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Digital Economy and Green behaviors in Context of Economic Vision 2030: A Case of Small and Medium Enterprises in UAE

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ABSTRACT

Unprecedented global issues in the recent past have shifted the focus of world economies towards digitization and UAE is of no exception. This study aims to highlight how effectively SMEs have embraced digitization under the umbrella of economic Vision 2030 and what challenges they have faced during adoption. Qualitative research strategy is adopted to carry out this study. The responses have been collected from 10 SME owners and 10 government officials. Results of the study revealed that SMEs have demonstrated their important function in accomplishing the UAE's Economic Vision 2030. Digital technologies have not just improved operational efficiency for these businesses but also helped to achieve the wider economic diversification aims of UAE. Similarly, role of digitization is also crucial in adopting the green practices by SMEs yet number of SMEs has still to materialize this aspect in true spirit. Many enterprises have shown their keen interest in adopting green practices and are also implementing one way or another. However, challenges such as high initial costs and lack of skill set hinders the implementation.

Keywords: Economic Vision 2030, Digitization, Green Behaviors, SMEs
JEL Classifications: O10, Q56

1. INTRODUCTION

The past few years have witnessed what is described as a digital economy and this indicates a significant move from traditional physical asset-centered models to current models that are deeply embedded in digital technologies (Guo et al., 2023). This wave of change is not just a trend but rather signifies an economic revolution that has given rise to new domains such as e-commerce, fintech and creation of digital content (Tao et al., 2022). Countries such as UAE, USA, UK and India testify to the unlimited opportunities provided by this era of digitization. They have extended these efforts beyond just integrating digital technologies into their economies as they have made them part of their entire society (Xun et al., 2020).

Nevertheless, the path is full of hindrances which range from challenges about privacy of data to cybersecurity threats that can only be addressed by a wide ranged approach to digital synchronization. The heart of this revolution is composed of companies demanding unparalleled speed, vision and adaptability. In these times, it is not enough only to acquire the digital instruments (El Khatib et al., 2023). True success is in using these up-to-date devices for networking, making themselves different amidst the congested sectors as well as continually providing extra ordinary service to the world customers who have discriminative tastes. Therefore, the digitalized economy is not just a turn-it-around; it represents a revolution in the way countries and corporations perform competition within one another, prosper or perish (Guo et al., 2023).

The UAE has set forth an ambitious plan for economic transformation, with digital innovation at its core. This plan is encapsulated in the UAE's Economic Vision 2030, which aims to diversify the economy, promote sustainable growth, and reduce reliance on oil revenues Chen (2020). However, there may exist a possible gap between these high-level strategic goals and the

actual experiences of entrepreneurs and small and medium-sized enterprises (SMEs) in the country. While the vision is clear, the practical realization of this vision is fraught with challenges. Entrepreneurs and SMEs need to adopt digital technologies as rapidly or as effectively as the vision envisages. This gap is not merely an economic issue but a complex problem space that demands thorough research. It indicates that there are underlying issues and barriers that might have not been fully understood or addressed. This possible discrepancy between what is planned at the policy level and what is happening on the ground creates a fertile area for investigation. A research project in this space would aim to uncover, analyze, and provide solutions for the issues that are preventing the envisioned digital transformation.

In the UAE, SMEs are not merely businesses but important components of the country's economic system that largely enhance economic diversification, employment creation, and adds on to innovation. Nevertheless, concerns have been raised concerning how digital strategies can help these firms increase their performance, competitiveness as well as long-term viability in a context characterized by rapid changes in technology. Consequently, there is growing interest in learning how such key strategies could assist them adopt environmentally friendly practices (Telukdarie et al., 2023). Most of the studies are done on SMEs performance in context of digital economy (Abudaqa et al., 2022; Ghanem and Hamid, 2021) and least studies are done on SMEs green behavior (Al Remeithi and Al Omani, 2022) which is the essence of this study under the umbrella of economic vision 2030.

A research problem emerges when considering the possible disparity between the ambitious goals of UAE's 2030 vision and the on-ground realities facing entrepreneurs and SMEs in the digital domain if any. This gap suggests a problem space ripe for investigation, where the research will seek to demystify the complex interplay of factors impeding the digitization process if any. In addition, the study also aims to investigate the specific challenges and enablers of integrating green practices into SME digital transformation strategies in alignment with Vision 2030.

The recent move from the government of the UAE towards a newly implemented digital economy strategy where the government wants that all its citizens whether staying abroad or within the nation should be capable of accessing all forms of government services digitally (Litvinenko, 2020). The adoption of the digital economy for business firms come with the aspect of the opportunities to make business expansions, the ability to create new employments, enhancement of public services, and a quick rise in the e-commerce framework. The digital transformation of the nation's economy will lead to the creation of a new business model along with a new process of doing business. It has transformed the way of business operations while creating new opportunities for them. The rise of the digital economy will help businesses in the UAE to reach a higher number of consumers, reducing the operational cost of the business organization, enhancing the efficiency and productivity of the firms, and leading towards new innovations. But there are several challenges faced by the business organization in terms of incorporating and adopting the digital economy framework (Nusairi, 2021). These include a major shortfall of trained and experienced workforce, weak financing, and poor governance. Also, there is a lack of digital expertise and an effective organizational structure that can support the digital transformation of the firms.

As far as SMEs are concerned, there are a total of 557,000 SMEs within the UAE at the end of 2022, as stated by Abdullah bin Touq Al Marri, the Minister of Economy. This statistic aligns with the nation's ambitious goal to elevate this count to 1 million by the culmination of 2030. Emphasizing the significance of SMEs, he highlighted that they contribute to 63.5% of the non-oil Gross Domestic Product (GDP). He further underscored that the ministry's efforts to foster an investment-friendly atmosphere for citizen-owned SMEs are in harmony with its vision of establishing a globally competitive knowledge-based economy, steered by UAE nationals.

This research endeavor, therefore, holds profound significance. By delving deep into the interplay between digital strategy, digitalization, and green behaviors in the post-pandemic context, it seeks to unearth insights that could guide SMEs in the UAE. Through this exploration, the research not only aims to contribute to the academic discourse on the subject but also hopes to offer tangible, actionable strategies for SMEs, empowering them to harness the full potential of the digital age while staying steadfast in their commitment to environmental sustainability.

2. LITERATURE REVIEW

The diffusion of innovation (DOI) theory, which is propounded by Everett Rogers, is the theoretical base of this study. It suggests that it is possible to explore how different innovations, particularly digital technologies and green practices, are diffused within organizations (Mamun, 2018). For the SMEs in the UAE, such kind of innovation is expected to play a major role in encouraging them to move towards the Economic Vision 2030. The theory goes on to discuss and emphasizes a number of key factors that are likely to affect the adoption process including perceived relative advantage, compatibility with the existing ones, and the complexity introduced by the innovations (Mamun, 2018). In this study, the use of DOI theory explains the extent to which the external pressures of market competition, government policies, and social demands enforce the diffusion of digital and sustainable practices among SMEs. Moreover, communication channels and leadership within SMEs become quite pivotal in the facilitation of innovation adoption. The adoption of green behavior and digital technologies through the DOI lens thus identifies barriers and enablers to prove a useful angle for studying the aspects related to the sustainability and economic objectives of the UAE.

The fast-changing environment of today marks the digitalization era as a pivotal point of reference for global organizations. Owners of business, whether they are startups or multinational corporations, encounter varied challenges in this respect. In order to attract attention, leave lasting impressions and retain competitiveness amidst the relentless growth of digital platforms (Ke et al., 2022), they must always strive to do so.

This digital revolution has been a key part of UAE and the UAE has lately become a progressive nation that has been thinking carefully about its plans towards a diversified, strong and sustainable economy. In order to do this, they want to break free from their dependence on oil as it will not last forever and as it appears the world's economic patterns are changing, this has led to a revolutionary position characterized by an audacious target of 2030. This ambitious plan lays out the road map for a future in which the nation's economy is independent of the rise and fall of oil prices, acting as its blueprint (Dakrory, 2023).

As part of "Vision 2030," UAE is putting more emphasis on sectors such as renewable energy, advanced technology, healthcare, and tourism. Furthermore, digital transformation within government services and industrial sectors in the UAE is a major contributor to improving the economic resilience and sustainability, and as such, digital transformation is also heavily funded. When compared to other countries, the strength of the United Arab Emirates as the next industrial nation is exemplified by its steered degree of development within a short period through ample state funding and foreign investments. It has emerged as the first country in the region that can catch up with advanced nations in adoption of advanced technologies particularly artificial intelligence and green energy for development relative to several other Middle East nations.

This transformational vision has two fundamental rationales. First, there's a determined attempt to lessen and finally overcome the country's excessive reliance on oil earnings. The UAE's rapid ascent has been driven by oil. However, its leadership now seeks a diversified, sustainable economy, less reliant on global oil markets. Secondly, there is a desire to shift focus to knowledge-driven industries that leverage innovation, technology, and human resources to promote the growth of economy.

Essentially, the UAE's 2030 vision is a reflection of the nation's goals rather than merely a strategic plan. The country is eager to support an ecosystem that depends on global interconnectedness as part of this ambition. This interconnectedness encompasses relationships, ideas, and inventions in addition to trade and business. The UAE hopes to establish itself as a hub—a place where international companies come together, work together, and create—by cultivating such an environment (Al-Abadi, 2023).

Central to this aspiration is the country's emphasis on cultivating a highly skilled, efficient, and adaptive workforce. The rationale here is simple yet profound: for a nation to truly thrive in the global digital economy, it needs a workforce that is not only adept at leveraging the tools of today but is also primed to navigate the uncertainties of tomorrow. This perspective aligns seamlessly with the broader global narrative, emphasizing the role of human capital in driving economic prosperity (Jahanger et al., 2022).

It is found that the demands concerning digital services among Emirati citizens are quite high which enhances the expansion scope for a substantial increase in the UAE's digital economy. 85% of the nation's population are having at least one smartphone and the average UAE-based users of mobile are funded to spend a minimum of 4 h regularly on their phones. It is because of the UAE-based consumer's higher usage of smartphones majority of the citizens are now preferring to perform online banking rather than physically visiting the branch (YouGov, 2019). Moreover, 80% of UAE citizens are preferring to avail themselves the different government services through different digital mediums (TADRA, 2019). This particular desire concerning the availing of digital experiences will bring around a major transformation within UAE's different industry sectors. Moreover, these sorts of digital services are applicable across borders helping in the process of expansion of the UAE's business firms. In a way to grow further, UAE needs to motivate a huge number of internationally-focused unicorns including digital startups with strong market capitalization (Lynn et al., 2022).

The UAE's digital economy plan is at the center of this digital transformation. This is more than simply a tactical plan; it symbolizes the goals of the country and fits in well with the larger economic strategy for 2030. The factors that determine value have experienced a seismic upheaval in this imagined future. The days of determining a country's riches only on its industrial prowess or natural resources are long gone. In the digital era, information and technology are just secondary to data as the ultimate resource (Zarrouk, 2023). Acknowledging this paradigm change, the UAE's approach highlights the importance of these modern assets and promotes their position as the cornerstone of future economic growth.

In addition, digital success in the UAE has not occurred randomly rather it's based on strong foundations. The state has shown great dedication towards building firm digital infrastructure which ensures that everyone can access technology and connectivity. As a result, currently UAE has some of highest levels of global digital penetration rate. Such a firm base illustrates country's foresight, perseverance and resilience as well as bestows to handle challenges posed by new age internet or digital age (Antwi-Boateng and Al Mazrouei, 2021). In the grand scheme of digital transformation, small and medium-sized enterprises (SMEs) have emerged as a specific focal area that has attracted major interest. SMEs are undergoing a significant paradigm shift that involves changing their operations in line with the digital economy. However, on retrospective analysis, it can be observed that SMEs have taken a long time to adjust and accept the principles of the digital economy primarily because of their restricted resources and lack of information.

Moreover, Melo et al. (2023) pointed out that the adoption of the digital revolution by SMEs is no longer a matter of stepping on it but rather taking lead. These firms are shifting from conventional operations to advanced online models through the use of digital frameworks. More than mere survival, this transformation represents an opportunity for prospering amidst competition. Through digital technologies, SMEs have become more agile in order to expand their audience and offer unparalleled value to their customers.

The efforts to understand the impact of digital technologies on entrepreneurship has grown worldwide. For instance, a recent

study has conducted on 110 countries including Europe and others and have found the positive effect of digital technology on entrepreneurial ecosystem (Zhang et al., 2023) however little has been known in the context of UAE particularly in developing the link of digitization with entrepreneurship within the realm of SMEs. The UAE as a nation is considered important owing to its ambitious startups and different technology companies in a way to become one of the first nations across the globe to go completely digital. UAE is one of the most rapidly growing economies in the Middle East and there is no sign of an economic downturn in the nation following new technological implementations and business strategies (Jiang, 2020). This is providing quick and accurate help to these business organizations in processing the seismic data followed by the identification of the oil and gas reservoirs while analyzing the working conditions of these companies.

In addition to being business units in the UAE, Ghak and Zarrouk's (2022) research found that SMEs play an active role in the functioning of the economy of the nation as they are a major engine for employment creation, economic diversification and also innovation. As these businesses seek to operate in the digital economy, the question here is about how best to use a digital strategy to improve their efficiency, competitiveness and longevity. More specifically, there is increasing focus on how the digital mechanics can propel these SMEs into adopting green and sustainable practices (Telukdarie et al., 2023).

Sustainability, understanding it as "green" or environmental responsibility is not a matter of a few radical proponents anymore. In view of the global environmental crisis that is growing out of control and the growing awareness of the need for businesses to exercise social responsibility in this regard, performance indicators which are "green' have become imperative for all businesses everywhere (Abu-Rayash and Dincer, 2021). For instance, the green practices of SMEs in the UAE assume great significance as environmental sustainability is part of the country's overall image of achieving development without compromising the environment (Lasrado and Zakaria, 2020).

However, the process of SMEs integrating and reaping the benefits of digital measures, more so with the respect of their green practices is never smooth. The initiative is even more complex considering how the post covid period has depression effects, changes in consumer patterns and a lot of focused attention to health and all safety incidences (Alalawi et al., 2022). Now at this juncture, having mastered most if not all of the operational challenges posed by digital transformation, relevant SMEs are in the next stage seeking almost desperately to figure out where "green digital" comes into play within this ever-shifting world order.

3. MATERIALS AND METHODS

As far as this study is concerned, "interpretivist" research design is followed to conduct the research. The reason for using the paradigm is that the researchers intend to focus on explaining the interpretations of the respondents to explain their stance on the digital and green economy. In addition, this study employs qualitative research strategies. Qualitative study helps in gaining deep insights from the respondents which quantitative study may not. Moreover, this study employs purposeful sampling as the chosen method for participant recruitment, focusing on individuals capable of offering both in-depth and detailed insights into the phenomenon under investigation. This type of sampling technique helps in identifying the participants which are most suitable to collect the data on purpose. Specifically, the study aims to select 10 SME owners and 10 government officials who possess the knowledge and experience necessary to provide comprehensive information. The overarching goal is to gain a nuanced understanding of the digitization of SMEs and its relationship with green behaviors in alignment with the economic vision of 2030. SME owners have been selected from different sectors such as education, health care or industry leaders, e-commerce, fashion, alongside food delivery.

To achieve this objective, a semi-structured interview approach has been adopted. This method allows for a flexible yet focused interaction with the selected SME owners and government officials, ensuring that relevant data is gathered effectively. The SME owners and government officials chosen for participation in the United Arab Emirates (UAE) have been interviewed in depth, enabling the research to explore and capture the intricate details surrounding the digitization efforts within SMEs and how these efforts contribute to environmentally sustainable practices.

Moreover, the research employs a thematic data analysis procedure to enhance the comprehension of the phenomenon investigated in this research activity. This analytical approach is selected for its effectiveness in identifying and interpreting patterns, themes, and meanings within qualitative data. Individual interview sessions with SME owners and government officials form a crucial component of this research methodology. These one-on-one interviews are designed to elicit detailed and nuanced information relevant to the specific topic under investigation. The personalized nature of the interviews allows for a focused exploration of each SME owner's experiences, perspectives, and insights regarding the subject matter.

Lastly, the researchers have conscientiously adhered to established ethical guidelines throughout the course of this study. Both the aspects of privacy and confidentiality were rigorously maintained during the research process. Furthermore, any intentional manipulation, whether statistical or non-statistical, aimed at achieving predetermined results or aligning with prevailing public sentiments, was deliberately avoided. It is essential to note that this research remains impartial and devoid of any ideological bias. One of the key ethical considerations was obtaining informed consent from all respondents. Each participant was explicitly informed in writing about the study's expectations, and their consent to participate was obtained. To further safeguard the identities of respondents and the organizations they are affiliated with, anonymity was maintained, aligning with the provisions outlined in the Code of Ethics. This approach underscores the researcher's commitment to conducting the study ethically and responsibly.

4. FINDINGS AND DISCUSSION

4.1. Role of SMEs

Table 1 presents the themes related to SMEs. It has been observed that SMEs have significantly adopt the technology in the post-covid era. They have mostly gone online as well as started adopting digital technologies (Mishrif and Khan, 2023). As far as current study is concerned, the SME owners selected for this study belong to numerous educational and professional backgrounds, each bringing singular insights and capabilities to their small and medium enterprises. Majority respondents began their businesses spanning 2014-2019, indicating an emergent trend within digital entrepreneurship sphere. Their motivations derive from an amalgamation of recognizing market demands, personal passions, and influences originating either from education and health sectors or industry leaders. Despite technology and digital solutions majorly populating the responses, sectors such as healthcare, fashion, alongside food delivery also find representation. Marked emphasis on sustainability, improving accessibility and addressing particular market requisites through innovative solutions is noteworthy in the data. The following section exhibits the emergent themes from the data.

There have been number of reasons which are highlighted by the respondents to go for the digital entrepreneurship initiatives in context of UAE;

For instance, Respondent I, III and VI pointed out that they are impressed by United Arab Emirates due to its fast-developing and strong economy, its strategic geographical position and an accommodating business atmosphere. In addition, the country's highly advanced infrastructure such as good road networks make the UAE more appealing for entrepreneurs while its healthcare policies are among the most advanced globally just as its education systems is well developed as well as technology industries which act together to attract many innovators namely those who seek careers in business. There are different other arguments by respondents that have been presented by SME owners. For instance, the supportive government policies, especially with respect to technology, innovation, digitization, entrepreneurship as well as Internet of things (IoT) which significantly impacted on their decision to startup businesses in UAE. Moreover, respondent II, III, IV, VI, VII and IX highlighted that high standard living within UAE combined with various market niches such as fashion and food industry that make it very attractive as startup countries. Lastly, entrepreneurs looking at the UAE as a place to do business were impressed by its political stability, visionary leadership and sustainability driven initiatives among other factors.

4.1.1. Pre-and post-covid strategies

The purpose of this theme is to highlight the strategies adopted by SME owners in the pre-and post covid era. Outbreak of covid resulted in opting for digitization as sole option due to heavy lockdowns placed by the government. However, this was not the case before Covid outbreak. As per the respondents, they were heavily engaged in face-to-face interactions, visiting the clients themselves, face to face consultations and networking events. This strategy was quite helpful in building trust and relationships with the clients. Alongside, a lot of traditional marketing practices widely practiced were used. Furthermore, to exhibit their products, services and connect with prospective customers or clients, some of those interviewed went for specific industry events like food fairs and health care expos.

Table 1: Role of SMEs

Focus	Themes
Role of SMEs	Pre-and Post-Covid Strategies Contribution towards Global Digital Economy Use of Technology in Global Economy and Economic Vision 20230 Digital Technology and SMEs Effectiveness Challenges during adoption of digital technology Green Initiatives by SMEs

On contrary, post-COVID shift to digital strategies do represent a significant change in operational, marketing, and client engagement procedure for SMEs leading to the need to deploy virtual platforms and online marketing practices in order to keep their businesses afloat and even expand them. Respondent I, IV, and VII changed to online consultation, telemedicine and virtual lessons. Besides that, they put more emphasis on increasing their online presence and improving e-commerce abilities so they could meet escalating online demand. Moreover, there were some participants (II, V, X) who went into strategic partnerships and adjusted their reliant operational plans according to alterations in the market. That way, their staying on top was supported as they were able to understand and cater for the growing demands from clients within a swiftly evolving environment.

4.1.2. Contribution towards global digital economy

As discussed in earlier section, Respondent I, II, III, VI, V, VI, VII, IX, and X present the global digital economy as a sophisticated interconnected system that involves multiple digital processes, technologies, and relationships to encourage economic growth. From this perspective, it is considered that digital economy is akin to a network in which products, services and economic activities can move smoothly across different countries owing to the innovation in technology. The internet is increasingly dependent on billions of interactions among people, businesses, things and services that power it. Key components of the digital economy are; e-commerce, online transactions, digital health, education, and innovative services adapting to dynamic needs of the global market. The global economy is further facilitated through the internet, making international trade and different entities working together possible, hence making the world economy more closely knit. This all highlights that how digital technology transforms conventional economic activities, thus pointing out the necessity for digital knowledge, which is needed for maintaining economic growth in a sustainable manner.

Different techniques were used by the respondents to adjust to and contribute to the global cyberspace during post-COVID period, focusing much on enhancing e-commerce platforms and online presence to accommodate the surge in internet shopping. This point was echoed across several respondents who felt ecommerce could not be underestimated. Similarly, several respondents were of the

view to provide consultancy services to other firms in going digital. A respondent (I) innovated on telehealth applications as digital healthcare solutions addressing the increased demand for remote healthcare services, and developed solutions supporting remote work and online collaboration, a few others (III) made suggestions on how to improve operating systems for distance education in order to cater for flexible learning needs. In the food business, respondents VI and VIII said they had worked on boosting food delivery and had brought in remote ordering systems. Lastly, a handful of people looked into creation of digital finance services to be used in remote banking and for planning purposes regarding financial investments. These approaches conform with general pattern for employing electronic technology to address developing marketing needs and make bents for global digital economy.

4.1.3. Use of technology in global economy and economic vision 20230

To boost their business operations, respondents used different new technologies as part of global digital economy and to contribute in the Economic Vision 2030. Using artificial intelligence and machine learning to improve customer experience, optimize work flows and develop smart tools were among the key strategies applied by many respondents. These tools helped in operational efficiency, stock management and financial processes. Similarly, many respondents used cloud computing as part of economic vision 2030 for proper data management, scalability and effective delivery of the services.

Several respondents (I, III, VI and V) noted that Blockchain technology helped them to enact secure transactions while also improving services, highlighting improvements that come about with the security protocol associated with financial transactions.

> "*Blockchain technology has changed the pace as well as horizons of the world including UAE"*
>
> *Respondent III*

Few of them (IX) have also applied the concept of virtual reality and augmented reality in relation with customers. This usually dealt with devices producing information which is then transmitted to other devices through the experience moulding function. On the other hand, few (VII and X) have used internet of things (IoT) to create smart, energy efficient, eco-friendly solutions as well as monitor stocks. Big data analytics significantly contributed to the service optimization as well as enhancing decision making while ICT solutions were embedded in order to advance sustainability and innovation. Moreover, usage of both GPS and real time tracking resulted into enhancing of logistics services putting in place delivery services. At the same time, operational efficiency has been improved through the introduction of logistics and inventory management systems.

4.1.4. Digital technology and SMEs effectiveness

The SME owners have underscored several key issues about the impact of modern technology on their operations. Most of them were of the view that there has been improved performance in their organizations because of the digital technology which has led to smoother processes and operations ultimately achieving greater efficiency and effectiveness in different departments. Several SME owners (II, V, IX) highlighted that digital technologies have helped to cut costs by making sure that they optimize the resources well and do not spend too much finances on running a business which is why they make more money and compete favorably besides lowering costs. In addition to that, it was pointed out that customer service was made better through digital technologies since tailored solutions could be provided, allowing SMEs to personalize their offerings, better meet clients' needs as well as provide better quality of products and services leading to customer satisfaction. Similarly, several responses (III, IV and VII) pointed out that digital technologies have improved business performance through streamlining of processes, increasing output and customer service while at the same time making it more focused.

> *"Digital technologies have been extremely useful as well as effective in streamlining our business operations".*
>
> *Respondent IV.*

4.1.5. Challenges during adoption of digital technology

Securing capital for technology investments poses a significant problem as indicated by many respondents. To illustrate, one of them said, "Finding sources of finance is the main issue" thereby showing how hard it is to get finance needed. Another pointed out that it was the initial cost that posed a problem more than anything else in terms of funding requirements. One respondent mentioned that there was "a greater cost related to investment in technology."

Few respondents experienced operational challenges while integrating new technologies with current systems. One respondent mentioned the "implementation of new technologies in currently functional systems" to indicate the complexity of merging new tools with the already functioning infrastructure, while another highlighted challenges like "integrating new technologies into existing ones" which are still rife according to other examples.

Many respondents emphasized that costs linked to technology adoption and personnel training constituted major hurdles.

> *"The high cost of implementation of various technologies have been the major hurdle"*
>
> *Respondent V*

And another stated that

> *"There are upfront costs in introducing new technologies".*
>
> *Respondent VII*

Several responders were concerned with security and privacy of information when trying out new technologies. Using innovative tools and still safe guarding the security of patient`s data, was a major worry for one respondent. He felt that the need to secure delicate health records outweighed everything else. Protection for records as well as confidentiality for learners was mentioned by some others.

4.1.6. Green initiatives by SMEs

Respondents largely see green initiatives as strategies or practices meant to reduce environmental impact. In one example, a respondent spoke of them being about ways to reduce the effects of human activities on the natural environment, whereas another mentioned it as management strategies that positively influence on the ecological front. Green initiatives should be taken as pro-active measures aimed at reducing the environmental damage resulting from business operations, prioritizing sustainability.

Many respondents were of the view that to go green, they had embraced the use of renewable energy. One of them gave an example of how he is "moving towards plugged in sources of energy," while another one said "acquiring power from renewable sources." For instance, a respondent highlighted that they are "adopting clean power sources entirely." This has been done with the main aim being reduction in the use of fossil fuels besides reducing carbon footprint by various companies hence contributing towards environmentally sustainable actions.

Alongside, several organizations have recycling programs and waste reduction strategies in place. Respondents identified "recycling," "reduction of waste through recycling programs," and "use of biodegradable packaging" as stated responses. They aim at recycling materials, reducing waste production while also promoting environmental stewardship and resource-efficiency through using biodegradable packaging.

One outstanding issue that emerged was the emphasis on remote work and virtual meetings to reduce carbon emission from commuting. One respondent said, "encouraging work from home" while another said "some meetings can be done online that's why stopping travel," and a third one said that we should "encourage working from home to reduce emissions." Organizations promote flexible work arrangements and leverage technology to conduct virtual meetings in order to reduce travel-related CO_2 emissions and support sustainable work practices because they encourage environmental friendliness.

In addition, creating clothes out of environmentally sustainable substances and using sustainable packages, helps save nature at every stage beginning with production and ending on disposal. Finally, switching from paper work to electronic documentation processes in different fields lessens the amount of paper used as well as administrative garbage; thus, fostering a more comprehensive approach towards staying green.

Lastly, IOT enabled systems have also helped in manufacturing units by applying HVAC system to reduce the power consumption. Moreover, use of blockchain technology has also helped in ensuring the sustainable sourcing and transparency of supply chain processes by lowering impact on climate. These instances demonstrate how different organizations are adopting eco-friendly measures for minimising their ecological footprints, as well as making the most of available resources and encouraging environmental protection and care using creative, sustainable and long-lasting approaches.

4.2. Role of Government Officials

Table 2 presents the themes related to government officials. Few governmental functionaries (III and VI) have characterized the worldwide cyberspace economy as relying on electronic innovations for every single financial transaction occurring anywhere on earth or within a country affecting business tactics, consumer communications and public policies drawn up. Interestingly enough, they underscored how much this form of technology is diffused into day-to-day business beyond just making money but also changing how firms engage with their clients.

Several respondents (I, VI, IX) stressed out that the global digital economy consists of economic dealings that result from wide-ranging links among the internet users, corporate bodies, gadgets, data and other processes. These respondents pointed out that worldwide digital economy is propelled by digital interconnection among billions of individuals and devices thus allowing for easy movement of trade all over the globe.

The greater part of respondents (I, II, III, V, VII, X) said that the worldwide digital economy involved economic activities that were entirely driven by interconnected systems of digital infrastructure and the web. They noted that this economy is born out of an extensive network connecting people, companies, things, knowledge as well as processes resulting into new business and trade initiatives. In their responses, these respondents stressed on how digital platforms and technologies have created a more complex as well as dynamic economy.

Moreover, several respondents (IV, V, VIII) emphasized prominent investments and strategic programs of the United Arab Emirates in digital frameworks. The Smart Dubai strategy, the Dubai Blockchain strategy, and the Mohammed bin Rashid innovation fund were cited as some of the ways, through which the United Arab Emirates government is encouraging digital economy development. With these initiatives, digitalization and entrepreneurship are supported to help create a strong base for economic expansion and discovery.

In their remarks, some respondents (I, IV) pointed out that the UAE had been gradually shifting into a digital society even before the outbreak of COVID-19 through programs like Smart Dubai and UAE Vision 2021. They designed these initiatives to make a smart city and promote a digital society.

Majority of the responses (I, II, IV, V, VII, IX, V) indicate that a significant acceleration took place in the national digital policies' development due to COVID19 pandemic. There is an increasing focus on remote work, telemedicine and online trade specifically

Table 2: Role of government officials

Focus	Themes
Role of government officials	Type of governmental initiatives and way forward Government's Assistance for SMEs adopting digitization Role of government to encourage green behaviors among SMEs

after the outbreak of COVID-19. Meanwhile government has made some efforts to offer support for these areas through improvement of cybersecurity, financial assistance for start-ups, provision of funds for companies utilizing digital technologies. The pandemic emphasized the need for readiness in terms of technology which ought to ensure continuity of business operations in addition to creating a stable economy against shocks.

As part of its Vision 2030, several respondents (II, III, IV) emphasized that the UAE government is focusing on vital digital sectors including artificial intelligence, blockchain technology, smart cities and digital healthcare. These fields play a critical role in determining what the future digital topography will look like and helping to attain economic diversification.

Majority of those who responded stressed that Vision 2030 should be approached holistically by melding together digital technologies like artificial intelligence, blockchain and smart cities. This way it is viewed as crucial in the UAE's technological advancement and economic diversification. In relation to merging economic prospects with digital policies, few informants attributed the responsibility for this aspect to the state which plays an important part in terms of setting up a conducive regulatory framework that fosters digitalization. This involves establishing legal structures and giving stimulus for growing digitization.

Several respondents (V, VI, VIII) noted that government efforts include aligning digital policies with the economy through favorable regulations and legal frameworks. This alignment is vital for merging digital developments into larger economic aims. In addition, majority of the respondents emphasized that the government has to develop a comprehensive legal framework, promote incentives for digital innovation and ensure that digital policies are in line with national economic plans. This integration is fundamental to promoting an enabling environment for digital transformation.

4.2.1. Type of governmental initiatives and way forward

Several respondents (I, II, IV, V) noted that UAE government's contribution for supporting digital entrepreneurship is notable. Key initiatives like the National Programme for Artificial Intelligence, establishment of the UAE Council for Digital Wellbeing, provision of grants and incentives for tech startups have played an important role in this regard. This has led to emergence of new tech ventures which forms a strong base for innovation.

Among other things, several survey respondents (II, III and VI) stressed that government initiatives such as Dubai Future Accelerators and UAE Artificial Intelligence strategy have made the environment much suitable for digital innovation together with funding and incentives for technological entrepreneurs. Thus, these efforts have been instrumental in fostering an environment that has given rise to numerous startups that have since become valuable players in the global digital economy.

> *"Dubai Future Accelerators program is going to be hit initiative as part of economic vision 20230"*
>
> *Respondent VI*

Most of the respondents acknowledged that even though the UAE government has done so much, there is more to be done. Enhancing funds provided to digital startups, more advanced mentorship schemes and improved coordination among academic and corporate sectors are some of the recommendations. By doing this, it can enhance the roles of entrepreneurs in the digital space while positioning UAE favorably in the world's digital finance.

4.2.2. Government's assistance for SMEs adopting digitization

In light of the Economic Vision 2030, a meticulous analysis of government aid to SMEs in adopting digital technologies shows an array of themes. To modernize and innovate through financially based incentives, training programs but mainly digital tools were mentioned by several respondents. Thus, government encourages SMEs to adopt digital technologies so they can operate under modern-day conditions that include economic benefits.

Several government officials (VI, VIII, X) who took part in the study contextualized the support measures. They mentioned different types of financial help that include business development funds and digital infrastructure. This variety reflects the efforts made to help those small medium enterprises (SMEs) understand what they actually need at all stages including starting up and ongoing technological support. Most respondents reported on vast government participation encompassing grants, training courses as well as provision of technologies. A well-rounded approach like this one is indicative of an intricate and all-encompassing plan towards facilitating integration into electronic platforms by small businesses; thus, guaranteeing provision of requisite resources even for its sustenance.

Respondents highlighted that government policies are critical for fostering Economic Vision 2030. They stated that these policies are meant to stimulate creativity, make financial resources available, and enhance opportunities to reach markets so that the aim of SMEs is similar to the larger UAE economy goals. Particularly, several respondents (V, VI, VIII) explained about particular regulations targeting small and medium enterprises towards meeting the goals of Economic Vision 2030. These regulations consist of provisions in support of innovation, acquiring funds and enlarging market spaces, with a view to enabling SMEs play their proper role in promoting national economic development.

In alignment with the Economic Vision 2030, most respondents emphasized on the role of the government in policy design. Among them were some that suggested developing support structures, such as e-governance platforms and digital training initiatives. Thus, an enabling legal and regulatory environment for SMEs would ensure that they innovate and grow in tandem with the national economy. Some respondents discussed the creation of support structures like e-governance platforms and digital training initiatives. Such structures are meant to facilitate SMEs in a digital world by providing them (with essentials) such as online learning and innovation hubs.

E-governance and digital solutions were the observation of a number of respondents as being merged into support structures. These involve the building of digital training platforms and

innovation centers which help SMEs grow by offering extra resources in a digital setting. To most respondents, e-governance assistance is very broad based and includes components such as digital learning frameworks and innovation centers. Such an all-inclusive support equips SMEs to meet technological challenges by giving them all round opportunities for advancement.

4.2.3. Role of government to encourage green behaviors among SMEs

An overview based on thematic analysis, which focuses on the initiatives of the government to promote sustainable actions in SMEs, particularly those that incorporate digital technology shows that some emerge as primary themes. In essence, there are instances when respondents noted the proactive measures taken by the government in making policies aimed at ensuring that SMEs adopting digital technologies engage in eco-friendly practices. This includes incentives for green technologies as well as legal frameworks established to advocate for sustainable development. Several respondents were specific about certain step adopted by government authorities to aid environmentally friendly strategies. They include tax ornaments for green technologies and legislation intended at fostering sustainability amongst SMEs. By this way, these to policies by the government represent a systematic strategy for incorporating environmental aspects into the digital transformation of SMEs.

Majority of those surveyed (II, IV, V, VI, VIII, IX and X) noted the all-encompassing character of the government's policy-making process. This means the creation of policies, which are diverse, to support sustainable actions, promote green technologies and establish frameworks for environmental learning. The government's multifaceted approach enables SMEs have access to various resources and motivations to embrace eco-friendly practices. Several respondents talked about how the government was coming up with policies that specifically supported sustainable practices. Some of such policies include incentives for using green technologies as well as regulations aimed at creating awareness on environmental matters among SMEs. These measures are important in encouraging SMEs to incorporate sustainability into their business models.

> *"We have received incentives from the government for adopting green practices for our organization".*
>
> *Respondent X*

Several respondents (V, VIII, IX) highlighted how the government was interested in promoting green technologies and environmental education. Policies aim at encouraging the use of new sustainable technologies and increasing public consciousness on matters relating to the environment. This two-pronged approach enables small and medium enterprises (SMEs) to embrace green practices as well as appreciate their significance within the bigger picture of sustainability. Most respondents pointed out that it is the responsibility of the government to enable the integration of sustainability in policy frameworks. This can be done through setting up mechanisms such as legislation, rewards for green innovations and educational campaigns on sustainability. The alignment of policies with sustainability goals ensures that SMEs receive support from government agencies in their journey towards becoming environmentally friendly.

The establishment of enabling policies and support systems by a few respondents make mention of creating support systems that would enable SMEs engage in sustainable practices. These structures provide essential resources and motivation for SMEs to use environment-friendly methods. Other respondents pointed out governmental initiatives to promote ecological awareness in SMEs through educational initiatives and incentives offered by various agencies. This way, they help them know how (and when) to adopt eco-friendly technologies as well as methods. For most of the respondents, they acknowledged that core government policies affect SMEs' performance. Specifically, this was due to comprehensive support systems established thereby incorporating environmental issues in business strategies leading to increased participation in green initiatives thus contributing towards wider eco-development objectives.

Such results derive from this analysis in reporting the unique interplay of the digital economy and greens behaviours of SMEs in the UAE Economic Vision 2030. In bringing more contextual depth in the study findings, it may be interesting to compare SMEs from countries sharing similar economic objectives, like the Saudi Arabia Vision 2030 and the Singapore Smart Nation initiative. For example, small-scale enterprises in Saudi Arabia are also challenged by the strong digitization and sustainability imperatives within a resource-driven economy while Singapore SMEs are constrained by geography and heavy regulation, which drive them to more innovative sustainability practices. Using such comparative perspectives would give insights into UAE-specific challenges like policy gaps, infrastructure needs, and culture-related issues affecting green behaviour. This would thus not only contextualize findings but also increase their relevance to policymakers and actors involved in advancing sustainability in the digital economy within the UAE.

Lastly, intricate relationships and connections between identified themes can also be observed, where the challenges and enablers outlined have been hybridized and determine how they will be taken together to influence the adoption of digital technologies and green practices in SMEs. Those strategies adopted by SMEs pre- as well as post-Covid underscore the relevance of these enterprises to what the global digital economy is all about; these strategies are meant to push SMEs towards digitization to ensure competitiveness and resilience. With digital technology, however, the capabilities of SMEs have been transformed in terms of cost-efficient production, access to markets globally, and innovative solutions. Some of the impediments to further progress have been issues such as limited access to funding, technological infrastructure, and skilled labour, thus increasing the burden of systemic need with respect to support.

Such government initiatives are the most critical enablers and drivers of this transformation through the digital revolution. They support SMEs in financial incentives, policy frameworks, and capacity building programs around the adoption of digital technologies as SMEs converge in the area of government support,

financial subsidies, policy frameworks, and capacity building programs. For example, there can be direct subsidized technology adoption by providing funding assistance or tax credits for a business that adopts environmentally friendly practices. Both can relieve some cost burden on SMEs, which is one of the negative aspects of digital transformation within organizations. Thus, the aspect of the government's role in nurturing green behavior among SMEs is also vital because the regulatory framework and public-private partnerships (PPPs) will form an enabling environment for those sustainable practices. This is particularly favorable toward aligning the efforts of SMEs with the general sustainability goals of greater national and international initiatives, such as Vision 2030 of the UAE Economic Vision.

The relationship of digitization with green initiatives is worth focusing on such as IoT and big data analytics, which enable SMEs to monitor and optimize the way they consume their resources, thereby reducing waste and promoting sustainability. Apart from making operations much more efficient, these technological developments coincide with the green economy agenda by lowering carbon footprints. The challenges, such as resistance to change, lack of technical skills, and inertia due to culture in adopting those technologies manifest poorly associated interconnected nature of barriers and, therefore, the need for cohesive strategies to address the adoption barriers in their minimized multifocal forms. Programs could be conducted, for example, to train the government or industry leaders and the public under the same umbrella.

5. CONCLUSION

This study highlights how SMEs in UAE interact with global digital economy, their role in UAE Economic Vision 2030, and how digitization has promoted a greener path for SMEs. Several key aspects are highlighted by the findings that shed light on how such businesses can shape the future of UAE economy even as they cater for environmental sustainability. Digitization is now being led by a majority of SMEs mainly due to the need for post COVID recovery. UAE entrepreneurs have utilized current technology at an outright pace leading them into new international markets hence contributing towards establishment of global digital economy. This not only enhances local economic stamping out-their-digital impact but also expands their global outreach that is, the SMEs in UAE being able to invent and move towards digital usuals create more marketing opportunities across world than any other nation in the world. These contributions demonstrate resilience and flexibility from UAE entrepreneurs, thereby positioning our country higher on the international digital economy ladder.

In addition, SMEs have shown their important function in accomplishing the UAE's Economic Vision 2030. Digital technologies have not just improved operational efficiency for these businesses but also helped to achieve the wider economic diversification aims of UAE. There are several successful SMEs that have managed to use digital platforms for extensive market access, greater productivity, and creation of innovative ideas. In contrary, if SMEs want to fully optimize the benefits of economic Vision 2030, they should counter the obstacles such as skills set shortage, limited access to funding and more support from the government.

Similarly, role of digitization is also crucial in adopting the green practices by SMEs yet number of SMEs has still to materialize this aspect in true spirit. While many enterprises have shown their keen interest in adopting green practices, and are also implementing one way or another, challenges such as high initial costs and lack of skill set hinders the implementation despite the fact that government has also spread its hands in terms of support through various incentive plans and other policy measures.

In nutshell, SMEs play a crucial role in establishing a digital economy in the UAE and implementing the Economic Vision 2030. However, their optimization is limited by a number of factors, particularly the embrace of green and cleaner methods. This challenge requires coordinated efforts between government, private sector and SMEs themselves to prevent UAE from only being competitive globally but also from leading sustainable business practices. In this way, SMEs can still shape the UAE's future that is both digitally advanced and environmentally sustainable through continuous innovation, government policies support and strategic investments in various sectors.

5.1. Recommendations

This study has proposed various recommendation based on the findings of the study on both parts i.e. SMEs and government of UAE.

5.1.1. SMEs level

SMEs should focus on spending in universal and inexpensive green technologies that can reduce their effect on the environment. While starting costs may seem expensive, the future energy savings and how customers appreciate or comply with future regulations should be considered which is going to receive it. Moreover, SMEs could think about public-private partnerships or loans focused on environmental innovation.

As we move further into the digital age, SMEs are required to increase grasp of sustainable practices and digital tools. Industry workshops, seminars, and ongoing professional development programs dedicated to both these areas can help realize this goal. Similarly, internal training sessions should sensitize the cultural aspect of embracing the responsibility for improving the environment at larger scale.

SMEs need to work on the connections with manufacturers who have the sustainable practices in place as well as academia who taught these subjects in their insitutions as well as policy level think tanks and researchers who are having the specific knowledge in this regard, this solution is also const effective as well as easy to implement without any delay. Similarly, such enterprises can also seek assistance from government level think tanks and innovation centres of the country.

Such enterprises also suffer with shortage of funds to start with or even with the sustainable models. In that case, this study suggests to start green operations in incremental phase. For instance, in first instance, few operations can be transformed to be operated on solar energy and in the second instance, whole model can be operationalized through renewable energy to avoid the hit of

initial costs. This is how sustainable supply chain model can be implemented too.

Digital technologies integration that enhances operational efficiency and environmental conservation in SMEs is an area that should be actively tapped. For instance, carbon emissions can be greatly reduced through use of cloud computing services, digital supply chains or artificial intelligence systems thereby promoting sustainable development.

5.1.2. Government level

UAE government has to provide more financial rewards for SMEs that are environmentally friendly and sustainable. In the beginning, it would be easier to adopt green technology if some grants, interest-free loans and tax exemptions are provided.

The government can help in regards to providing a common access point from which small and medium enterprises can get green technologies at an affordable price. For this purpose, it can include a directory of verified suppliers of sustainable technology offering discounts, hence hastening their turnaround time. They may also offer consultancy services and assist them in choosing the right option.

The government needs to start the awareness campaigns at massive level towards sustainability. Government can introduce many programs for the SMEs such as short courses for the managers towards sustainability and its usage, or by telling the best practices in the UAE or at global level.

Legal framework also needs to be stablished in this regard to protect citizens from any harm they might encounter because of businesses that disregard environmental concerns and also ensure that small businesses conform to business laws. Consequently, by offering free online resources or consultations, SMEs would be encouraged to embrace eco-friendliness without the fear of closing down.

One of the methods through which government can accelerate sustainability initiatives is through collaboration of public institutions, large companies and small businesses. In this case, SMEs can be given monetary grants, mentorship on strategic planning and access to places where one can learn about digital transformation and green technologies simultaneously.

The government needs to create reward schemes to recognize SMEs that have made significant strides in digital transformation and sustainability efforts. To this end, some national awards related to certification or cash prizes would honor such organizations as those that are adopting eco-friendliness as well as online development.

The creation and patronage of green business networks that would bring together SMEs with similar sustainability targets could be done by the government. To help businesses apply green technologies while benefiting from economies of scale, these clusters may also provide communal resources, information centers, and innovation parks.

These recommendations, if implemented, will help SMEs to contribute more in digital arena around the globe and being sustainable will be among the top most priority for these organizations by going green in their operations. This strategy will also help in achieving the Economic Vision 2030 for UAE.

5.2. Practical Implications

The findings of the study present significant practical implications for SMEs and policymakers in terms of digital transformation and sustainability. The recommendations for SMEs reiterate the necessity for technology adoption for improved operational efficiency and greening efforts about international sustainability goals through leveraging government incentives and training programs. It is proposed that policymakers should design targeted support provisions such as financial grants, infrastructure development, and capacity building to effectively address the issues around SMEs on the digitization and sustainability parts. PPPs are also suggested to improve adoption rates for eco-friendly practices. The research points out the need for further studies to contextualize the issues of digital transformation and sustainability concerning regions with common economic objectives where SMEs differ. The comparative approach will allow a more profound understanding of effective strategies and a better understanding of how technology adoption takes place with sustainable development in varied contexts.

5.3. Limitations and Future Directions

The study is focused mostly on SMEs that are in particular sectors of the UAE. Therefore, these findings cannot be fully generalized across all industries especially those which have low dependence on digitization or traditional sectors like agriculture and construction that may face different challenges when it comes to adopting green practices. This study is geographically focused on the United Arab Emirates, which has specific economic, cultural and governance dynamics. Consequently, they may not apply to SMEs operating in other political or regulatory settings particularly developing countries with lesser resource endowments and fragile support by the state. In future, cross regional and cultural SMEs can be selected for generalizability of the findings.

The sample of the study is also limited and belongs to specific sectors such as education, health, and other IT related firms however it limits the generalizability of the findings. Much of the data gathered from SMEs relies on self-reporting by entrepreneurs and business owners. This can introduce bias as participants may overstate their adoption of green practices or underreport challenges due to social desirability or a desire to present their businesses in a positive light. Future studies must consider reducing this bias by introducing the quantitative set of inquiry and relevant statistical procedures to limit the bias.

The study might suffer from sample selection bias, as SMEs that are more progressive in terms of adopting digital technologies and green practices may be more willing to participate. This can skew the findings to reflect more favorable outcomes and may not accurately represent the challenges faced by less digitally advanced SMEs.

The use of digital technologies in achieving sustainability is emphasized by this study but it may not represent the relevance of the non-technological factors like commitment from these leaders, employees' involvement, and the larger socio-economic context that are necessary for promoting ecologically friendly habits among small and medium enterprises (SMEs). This research, while raising organizational culture as an issue, does not seem to really show how deep-seated obstructions to change exist within SMEs. Factors such as leaders' opposition, distrust towards digitization or fear for regulations could have a more significant influence and randomness over green behavior. However, they may also vary strongly. Thus, future studies should take into account the normative side of the variables.

This study has not measured the long-term influence of government policies, financial incentives, or sustainability initiatives on the performances of SMEs. Hence, it is unable to provide an answer as to whether the enlistment of green practices leads to economic and environmental advantages in the long run. The regulatory frameworks set up by both the state and agencies which touch on digitalization and sustainability are always changing course. The present study only represents a single instance in time whose implications may be either intensified or watered down depending on subsequent developments in terms of policies. Future studies can opt for longitudinal data to tackle this issue.

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