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The Role of Information Technology in Improving Entrepeneurship Performance through Socio-Culturel Adaptation

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Abstract: *This study examines current literature on the impact of information technology on entrepreneurial performance through socio-cultural adaptation. This review reveals the role of information technology as a key driver of innovation and entrepreneurial growth by facilitating global communication and rapid exchange of information. However, research in the field of digital entrepreneurship still faces the challenges of fragmentation and a lack of a unified framework. An interdisciplinary approach is needed to understand the unique characteristics of adaptive and generative digital technologies. In conclusion, information technology plays a strategic role in increasing efficiency, innovation and entrepreneurial collaboration. Future research is expected to integrate various disciplines to gain a comprehensive understanding of digital entrepreneurship and develop business models that are more responsive to technological and market changes.*

INTRODUCTION

Information technology has played an important role in enabling socio-cultural adaptation that supports innovation and entrepreneurial growth. By facilitating cross-cultural communication and collaboration and accelerating the exchange of information and ideas, information technology is a catalyst for the development of new business models that respond quickly to the demands of dynamic and culturally diverse markets. Through the use of digital tools and online platforms, entrepreneurs are able to identify new opportunities and create value that is not only locally relevant but also has global appeal. This shows how information technology not only supports day-to-day business operations, but also paves the way for broader entrepreneurial adaptation in various socio-cultural environments.

Various industries and markets, such as media, entertainment, advertising, retail, transportation and accommodation, have experienced major transformations due to the emergence of innovative business models. These models include multi-sided digital marketplaces, social media, e-commerce, and software as a service. The growth of the digital economy is driven in large part by the entrepreneurial spirit enabled by digital technology. The proof is that digital start-up companies such as Google, Facebook, Amazon, Alibaba, Tokopedia, Bukalapak and

Tiktok have now become global giants. The advancement of the digital economy is recognized as one of the most important developments since the industrial revolution, and digital entrepreneurship is a key driver behind it (Kraus et al., 2019; Nambisan, 2019; Zhao and Collier, 2016).

The field of digital entrepreneurship has had difficulty establishing a solid foundation due to the legacy of the fragmented and diverse nature of traditional management and entrepreneurship research (Moroz & Hindle, 2012; Tranfield et al., 2003). This leads to a lack of clarity and consensus about its scope, characteristics and limitations. Some examples that demonstrate this confusion are the lack of a framework for early stage startups, namely the dynamics and lack of structure in the early phases of startups often makes them difficult to categorize and analyze (Davidsson & Gordon, 2009). Apart from this, there is no clear agreement on the scale of ambition required for a company to be categorized as entrepreneurial and not just a small business. The very diverse models of the entrepreneurial process illustrate that existing models of the entrepreneurial process are often incompatible and conflict with each other (Moroz & Hindle, 2012).

Technological developments in the field of digital entrepreneurship open up interesting opportunities for further research. By understanding the unique nature and characteristics of digital technology (Nambisan et al. (2017) explain that the nature of digital technology which can be changed, recombined, reprogrammed and generative has a significant impact on various aspects of the process and results of innovation and entrepreneurship. Examples include technology digital enables founders to build scalable products and services with the potential to drive change and growth. This is possible because of the generative nature of digital technology that facilitates action by large, uncoordinated audiences without the need for intervention.

Another advantage of digital technology is the separation of content from the medium in which it is delivered, which allows flexibility and encourages rapid experimentation and learning. The fluid and dynamic processes enabled by digital technologies encourage rapid iteration on non-linear paths in the entrepreneurial process. Furthermore, digital technologies enable dispersed distribution and entrepreneurial agency, encouraging disintermediation and resulting in a greater emphasis on ecosystems. In fact, entrepreneurial ecosystems enabled by digital affordances differ from geographic spatial clusters and require different entrepreneurial skills, and innovation processes (Nambisan et al., 2017)

Nambisan (2017) calls for a clear theory of concepts related to digital technology and a construction - digital technology perspective, to study the phenomenon of entrepreneurship in the digital world. In other words, digital technology is not the only context for studying entrepreneurship. On the contrary, the impact of digital technologies forces the review and development of new theories of entrepreneurship and management in the digital world, which opens up many research opportunities. One of the opportunities that arises in improving entrepreneurial performance through socio-cultural adaptation is to combine an interdisciplinary approach in reviewing literature to develop a holistic understanding of the role of information technology. In this case, understanding how the field has developed in the past, how it is progressing, and what the future research opportunities are becomes important. However, most systematic reviews tend to be discipline specific or focused on a particular context.

Dalam konteks ini, beberapa penelitian telah dilakukan. Misalnya, Kraus et al. (2019) yang meninjau 35 artikel terbaru dalam jurnal kewirausahaan, memperlihatkan bagaimana teknologi

informasi telah mempengaruhi kewirausahaan. Studi literatur ini menggunakan pendekatan berbasis bukti untuk mengkaji bidang kewirausahaan digital, menggabungkan wawasan dari berbagai praktisi, seperti pembuat kebijakan pemerintah, manajer akselerator, eksekutif perusahaan mapan, dan pengusaha. Pendekatan multidisiplin ini memungkinkan analisis dan sintesis yang komprehensif, memberikan pemahaman yang mendalam tentang perkembangan dan arah masa depan bidang ini. Artikel ini didasarkan pada tiga pilar utama penelitian manajemen yaitu (1).Wawasan yang merupakan pemahaman bagaimana penelitian kewirausahaan digital telah berkembang dan berevolusi. (2). Kritik yaitu melakukan identifikasi pada fokus dan kelemahan dalam literatur kewirausahaan digital saat ini. (3). Redefinisi Transformatif, yaitu penentukan arah masa depan penelitian kewirausahaan digital. Untuk mencapai tujuan ini, dapat dirumuskan penelitian sebagai berikut:

1. What research topics dominate the attention of researchers in the context of information technology and entrepreneurial performance?
2. What are the main studies that make significant contributions to research on the influence of information technology on entrepreneurial performance?
3. What are the key research areas and topics that have been explored in the context of socio-cultural adaptation by entrepreneurship?
4. Are there variations in the methodological approaches used in the literature related to the influence of information technology on entrepreneurial performance?
5. What values are considered important in creating successful entrepreneurial performance through information technology, and how are these values reflected in the literature?

METHO

Inspiration for using the meta-synthesis method as the basis for making a literature study was taken from Tranfield et al. (2003), which provides detailed and efficient evidence-based guidance for conducting, reporting, and disseminating systematic literature reviews. These systematic reviews are helpful in reducing bias in study selection and provide detailed audit records of reviewers' decisions, procedures, and conclusions, thereby increasing the transparency and reproducibility of research. The method designed by Tranfield and his colleagues, originally from the field of medicine, has been adapted for the more application-oriented realities of social science. Consequently, their methodology allows for the incorporation of qualitative literature and support for qualitative meta-synthesis as well as quantitative meta-analysis, replacing the evidence-oriented paradigm of medical science with a more focused approach to evidence-based policy and practice.

a. Data source: In creating a data set of high-quality and relevant digital literature for entrepreneurship, we searched from various data sources on the internet including Google Scholar, Scopus and emerald using various combinations of keywords such as 'digital', 'internet', 'net', 'e- ', 'cyber', or 'online' combined with 'entrepreneurship', 'entrepreneur', 'startup', or 'start-up'. This allows identification of relevant phrases such as 'digital entrepreneurship', 'internet startup', etc. Our research was extended by creating various related phrases by adding terms related to aspects of entrepreneurship such as 'capital', 'funding', 'skills', 'team', 'ecosystem', 'network', 'strategy', 'growth' , 'education',

'women', and 'minorities'.

b. Article selection To comprehensively organize the literature on the development of the digital entrepreneurship field, we screened an initial list of 275 articles by reading the abstracts to ensure relevance to digital entrepreneurship. From this process, the final dataset consisted of 133 articles, including 105 journal papers, 25 conference articles. From these articles, 20 articles were taken for review, with a list as in table 1 as follows:

Table 1. List of literature articles and their classification

Article title	Penulis	Disiplin	Unit Analisis	Metode	Lokasi Geografis
Designing a maturity model for software startup ecosystems	Cukier	Entrep	Digital start-up founder	Qual	US
Digital technology entrepreneurship: a definition and research agenda	Giones and Brem	Entrep	Digital start-up	Concep	Denmark
Digital entrepreneurship eco-system as a new form of organising: the case of Zhongguancun	Li et al.	Entrep	Digital entreprene urship eco-system	Qual	China
Growing on steroids: rapidly scaling the user base of digital ventures through digital innovation	Ratzing er et al.	Entrep	Digital start-up founder	Quant	China
Entrepreneurship in digital platforms: a network-centric view	Srinivasa n and Venkatra m an	Entrep	Digital platforms	Concep	US
Blockchain entrepreneurship opportunity in the practices of the unbanked	LariosHe r nandez	IS	Blockchai n technology	Qual	Mexico
The Internet of Things and new business opportunities	Krotov	IS	IoT	Concep	US
Agile business model innovation in digital entrepreneurship: Lean startup approaches	Ghezzi and Cavallo	Entrep	Multi-sided platform	Qual	Italy
Exploration of technical debt in start- ups	Klotins et al.	IS	Technical debt	Qual	Sweden
Digital entrepreneurship: toward a digital technology	Nambisa	IS	Digital start-up	Qual	US

perspective of entrepreneurship	n				
boldly go where no [man] has gone before" - institutional voids and the development of women's digital entrepreneurship	McAdam et al.	Entrep	Female entrepreneur	Qual	Saudi Arabia
Effectuation and causation in new internet venture growth: the mediating effect of resource bundling strategy	Guo et al.	Entrep	Internet venture	Quant	China
Network dynamics and new ventures in China: A longitudinal study	Batjargal	Entrep	Internet start-ups	Quant	China
A web of opportunity or the same old story? Women digital entrepreneurs and intersectionality theory	Martinez Dy et al.	Mgmt	Women digital entrepreneurs	Qual	UK
The Internet of Things and new business opportunities	Krotov	IS	IoT	Concep	
The early stage software startup development model: a framework for operationalising lean principles in software startups	Bosch et al.	IS	Software start-ups	Qual	US
E-commerce and entrepreneurship in agricultural markets	Mueller DeYoung	Eco Mgmt	Agribusiness firms	Concep Quant	Germany USA
The performance of Internet-based business models: evidence from the banking industry	Still et al.	Entrep	Internet-only bank startup	Qual	Finland
Business model innovation of startups developing multisided digital platforms	Ratzinger et al.	Entrep	Digital platform start-up	Qual	UK
The role of universities as educators in the UK Internet start-up ecosystem: research opportunities			Internet start-up founders		

RESULT AND DISCUSSION

Findings

Article Topics in Various Journals

In the field of digital entrepreneurship, this topic has received little representation in high-quality journals throughout its history. In addition, there is a gap between the research conducted and existing practice. The oldest article in our dataset was published by Sutton in 2000, which was five years after the first wave of digital startups launched. On average, each article in the main dataset of 133 articles was written by two authors (with a mean of 2.5 and a range of 1–7 authors).

Disciplines

The scientific disciplines here relate to the boundaries of scientific disciplines used in the context of business, management, entrepreneurship and information technology. Recent trends show that research that combines various topics and methods across disciplines is starting to develop. For example, Cukier et al. (2015) succeeded in integrating the disciplines of information systems (IS), management, and entrepreneurship by applying a maturity model originally designed for software developers in digital startup clusters in urban areas. Likewise, in their study of how digital startups can thrive through the generativity of digital technologies, Huang et al. (2017) explored marketing issues in an entrepreneurial context and published them in the IS journal. There is a push towards an interdisciplinary approach in digital entrepreneurship influenced by the latest digital technology perspectives and the Lean revolution, as discussed by Ghezzi (2019), Ghezzi and Cavallo (2018) and Nambisan (2017), by encouraging the integration of IS theory in entrepreneurial phenomena and management.

In addition, it was found that research in digital entrepreneurship also often uses theories from management and various other social science fields such as media, psychology, sociology, and IS. Some applied theories include institutional voids (McAdam et al., 2019), resource pooling (Guo et al., 2016), social networks (Batjargal, 2010), intersectionality and socio-positionality (Dy et al., 2016, 2018), as well as socio-technical systems (Krotov, 2017).

Technological Dimensions and Entrepreneurial Performance

In reviewing the literature relating to the role of information technology in entrepreneurial performance, various dimensions have been identified that show how technology influences this sector. The technical aspect, for example, includes the evolution from the use of basic technology towards more interactive and integrated systems that support entrepreneurial activities. Studies show that improvements in communications and information technology have significantly increased the operational efficiency of startup businesses. This includes process automation that reduces operational costs and speeds up the decision-making process and strategy implementation.

Innovation management in the context of information technology also receives special attention, where the use of digital platforms has enabled entrepreneurs to implement new and innovative business models. The integration of big data processing systems and advanced analytics, for

example, has enabled companies to identify market opportunities more quickly and with lower risk, as well as facilitating the tailoring of products and services to better suit consumer needs and preferences. Additionally, the impact of technology on operational efficiency has become clear through the ability of these companies to connect and mobilize resources globally. By leveraging information technology, entrepreneurial companies can operate at lower costs, reach broader markets, and respond more quickly to changing market conditions. This has changed the way companies interact with customers and competitors, and enables sustainable value creation through a more dynamic and responsive approach to managing their business operations.

Strategy and Practice

The strategies and practices implemented or proposed in the literature to support entrepreneurial performance through the use of information technology include several important aspects such as product development, digital marketing, and human resource management.

1) Product Development, In product development there are two strategies, including: a) Digital Product Innovation. This innovation uses information technology which enables faster and more efficient digital product innovation. This includes data-driven product development and the use of analytics to understand customer needs in greater depth. b) Collaboration in Innovation Networks. To achieve the right goals, product development often involves collaboration within an innovation network consisting of various stakeholders, including customers, business partners, and the technology community.

2) Digital Marketing: In digital marketing, two strategies are used, including: a) Data Driven Marketing: In data-based marketing, marketing strategies using information technology enable more targeted and data-based marketing. The use of analytics and big data helps in more precise market segmentation and personalization of marketing campaigns. b) Social Media and SEO With the increase in social media users and automatic search engines, digital marketing also includes the use of media social and search engine optimization (SEO) to increase visibility and interaction with customers.

3) Human Resource Management: Strategy in terms of human resource management consists of two things, namely a) Use of HR Information Systems:The use of HR MIS is the implementation of an information system in human resources management (HRIS) which helps in managing employee data, recruitment, training and career development. b) Digital Competency Development To increase knowledge and expertise in the field of information technology, training and digital competency development is needed for employees, this is done to ensure that they can adapt to technological changes and support innovation in the organization

Success and Failure in the Application of Information Technology

Identification and discussion of key factors that influence success or failure in implementing information technology to improve entrepreneurial performance includes several important aspects such as technology readiness, privacy and security policies, and organizational cultural adaptation. In applying information technology to improve entrepreneurial performance, several critical factors must be considered to ensure success. One key factor is the readiness of the technological infrastructure. Organizations need to ensure that they have adequate hardware and

software, as well as a stable network. This strong infrastructure is the foundation that supports the company's entire digital operations. Furthermore, the technological competence of the team is also very important. Technology readiness depends not only on existing equipment, but also on the technical capabilities of the individuals managing and implementing the technology.

Data security is another important component. Organizations must implement strong security policies to protect sensitive data from cyber threats. This includes, but is not limited to, the use of encryption, firewalls, and intrusion detection systems. Additionally, compliance with applicable data privacy regulations—such as GDPR in Europe or CCPA in California—not only protects customer data but also builds their trust. The final factor that is no less important is organizational cultural adaptation. A culture that supports innovation and experimentation is vital to successful technology adoption. Organizations must provide space for employees to try new things and learn from failure. In addition, change management must be handled well through effective communication and involving employees in the change process, with strong support from top management. All these factors are interrelated and influence each other. Without sufficient technological readiness, strong privacy and security policies, or appropriate organizational cultural adaptation, efforts to improve entrepreneurial performance through information technology can face significant obstacles.

Synthesis of Findings: The Role of Information Technology in Improving Entrepreneurial Performance

Various theoretical perspectives rooted in entrepreneurship and management with various methodologies have been studied, but more depth is still needed. These contexts require greater breadth so that research can inform policy and practice not only at a global level but also in greater detail. Startups in various countries, regions, industries, and even cities, have business patterns that need to be understood. Therefore, the context of digital entrepreneurship is much broader than this list of generic standards. In formulating research questions, we take the perspective of digital technology as integral in generating new theories that modify our traditional understanding of how digital startup founders create and pursue new ventures due to the unique characteristics of digital technology (Nambisan, 2017). The research question is also based on the assumption of the socio-material nature of digital technology which means that human entrepreneurs are inextricably tied to digital technology. Even in the case of highly digitalized products and services, capabilities and resources in the physical and digital domains work together to create a less constrained entrepreneurial process. The result is an outcome that has physical, social and digital characteristics. We argue that the socio-material nature of these digital technologies, together with digital technology perspectives, will form the basis of future research. In the process, recent digital entrepreneurship research is a step to not only contextualize theory but to ‘theorize context’ – how the specific context – of digital technology in this case, influences entrepreneurship theory.

In the context of digital startups, many of the principles that have been introduced by the recent Lean Startup revolution had actually been developed years earlier. Academic researchers are also starting to engage with the methods used by practitioners. For example, Bosch et al. (2013) contextualizes and extends Lean Startup methods for digital startups, while Ghezzi (2019) examines how Lean Startup provides operational support to digital startups in their

entrepreneurial process. An increasing influx of information science scholars and practitioners will lead to more solution-oriented research. Ultimately, this will result in better, evidence-based policies and practices.

As the field develops, we anticipate that more studies will explicitly target digital entrepreneurship in specific contexts, as scholars are just beginning to do. These contexts would include: industries such as agriculture by Mueller (2001) and banking by deYoung (2005); business model patterns such as multi-sided markets (Still et al., 2017), and geographic locations at various levels – continents, countries, regions, cities, even local clusters. Existing studies in the Chinese context have provided a broad understanding of digital entrepreneurship in China, but the same cannot be said for other regions.

The trend towards research in narrower contexts is likely to continue in the next few years. As the digitalization process accelerates, many underrepresented themes will become more significant. Furthermore, as digital entrepreneurship scholars, our understanding of the social and institutional context and effects of interventions remains unclear. Government, industry and universities need to collaborate in a new research phase to clarify the social and individual effects of digital entrepreneurship and its outcomes. Digital startups are perfect for experimental training. because of the adaptive learning inherent in the entrepreneurial process (Ghezzi, 2019). The flexible and generative characteristics of digital technologies align with low-cost experiments and practical learning tools oriented towards trial and error. We hope that in the future, digital startups operated by students will be used to provide learning in real situations, or at least close to real life. Moving forward, we hope to see more innovative educational models that combine pedagogy with entrepreneurship and action research or scientific design methods.

Education is often associated with long-term individual career development, and growth and is known as an important element of human capital that supports the entrepreneurial process (Ratzinger et al., 2018). However, the existing literature on digital entrepreneurship focuses more on firms than individuals. Startup founders were only used as the unit of analysis in 15 studies. Future studies need to examine the processes and outcomes of long-term persistent and serial entrepreneurship in digital contexts to add modern texture and relevance to our current understanding of the role of education in this emerging field.

a. Theoretical and Practical Implications

1) Development of Digital Entrepreneurship Theory:

This study enriches the digital entrepreneurship literature by determining the phases of research evolution as well as clarifying the definitions of the concepts

key concepts in this field. This shows the importance of using an interdisciplinary approach in digital entrepreneurship research, integrating theories from the fields of management, information science, psychology, and sociology.

2) Strategic Management Theory:

The research findings emphasize the importance of adapting business strategies in a digital context, including the use of data analytics for strategic

decision making and the need for continuous innovation in a dynamic business environment. This study also highlights the role of information technology in establishing competitive advantage through operational efficiency and service personalization.

3) Practical Implications of the Application of Information Technology in Entrepreneurship:
Practitioners can utilize these findings to formulate more effective strategies in implementing information technology, such as using data analytics to better understand markets and customers. These findings also emphasize the importance of having a strong technology infrastructure and digital competency training for employees to ensure successful technology implementation.

4) Practical Implications of Strategic Management:
Managers can use the results of this research to develop better privacy and security policies and manage changes in organizational culture to support innovation. Practitioners can also take advantage of these insights to develop business models that are more adaptive and responsive to technological and market changes.

b. Limitations and Future Research Directions

1) Limitations of Research Fragmentation:
Research in digital entrepreneurship is often fragmented and lacks integration between disciplines. Many studies rely on single case studies or conceptual approaches, which may not adequately describe broader phenomena.
2) Geographical Limitations:
Many studies focus on specific geographic contexts, which may not be universally applicable.

c. Recommendations for Future Research

1) Interdisciplinary Approach:
Future research should further integrate multiple disciplines to gain a broader understanding of digital entrepreneurship. The use of diverse research methods, such as longitudinal studies and action research, can provide deeper and more applicable understanding.
2) Wider Empirical Research:
Future research needs to involve more empirical studies across multiple geographic and industrial contexts to broaden the applicability of the findings. Research should also focus on developing dynamic models that can help predict digital entrepreneurial success.

Given these limitations and following recommendations for future research, the field of digital entrepreneurship can continue to develop and make significant contributions to both theory and practice.

CONCLUSION

Based on the literature, several research topics that dominate regarding the role of Information Technology in Improving Entrepreneurship Performance through Socio-Cultural Adaptation are Research in the context of information technology and entrepreneurial performance, especially focused on business model innovation, data analytics for decision making, the influence of digital platforms in the innovation ecosystem , as well as the application of Lean Startup and Agile methods. This focus shows the importance of information technology in encouraging efficiency, innovation and collaboration in entrepreneurship. Significant contributions in research on the influence of information technology on entrepreneurial performance include studies that integrate socio-technical theory to explore the interaction between technology and the entrepreneurial process, empirical research that highlights the success factors and challenges faced by digital startups, as well as research on the use of big data and artificial intelligence to increase efficiency and innovation. This study shows how information technology can strategically influence and improve performance in a dynamic entrepreneurial environment.

In the context of socio-cultural adaptation by entrepreneurship, key research areas that have been explored include the influence of organizational culture on the adoption of technology, how entrepreneurship adapts to social and technological change, and the importance of social interactions and networks in supporting innovation and business growth. This research underscores the importance of understanding and integrating social and cultural factors in entrepreneurial strategies to maximize the use of information technology. Variations in methodological approaches used in the literature relating to the influence of information technology on entrepreneurial performance include the use of case studies and qualitative methods for in-depth insights, as well as quantitative and survey research for broader analysis. Mixed methods are also popular, combining the strengths of qualitative and quantitative approaches to provide a more comprehensive perspective and validity in research. This approach reflects the complexity and diversity of situations faced in digital entrepreneurship. Values that are considered important in creating successful entrepreneurial performance through information technology, such as innovation, creativity, collaboration, adaptability, flexibility, sustainability, and ethics, are reflected in the literature. This emphasis on values suggests that effective entrepreneurial performance through information technology requires more than just technical ability; it also requires a supportive organizational culture, an adaptive approach to change, and a commitment to ethical and sustainable practices.

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