VUCA AND BANI WORLDS - CHALLENGES FOR NOWADAYS BUSINESS MODELS. COULD CIRCULAR ECONOMY AND VARIOUS DIGITAL INSTRUMENTS LIKE INTERNET OF THINGS HELP A BUSINESS MODEL TO RESPOND TO SUCH CHALLENGES? AN EXAMINATION OF SOLUTIONS AND FUTURE STRATEGIES THROUGH MARKETING LENS

Denisa-Roxana BOTEA-MUNTEAN[1]
Raluca CONSTANTINESCU[2]
Daniela MARINICĂ[3]

Abstract

The present paper constitutes a research endeavour grounded in a fundamental question posed by its title: 'Could circular economy and various digital instruments like Internet of Things help a business model to respond to such challenges?' This inquiry is intrinsically linked to the broader context of the last decades, which have witnessed a rapid technological revolution, reshaped global industries, and nurtured a digital ecosystem. While this transformation has yielded considerable advantages, it has concurrently introduced formidable challenges, encompassing climate change, resource depletion, large-scale migrations, pandemic, and conflicts, all of them provoking profound contemplation on the way forward for both businesses and humanity.

In the context of this research, we will delve into the crucial topic of how VUCA, a framework for risk assessment and response, has played a central role in adapting and developing new business marketing strategies to effectively navigate complexity. Additionally, we will explore the significance of BANI, emphasizing the vital need for flexible marketing strategies when confronting unforeseen global crises. The paper focuses on the role of VUCA and BANI frameworks in guiding businesses' marketing strategies. Therefore, the case study will explore how these frameworks have influenced marketing strategies, and what they mean in response to unforeseen global crises.

In our interconnected world, IoT is vital for understanding consumer behaviour and creating data-driven marketing strategies. The transition to circular business models, influenced by environmental concerns, fosters sustainable marketing through eco-friendly products. To navigate the intricate VUCA and BANI landscape, marketers need innovative strategies blending digital technologies, big data, and AI with IoT insights and circular economy principles. This paper will provide essential insights for understanding whether circular economy and various digital instruments like the Internet of Things can empower a business model to effectively respond to the multifaceted challenges of the modern era.

[1] PhD Candidate, Bucharest University of Economic Studies, Romania, munteandenisa21@stud.ase.ro
[2] PhD Candidate, Bucharest University of Economic Studies, Romania, constantinescu1raluca21@stud.ase.ro
[3] PhD Candidate, Bucharest University of Economic Studies, daniela.marinica@mk.ase.ro

Keywords: Sustainable Development, Technological Change, International Business, Marketing, Environmental Economics

JEL Classification: Q01, O33, F23, M31, Q55

1. Introduction

21st century came with many changes either good or bad. Technology evolved exponentially, basically in all areas, whether we talk about healthcare, automotive, retail or even tourism. People get more and more information each and every day, being more connected to each other through digital means, living in a world evolving quickly. This evolution touching all layers came with its downsize effects. Climate change, depletion of resources, migration experienced in certain areas of the globe started to pose questions about the direction of humanity and ways forward.

During the 20th century and over the last decades, humanity faced many challenges. Two World Wars, a Cold War, many and various changes in the geo-politics that had a huge impact on economies and many initiatives in response to these challenges like the United Nations, the World Bank and International Monetary Fund. In this tumultuous world, the worldwide business environment was forced to find solutions, not only to survive, but to thrive, being in a continuous search to find the right business model as a response to what was going on outside their big or small doors.

In the late 80s, two American academics put together a model that could have helped companies for a better and faster response to challenges and assessment of risks. VUCA (Volatility, Uncertainty, Complexity and Ambiguity) concept has been firstly adopted by the U.S. Army as a way to help them to assess the situation and developments of the Cold War. The concept became quite common and used in companies being helpful in quantifying various risks and put together mitigation solutions and strategies.

And when everybody thought that humanity has started to understand its challenges and launched a comprehensive process of finding solutions, March 2020 came and with it a totally new series of challenges: a pandemic which affected the entire world in its deepest layers and brought the world economy on the verge of a crisis, followed by a war which jolted an energy crisis and serious movements in the East. VUCA already felt like an obsolete notion and the term BANI *(Brittle, Anxious, Nonlinear, and Incomprehensible*) has been brought to the spotlight. BANI could be seen as a "the end is near" scenario, but it sheds enough light to put some order into a chaotic world.

In addition to the challenges presented by the VUCA and BANI frameworks, the 21st century has also witnessed a critical shift toward circular business models, sustainability, and eco-conscious marketing practices. With concerns about climate change and resource depletion becoming even more pressing, businesses explore circular economy principles. This paradigm shift allows marketers to create eco-friendly products and campaigns that

resonate with environmentally conscious consumers. Moreover, in our rapidly evolving world, IoT serves as a pivotal tool in understanding consumer behavior and formulating data-driven marketing strategies. This paper will explore how these elements - circular economy, sustainable marketing, and IoT - intertwine with the VUCA and BANI frameworks, offer new possibilities and strategies for businesses to thrive amidst evolving challenges.

2. VUCA and ways it helped companies to build long lasting and sustainable business models

Volatility, Uncertainty, Complexity and Ambiguity or in short VUCA is a notion firstly used by Warren Bennis and Burt Naus, American academics who dedicated their work to management and business administration (Bennis and Nanus, 1985). At that time, it was just a theory without any concrete applications. In 1987, 2 years later, the U.S. Army adopted and started to apply the model, more concretely by describing the multilateral military world after the end of the Cold War in 1991 and the war in Afghanistan (U.S. Army Heritage and Education Centre, 2022).

But what does VUCA mean in practice?

Volatility (V) means repeated, fast and, usually, big changes. For example, in a volatile market, prices may change considerably overnight and nobody could set a trend (Wright and Wigmore, 2023).

Uncertainty (U) comes when events become unpredictable. Situations are not entirely understood, and previous experiences' lessons learnt do not apply. In such an environment investments, growth and development could not take place as nobody would be able to predict the way forward (*VUCA - Leaders with Vision, Understanding, Clarity, Agility!*, 2015)

Complexity (C) is made up of multiple layers of issues, challenges, factors and causes which are complexly connected, their understanding being quite difficult and implicitly the decision-making process being almost impossible. As an example, the gas price could be considered an important distorting factor, given that its change may affect other products and services that are not directly linked or related (Wright and Wigmore, 2023).

Ambiguity (A) is in fact the lack of clarity, with information being misinterpreted, where "one size fits all" and "best practice" could not be applied and the decision-making process is an act of courage, open to risks and even failures (Wright and Wigmore, 2023; *VUCA - Leaders with Vision, Understanding, Clarity, Agility!*, 2015).

It is good that challenges have been identified and reduced to short and approachable notions, but is it possible to be prepared for such challenges and even build a business model that could compensate for their effects?

For *Volatility*, the challenge is utterly sudden without a defined timeline, but information should be available and the challenge not hard to translate. In the above example about prices, one could adopt the strategy of stockpiling, but usually the investment should match the risk (Bennett and Lemoine, 2014). Questions should be put and asked in order to find the right model of business and balance between investments and risks. They should address basic information that could be collected, but crucial for the future, like the high and low limit of the change, the timeline and speed of the change and the resilience of the company (Wright and Wigmore, 2023)

For *Uncertainty*, lack of information is the main cause, but usually there is information about the cause and effect. That is why companies should invest more in collecting, interpreting, and sharing intelligence, also operating structural changes by improving through intelligence networks (Bennett and Lemoine, 2014). For this it is also important for companies to establish the base lines: What might change, and which are the signs of change? Would the company be aware of the change and how fast could it react? (Wright and Wigmore, 2023)

For Complexity, layers and implications are multiple. Some information is unknown, but not all of it. Some info is accessible and other could be predicted and the real obstacle could be the amount of data and too much effort to put in processing with the existing resources. Companies should invest more in developing either human and/or technology resources in order to address more efficient the complexity (Bennett and Lemoine, 2014). It is also important for the companies to start understanding the layers involved and their interconnection, but also its capability to stop a domino effect (Wright and Wigmore, 2023).

For *Ambiguity*, it is a contest of try and learn, of conducting experiments, generating hypotheses, and testing them. It could be costly on a shorter term, but quite useful and add profit on a longer term (Bennett and Lemoine, 2014). At the same time an assessment on knowledge and visibility of various internal and external factors should be performed in order to understand to what degree events could be misunderstood or misinterpreted. It should also be a process of finding clearer direction and the real amount of information needed to take a decision (Wright and Wigmore, 2023)

In a VUCA world, other parameters have been identified which should be monitored in order for companies to have a faster reaction with better results. Choyon in the Financial Express considers the impact of technology on businesses one of these parameters. Technology trends and tracking various shifts like big data collected through IoT, automations built with the help of big data and even AI and chatbots should be assessed and used to predict and respond to sudden changes (Choyon, 2021). Consumer behaviour is another such parameter extremely important especially for businesses driven by customers. Updated SWOT analysis, mapping of resources' skills, assessment of markets, both consumers and supplies, should be considered by all companies when facing the VUCA world (Choyon, 2021).

Leadership and leaders of companies play the crucial part in navigating a business through such distortions. Vision, focused more on short-term initiatives and mid-term goals and data

should be at the forefront of their strategies. Leaders should rely more on data, and this means bringing on more digitalisation into a company to produce more precise trend analysis. Using IoT would ease their jobs in determining consumer behaviour and react quickly to any change that could undermine their companies (Choyon, 2021).

3. BANI or a way to shed some light into a chaotic world

We may say that nowadays we live in a perfect VUCA world. Who would have thought of a pandemic that lasted over 2 years? Or a war potentiating an economic crisis started because of the pandemic and on all of it adding an energy crisis? Many challenges organised in multiple layers which companies had and still have to face without any warning.

In 2020, Jamais Cascio thought that VUCA was already obsolete, and he started to speak about BANI (*Brittle, Anxious, Nonlinear, and Incomprehensible*) trying to find a way to understand the chaos and find ways to respond to it.

The world that we lived in seemed advanced, in a continuous development, ready to face any tasks and to have answers to any challenges. The Pandemic proved that actually our world is *brittle*, rigid and non-resilient, victim of a potential catastrophe at any time (Prasad, 2022). Many of the systems on which human life depends on, like energy, food or global trade already experienced brittleness and only thinking of this induces a lot of *anxiety* (Cascio, 2022). In a world full of choices, making the right one became the hardest thing to do and from here comes the *anxiety* and it seems that VUCA started this feeling of uneasiness of taking decisions (Prasad, 2022). An *anxious* state is detrimental to anyone, as it could lead to an over-reaction, making the things worse than they were, under-reaction, mostly when the bigger picture is missed, or even no-reaction, waiting for everything to collapse (Cascio, 2022). On top of these two notions comes *non-linear*, where the decision or the cause and the outcome are usually unbalanced and out of the known grid, and *incomprehensible*, where answers that everybody tries to find have no meaning and sense (Prasad, 2022).

Even if BANI world sounds gloomy and the novelty and implications of the term are quite deep, academia, think-tanks and various professionals started to look into this and tried to find solutions. The subject is yet to be further studied, but better business planning, resilience, empathy, transparency, and data have already emerged as possible solutions (Grabmeier, 2020)

The industrial revolution and all its discoveries brought us also the depletion of resources and the environmental challenges that we are facing nowadays. Grabmeier in his study BANI versus VUCA: a new acronym to describe the world considers this as one of the starters of our BANI world. But recent years and studies showed that companies found a way to respond to this challenge by applying new business models and transforming their linear models into circular ones.

The qualitative context is based on Grabmeier highlights, where the interconnectivity of global systems as a precursor of a ripple effect concludes that a failure in one country could have catastrophic consequences worldwide. He illustrated this concept by referring to the resource curse, wherein large regions overly rely on their natural resources, only to be superseded by technological advancements. Moreover, Grabmeier emphasizes that in today's interconnected world, a disastrous event in one country can trigger a chain reaction that impacts the entire planet (Grabmeier, 2020). Contrasting with the complexity of the VUCA framework, BANI offers a concise and productive framework for understanding the world. It aims to provide a fresh perspective, enhance comprehension of cause-and-effect relationships, and establish a stable structure for interpreting global dynamics. Additionally, Grabmeier suggests that technologies such as Artificial Intelligence, Big Data, and Data Science offer effective solutions to address misunderstandings within this framework.

4. Navigating the VUCA and BANI worlds: challenges for contemporary business models

In this part of the paper, we embark on a journey through the intricate landscapes of the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) and BANI (Brittle, Anxious, Nonlinear, Incomprehensible) worlds, exploring their implications for modern business models (Forbes, 2023). Against the backdrop of an ever-evolving global landscape characterized by rapid technological advancements and unpredictable socio-economic shifts, we delve into the pressing question: Could the principles of circular economy and the integration of digital tools like the Internet of Things (IoT) empower businesses to effectively navigate the challenges posed by the VUCA and BANI environments? Through a detailed case study and analysis of innovative solutions, this chapter aims to shed light on this critical inquiry and provide insights for shaping the future of business strategies.

Exploring the VUCA and BANI context: the premises were set by dissecting the VUCA and BANI frameworks, tracing their origins and evolution in response to the dynamic forces shaping our world. By examining the concepts of volatility, uncertainty, complexity, and ambiguity, as well as their brittle, anxious, nonlinear, and incomprehensible counterparts, we paint a comprehensive picture of the challenges confronting contemporary businesses (Bushuyev, S., Piliuhina, K., & Chetin, E., 2023).

Challenges faced by modern business models: an analysis of the specific challenges encountered by today's business models within the VUCA and BANI contexts was highlighted. From the disruptive effects of rapid market changes to the pervasive sense of uncertainty permeating global markets, we elucidate the obstacles hindering sustainable growth and adaptation. Additionally, we explore how the inherent complexities of these environments can impede the implementation and scalability of innovative solutions, like digital transformation, e-commerce, data-driven or tech savy businesses (Fonseca, M. P., et al., 2024).

The role of circular economy and digital instruments: central to our inquiry is the exploration of whether circular economy principles and digital instruments such as IoT could offer viable pathways for businesses to overcome VUCA and BANI challenges. Drawing on real-world examples and empirical evidence, we assess the effectiveness of integrating sustainability practices and leveraging digital technologies to enhance resilience and responsiveness (Nijkamp, P., Ţigănaşu, R., Bănică, A., & Pascariu, G. C., 2024).

5. Case study – solutions and future prospects

Through an analytical examination of some explanatory case studies, we present businesses within education, retail, and healthcare that have adeptly navigated through the challenges of VUCA and BANI environments. These businesses have achieved success by adopting circular economy principles and leveraging digital innovations. Our analysis delves into the strategies, best practices, and lessons acquired, offering actionable insights for businesses aiming to fortify their operations and excel amidst uncertainty.

Therefore, we reflect on the overarching themes and findings presented in this paper, emphasizing the critical importance of adopting adaptive, forward-thinking approaches in the face of VUCA and BANI challenges. By embracing the principles of circular economy and leveraging digital tools effectively, businesses can not only survive but thrive in an increasingly complex and uncertain world.

5.1. Higher education in the VUCA and BANI World: IoT and Circular Economy Perspectives

The higher education industry is undergoing significant transformations in response to the challenges posed by the VUCA and BANI environments, with the integration of IoT and circular economy principles offering promising solutions.

By considering some various global and technological trends, including Artificial Intelligence (AI) and Machine Learning, Internet of Things (IoT), Blockchain, Augmented Reality (AR), and Robotics, we all witness the reshaping of the education landscape for organizations. IoT, for instance, facilitates the creation of intelligent systems that enhance efficiency and safety, while Blockchain ensures transparency and security in data management. AR and VR technologies provide immersive learning experiences, and robotics offer opportunities for automation and collaboration. Additionally, biotechnologies and genetic engineering contribute to advancements in medical education and personalized learning.

Digitalization serves as a key driver in implementing these trends, enabling educational organizations to digitize processes, utilize digital platforms for enhanced management, leverage cloud computing for data storage and scalability, and harness AI and data analytics for informed decision-making (Bushuyev, S., Bushuyeva, N., Murzabekova, S., &

Khusainova, M., 2023). Embracing digitalization not only transforms customer interactions and business processes, but also fosters innovation and the development of new business models. Educational organizations that successfully adapt to these trends stand to gain a competitive edge in the evolving market landscape.

The research delves into the intricacies of the BANI world in comparison with the VUCA realm, characterized by increasing process chaotization and heightened vulnerability to unexpected adverse events, often resulting in severe consequences (Adzhienko, V. L., Soboleva, S. Y., Knyazev, S. A., Shestakova, I. V., & Zavolochkina, K. A., 2023). In such circumstances, the traditional approach of extrapolating past events to predict the future, commonly used in strategic planning, proves insufficient. An essential aspect of organizational strategic management in the era of Industry 4.0 is to strengthen anti-fragility. The desk research study outlines key priorities for universities in this context, including anticipating future labour market demands, promoting seamless integration of science and education, and embracing interdisciplinary research approaches. These objectives could be achieved through strategies such as the barbell or lateral strategy, the latter challenging traditional patterns of strategic thinking. The investigation exemplifies how universities align their strategies with global and local agendas through lateral development strategies. However, to enhance their antifragility and effectively address the challenges of the BANI world, universities must intensify their efforts to implement lateral strategies, focusing on strengthening horizontal connections in social space, delivering personalized education, and adopting an edutainment approach.

As a result, the integration of IoT and circular economy principles emerges as a pivotal opportunity for higher education institutions. By embracing these principles, universities can effectively address the complexities of the VUCA and BANI environments while advancing sustainability goals (Garcia-Alvarez, M., Rekalde-Rodríguez, I., & Gil-Molina, P., 2023). As educational organizations adapt to global and technological trends such as AI, IoT, Blockchain, AR, and Robotics, they gain the capability to reshape the educational landscape and enhance efficiency and safety. However, in the face of escalating process chaotization and vulnerability to unforeseen events, traditional strategic planning methods prove inadequate. To thrive in the era of Industry 4.0, universities must prioritize antifragility by anticipating future labour market demands, seamlessly integrating science and education, and embracing interdisciplinary research. Implementing lateral strategies, including strengthening horizontal connections, delivering personalized education, and adopting an edutainment approach, will be imperative for universities to effectively navigate the challenges of the BANI world. Through these concerted efforts, educational institutions can not only gain a competitive edge but also contribute significantly to building a sustainable and resilient future.

5.2. Integrating IoT and circular economy principles in healthcare industry

In the VUCA and BANI world, the healthcare industry faces unprecedented challenges, necessitating innovative approaches to ensure effective patient care and operational

resilience. This case study delves into how healthcare organizations are embracing digital transformation through the integration of IoT and circular economy principles. By leveraging IoT technologies, healthcare providers can enhance patient monitoring, streamline data collection, and optimize resource utilization. Circular economy principles further promote sustainability by minimizing waste and maximizing resource efficiency in healthcare operations. Through the adoption of these strategies, healthcare organizations can navigate the complexities of the VUCA and BANI environments, ensuring quality care delivery while fostering sustainability and resilience in the healthcare sector.

Starting from the idea of some specialized authors (Steffen, B., Braun von Reinersdorff, A., & & Rasche, C., 2023), the healthcare landscape grapples with two significant disruptors: hyper-dynamic competition and evolving customer demands. Digitalization, while causing industry turbulence, also offers opportunities to enhance services, making them smarter and more user-friendly. However, closing the digitalization gap is crucial for healthcare providers to transition into VUCA service organizations. Digitalization serves as a catalyst for overcoming challenges arising from traditional hierarchies and evidence-based healthcare approaches. Moreover, the shift towards value-based healthcare emphasizes the importance of patient engagement and proactive health management. Yet, many hospitals face obstacles due to outdated practices and governance structures, hindering their ability to adapt to changing dynamics. This vulnerability makes them targets for digital giants like SAP, Google, and Amazon, who challenge the status quo with innovative solutions tailored to value-based care. Digitalization, encompassing AI, machine learning, and the Internet of Medical Things, holds immense potential to revolutionize healthcare delivery and empower individuals to make informed health decisions. In this context, ICT competencies emerge as vital assets for navigating the uncertainties of the VUCA landscape, enabling strategic and operational resilience. However, true success lies in aligning technology with people and processes to foster adaptability and responsiveness in the face of disruption.

As a result, it is evident that the healthcare industry is undergoing profound changes driven by digitalization and the challenges of VUCA conditions. These disruptions necessitate a paradigm shift in established healthcare organizations towards dynamic and agile service delivery models. Also, many healthcare organizations are struggling to bridge the digitalization gap and adapt to the evolving landscape (Stein Kleppestø). To address these challenges, we propose leveraging IT-based multi-perspective analysis processes, such as enabling holistic understanding and decision-making. This approach facilitates the development of customized digitalization strategies tailored to each organization's unique needs and context. By integrating IoT and circular economy principles into marketing strategies, healthcare organizations can harness the power of data analytics to derive valuable insights, improve patient outcomes, and lower healthcare costs. Embracing these innovative approaches not only enhances organizational resilience but also fosters sustainable growth in an ever-changing healthcare landscape.

5.3. Retail industry

In 2017, Prachi Gupta in their *How to Survive in the VUCA World of Retail* (Prachi Gupta, How to Survive in the VUCA World of Retail, 2017) exposed the challenges faced by the retail industry in taking the decision to move from physical retail to online. Such decisions were not influenced only by consumers who were more inclined towards shopping from their own couches, with various platforms becoming more attractive and appealing and offering more tailored services, but also by the costs involved in managing physical stores and the race to become sustainable.

Some companies and brands took this challenge seriously and started to plan accordingly, moving part of their operations in an online environment, starting to experience the benefits of their decisions: fewer costs, less consumption, more attention towards the online consumer who was more present and more vocal, ready to provide feedback and help companies to improve. Logistics had to be changed, personnel to be re-trained, and all these to re-adapt their businesses and answer to the challenges posed by the digital environment and the necessity to adopt modern circular economy principles.

In 2020, when pandemic hit, those companies who took seriously their pledge on digital transformation, had only benefits, because their business model was already adapted to an online environment. Their response to a VUCA world has actually been a wise preparation for a BANI world, which did not take them by surprise. The same happened also with environmental challenges, as they were already prepared for a stricter stance to take.

6. Methodology

In this exploratory research regarding two major subjects VUCA and BANI worlds and their implications for contemporary business models, this research adopts a multi-faceted approach encompassing literature review, critical analysis, and examination of case studies. (Tavanti, M., 2023).

The methodology begins with an extensive review of academic articles, papers, and internet sources pertaining to VUCA and BANI frameworks. This review aims to identify key concepts, challenges, and strategies associated with navigating volatile, uncertain, complex, and ambiguous business environments.

By synthesizing insights from diverse sources, the research seeks to establish a comprehensive understanding of the theoretical foundations underlying these frameworks.

Drawing upon the insights garnered from the literature review, the research employs critical thinking to interpret and contextualize the concepts of VUCA and BANI within the contemporary business landscape. Through critical analysis, the study aims to elucidate the practical implications of these frameworks for businesses, including their relevance, limitations, and potential applications in addressing modern challenges.

To provide empirical evidence and illustrate theoretical concepts in real-world contexts, the methodology incorporates the analysis of relevant case studies. These case studies offer insights into how businesses have responded to VUCA and BANI challenges, leveraging

strategies such as circular economy principles and digital technologies like Internet of Things (IoT). By examining concrete examples of successful adaptation and innovation, the research aims to identify actionable insights and best practices for contemporary business models.

In addition to synthesizing existing knowledge, the research adopts qualitative research aspects to explore emerging themes related to circular economy and digital instruments like IoT. Qualitative approaches, including interviews, surveys, and thematic analysis, may be employed to gather perspectives from academic experts, industry practitioners, and stakeholders. These qualitative insights contribute to a nuanced understanding of the complexities and opportunities inherent in addressing contemporary business challenges.

Central to the methodology is the exploration of interconnections between VUCA and BANI frameworks, circular economy principles, and digital technologies like IoT. By synthesizing these disparate elements, the research aims to uncover synergies and potential pathways for businesses to effectively respond to multifaceted challenges. This synthesis underscores the holistic and integrated nature of contemporary business strategies, highlighting the importance of interdisciplinary approaches in navigating complex environments.

Overall, the methodology adopts a comprehensive and integrative approach to investigate the research questions posed, leveraging diverse sources, analytical frameworks, and empirical evidence to generate meaningful insights and contribute to the scholarly discourse on modern business models and strategies.

7. Results

The results effectively communicate the idea that alongside the challenges posed by the VUCA and BANI frameworks, there has been a notable transition toward circular business models, sustainability, and eco-conscious marketing practices in the 21st century. The premises of the work are conveying the message that businesses are increasingly embracing circular economy principles and leveraging IoT for understanding consumer behaviour and developing data-driven marketing strategies. Overall, the paper effectively sets the stage for exploring how these elements intersect with the VUCA and BANI frameworks to provide new opportunities for businesses facing evolving challenges.

8. Conclusions

The findings of the research underscore the central theme of the study, which is dedicated to delving into the vast potential offered by the integration of circular economy principles and digital technologies such as the Internet of Things (IoT) in assisting business models to effectively address the multifaceted challenges of the contemporary landscape. This research seeks to meticulously examine the intricate interplay between these innovative

approaches and their impact on reshaping business strategies in response to the complex demands of the modern era.

One notable aspect of the research is the well-structured presentation of its premises, which facilitates a coherent and logical progression of ideas throughout the study. From the outset, the context is established, effectively introducing the research topic and highlighting its significance within the broader context of today's rapidly evolving business environment. This serves as a foundational framework upon which subsequent explorations of the VUCA and BANI frameworks, IoT applications, and circular economy principles are built.

As the research unfolds, it systematically navigates through the complexities of each component, offering in-depth analyses and insights into their respective roles and contributions to business strategies. The exploration of VUCA and BANI frameworks provides a nuanced understanding of the challenges and uncertainties businesses face, while also emphasizing the need for adaptive and resilient marketing approaches in navigating turbulent times.

Furthermore, the integration of IoT technologies emerges as a pivotal aspect of the research, showcasing its transformative potential in deciphering consumer behavior patterns and enabling data-driven marketing strategies. This technological advancement not only enhances businesses' ability to understand market dynamics but also empowers them to tailor their offerings to meet evolving consumer preferences effectively.

In parallel, the study sheds light on the growing significance of circular economy principles in fostering sustainable business practices. By embracing circularity and minimizing waste through innovative product design and resource management, businesses can not only reduce their environmental footprint but also appeal to an increasingly eco-conscious consumer base. This shift towards sustainability aligns with broader societal trends and presents opportunities for businesses to differentiate themselves in the market while contributing positively to environmental conservation efforts.

Overall, the research offers a comprehensive exploration of the intricate relationship between circular economy principles, IoT technologies, and business strategies in the face of contemporary challenges. Through its rigorous analysis and insightful observations, the study provides valuable insights and actionable recommendations for

References

[1] Adzhienko, V. L., Soboleva, S. Y., Knyazev, S. A., Shestakova, I. V., & Zavolochkina, K. A. (2023). The Lateral Strategy of University Development in the BANI World. In Anti-Crisis Approach to the Provision of the Environmental Sustainability of Economy, 53-62.

[2] Bennett, N. and Lemoine, G.J. (2014) 'What VUCA Really Means for You', Harvard Business Review, 1 January. Available at: https://hbr.org/2014/01/what-vuca-really-means-for-you (Accessed: 29 July 2023).

[3] Bennis, W.G. and Nanus, B. (1985) Leaders: the strategies for taking charge. New York: Harper & Row. Available at: http://archive.org/details/leadersstrategi00benn (Accessed: 29 July 2023).

[4] Bushuyev, S., Piliuhina, K., & Chetin, E. (2023). Transformation of values of the high technology projects from a VUCA to a BANI environment model. Innovative Technologies and Scientific Solutions for Industries, (2 (24)), 191-199.

[5] Bushuyev, S., Bushuyeva, N., Murzabekova, S., & Khusainova, M. (2023). INNOVATIVE DEVELOPMENT OF EDUCATIONAL SYSTEMS IN THE BANI ENVIRONMENT. Scientific Journal of Astana IT University, 14.

[6] Cascio, J. (2022) 'BANI and Chaos – BANI', 26 April. Available at: https://ageofbani.com/2022/04/bani-and-chaos/ (Accessed: 29 July 2023).

[7] Choyon, S.A. (2021) Businesses in the VUCA world, The Financial Express. Available at: https://thefinancialexpress.com.bd/views/analysis/businesses-in-the-vuca-world-1619200860 (Accessed: 29 July 2023).

[8] De la Cruz, C. D., & Valdivieso, R. E. P. (2023). Competencies for sustainability: Insights from the encyclical letter Laudato Si.

[9] Dziadkiewicz, A., & Jakubowski, M. (2022). Managerial determinants in design management as a means of developing organisational resilience in an uncertain economic environment. Annales Universitatis Mariae Curie-Skłodowska, Sectio H Oeconomia, 56(5)

[10] Fonseca, M. P., de Lima, F. L. P., Craveiro, E. G., da Silva Pessoa, S., Colares, C. B., Fonseca, M. P., & Correia Filho, W. L. (2024). Analyzing economic conditions and operating dynamics in global markets: a comprehensive study. Caderno Pedagógico, 21(2), e2636-e2636.

[11] Garcia-Alvarez, M., Rekalde-Rodríguez, I., & Gil-Molina, P. (2023). No Transition Without Transformation: Educating Sustainability. SDGs in the European Region, 1-35.

[12] Godoy, M.F. de, & Ribas Filho, D. (2021). Facing the BANI World. International Journal of Nutrology, 14(2), 33.

[13] Grabmeier, S. (2020) 'BANI versus VUCA: a new acronym to describe the world', Stephan Grabmeier, 28 July. Available at: https://stephangrabmeier.de/bani-versus-vuca/ (Accessed: 15 August 2023).

[14] Grucza, B., & Tomszys, P. (2021). The concept of organizational resilience model and adequate measurement mechanism. Challenges in Economic Policy, Business and Management in the COVID-19 Era, 221.

[15] Gläser, W. (2023). VUCA as a practical model: A commentary. Journal of Applied Journalism & Media Studies, 12(2), 267-275.

[16] Jeyakodeeswari, R., & Nithila, R. C. J. DIGITAL TRANSFORMATION AS A KEY TO UNCERTAINTY WITH SPECIAL REFERENCE TO THE SHIFT FROM VUCA TO BANI WORLD. Convergence of Business and Technology, 318.

[17] Nandi, A., Agarwala, N., & Sahu, T. N. (2023). Towards a Sustainable Future: The Interaction of Corporate Governance and Sustainable Policies with Corporate Social Responsibility. Indian Journal of Corporate Governance, 16(2), 149-176.

[18] Nijkamp, P., Ţigănaşu, R., Bănică, A., & Pascariu, G. C. (2024). Institutional adaptability: Its relevance for enhancing resilience and smart specialization capacity of the European Union's lagging regions. Eurasian Geography and Economics, 65(1), 1-33.

[19] Obradović, V., Todorović, M., & Bushuyev, S. (2019). Sustainability and Agility in Project Management: Contradictory or Complementary? Advances in Intelligent Systems and Computing.

[20] Prasad, S.S. (2022) BEAT the VUCA or BANI world: A responsive framework, MarketExpress. Available at: http://www.marketexpress.in/2022/04/beat-the-vuca-or-bani-world-a-responsive-framework.html (Accessed: 29 July 2023).

[21] Prachi Gupta (2017). How to Survive in the VUCA World of Retail. Retrieved from https://www.linkedin.com/pulse/how-survive-vuca-world-retail-prachi-gupta/

[22] Tavanti, M. (2023). The impact challenge for global sustainability. In Developing sustainability in organizations: A values-based approach (pp. 427-437). Cham: Springer International Publishing.

[23] Wright, G. and Wigmore, I. (2023) What is VUCA (Volatility, Uncertainty, Complexity and Ambiguity)? | Definition from TechTarget, WhatIs.com. Available at: https://www.techtarget.com/whatis/definition/VUCA-volatility-uncertainty-complexity-and-ambiguity (Accessed: 29 July 2023).

[24] Zachosova, N. (2023). PATTERNS OF INDIVIDUALS'SECURITY-ORIENTED ECONOMIC BEHAVIOR UNDER THE RISK OF DISPLACEMENT IN BANI WORLD AND WAR CONDITIONS. Economics, Finance and Management Review, (3), 4-16.

Bibliography

Adzhienko, V. L., Soboleva, S. Y., Knyazev, S. A., Shestakova, I. V., & Zavolochkina, K. A. (2023). The Lateral Strategy of University Development in the BANI World. In Anti-Crisis Approach to the Provision of the Environmental Sustainability of Economy, 53-62.

Bennett, N. and Lemoine, G.J. (2014) 'What VUCA Really Means for You', Harvard Business Review, 1 January. Available at: https://hbr.org/2014/01/what-vuca-really-means-for-you (Accessed: 29 July 2023).

Bennis, W.G. and Nanus, B. (1985) Leaders: the strategies for taking charge. New York: Harper & Row. Available at: http://archive.org/details/leadersstrategi00benn (Accessed: 29 July 2023).

Bushuyev, S., Piliuhina, K., & Chetin, E. (2023). Transformation of values of the high technology projects from a VUCA to a BANI environment model. Innovative Technologies and Scientific Solutions for Industries, (2 (24)), 191-199.

Bushuyev, S., Bushuyeva, N., Murzabekova, S., & Khusainova, M. (2023). INNOVATIVE DEVELOPMENT OF EDUCATIONAL SYSTEMS IN THE BANI ENVIRONMENT. Scientific Journal of Astana IT University, 14.

Cascio, J. (2022) 'BANI and Chaos – BANI', 26 April. Available at: https://ageofbani.com/2022/04/bani-and-chaos/ (Accessed: 29 July 2023).

Choyon, S.A. (2021) Businesses in the VUCA world, The Financial Express. Available at: https://thefinancialexpress.com.bd/views/analysis/businesses-in-the-vuca-world-1619200860 (Accessed: 29 July 2023).

De la Cruz, C. D., & Valdivieso, R. E. P. (2023). Competencies for sustainability: Insights from the encyclical letter Laudato Si.

Dziadkiewicz, A., & Jakubowski, M. (2022). Managerial determinants in design management as a means of developing organisational resilience in an uncertain economic environment. Annales Universitatis Mariae Curie-Skłodowska, Sectio H Oeconomia, 56(5)

Forbes. (2023). The 7 Most Successful Business Models Of The Digital Era. Retrieved from Forbes.com: https://www.forbes.com/sites/bernardmarr/2023/03/14/the-7-most-successful-business-models-of-the-digital-era/?sh=2979988e5617

Fonseca, M. P., de Lima, F. L. P., Craveiro, E. G., da Silva Pessoa, S., Colares, C. B., Fonseca, M. P., & Correia Filho, W. L. (2024). Analyzing economic conditions and operating dynamics in global markets: a comprehensive study. Caderno Pedagógico, 21(2), e2636-e2636.

[Garcia-Alvarez, M., Rekalde-Rodríguez, I., & Gil-Molina, P. (2023). No Transition Without Transformation: Educating Sustainability. SDGs in the European Region, 1-35.

Godoy, M.F. de, & Ribas Filho, D. (2021). Facing the BANI World. International Journal of Nutrology, 14(2), 33.

Grabmeier, S. (2020) 'BANI versus VUCA: a new acronym to describe the world', Stephan Grabmeier, 28 July. Available at: https://stephangrabmeier.de/bani-versus-vuca/ (Accessed: 15 August 2023).

Grucza, B., & Tomszys, P. (2021). The concept of organizational resilience model and adequate measurement mechanism. Challenges in Economic Policy, Business and Management in the COVID-19 Era, 221.

Gläser, W. (2023). VUCA as a practical model: A commentary. Journal of Applied Journalism & Media Studies, 12(2), 267-275.

Jeyakodeeswari, R., & Nithila, R. C. J. DIGITAL TRANSFORMATION AS A KEY TO UNCERTAINTY WITH SPECIAL REFERENCE TO THE SHIFT FROM VUCA TO BANI WORLD. Convergence of Business and Technology, 318.

Nandi, A., Agarwala, N., & Sahu, T. N. (2023). Towards a Sustainable Future: The Interaction of Corporate Governance and Sustainable Policies with Corporate Social Responsibility. Indian Journal of Corporate Governance, 16(2), 149-176.

Nijkamp, P., Ţigănaşu, R., Bănică, A., & Pascariu, G. C. (2024). Institutional adaptability: Its relevance for enhancing resilience and smart specialization capacity of the European Union's lagging regions. Eurasian Geography and Economics, 65(1), 1-33.

Obradović, V., Todorović, M., & Bushuyev, S. (2019). Sustainability and Agility in Project Management: Contradictory or Complementary? Advances in Intelligent Systems and Computing.

Prasad, S.S. (2022) BEAT the VUCA or BANI world: A responsive framework, MarketExpress. Available at: http://www.marketexpress.in/2022/04/beat-the-vuca-or-bani-world-a-responsive-framework.html (Accessed: 29 July 2023).

Prachi Gupta (2017). How to Survive in the VUCA World of Retail. Retrieved from https://www.linkedin.com/pulse/how-survive-vuca-world-retail-prachi-gupta/

Tavanti, M. (2023). The impact challenge for global sustainability. In Developing sustainability in organizations: A values-based approach (pp. 427-437). Cham: Springer International Publishing.

Team, M.J.V. (2021) From a VUCA world to a BANI one: how uncertainty has changed and how your company can prepare - MJV, MJV Technology & Innovation. Available at: https://www.mjvinnovation.com/blog/from-a-vuca-world-to-a-bani-one/ (Accessed: 29 July 2023).

U.S. Army Heritage and Education Centre (2022) Who first originated the term VUCA (Volatility, Uncertainty, Complexity and Ambiguity)? - USAHEC Find Your Answer. Available at: https://usawc.libanswers.com/faq/84869 (Accessed: 29 July 2023).

VUCA - Leaders with Vision, Understanding, Clarity, Agility! (no date) VUCA-WORLD. Available at: https://www.vuca-world.org/ (Accessed: 1 December 2022).

Wright, G. and Wigmore, I. (2023) What is VUCA (Volatility, Uncertainty, Complexity and Ambiguity)? | Definition from TechTarget, WhatIs.com. Available at:

https://www.techtarget.com/whatis/definition/VUCA-volatility-uncertainty-complexity-and-ambiguity (Accessed: 29 July 2023).

Zachosova, N. (2023). PATTERNS OF INDIVIDUALS'SECURITY-ORIENTED ECONOMIC BEHAVIOR UNDER THE RISK OF DISPLACEMENT IN BANI WORLD AND WAR CONDITIONS. Economics, Finance and Management Review, (3), 4-16.