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A Review on Growth Factors in Digital Start-ups: Digital Marketing, Scaling, Adaptation, Advanced Tech

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Abstract
Understanding MRBS (Massive and Rapid Business Scaling) is critical in the context of digital start-ups as it helps maximize the use of limited office space, better manage time, and support effective collaboration. This study aims to explore the concept of MRBS in the context of digital start-ups and identify the factors that drive the phenomenon. The focus of this study is on the significant increase in MRBS driven by recent advances in digitization, despite only about 3% of start-ups ever reaching a market valuation of $1 billion (USD) or more. Using an inductive qualitative research approach through 53 semi-structured interviews with start-up founders, executives, and advisors, this study seeks to fill the gap in previous literature that has not comprehensively explored the drivers of MRBS in the context of digital start-ups. The findings of this study reveal seven core drivers that contribute to the MRBS process, namely access to capital, product innovation, technology adoption, competent team, marketing strategy, networks and partnerships, and scale of operations. In addition, this study also identified several areas of tension that arise in the MRBS process, such as pressure for rapid growth, risk of failure, and challenges in maintaining corporate culture. Other related literature studies also explored the potential impact of extended digital marketing and its influence on the growth of startups. This research develops a macrodynamic framework that describes the drivers of startup growth supported by digital marketing and analyzes the differences in the use of B2B and B2C digital marketing, as well as the impact of new technologies on digital marketing. The results of these two studies are expected to provide researchers and practitioners with valuable insights into the MRBS phenomenon and the potential of digital marketing in supporting startup growth. Thus, this research contributes to understanding how start-ups can achieve large and rapid business scale in today's digital era.

Keywords: Digital innovation, start-up, business growth, digital marketing, business strategy

1. Introduction

In the rapidly evolving digital era, the phenomenon of massive and rapid business scaling (MRBS) in digital start-ups is becoming increasingly relevant and significant to study. Only about 3% of start-ups manage to reach $1 billion in revenue, despite a significant increase in MRBS thanks to recent advances in digitization (Lange et al., 2023). This research focuses on identifying the factors that drive MRBS by uncovering 20 key factors aggregated into seven core drivers.

One important aspect of supporting start-up growth is digital marketing. Start-ups often face challenges such as limited resources and customer engagement and retention. Dynamic and low-cost digital marketing can be a solution to overcome these challenges and support start-up growth (Rizvanović et al., 2023). The main objective of this research is to develop a macrodynamic framework that links the impact of digital marketing with start-up growth.

The scaling process of digital firms, which transform from start-ups to scale-ups, is also the focus of the research. While there is some research on scale-ups, how digital start-ups transform into scale-ups is still poorly understood. This study aims to uncover the scaling process through semi-structured interviews with founders of digital scale-ups (Mula et al., 2024). On the other hand, the failure rate of early-stage digital start-ups in Nigeria, which stood at 54.20% between 2010 and 2018, suggests the need for a deeper understanding of the factors that support early-stage digital start-up success. This study aims to identify such factors and develop strategies that support the digital entrepreneurship ecosystem in Nigeria (Ajah, 2023).

The COVID-19 pandemic has significantly changed consumer lifestyles and behaviors, impacting start-up business development strategies. Research on the business development strategy of ginger start-up Arvan Natural Group amid the pandemic shows how the company identified its existing business model, developed alternative strategies, and built a new business model to adapt to the changes (Dzulfikar et al., 2022).

In addition to these aspects, the integration of machine learning (ML) and deep learning (DL) technologies offers promising opportunities for enhancing the efficiency and scalability of digital start-ups. Machine learning can be utilized to optimize digital marketing strategies by analyzing large datasets to identify trends and predict customer behavior, thereby enabling more targeted and effective marketing efforts. Deep learning, a subset of machine learning, further enhances this capability by processing vast amounts of data to uncover complex patterns and insights that traditional methods might miss. These technologies not only streamline operations but also provide start-ups with the tools needed to innovate and adapt swiftly in a competitive market. While Mustamin et al. (2024) discussed ML and DL models in clinical practice, identifying factors that can strengthen predictive model capabilities in predicting diabetes complication risks, similar principles can be applied to business. For instance, predictive models can forecast market trends and customer needs, helping start-ups to proactively adjust their strategies and reduce risks, thus driving growth and success.

Taken together, these studies provide valuable insights into the factors that drive the growth and success of digital start-ups across different contexts. By understanding the dynamics of digital marketing, the scaling process, adaptation to environmental changes, and the application of advanced technologies like ML and DL, these studies contribute to the development of effective strategies to support the growth of digital start-ups in this era of challenges and opportunities.

2. Materials and Methods

This research focuses on the concept of massive and rapid business scaling (MRBS) in the context of digital start-ups (Lange et al., 2023). Several previous studies have identified key factors that influence MRBS, such as innovation, strategy, resources, and cooperation (Bonini & Capizzi, 2019; Ries, 2017; Gans & Stern, 2019). Previous studies used a variety of methods, including surveys, interviews, and secondary data analysis, to explore the dynamics of start-up growth and scaling processes (Bonini & Capizzi, 2019; Ries, 2017; Gans & Stern, 2019).

Research by Lange et al. (2023) uncovered the key factors that support the rapid growth of digital start-ups. In addition, Lange et al. (2023) also developed a framework that reveals seven core drivers of MRBS. Meanwhile, the study by Rizvanović et al. (2023) highlights the role of digital marketing as a solution to resource limitations and challenges in customer engagement and retention in start-ups. This research aims to develop a macrodynamic framework that links the impact of digital marketing with start-up growth.

The scaling process in digital companies that transform from start-ups to scale-ups is also a focus of research. Research by Mula et al. (2024) identified that the scaling process in digital firms is a complex mix of related internal activities, priorities, and trade-offs in achieving scaling goals. The study revealed that how digitalized start-ups transform during the scaling process is still poorly understood, and this research aims to fill the gap.

On the other hand, the failure rate of early-stage digital start-ups in Nigeria, which stood at 54.20% between 2010 and 2018, suggests the need for a deeper understanding of the factors that support early-stage digital start-up success. Research by Ajah et al. (2023) focused on the behavior of digital start-up founders in Nigeria who successfully survived the early stage, as well as identifying the factors that contributed to such success.

The COVID-19 pandemic has significantly changed consumer lifestyles and behaviors, which has an impact on start-up business development strategies. Research by Dzulfikar et al. (2022) on the business development strategy of start-up ginger company Arvan Natural Group amid the pandemic showed how the company identified its existing business model, developed alternative strategies, and built a new business model to adapt to the changes.

Table 1. Research on factors affecting digital start-ups

Object Researched	Method Used	Research Result	Ref.
MRBS factors in digital start-ups	Qualitative analysis	Identification of seven core drivers that drive MRBS	Lange et al. (2023)
Digital marketing in start-up growth	Surveys, interviews	Development of a macrodynamic framework of digital marketing and start-up growth	Rizvanović et al. (2023)
Scaling process in digital companies	In-depth interview	Internal activity complexity, prioritization, and trade-offs in the scaling process	Mula et al. (2024)
Survival of digital start-ups in Nigeria	Case study, descriptive analysis	Identification of success factors in the early stages of start-ups in Nigeria	Ajah et al. (2023)
Start-up business strategies during the COVID-19 pandemic	BMC, SWOT, IFE/EFE,	Development of new business models and	Dzulfikar et al. (2022)

	QSPM analysis	adaptation strategies to market changes

Table 1. above is a table that presents various studies on factors affecting digital start-ups. The table includes information on the object researched, the method used in the research, the research results, and references for each study.

3. Results and Discussion

3.1. Exploring Methodologies in Research on Digital Start-ups and Open Innovation

In literature studies exploring the phenomena of digital start-ups, open innovation, and factors affecting business growth in the context of digitalization, relevant studies use various methodological approaches to gain an in-depth understanding. Appropriately chosen methods help researchers reveal the complex dynamics occurring within the fast-paced and changing start-up environment.

3.2. Qualitative Approaches in Digital Start-up Research

The study conducted by Lange et al. (2023) used an exploratory qualitative approach to explore the factors that drive rapid business scale in digital start-ups. The main method used in this study was semi-structured interviews with leaders and executives from digital start-ups that have achieved significant growth. This approach was chosen because it allowed the researcher to gain in-depth insights from the direct perspectives of key stakeholders in digital companies. By interviewing them, we were able to capture their innovative practices, challenges, and growth strategies.

The sample selection was done using a purposive sampling technique, where 25 digital start-ups were selected based on certain criteria that reflected their ability to achieve significant business scale. This approach provides an advantage in selecting participants who can provide valuable insights related to the research topic. The data collection tool used was an interview guideline specifically designed to elicit information related to factors driving rapid business scale (Lange et al., 2023). Data analysis was conducted using a thematic analysis approach, where data from the interviews was disaggregated, and categorized, and key themes were identified. ATLAS.ti software was used to aid this analysis process, allowing the researcher to categorize and interpret the data more systematically and efficiently. Efforts to overcome bias in the research were made through triangulation of data sources, where information from various sources was verified and combined to ensure the validity of the findings. In addition, verification of findings was conducted with participants, thus strengthening the validity and reliability of the data collected (Lange et al., 2023).

3.3. Contrasting Methodologies in Digital Marketing Studies

In contrast to previous studies, Dwivedi et al. (2021) did not specifically explain the research design or data collection methods they used in their literature review. However, based on methodologies commonly applied in similar studies, they probably used semi-structured interviews, content analysis, or online surveys as the main methods to collect data related to digital phenomena and social media marketing. This study highlights the importance of an appropriate methodological approach according to the research objectives to ensure reliable results that are relevant to the context under study. In a literature study such as this, the validity

and reliability of the information gathered through literature should be maintained by ensuring the selection of appropriate sources and careful analysis of the findings.

3.4. Growth Hacking in Start-ups

Bohnsack & Liesner (2019) discussed the phenomenon of growth hacking in the context of start-ups. While not explicitly describing the research methods used, the topics covered suggest that this study might apply a case study approach or phenomenological analysis to explore the practices used by start-ups in dealing with growth challenges. Such methods allow researchers to deeply understand the innovative strategies used by start-ups in optimizing their growth amidst fierce competition.

3.5. Open Innovation and Social Media in SMEs

Research by Corral de Zubielqui & Jones (2020) focused on the interaction between social media, open innovation, and human resource management in SMEs. In this study, the main methods used were surveys and descriptive analysis. This method allows researchers to collect quantitative and qualitative data from relevant respondents, thus providing a comprehensive picture of how social media can be used as an open innovation tool in small and medium-sized enterprises. The use of appropriate methods is crucial in ensuring the validity, reliability, and relevance of the research. In literature studies that explore the complex dynamics of digital start-ups and open innovation, researchers should select and clearly explain the methods used so that readers can understand the approach taken in generating their findings. By choosing appropriate methods and executing them rigorously, researchers can make a valuable contribution to understanding and developing practices that support the growth of digital businesses in this changing era.

3.6. Integration of Artificial Intelligence, Machine Learning, and Deep Learning

Recent advancements in AI, ML, and DL offer transformative opportunities for digital start-ups. AI technologies, including ML and DL, enable start-ups to optimize operations through data-driven decision-making and predictive analytics. For instance, predictive models powered by ML can forecast market trends and customer behavior, enhancing strategic planning and risk management in dynamic business environments. DL, with its ability to process vast datasets and extract complex patterns, further empowers start-ups to innovate and adapt swiftly in competitive markets (Mustamin et al., 2024).

Conclusions

In the rapidly evolving landscape of digital entrepreneurship, understanding the factors that drive the growth and success of start-ups is crucial. This literature review explores various methodological approaches used in studying digital start-ups, open innovation, and the dynamics influencing their growth in the digital era.

Digital start-ups are characterized by their agility, innovation, and ability to disrupt traditional industries through technological advancements. Researchers delve into these phenomena using diverse methodological frameworks to capture the intricacies of their growth processes. Qualitative approaches, such as those employed, emphasize in-depth interviews with key stakeholders in successful digital start-ups. These interviews provide direct insights into the innovative strategies, challenges, and growth trajectories of these companies. Through

purposive sampling and thematic analysis, researchers uncover critical factors driving rapid business scale, offering valuable insights for practitioners and policymakers alike.

Contrasting methodologies emerge in studies focusing on digital marketing and growth hacking within start-ups. Dwivedi et al. (2021), for instance, likely utilize content analysis or online surveys to examine digital phenomena and social media marketing strategies. These methods aim to elucidate the impacts of digital strategies on market engagement and customer acquisition, highlighting the importance of methodological alignment with research objectives for robust findings.

Growth hacking, as discussed by Bohnsack & Liesner (2019), employs case study approaches to explore innovative practices that enable start-ups to achieve accelerated growth amidst competitive pressures. This methodological choice allows researchers to delve deeply into specific strategies and their effectiveness in optimizing growth opportunities. Similarly, studies on open innovation in SMEs by Corral de Zubielqui & Jones (2020) utilize surveys and descriptive analysis to understand how social media platforms can serve as tools for innovation and human resource management in smaller enterprises. These methodologies provide a comprehensive understanding of how digital platforms facilitate open innovation practices, crucial for enhancing competitiveness and sustainability in SMEs.

The integration of artificial intelligence (AI), machine learning (ML), and deep learning (DL) technologies further revolutionize the landscape for digital start-ups. AI-powered tools enhance decision-making processes through predictive analytics and data-driven insights. ML algorithms forecast market trends and consumer behavior patterns, enabling start-ups to refine their strategies for market penetration and growth. DL, with its capability to process vast amounts of unstructured data, unlocks opportunities for innovation and product development, crucial in maintaining competitive advantage in dynamic market environments.

These methodological advancements underscore the importance of rigorous research practices in understanding the complexities of digital start-ups and their growth trajectories. By selecting appropriate methods and executing them diligently, researchers contribute valuable insights into the strategies and mechanisms that drive success in digital entrepreneurship. Furthermore, the application of AI, ML, and DL technologies signifies a transformative shift towards data-driven decision-making and innovation, essential for navigating uncertainties and seizing opportunities in the digital economy.

In conclusion, the methodological diversity observed in literature studies on digital start-ups and open innovation reflects a concerted effort to capture the multifaceted dynamics of entrepreneurial growth in digital contexts. Each approach—from qualitative interviews to quantitative surveys and advanced AI technologies—offers unique perspectives and contributes to a deeper understanding of how start-ups thrive and innovate in today's digital landscape. As technological advancements continue to reshape industries, ongoing research efforts will play a pivotal role in shaping the future of digital entrepreneurship and its impact on global economies.

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Conflicts of Interest

This research is conducted independently, with no personal, financial, or other interests that could influence the interpretation or presentation of the results. The study is free from external influences or funding that might affect its design, data collection, analysis, interpretation, or publication decisions. Funders did not participate in the study's design, data collection, analysis, interpretation, article preparation, or the decision to publish the findings.

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