, and its significance in fostering digital entrepreneurship aligns with contemporary trends in green technology and sustainable e-commerce.

Prior studies suggest that ecological innovation is a crucial driver of business competitiveness and long-term sustainability. Rennings (2000) defines ecological innovation as a response to environmental challenges, often facilitated by advancements in digital technology. Similarly, Yin et al. (2022) argue that firms engaging in ecological innovation tend to be more proactive in adopting digital solutions to reduce waste, enhance operational efficiency, and comply with environmental regulations.

The mediation effect of entrepreneurial self-efficacy suggests that confidence in one's ability to manage ecological innovation efforts strengthens the likelihood of pursuing digital ventures. This is consistent with findings by Gregori & Holzmann (2020), who suggest that entrepreneurs who believe in their capability to create environmentally friendly solutions are more likely to take the risks associated with digital entrepreneurship. The results further reinforce the argument that ecological innovation is not just about environmental responsibility but also about economic opportunity, particularly in the digital domain.

Entrepreneurial mindset was found to have a significantly positive relationship with digital entrepreneurial intention (β=0.118, t=2.832, p=0.005), but entrepreneurial self-efficacy did not significantly mediate this relationship (β=-0.017, t=1.894,

p=0.058). This finding highlights the importance of an entrepreneurial cognitive framework in fostering digital business intentions while also indicating that self-efficacy alone does not necessarily enhance this relationship.

Entrepreneurial mindset is widely recognized as a critical determinant of entrepreneurial behaviour, as it shapes how individuals perceive opportunities, risks, and uncertainties. Previous studies indicate that individuals with a strong entrepreneurial mindset are more likely to engage in innovative and technology-driven ventures (Krueger Jr, 2007). The significant impact of entrepreneurial mindset on digital entrepreneurial intention aligns with research by Volberda et al. (2021), who argue that cognitive adaptability is essential for navigating digital markets.

However, the lack of a significant mediation effect of entrepreneurial self-efficacy suggests that while an entrepreneurial mindset is important, it may not necessarily need self-efficacy to translate into digital entrepreneurial action. This finding contrasts with previous studies that emphasize self-efficacy as a major enabler of entrepreneurial action (Broccia et al., 2022). One possible explanation is that individuals with a strong entrepreneurial mindset may already possess intrinsic motivation and risk-taking behaviour that drives their digital business intentions, making self-efficacy less critical in this context. Furthermore, the negative direction of this indirect effect (β=-0.017) may reflect the unique cultural characteristics of Saudi Arabian entrepreneurs, where individuals with a strong entrepreneurial mindset may already possess sufficient intrinsic drive and cognitive clarity to pursue digital entrepreneurial intentions without requiring self-efficacy as an intermediary, a pattern consistent with entrepreneurial behaviour in collectivist cultural contexts where cognitive traits operate more directly on intentions (Krueger Jr, 2007).

The study found that entrepreneurial self-efficacy has a strong positive relationship with digital entrepreneurial intention (β=0.243, t=3.409, p=0.001), further reinforcing the role of confidence in shaping entrepreneurial behaviour. This is consistent with Bandura's (1986) theory of self-efficacy, which posits that individuals who believe in their abilities are more likely to engage in goal-directed behaviour.

Several studies support these findings. Saoula et al. (2023) highlight that entrepreneurial self-efficacy is a major determinant of entrepreneurial intention, particularly in digital and technology-driven domains. Similarly, research by Ulfert-Blank & Schmidt (2022) suggests that individuals with higher self-efficacy are more likely to experiment with digital platforms and innovative business models. In the

context of Saudi Arabia, where digital entrepreneurship is gaining traction, self-efficacy may serve as a critical psychological factor that enables entrepreneurs to navigate regulatory challenges, financial constraints, and technological uncertainties.

4.4 Chapter Summary

Chapter 4 encapsulated the data analysis and findings of this research. After the chapter's introduction, the data validation procedure was discussed in detail. Data validation procedure covered the discussion on data cleaning, response rate, descriptive analysis, normality analysis, and the demographic profile of this research. After discarding the unusable questionnaires, the response rate was 81.25%, exceeding the acceptable threshold of 80%. Descriptive analysis and univariate normality analysis suggested that the dataset was normally distributed and no outliers were detected. After the data validation procedure, PLS-SEM results were presented by assessing the measurement model and structural model. Inner model or measurement model results proved that all research constructs and their indicators were reliable and valid. Structural model results indicated that there was no serious issue of multicollinearity. Predictive relevance and predictive accuracy of the structural model of this research were established. The effect sizes of the majority of independent constructs indicated meaningful contributions to the predictive accuracy of entrepreneurial self-efficacy and digital entrepreneurial intention. Model fit statistics of the structural model were also satisfactory. The chapter concluded with the detailed discussion of research hypotheses in accordance with the established significance criteria. Out of nine hypothesized relationship paths, one was not supported and eight were supported.

CHAPTER 5
DISCUSSION, CONCLUSION, AND RECOMMENDATION

5.1 Introduction

This study examined the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention through the mediating role of entrepreneurial self-efficacy. Chapter one of this study presented the introduction to the study and background, highlighting the importance of the study. The problem statement was also presented in the first chapter which shows why this study is conducted. After the research problem, research gaps, including contextual gaps, conceptual gaps, and theoretical gaps, were also discussed in the first chapter. Moreover, research objectives and research questions were also presented in the first chapter which provides direction and purpose for this study. In the end, the significance, scope and limitations of the study were also briefly discussed in the first chapter.

The second chapter of this study discussed the available literature on the study variables. The theoretical background was also discussed in the second chapter. The theory of planned behaviour is the underpinning theory for this study. The theoretical background led to the conceptual framework and hypotheses development in the second chapter. The third chapter presented the research methodology. Quantitative research methodology was used in this study and primary data was collected from the SMEs in Saudi Arabia. After the third chapter, chapter four presented data analysis and results of the study. The data analysis was performed using a structural equation modelling technique on the SmartPLS 4 software. The results indicate that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset significantly impact digital entrepreneurial intention directly. Additionally, entrepreneurial self-efficacy significantly mediates the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and digital entrepreneurial intention, though it did not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention.

This chapter, chapter five, presents the discussion on the results. The discussion part comprises the research objectives and research questions. It has been evaluated in this chapter whether the study research objectives have been addressed and whether the research questions have been answered. The discussion part explains the extent to which the research objectives have been addressed. After discussing the research objectives, the next step was to address research problems. In this section of the chapter, the research problem has been discussed, and it has been evaluated whether the research problem has been addressed. After addressing the research problem, the outcome of the study, contributions of the study, theoretical implications, practical implications, recommendations, study limitations, and the conclusion are presented.

5.2 Addressing Research Objectives

This study examined the direct impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention. The indirect impact of independent variables has also been examined through the mediating role of entrepreneurial self-efficacy. This study also examined the impact of entrepreneurial self-efficacy on the digital entrepreneurial intention of SMEs entrepreneurs in Saudi Arabia. The above-mentioned relationships were examined for achieving the following research objectives:

i. To examine entrepreneurial bricolage's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
ii. To examine green entrepreneurial orientation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
iii. To examine ecological innovation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
iv. To examine entrepreneurial mindset's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention.
v. To evaluate the mediating role of entrepreneurial self-efficacy in the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention of Saudi Arabian entrepreneurs.

The relationships between independent and dependent variables have been examined with the help of SmartPLS 4 software. First of all, the measurement

assessment model was evaluated which included the content reliability and validity. After making sure that the data was reliable and valid, then the structural model has been assessed. The assessment of the structural model included the examination of the determination of the coefficient, and the level of effect. Finally, the decision regarding the impacts of independent variables on the dependent variable was made with the help of t-values and p-values. Relationships with t-values greater than 1.96 and p-values less than 0.05 were considered significant. The following Table 5.1 presents the overview of which relationships have turned out to be significant and which have not. However, most of the relationships in this study are significant. Afterwards, detailed discussions on the research objectives were presented.

Table 5.1
Summary of the Hypotheses Analyses

No.	Hypotheses	Result
H1a	Entrepreneurial bricolage significantly impacts digital entrepreneurial intention.	Significant
H1b	Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention.	Significant
H2a	Green entrepreneurial orientation significantly impacts digital entrepreneurial intention.	Significant
H2b	Entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention.	Significant
H3a	Ecological innovation significantly impacts digital entrepreneurial intention.	Significant
H3b	Entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intention.	Significant
H4a	Entrepreneurial mindset significantly impacts digital entrepreneurial intention.	Significant
H4b	Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial mindset and digital entrepreneurial intention.	Insignificant
H5	Entrepreneurial self-efficacy significantly impacts digital entrepreneurial intention.	Significant

5.3 Discussion of the Research Findings

Results of research hypotheses are discussed in detail in this section, orderly and according to the research hypotheses.

5.3.1 Entrepreneurial Bricolage and Digital Entrepreneurial Intention

The first objective of this study was to examine entrepreneurial bricolage's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention. The fifth objective further evaluated the mediating role of entrepreneurial self-efficacy in this relationship. Bricolage means to construct or create something by using existing resources. Entrepreneurial Bricolage can be defined as inventing something new from existing resources, but the product, service or process created is novel with new features which are different from its individual constituents (Baker & Nelson, 2005). Therefore, bricolage entrepreneurs need to be extremely efficient at utilizing available resources to the optimum capacity (Senyard et al., 2014). The literature review in the second chapter presented different types of bricolages including institutional bricolage, social bricolage, and entrepreneurial bricolage. Institutional bricolage combines social and cultural resources to create a different setup changing business conditions or environments (Cleaver, 2017). Social bricolage refers to innovative methods which the social corporations deploy in times of scarce resources to create a social value for their customers (Johannisson & Olaison, 2007). Entrepreneurial bricolage is defined as the pursuit of opportunity through the creative use of resources at hand in resource-constrained environments (Baker & Nelson, 2005).

Digital entrepreneurial intention means “the cognitive predisposition of an individual to actively opt for and pursue a career in digital entrepreneurship” (Aloulou et al., 2024). It also encompasses a proactive commitment to navigate the digital realm to pursue novel business initiatives and ventures (Vu et al., 2024). The rapid development in digital technologies has transformed the economic behaviour from an offline to an online activity. Therefore, the digital entrepreneurial intentions also increase due to the growing demand of digital products and services (Wibowo et al., 2024). Self-efficacy is defined as an individual’s judgement of their own skill set and expertise required to perform an action (Bandura, 1977). Entrepreneurial self-efficacy is the application of the self-efficacy concept in entrepreneurship, measuring the level of confidence an entrepreneur has in their entrepreneurial skills to achieve entrepreneurial goals (Chen et al., 1998). Moreover, ESE is the principal determinant of the entrepreneurial intentions of the individuals or the employees of the organizations. In order to develop such intentions, the entrepreneur must be clear about the opportunities, risks and benefits associated with the firm (Wilson et al., 2007).

The findings of this study indicate that entrepreneurial bricolage significantly impacts the digital entrepreneurial intention of Saudi Arabian SME entrepreneurs directly (β=0.191, t=2.573, p=0.010), and indirectly through the mediating role of entrepreneurial self-efficacy (β=0.114, t=3.277, p=0.001). Creating something new from existing resources enhances the digital entrepreneurial intention of the Saudi entrepreneurs. The results indicate that combining existing elements and resources to create new products, services, or processes motivates entrepreneurs to think innovatively, which increases their intention to create new digital products, services or processes. The results of this study regarding the specific direct relationship between entrepreneurial bricolage and digital entrepreneurial intention are in line with the studies of Yuan (2022). Entrepreneurs leverage existing available resources to create new products and services, aligning with the Vision 2030 objectives of Saudi Arabia.

Apart from the direct relationship between entrepreneurial bricolage and digital entrepreneurial intention, this study also examined the mediating role of entrepreneurial self-efficacy. The results indicate that entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention. The mediation of entrepreneurial self-efficacy indicates that the ability to use existing resources enhances the motivation and self-confidence of Saudi entrepreneurs which then strengthens their intentions of building something new from existing scarce resources. The findings of this study are in line with the findings of Guo et al. (2022) that bricolage plays a key role in enhancing digital entrepreneurial intention directly and through the mediating role of entrepreneurial self-efficacy. Bricolage impacts the intentions of entrepreneurs to find, integrate, and use scarce resources to generate novel digital solutions. In the current era of digital transformation, entrepreneurial bricolage is an essential capability for entrepreneurs to sustain and grow their ventures.

These results also answer the following research questions:

i. Does entrepreneurial bricolage affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
ii. Does entrepreneurial self-efficacy mediate the relationships between entrepreneurial bricolage and digital entrepreneurial intention of Saudi Arabian entrepreneurs?

Entrepreneurial bricolage significantly directly impacts the digital entrepreneurial intention of Saudi Arabian SME entrepreneurs. Furthermore, entrepreneurial self-efficacy significantly mediates the relationship between

entrepreneurial bricolage and digital entrepreneurial intention of Saudi Arabian SME entrepreneurs.

5.3.2 Green Entrepreneurial Orientation and Digital Entrepreneurial Intention

The second objective of this study was to examine green entrepreneurial orientation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention. The fifth objective further evaluated the mediating role of entrepreneurial self-efficacy in this relationship. Green entrepreneurship refers to the firm's consideration of the impact of its business activities on the natural environment (Nikolaou et al., 2018). Green entrepreneurial orientation involves actions that are related to green innovation and a proactive search for risk-taking opportunities to capitalize on green opportunities: actions that are beneficial to the environment (Pratono et al., 2019). There are two approaches to green entrepreneurial orientation: first, designing activities in such a manner that the environment is not harmed; and second, engaging in activities that actively improve the environment (Nikolaou et al., 2018). For organizations with a strong green entrepreneurial orientation, such practices are systematically embedded in their business activities. The businesses proactively follow the green entrepreneurial orientation, and this enables them to make decisions that allow them to initiate and follow green projects and, hence, improve financial performance as well (Jiang et al., 2018).

It is important for entrepreneurs to use environment-orientated green strategies because the use of such strategies enhances their self-efficacy, which ultimately enhances the entrepreneurial intentions of those entrepreneurs. Commitment to environmentally sustainable green practices is important for entrepreneurs to build a long-term business. Commitment to the environment also improves an entrepreneur's self-efficacy to build eco-friendly products and services that can help society and environment along with generating profit for the organization (Pratono et al., 2019). In the current era of climate awareness, most people prefer buying products that are environmentally sustainable and that do not harm the environment. Therefore, focusing on green entrepreneurial orientation is important for the Saudi SME entrepreneurs. The results of this study indicate that green entrepreneurial orientation significantly and directly impacts the digital entrepreneurial intention of Saudi Arabian entrepreneurs (β=0.234, t=4.469, p=0.000). This suggests that when entrepreneurs adopt

environmentally oriented strategies and mindsets, their digital entrepreneurial intention is strengthened. The results of this study are in line with the study of Hugo and Nuringsih (2020). Furthermore, it is also evidenced in the literature that green orientation towards environmentally sustainable practices enhances entrepreneurial intentions (Polas et al., 2022; Soomro et al., 2020). Therefore, it can be concluded that green entrepreneurial orientation significantly impacts entrepreneurial intention.

Apart from the direct impact of green entrepreneurial orientation on the digital entrepreneurial intention, this study also examined the mediating role of entrepreneurial self-efficacy. The results indicate that entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention (β=0.028, t=2.262, p=0.024). This result emphasises the importance of entrepreneurial self-efficacy for the successful adoption and implementation of green entrepreneurial activities towards enhancing the digital entrepreneurial intention of Saudi entrepreneurs. This result is consistent with the findings of Muangmee et al. (2021) who also concluded in their study that entrepreneurial self-efficacy mediates the relationship between green orientation and intentions of entrepreneurs. Therefore, this study concludes that green entrepreneurial orientation significantly enhances the digital entrepreneurial intention of Saudi Arabian entrepreneurs, with entrepreneurial self-efficacy serving as a significant mediating mechanism.

These results also answer the following research questions:

i. Does green entrepreneurial orientation affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
ii. Does entrepreneurial self-efficacy mediate the relationships between green entrepreneurial orientation and digital entrepreneurial intention of Saudi Arabian entrepreneurs?

Green entrepreneurial orientation significantly directly impacts the digital entrepreneurial intention of Saudi Arabian SME entrepreneurs. Furthermore, entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention of Saudi Arabian entrepreneurs.

5.3.3 Ecological Innovation and Digital Entrepreneurial Intention

It is important for entrepreneurs to use innovative technologies that do not harm the environment. Therefore, the third objective of this study was to examine ecological innovation's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention. The fifth objective further evaluated the mediating role of entrepreneurial self-efficacy in this relationship. Ecological innovation is defined as an innovation that aims at achieving sustainable development of an organization or the society as a whole, reducing the negative impact of products or processes on the natural environment through efficient and responsible management and utilization of natural resources (Rennings, 2000). By reducing environmental footprints, organizations can achieve sustainability in environmental resources which would also help organizations benefit in terms of long-term supply of natural resources (Klewitz & Hansen, 2014). Increasingly, organizations are proactively investing in ecological innovation and this would ultimately help reconcile economic and environmental objectives, benefiting both organisations and society (Yin et al., 2022). Furthermore, by investing in ecological innovation, organizations finance their long-term growth as well (Vargas-Hernández & López-Lemus, 2021).

Ecological innovation emphasises the role of psychological factors and mindset of the entrepreneurs to build environmentally sustainable products with the use of innovative resources. Therefore, the main purpose of ecological innovation in this study was to assess the use of sustainable resources to reduce environmental impact with the use of innovative products. This purpose can be achieved by generating green energy, using energy-efficient resources, and incorporating sustainable materials in the production processes. Furthermore, eco-friendly recyclable products can also be designed for the good of the environment. The triple bottom line approach represents the essence of ecological innovation which focuses on the importance of society, environment, and profit at the same time (Nogueira et al., 2022).

This study examined the impact of ecological innovation on the digital entrepreneurial intention of Saudi entrepreneurs. The results indicate that ecological innovation has a significant positive impact on digital entrepreneurial intention (β=0.150, t=2.138, p=0.033), and entrepreneurial self-efficacy significantly mediates this relationship (β=0.099, t=3.062, p=0.002). The result of this study is in line with studies of Li et al. (2019) and Xu et al. (2023). This result supports the discussion in the

literature that ecological innovation plays an important role in shaping the digital entrepreneurial intentions of entrepreneurs. Entrepreneurs can implement environmentally friendly strategies such as the use of recycled products, efficient energy systems, sustainable product designs, and compliance with environmental regulations. Furthermore, this study also investigated the mediating role of entrepreneurial self-efficacy in the relationship between ecological innovation and the digital entrepreneurial intentions of the Saudi entrepreneurs. The analysis of the data indicates that entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intentions. Therefore, it can be concluded that ecological innovation enhances the self-efficacy of entrepreneurs, which in turn strengthens their digital entrepreneurial intention.

These results also answer the following research questions:

i. Does ecological innovation affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
ii. Does entrepreneurial self-efficacy mediate the relationships between ecological innovation and digital entrepreneurial intention of Saudi Arabian entrepreneurs?

Ecological innovation significantly directly impacts the digital entrepreneurial intention of Saudi Arabian entrepreneurs. Furthermore, entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intention of Saudi Arabian entrepreneurs.

5.3.4 Entrepreneurial Mindset and Digital Entrepreneurial Intention

The fourth objective of this study was to examine entrepreneurial mindset's impact on Saudi Arabian entrepreneurs' digital entrepreneurial intention. The fifth objective further evaluated the mediating role of entrepreneurial self-efficacy in this relationship. An entrepreneurial mindset is a set of skills and abilities developed by the entrepreneurs that help them recognize the opportunities systematically and then capitalize on them. The process also involves learning from the failures (Nqoko & Chiweshe, 2022). Therefore, an entrepreneurial mindset is the outcome of a learning process where the entrepreneur uses their experience, positive or negative to identify and make the most of market opportunities (Tshishonga, 2022). Entrepreneurs are the first people to identify opportunities which other people might not realize until later.

Moreover, they are not just able to identify them, they also are the first movers to exploit those opportunities. This distinguishes an entrepreneurial mindset from mere cognitive awareness of opportunities. A person with an entrepreneurial mindset would not only cognitively get the idea before other people, but they are also the ones to react accordingly in order to reap the benefits. The ability to both recognise and act upon opportunities is a defining characteristic of an entrepreneurial mindset.

In this study, the data were collected from the Saudi SME entrepreneurs. The results indicate that entrepreneurial mindset has a significant positive impact on the digital entrepreneurial intention of Saudi Arabian entrepreneurs (β=0.118, t=2.832, p=0.005. This suggests that entrepreneurs with a strong entrepreneurial mindset are more likely to develop digital entrepreneurial intention. This ability of the entrepreneurs to develop unique products comes from the entrepreneurial mindset. The results of this study are consistent with the studies of Liao et al. (2022) and Mukhtar et al. (2021), who emphasise the importance of an entrepreneurial mindset in fostering entrepreneurial intentions among entrepreneurs.

Furthermore, this study also examined the mediating role of entrepreneurial self-efficacy in the relationship of entrepreneurial mindset and digital entrepreneurial intentions of Saudi entrepreneurs. The results indicate that entrepreneurial self-efficacy does not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention (β=-0.017, t=1.894, p=0.058). This result is not in line with the findings of Jiatong et al. (2021) who found that entrepreneurial self-efficacy plays a significant mediating role in the relationship between entrepreneurial mindset and digital entrepreneurial intentions. However, this finding is consistent with research suggesting that strong cognitive entrepreneurial traits may directly drive entrepreneurial action without necessarily requiring self-efficacy as an intermediary mechanism (Baron, 2006). This finding is important for Saudi entrepreneurs because it shows that entrepreneurial self-efficacy does not influence the relationship between entrepreneurial mindset and digital entrepreneurial intention. Moreover, an entrepreneurial mindset itself theoretically indicates the presence of entrepreneurial self-efficacy. Entrepreneurs with a strong entrepreneurial mindset may already possess the intrinsic drive and cognitive clarity needed to develop digital entrepreneurial intention without requiring self-efficacy as an intermediary. Notably, the negative direction of the indirect effect (β=-0.017) suggests that entrepreneurial self-efficacy may function as a suppressor rather than a facilitator in this relationship, a pattern consistent with entrepreneurial

behaviour in collectivist cultural contexts where cognitive traits operate more directly on intentions (Krueger Jr, 2007). Therefore, the mediating role of entrepreneurial self-efficacy is only significant in the relationship between entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation with digital entrepreneurial intention.

These results also answer the following research questions:

i. Does an entrepreneurial mindset affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?
ii. Does entrepreneurial self-efficacy mediate the relationships between entrepreneurial mindset and digital entrepreneurial intention of Saudi Arabian entrepreneurs?

Entrepreneurial mindset significantly impacts the digital entrepreneurial intention of Saudi Arabian entrepreneurs. Entrepreneurial self-efficacy did not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention of Saudi Arabian entrepreneurs.

5.3.5 Entrepreneurial Self-Efficacy and Digital Entrepreneurial Intention

Beyond its mediating role addressed in the fifth objective, this study also examined the direct relationship between entrepreneurial self-efficacy and digital entrepreneurial intention of Saudi Arabian entrepreneurs. The results indicate that entrepreneurial self-efficacy has a significant positive relationship with digital entrepreneurial intention (β=0.243, t=3.409, p=0.001). This result is consistent with the results of Maheshwari and Kha (2022) and Zhang and Huang (2021). This result signifies that entrepreneurial self-efficacy is an important factor for enhancing the digital entrepreneurial intention of Saudi SME entrepreneurs. Entrepreneurial self-efficacy empowers entrepreneurs with the necessary confidence and strengthens their digital entrepreneurial intention. Enhanced entrepreneurial self-efficacy also increases the motivation and commitment of Saudi Arabian entrepreneurs towards pursuing digital entrepreneurial ventures.

These results also answer the following research question:

i. Does entrepreneurial self-efficacy affect the digital entrepreneurial intention of Saudi Arabian entrepreneurs?

Entrepreneurial self-efficacy significantly directly impacts the digital entrepreneurial intention of Saudi Arabian entrepreneurs.

5.4 Addressing Research Problem

To achieve the ambitious goals enumerated in Saudi Vision 2030, it is essential to foster an environment conducive to innovative initiatives that not only protect the environment but also promote business sustainability. This endeavour depends on the development of entrepreneurial self-efficacy and digital entrepreneurial intention of Saudi entrepreneurs (Elnadi & Gheith, 2021). This study focused on the digital entrepreneurial intentions of SME entrepreneurs in Saudi Arabia, and the factors that may influence it. Therefore, by examining the effects of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention, the study aimed to align with the goals of Saudi Vision 2030.

Entrepreneurial bricolage requires entrepreneurs to be ready for unexpected and unfavourable circumstances in terms of resource availability (Senyard et al., 2010). Moreover, the entrepreneurs need to be able to handle the risks associated with uncertain environments such as the one created after COVID-19. Resource shortages should not impede the process of growth; entrepreneurs must therefore persevere even under challenging circumstances. Entrepreneurs of SMEs are the ones most vulnerable to resource shortages as such firms constantly compete for limited resources due to their smaller size and limited experience. Green entrepreneurial orientation is the tendency or positioning of the firm towards adopting such activities which are eco-friendly and do not harm the environment (Jiang et al., 2018). It is widely considered that green activities have added costs and are also very difficult to understand and also implement effectively (Makki et al., 2020). One of the reasons for such a belief is that entrepreneurs and other human resources are not well equipped with knowledge and expertise in this regard.

Ecological innovation is the concept that is applied by the firms while pursuing for innovations and novelties in their business. The organizations, while innovating, align their resources and expertise in such a way that any new product, service, process or business model created is not harmful to the environment (Fussler & James, 1996). Ecological innovation is the process through which organisations create ecologically

innovative products or services (Rennings, 2000). Ecological innovation is focused on the creation of eco-friendly tangibles, whereas green entrepreneurial orientation is an overall inclination of the firm towards environmentally friendly activities. Ecological innovation is also a challenging undertaking due to the same barriers identified for green entrepreneurial orientation, including cost-benefit imbalance, complex technologies, and limited knowledge among entrepreneurs (Horbach, 2016).

Entrepreneurial mindset can be described as the mental orientation of an individual or a firm which enables them to identify and capitalize on the opportunities as they are presented (McGrath & MacMillan, 2000). An entrepreneurial mindset is developed through experiences and individual characteristics such as education, age, and cultural background (Liao et al., 2022). People with an entrepreneurial mindset must be able to translate it into actions (Kuratko et al., 2021). Once entrepreneurs are able to translate mindset into action, they are positioned to identify and exploit market opportunities effectively. Moreover, they are bold in decision-making (Pidduck et al., 2023). Digital and sustainable technologies provide excellent opportunities for organizations and entrepreneurs to cut costs, increase revenues and reach larger markets. This represents a significant opportunity for entrepreneurs to capitalise on digital innovation for growth and competitive advantage (Kuratko et al., 2021). This suggests that entrepreneurs with a stronger entrepreneurial mindset are more inclined to pursue digital innovations as opportunities for growth, while those with a weaker entrepreneurial mindset are less likely to recognise or act upon such opportunities.

Entrepreneurs must be mentally, physically, and resourcefully equipped and show strong digital entrepreneurial intent all the time if they or their firms are to survive and grow in such digitally innovative times. Moreover, it is imperative that entrepreneurs are not only equipped with digital entrepreneurial intention but are also confident in their ability to successfully transform that intention into action. Self-belief is a prerequisite for the challenging pursuit of digital entrepreneurial intention, where entrepreneurs continuously encounter novel and unpredictable circumstances. Individuals who lack self-belief are likely to fall behind and exhaust themselves mentally and physically too, even if they have external resources at their disposal. This self-belief by entrepreneurs is termed entrepreneurial self-efficacy (Bandura, 1997). The study used entrepreneurial self-efficacy as a mediating factor for examining the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention.

Entrepreneurs in Saudi Arabia who struggle to adapt and remain competitive in today's dynamic economy, face a severe dilemma posed by the rapid growth of digital innovation as it is one of the consequences of the Saudi economy’s shift from an oil-based economy to a knowledge-based economy. Entrepreneurs must cultivate their abilities, self-assurance, and agility in order to overcome obstacles such as limited resources, environmental concerns, and ever-changing digital landscapes. This study aimed to examine the connections between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and digital entrepreneurial intention of Saudi entrepreneurs, with entrepreneurial self-efficacy serving as a mediator. The primary challenge lies in identifying the critical components and mindset required for entrepreneurs to successfully adopt and utilize digital and sustainable technology, which will ultimately result in improved efficiency, sustainability, and excellence. By addressing this issue, the findings will provide entrepreneurs, policymakers, and educators with significant insights for developing focused strategies that enable entrepreneurs to manage the complex dynamics of sustainability and innovation.

The problem statement identified that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset have a direct and indirect impact, through the mediating role of entrepreneurial self-efficacy, on digital entrepreneurial intention. This study successfully examined the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on the digital entrepreneurial intentions of Saudi Arabian SME entrepreneurs. The results indicate that all the independent variables have significant impacts on the digital entrepreneurial intention. The results signify the importance of these variables in enhancing the digital entrepreneurial intention of Saudi Arabian entrepreneurs. The results indicate that entrepreneurial self-efficacy plays a significant mediating role in the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and digital entrepreneurial intention, though it did not significantly mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention. Therefore, this study emphasises the importance of all the independent variables and the mediator for the successful use of digital technologies and resources for Saudi entrepreneurs, helping in achieving the Vision 2030.

5.5 Outcome of the Study

The outcome of the study offers a comprehensive understanding of the relationships between entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, entrepreneurial self-efficacy, and digital entrepreneurial intention of Saudi Arabian SME entrepreneurs. The key outcomes of the study include:

i. Entrepreneurial bricolage has a significant impact on digital entrepreneurial intention.
ii. Entrepreneurial self-efficacy significantly mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention.
iii. Green entrepreneurial orientation significantly impacts digital entrepreneurial intention.
iv. Entrepreneurial self-efficacy significantly mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention.
v. Ecological innovation significantly impacts digital entrepreneurial intention.
vi. Entrepreneurial self-efficacy significantly mediates the relationship between ecological innovation and digital entrepreneurial intention.
vii. Entrepreneurial mindset significantly impacts digital entrepreneurial intention.
viii. Entrepreneurial self-efficacy does not mediate the relationship between entrepreneurial mindset and digital entrepreneurial intention.
ix. Entrepreneurial self-efficacy significantly impacts digital entrepreneurial intention.

5.6 Research Contributions

This study contributed to the existing body of knowledge by establishing that entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation have significant impacts on digital entrepreneurial intention both directly and through the mediating role of entrepreneurial self-efficacy. Entrepreneurial mindset, however, only demonstrated a direct impact on digital entrepreneurial intention. Entrepreneurial self-efficacy was also found to directly and significantly impact digital entrepreneurial intention. Furthermore, this study made a significant contribution by examining these

variables within the framework of the Theory of Planned Behaviour (TPB). The simultaneous examination of these relationships within a single study represents a novel contribution to the entrepreneurship literature.

One of the key contributions of this study lies in its confirmation that entrepreneurial bricolage plays a crucial role in shaping digital entrepreneurial intention. Bricolage, which refers to the ability of entrepreneurs to make do with limited resources and creatively repurpose what is available, has been widely acknowledged as a critical factor in traditional entrepreneurship (Baker & Nelson, 2005). However, its role in digital entrepreneurship has remained relatively underexplored. This study provides empirical evidence that individuals with strong bricolage skills are more likely to engage in digital entrepreneurial activities, as they can leverage digital tools, online platforms, and non-traditional resources to innovate and create value in virtual markets. Moreover, the study establishes that entrepreneurial self-efficacy mediates this relationship, indicating that entrepreneurs who engage in bricolage develop greater confidence in their ability to navigate digital ventures, thereby enhancing their digital entrepreneurial intention.

Similarly, the study contributes to the growing discourse on green entrepreneurial orientation and its implications for digital entrepreneurship. Green entrepreneurial orientation, which reflects an organisation or individual's commitment to sustainable and environmentally friendly business practices, has been extensively studied in the context of traditional businesses. However, this research extends its application to digital entrepreneurship by demonstrating that individuals with a strong green entrepreneurial orientation are more likely to pursue digital ventures. The digital business landscape provides numerous opportunities for sustainability-driven entrepreneurs, such as eco-friendly e-commerce platforms, digital solutions for waste management, and sustainable supply chain innovations. By linking green entrepreneurial orientation to digital entrepreneurial intention, this study highlights the growing intersection between sustainability and digital business models.

Furthermore, this study enhances the understanding of ecological innovation as a driver of digital entrepreneurship. Ecological innovation refers to the development of new products, processes, or business models that minimise environmental impact while maintaining or improving economic performance (Rennings, 2000). Previous research has primarily focused on ecological innovation within traditional manufacturing, energy, and environmental policy contexts. This study expands its scope by

demonstrating that ecological innovation is also a key determinant of digital entrepreneurial intention. Entrepreneurs who prioritise ecological innovation are more likely to explore digital platforms as sustainable solutions, reduce physical waste, and create eco-conscious business models. The findings underscore the importance of fostering ecological innovation in digital entrepreneurship ecosystems to promote sustainable digital business practices.

An additional contribution of this study is its nuanced examination of the role of entrepreneurial self-efficacy as a mediator in the relationship between these entrepreneurial factors and digital entrepreneurial intention. Self-efficacy, or an individual's belief in their ability to achieve specific goals, is a well-established determinant of entrepreneurial behaviour (Bandura, 1986). This study reinforces the idea that entrepreneurial self-efficacy enhances digital entrepreneurial intention by increasing confidence in navigating the challenges of the digital business landscape. The mediating role of self-efficacy suggests that while entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation contribute to digital entrepreneurial intention, their impact is significantly strengthened when individuals possess strong self-efficacy. This insight has important implications for entrepreneurship education and training programmes, emphasising the need to build self-efficacy among aspiring digital entrepreneurs through experiential learning, mentorship, and skill development initiatives.

Notably, the study also finds that while entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation influence digital entrepreneurial intention both directly and indirectly through self-efficacy, the entrepreneurial mindset only has a direct impact on digital entrepreneurial intention. This distinction is noteworthy, as it suggests that an entrepreneurial mindset, which is characterised by opportunity recognition, risk-taking, and resilience, does not necessarily require the mediating influence of self-efficacy to shape digital entrepreneurial intention. This finding implies that individuals with a strong entrepreneurial mindset may be directly motivated to pursue digital entrepreneurship without necessarily requiring high self-efficacy as a mediating mechanism. This insight contributes to the broader entrepreneurship literature by distinguishing between entrepreneurial traits that influence digital entrepreneurial intentions directly and those that require self-efficacy as a reinforcing mechanism.

Beyond its empirical contributions, this study also makes a significant theoretical contribution by integrating these variables within the framework of the Theory of Planned Behaviour (TPB). TPB posits that individual behaviour is shaped by three key components: attitudes toward the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). By grounding entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset within the attitude construct of TPB, and entrepreneurial self-efficacy within the perceived behavioural control construct, this study extends the applicability of TPB to digital entrepreneurship. The findings suggest that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset shape attitudes toward digital entrepreneurship, while entrepreneurial self-efficacy enhances perceived behavioural control, collectively influencing digital entrepreneurial intention. This extends the theoretical understanding of entrepreneurial decision-making in digital contexts.

In practical terms, the study's findings have important implications for policymakers, educators, and entrepreneurship support organisations. Given the critical role of entrepreneurial bricolage in digital entrepreneurship, policymakers and business development agencies, particularly within the Saudi Vision 2030 framework, should design initiatives that encourage resourceful and improvisational business strategies for start-ups and SMEs operating in digital spaces. Similarly, fostering green entrepreneurial orientation and ecological innovation should be a priority for sustainability-focused entrepreneurship programmes, as these factors significantly influence digital business creation. Moreover, entrepreneurship education curricula should incorporate self-efficacy-building interventions, such as mentorship programmes, real-world entrepreneurial challenges, and digital skills training, to equip aspiring entrepreneurs with the confidence needed to succeed in digital ventures.

Overall, this study provides a comprehensive and novel perspective on the factors influencing digital entrepreneurial intention, offering both theoretical advancements and practical insights. By simultaneously examining entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, entrepreneurial mindset, and entrepreneurial self-efficacy within the TPB framework, this study fills a crucial gap in the literature and advances future research on sustainable and digital entrepreneurship. Future studies could further explore the dynamic interactions between these variables across different cultural and economic contexts, as well as investigate

how digital transformation and emerging technologies shape entrepreneurial bricolage and ecological innovation in the digital economy.

5.7 Research Implications

Theoretical and practical implications of this research are discussed in detail in the following subsections.

5.7.1 Theoretical Implications

The findings of the study have significant implications for the theory of planned behaviour. The theory of planned behaviour has three predominant factors that impact behavioural intentions, namely attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Darmanto et al. (2022) used digital entrepreneurial intention as a dependent variable within the framework of the theory of planned behaviour, confirming the applicability of TPB in digital entrepreneurship research.

Entrepreneurial self-efficacy, or the belief in one's capacity to perform the desired behaviour, is conceptualised within the perceived behavioural control factor of TPB. Entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset are conceptualised within the attitude factor of TPB, as they reflect entrepreneurs' cognitive and behavioural orientations toward digital entrepreneurship (Ajzen, 1991). Within the framework of the theory of planned behaviour, this study investigated entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset as entrepreneurial attitudes. Prior literature has not simultaneously examined entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset within the framework of TPB. Therefore, this study addressed this gap by demonstrating that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset significantly impacted digital entrepreneurial intention.

5.7.2 Practical Implications

The above-discussed findings of the study provide multiple practical implications for the SME industry of Saudi Arabia. These implications include

entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset. Entrepreneurial self-efficacy, as a significant mediator in three of these relationships, also carries important practical implications that are addressed within each of the following subsections.

5.7.2.1 Enhancing Entrepreneurial Bricolage

Entrepreneurial bricolage enables the efficient use of available resources for creating digital products. Saudi SMEs can use available resources to create new digital products. The application of bricolage enables innovation in any industry. Entrepreneurial bricolage is not only limited to SMEs; it can be applied by entrepreneurs across all businesses, as it develops their capacity to reduce dependency on large quantities of resources and instead utilise what is available. The use of bricolage activities by the entrepreneurs is valuable for creating new digital products at reasonable costs. It enables SMEs to compete in the market and generate revenues. Therefore, entrepreneurial bricolage is an important factor for all Saudi entrepreneurs.

Entrepreneurial bricolage enhances entrepreneurs' resilience to economic fluctuations. Entrepreneurs well equipped with bricolage strategies can easily combat economic fluctuations. A significant example of such economic fluctuations occurred during the COVID-19 when supply chains around the world were severely disrupted. During that period, entrepreneurs who were able to leverage scarce resources through bricolage strategies were better positioned to sustain their businesses. The use of bricolage can also help reduce the cost of goods by utilising available cost-effective resources. Moreover, businesses can create tailored digital products for their customers. These practical implications are important to understand the role of entrepreneurial bricolage for Saudi SME entrepreneurs. Since entrepreneurial self-efficacy mediates the relationship between entrepreneurial bricolage and digital entrepreneurial intention, building self-confidence among Saudi SME entrepreneurs through bricolage training is equally important for strengthening their digital entrepreneurial intention.

5.7.2.2 Enhancing Green Entrepreneurial Orientation

Green entrepreneurial orientation is also important for Saudi SMEs. The results of the study indicate that there exists a significant relationship between green

entrepreneurial orientation and digital entrepreneurial intention. This result is practically useful for Saudi SMEs to focus on the use of green activities to enhance entrepreneurs' self-efficacy and their digital entrepreneurial intention. Green entrepreneurial orientation is also a key factor, as customers have become increasingly educated and environmentally conscious in recent decades. Whenever organizations launch new products, customers increasingly seek information about their environmental impact. Therefore, Saudi entrepreneurs are therefore well-positioned to create environmentally friendly products.

Green entrepreneurial orientation can foster the creation of sustainable digital products that can be useful for the environment, or at least that cannot harm the environment. Therefore, businesses can attract specific types of customers for their products and can establish distinctive market positions. Furthermore, green entrepreneurial practices facilitate compliance with environmental protection regulations. Organisations that adhere to environmental protection regulations avoid legal complications, strengthening long-term business sustainability. The adoption of green entrepreneurial orientation by Saudi entrepreneurs is important for achieving Vision 2030 goals, as it enhances their digital entrepreneurial intention. Furthermore, since entrepreneurial self-efficacy mediates the relationship between green entrepreneurial orientation and digital entrepreneurial intention, programmes that simultaneously foster green orientation and build entrepreneurial confidence will be most effective in enhancing digital entrepreneurial intention among Saudi entrepreneurs.

5.7.2.3 Enhancing Ecological Innovation

Similarly to green entrepreneurial orientation, this study emphasises the importance of ecological innovation as well. The results indicate that ecological innovation significantly impacts the digital entrepreneurial intention of Saudi entrepreneurs either directly or indirectly. Therefore, Saudi entrepreneurs need to create sustainable products that are equally beneficial for the organisation and the environment. The fact that the study results show that ecological innovation impacts digital entrepreneurial intention is important for the Saudi SMEs to create eco-friendly products that are sustainable for the organisation and the environment.

Ecological innovation is not only important for creating unique sustainable products, but the Saudi SMEs need to make sure that the products are different from their competitors. Competitors may not yet be producing eco-friendly products; therefore, organisations that develop ecologically innovative products can capitalise on this market gap. Such proactive strategies are important for all the Saudi SMEs to compete in the global market. The integration of digital technologies can help reduce operational costs and support the future scalability of organisations. Therefore, organisations that develop ecologically innovative products hold greater competitive potential than those that do not. Similarly, since entrepreneurial self-efficacy mediates the relationship between ecological innovation and digital entrepreneurial intention, organisations that invest in ecological innovation should also prioritise confidence-building initiatives to maximise the impact on digital entrepreneurial intention.

5.7.2.4 Enhancing Entrepreneurial Mindset

An entrepreneurial mindset is another important factor for Saudi entrepreneurs. The findings of this study reveal that an entrepreneurial mindset significantly impacts digital entrepreneurial intention. This study also provides an important way forward for the Saudi government and SMEs on how to enhance digital entrepreneurial intention. Therefore, it is important for the government to focus on designing curricula that foster the development of an entrepreneurial mindset among entrepreneurs. This study also emphasises the importance of developing an entrepreneurial mindset through training activities implemented by organisations. Enhancing an entrepreneurial mindset can be done not only by the government but also by the SMEs.

Furthermore, an entrepreneurial mindset can be achieved through mentoring, coaching, policymaking, and systems support. Through an entrepreneurial mindset, the entrepreneurs develop the ability to solve problems proactively. They are resilient to challenges and they embrace calculated risks. Furthermore, an entrepreneurial mindset promotes creativity, leadership, networking, and resource management skills that are necessary for entrepreneurs to successfully establish and grow their ventures. Notably, the findings indicate that an entrepreneurial mindset directly influences digital entrepreneurial intention without requiring entrepreneurial self-efficacy as an intermediary, suggesting that cultivating an entrepreneurial mindset alone may be sufficient to drive digital entrepreneurial intention among Saudi entrepreneurs.

5.8 Recommendations

This section provides recommendations for the Saudi SMEs and policymakers based on the findings of the study. The recommendations are based on the findings; therefore, these are categorised according to the variables of the study.

5.8.1 Recommendations Regarding Entrepreneurial Bricolage

Entrepreneurs can utilise underutilised resources such as vacant office spaces to create productive shared environments. Such office spaces can be used to build a common discussion area or a conference room. Entrepreneurs can also use available infrastructure such as local networks. Entrepreneurs can use existing networks of other organisations to lower their costs. For instance, Saudi SMEs operating in the same sector could collaborate by sharing office infrastructure, digital platforms, or logistics networks, thereby reducing individual operational costs while maximising the collective use of available resources. Such collaborative resource-sharing strategies align with the Vision 2030 objective of fostering a dynamic and interconnected SME ecosystem in Saudi Arabia.

Saudi SMEs can encourage their employees to experiment with new ideas and generate innovative solutions. This can be done in all the industries such as agriculture, logistics, energy, mining, and manufacturing. For example, organisations can encourage their employees to identify innovative ways to utilise existing materials and technologies to develop new digital products or services. Similarly, in the tourism sector, entrepreneurs can develop digital applications using existing employee expertise to attract a wider customer base and enhance revenue generation. Regular brainstorming sessions are essential in entrepreneurial bricolage to generate innovative ideas for developing products and services from existing resources.

5.8.2 Recommendations Regarding Green Entrepreneurial Orientation

SMEs in Saudi Arabia can integrate environmentally friendly practices into their daily activities such as guiding employees about carbon footprints and using eco-friendly operations to build new products. Moreover, organisations can use renewable energy in their businesses to run their digital operations. In order to enhance digital

entrepreneurial intentions, the use of brainstorming sessions with employees is very important to make them aware of the impact of their daily activities on the environment.

Saudi SME entrepreneurs can also design innovative digital products such as eco-friendly smartphone apps, waste management systems, and electric vehicles charging stations. Moreover, entrepreneurs can also offer services to other businesses that promote sustainable and environmentally friendly products. Educating employees and offering sustainable products to customers can significantly contribute to environmental conservation. Furthermore, entrepreneurs should also demonstrate commitment to implementing environmentally friendly practices such as environmental impact assessment in their businesses, promoting transparency in this regard, and investing in green infrastructure.

5.8.3 Recommendations Regarding Ecological Innovation

There are many ways for Saudi entrepreneurs to contribute towards environmental protection by developing eco-friendly sustainable products. Entrepreneurs can invest in digital technologies to develop products and services with minimal environmental impact, such as digitally operated waste management systems built from sustainable materials. Entrepreneurs can also work on educating the community to enhance cultural sense of environmental protection. This can be effectively achieved by conducting awareness sessions in educational institutions, ensuring that students enter the workforce with an established inclination towards digital resources for environmental protection.

Moreover, customers are increasingly conscious of environmental issues. Therefore, organisations should leverage this growing environmental awareness among customers to their strategic advantage by marketing their digital eco-friendly products to targeted audiences. In particular, simply producing eco-friendly digital products may not be sufficient if those products do not reach the intended customer base. Developing digital applications specifically designed for environmentally conscious customers can further strengthen customer engagement and support environmental protection goals. For better market strategy and for working towards a sustainable environment, Saudi SMEs can also collaborate with competitors when the shared goal is environmental protection, as entrepreneurs should leverage all available resources to advance ecological digital product development.

5.8.4 Recommendations Regarding Entrepreneurial Mindset

Digital entrepreneurial intention can be significantly enhanced when entrepreneurs possess a strong entrepreneurial mindset and demonstrate willingness to pursue environmentally conscious business practices. To develop an entrepreneurial mindset, entrepreneurs are encouraged to take risks and perform experiments for developing digital products. Moreover, entrepreneurs are also advised to cultivate an entrepreneurially motivated digital environment that encourages all employees to actively contribute to the development of digital products and services, as the collective intention of entrepreneurs and employees is essential for achieving organisational goals. Notably, the findings of this study indicate that an entrepreneurial mindset directly influences digital entrepreneurial intention without requiring entrepreneurial self-efficacy as an intermediary, suggesting that cultivating a strong entrepreneurial mindset among Saudi entrepreneurs may in itself be sufficient to enhance their digital entrepreneurial intention.

An entrepreneurial mindset towards developing and enhancing digital entrepreneurial intention is all about the skills and attitude of entrepreneurs. These skills may include critical thinking, proactive problem-solving, self-improvement, networking, and adaptability with a continuous learning orientation. These skills improve the entrepreneurial mindset, which ultimately helps in developing digital entrepreneurial intention. Furthermore, motivation and confidence also help in developing an entrepreneurial mindset which is an important factor to enhance digital entrepreneurial intention.

5.8.5 Recommendations for Future Researchers

Future researchers are encouraged to investigate the long-term effects of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention. The effects can also be investigated in different industrial backgrounds, as the entrepreneurial strategies may indicate significant relationships for one industry and insignificant for others. Future researchers are therefore encouraged to conduct industry-specific studies, as the relationships between entrepreneurial strategies and digital entrepreneurial intention

may vary across different sectors. The industry-based comprehensive research could not be performed in this study because of time and financial constraints.

A cross-country study can also be conducted to examine the relationships in different geographic contexts. The impact of inter-country relationships and trade agreements can also be investigated in relation to the implementation of effective entrepreneurial strategies. Researchers can investigate how Saudi Arabia's relationships with the UAE, Europe, USA and other countries can be beneficial for Saudi entrepreneurs.

In the current age of artificial intelligence, future researchers can examine the use of AI in tackling environmental concerns. AI can also be used to form systems to keep employees engaged with the entrepreneurial activities. It can also be investigated how AI is making it easier for the entrepreneurs to implement innovative environmentally friendly green strategies.

Future researchers can also investigate how efficient marketing strategies, to target environmentally conscious customers, can impact the performance of environmentally conscious SMEs in Saudi Arabia. These marketing strategies can include the use of social media platforms and community engagement initiatives.

The role of employee education and training can also be examined, as greater education and training may enhance willingness to implement entrepreneurial strategies. Similar investigations could be conducted among university and college students, given their dual role as future entrepreneurs and consumers.

Furthermore, the role of corporate social responsibility can also be investigated for the environmentally conscious SMEs. It can also be investigated whether the environmentally conscious SMEs are following the triple bottom line approach (People, Planet, Profit) or not. The impact of effective corporate social responsibility policies on people, planet, and profit can also be investigated.

Future researchers can also examine the impact of government policies on nurturing an eco-friendly innovative environment for organisations. It is important for any government to provide a healthy environment and a proper guideline for the organisations to follow in order to implement environmentally friendly entrepreneurial strategies. Laws and regulations should therefore be considered when formulating entrepreneurial strategies.

The relationships between all the independent variables can also be examined. It is possible that an entrepreneurial mindset impacts entrepreneurial bricolage, and

green entrepreneurial orientation impacts ecological innovation. Therefore, it is also recommended to investigate the interrelationships between independent variables of this study. This study focused on the digital entrepreneurial intention of the Saudi SME entrepreneurs. Future researchers can examine the impact of entrepreneurial strategies on the actual behaviour of the same entrepreneurs. Therefore, a longitudinal study can also be conducted.

5.9 Limitations of the Study

It is imperative to acknowledge the limitations of this study to obtain a comprehensive understanding of the research outcomes and to provide guidance for future research endeavours in this area. Several of the principal limitations are as follows:

The geographic scope of this study was limited to Saudi Arabia, which may affect the generalisability of the findings to other national contexts. The use of purposive sampling represents a methodological limitation, as this approach may restrict the generalisability of the findings. A random sampling approach might have yielded more broadly generalisable results.

Moreover, data collection was conducted in three regions of Saudi Arabia, namely Riyadh, Makkah, and the Eastern Province. Although these regions represent the major economic hubs of the Kingdom, the findings may not fully capture the entrepreneurial dynamics present in other regions of Saudi Arabia, which may further limit the extent to which the results can be generalised across the country.

The cross-sectional nature of the data collection is also an important limitation of this study. Since all data were collected at a single point in time, it is not possible to establish causal relationships between the study variables with certainty. Future studies adopting a longitudinal design would be better positioned to examine how changes in entrepreneurial strategies influence digital entrepreneurial intention over time.

The scope of study variables is another limitation. This study focused on the impact of entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset on digital entrepreneurial intention and recognised the mediating role of entrepreneurial self-efficacy. There can be other entrepreneurial factors as well that might impact the digital entrepreneurial intention of Saudi SMEs.

5.10 Concluding Remarks

SMEs are the backbone of any economy. SMEs play an important part in the economic success of Saudi Arabia, especially for the achievement of Vision 2030. SMEs in Saudi Arabia face challenges such as changing business dynamics, growing costs, environmental protection policies, and an increasing number of environmentally conscious customers. Therefore, it is important for the SMEs to work on innovative ways to perform the business activities whether they have resources at hand or not. To foster such mindset, entrepreneurial activities are of utmost importance in today's transformative era. It is important for the Saudi SMEs to foster effective entrepreneurial strategies such as entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset to enhance digital entrepreneurial intention of Saudi SME entrepreneurs. It is also equally important to understand how entrepreneurial self-efficacy plays a key role in strengthening the above-mentioned relationships. Therefore, this study examined the impact of entrepreneurial strategies on digital entrepreneurial intention directly, and through the mediating role of entrepreneurial self-efficacy.

This study adopted a quantitative research methodology to collect data from Saudi SME entrepreneurs through a survey questionnaire. The structural equation modelling data analysis was performed using the SmartPLS 4 software. The results indicate that entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset significantly impact digital entrepreneurial intention of Saudi SME entrepreneurs. The study also concluded that entrepreneurial self-efficacy significantly mediates the relationships of entrepreneurial bricolage, green entrepreneurial orientation, and ecological innovation with digital entrepreneurial intention.

The findings of the study are important for Saudi SMEs, enabling them to compete effectively and survive in the transformative age of globalisation where organisations worldwide can access Saudi markets. It is important for the Saudi SMEs to work on entrepreneurial activities and mindset to enhance the digital entrepreneurial intention of their entrepreneurs as digitalisation has fundamentally transformed business practices globally, particularly following the COVID-19 pandemic. This study provides both practical and theoretical implications. This study contributes to the theory of planned behaviour by incorporating entrepreneurial bricolage, green entrepreneurial

orientation, ecological innovation, and entrepreneurial mindset within the attitude construct, and entrepreneurial self-efficacy within the perceived behavioural control construct of the theory. The study also provides recommendations for improving entrepreneurial bricolage, green entrepreneurial orientation, ecological innovation, and entrepreneurial mindset for enhancing digital entrepreneurial intention of Saudi SME entrepreneurs. Moreover, the study provides recommendations for future researchers, including conducting an inter-country comparison and a longitudinal study.

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APPENDICES

APPENDIX 1

Letter of Approval from UiTM Research Ethics Committee

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UNIVERSITI TEKNOLOGI MARA

Pejabat
Timbalan Naib Canselor
(Penyelidikan dan Inovasi)

Reference : 600-TNCPI (5/1/6)
Our reference : REC/09/2024 (PG/MR/443)
Date : 1445H صفر 29
3 September 2024

Mr/Ms Raza Ali - 2021271472
(Supervisor: Assoc. Prof. Dr Jati Kasuma Ali)
UiTM Sarawak Branch
Jalan Meranek
94300 Kota Samarahan
SARAWAK

سلام عليكم ورحمة الله وبركاته and Greetings

Mr/Ms

APPROVAL LETTER - UiTM RESEARCH ETHICS COMMITTEE

Thank you for submitting your research proposal to the Research Ethics Committee (REC). After considering your application, the Committee approved your proposal titled "The Effects of Entrepreneurial Strategies on Digital Entrepreneurial Intention Through The Mediation of Entrepreneurial Self-Efficacy in Saudi Arabia" in Saudi Arabia. Details of the approval are as follows:

Ref. number:	REC/09/2024 (PG/MR/443)
Approval Period:	7 August 2024 until 1 December 2024
Authorised personnel:	1. Raza Ali 2. Assoc. Prof. Dr Jati Kasuma Ali

The UiTM Research Ethics Committee operates in accordance to the ICH Good Clinical Practice Guidelines, Malaysian Good Clinical Practice Guidelines and the Declaration of Helsinki. The approval of this project is conditional upon your continuing compliance with these guidelines and declaration.

We draw to your attention the requirement that a report on this research, must be submitted every 12 months from the date of the approval or on the completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed. Amendments, if any, to the study documents are to be submitted to the REC for approval.

If you require further information, please contact the REC Secretariat at 03-55448069/03-55442794 or email at recsecretariat@uitm.edu.my.

اوسها، تقوى، موليا
"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"

Yours sincerely,

(EMERITUS PROFESSOR DATO' DR RAYMOND AZMAN ALI)
Chairman
UiTM Research Ethics Committee

c.c.: Deputy Rector (PJIM&A), UiTM Sarawak Branch

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UiTM di hatiku

APPENDIX 2

Questionnaire of The Study

Questionnaire of The Study

Please tick (/) the best box according to your information.	
Email/mobile (optional)	
Gender	a) Male ☐ b) Female ☐
Age	18 years to 25 years ☐ 26 years to 35 years ☐ 36 years to 45 years ☐ Above 45 years ☐
Marital Status	Married ☐ Unmarried ☐ Widowed ☐
Education Level	Below Matric ☐ Intermediate ☐ Bachelors ☐ Masters or above ☐

Please answer all the questions and tick (/) on the number that best reflects your opinion.

Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

	1	2	3	4	5	6	7
Entrepreneurial Bricolage							
We are confident of our ability to find workable solutions to new challenges by using our existing resources.							
We gladly take on a broader range of challenges than others with available resources.							
We use any existing resource that seems useful to responding to a new problem or opportunity.							
We deal with new challenges by applying a combination of existing and new resources available to us.							
When dealing with new problems or opportunities we take action by assuming that we will find a workable solution.							

By combining our existing resources, we take on a surprising variety of new challenges.							
When we face new challenges, we put together workable solutions from our existing resources.							
We combine resources to tackle new challenges that the resources weren't originally intended to tackle.							
Green Entrepreneurial Orientation							
Our organization uses less or non-polluting/toxic materials.							
Our organization has a strong tendency for high-risk green product development projects which have a chance for very high returns.							
Our organization strongly emphasizes on green R&D.							
Our organization tends to initiate green actions for competitors to respond to.							
Our organization has a tendency to be a market leader, always first in introducing green products, services, or technologies.							
Ecological Innovation							
We use low energy consumption such as water, electricity, gas, and petrol during production/use/disposal.							
We recycle, reuse, and remanufacture material.							
We use cleaner technology to create savings and prevent pollution.							
The manufacturing process in our organization effectively reduces the emissions of hazardous substances and waste.							
The manufacturing process in our organization reduces the use of raw material.							
Entrepreneurial Mindset							
My career goal is to become excellent at my job.							
My career goal is to become excellent with an entrepreneurial mindset.							
I'd like to take some entrepreneurship courses whenever feasible for me.							
Entrepreneurial Self-Efficacy							
I possess the ability to be a leader.							
I can make others agree with my thoughts.							
I can find work partners who complement my ability.							
I can have pleasant conversations with my work partners. I have the ability to make decisions after deliberation.							
Digital Entrepreneurial Intention							
I am ready to do anything to be a digital entrepreneur.							
I will make every effort to start and run my own digital business. I am determined to create a digital business venture in the future.							
My professional goal is to be a digital entrepreneur.							

AUTHOR'S PROFILE



Ali Raza is an Application Architect and Technology Leader with over 20 years of experience in enterprise software engineering, including more than 15 years in digital banking. His research interests include digital entrepreneurship, digital transformation, innovation, and the adoption of emerging technologies to support sustainable business growth, with a particular focus on Saudi Arabia's SME ecosystem and Vision 2030 initiatives. He completed his PhD in Business Management at the Faculty of Business and Management, Universiti Teknologi MARA, Malaysia. His research focuses on entrepreneurial bricolage, green entrepreneurial orientation, and digital transformation.

LIST OF PUBLICATIONS:

Raza, A., Ali, J. K., & Rozaimie, A. (2025). Impact of ecological innovation, entrepreneurial mindset, and green entrepreneurial orientation on entrepreneurial self-efficacy and digital entrepreneurial intention in the context of Saudi Arabia. *Journal of Advanced Research in Business and Management Studies*, 41(1), 108–123.

Raza, A., Ali, J. K., & Rozaimie, A. (2026). Impact of Entrepreneurial Bricolage, Ecological Innovation, Entrepreneurial Mindset, and Green Entrepreneurial Orientation on Digital Entrepreneurial Intention. *Jurnal Intelek*, 21(1), 24–40.