



Cultural Aspect in Technology and Innovation Policy for Small and Medium Enterprises in Creative Industry: Agenda for Future Research

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ABSTRACT

Technology and innovation are increasingly becoming the key elements for small and medium enterprises (SMEs) to achieve sustainable growth. However, policies related to technology and innovation in SMEs are rarely found which might be due to the limited access to financial support and organizational capability. In the case of creative industry, where the cultural aspect plays an important role in some sectors, technology and innovation are often a contradiction with the cultural value. This study aims to explore the current discussion on technology and innovation policy between 2015 – 2024 in the Scopus database and provide an agenda for future research. The 15 articles selected mainly focus on SMEs in emerging countries that take culture into consideration. The study used a systematic literature review (SLR) and the articles are descriptively analysed based on publication year, source title, subject area, and research methods. The articles are categorized into four themes namely technology, culture, innovation, and sustainability. The result shows that none of the relevant articles included in this study discussed cultural value in their technology and innovation policy recommendations. Future research directions are given and discussed, guiding researchers toward the most pressing and impactful aspects of the investigation.

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I. INTRODUCTION

In the global business landscape, the definition of Small and Medium Enterprises (SMEs) varies across countries. The World Bank (2022) standardized the definition of SMEs based on three classification criteria: annual average employment, total assets, and annual turnover. For small enterprises, there are fewer than 50 workers with total assets and annual turnover of less than USD 3 million. For medium-sized enterprises, there are fewer than 300 workers with total assets and annual turnover less than USD 15 million.

A significant number of SMEs are involved in the creative industry (Maryunani, S. R., & Mirzanti, I. R., 2015). The concept of the creative industry was first introduced by the Department of Culture, Media and Sport of the United Kingdom in 1998. The creative industries encompass a range of sectors that rely on creativity, skill, and talent to generate economic value through the products and services that lead to economic growth and job creation (Force, 1998). Expanding on this definition, UNCTAD (2024) further elaborates that the creative industries include advertising, architecture, arts and crafts, design, fashion, film, video, photography, music, performing arts, publishing, research & development, software, computer games, electronic publishing, and TV/radio.

Currently, SMEs across the globe are progressively integrating emerging technologies to enhance productivity, operational efficiency, and customer engagement. Among the prevalent technologies are cloud computing, which provides scalable infrastructure and facilitates improved collaboration; Artificial Intelligence (AI) and Machine Learning (ML), which automate processes and augment decision-making capabilities; the Internet of Things (IoT), which streamlines workflows and minimizes operational costs; blockchain technology, which ensures security and transparency; Virtual Reality (VR) and Augmented Reality (AR), which generate immersive experiences for customers; and big data analytics, which delivers valuable insights into consumer behaviour and market dynamics. Collectively, these technological advancements empower SMEs to maintain their competitive edge within a rapidly transforming business landscape (UNCTAD, 2022).

As we draw an understanding of the context of the creative sector, Yadav et al. (2024) showed that technology adoption affects the handicraft sector. Artisans are leveraging digital social

media for product promotion and digital marketing, where the government and policymakers are promoting digital payment for financial transactions. Bonfanti et al. (2018) reveal a positive outlook on technologies like 3D printing, foot scanners, and body scanners, not as a threat in the future. Emerging countries like Indonesia suggest digital marketing can provide artisans with a competitive edge (Raya et al., 2021).

Amid rapid technology advancement, digital platforms dominate the global ranking of technology adoption, with rates at 86,4% (Statista, 2024a). The European Union reported that 43% of Small and Medium Enterprises (SMEs) have adopted cloud computing, followed by smart devices, big data analytics, artificial intelligence, robotics, and blockchain (Statista, 2024b). In contrast, in emerging countries such as Indonesia, only 8 percent of SMEs in Indonesia have undergone digital transformation (Kominfo, 2024).

Regarding the utilization of technological innovation, Pilliang, Y. A. (2014) and Rubera et al. (2011) highlight a reciprocal relationship between cultural values and technological innovation. Cultural values in a particular society have a role in the development of technological innovation. On the other hand, the diffusion of technological innovation can fundamentally change the cultural values of society itself. This dynamic is particularly evident in the context of SMEs, as shown by Rujirawanich et al. (2011). Younger generation tends to shift from the traditional culture values because of western influence and engage in incremental innovation. However, there are still SMEs who continue to value their heritage culture to maintain uniqueness. In Indonesia, the increasing adoption of machine printing for batik exemplifies the tension between tradition and modernity due to the cost advantages (Raya et al., 2021). Thus, culture, technological innovation are intertwined by each other in a complex way.

Research on the policies governing technological adoption in developing nations elucidates numerous challenges and pivotal considerations. A pronounced technological chasm exists, particularly within developing countries where the dissemination of advanced technologies occurs at a more gradual pace (Choi & Shim, 2024). Elements such as market demand, governmental regulations, and the availability of proficient personnel propel adoption; however, impediments including insufficient infrastructure, financial constraints, and onerous

regulatory frameworks may obstruct advancement (Cirera, et al., 2022). The presence of reliable infrastructure is imperative; nonetheless, inadequacies within the telecommunications and energy sectors may inhibit the utilization of digital technologies. Governmental policies, encompassing support initiatives and technology transfer entities, are instrumental in promoting adoption.

A significant conundrum for policymakers lies in reconciling the adoption of foreign technologies with the encouragement of domestic innovation. Empirical evidence from South Korea indicates that while the initial adoption of foreign technology results in productivity enhancements, a transition towards innovation subsidies becomes critical for enduring growth as the technological disparity diminishes (Choi & Shim, 2024). Knowledge spillovers, wherein non-adopters reap indirect benefits through heightened patent citations of foreign technologies, also contribute to this phenomenon. The most effective policy strategy is contingent upon the developmental stage, with an emphasis on transitioning from adoption to innovation subsidies as nations evolve. These findings illuminate the intricacies involved in formulating efficacious technological adoption policies in emerging economies.

Thus, this study formulates the following research questions: 1.) What is the current state of technological innovation policy literature in emerging countries? 2.) How can cultural aspects be integrated into technology and innovation policy to promote growth in SMEs?

Based on the above question, we formulate the objectives to evaluate and consolidate the prevailing body of literature concerning technological innovation policy in emerging nations, while elucidating significant trends, obstacles, and deficiencies in current research and policy frameworks and investigating how cultural dimensions can be proficiently incorporated into technology and innovation policies, to foster growth and advancement in Small and Medium Enterprises (SMEs) within emerging countries. To the best of the authors' knowledge, there is limited research on technology policies in the creative SMEs sector especially in emerging countries. This study aims to contribute original knowledge to the field of technology policy in creative SMEs, by enriching the existing body of literature. Additionally, this study seeks to provide insight to assist researchers, stakeholders, and policymakers in adopting or developing technology policies,

especially in the creative industry in emerging countries.

Toward the methodology, this study conducts a systematic literature review (SLR). Recognized as a rigorous method, SLR can provide evidence as a synthesis of the scientific study on a specific topic or research question (Kitchenham et al., 2009; Paul & Criado, 2020). Kraus & Dasi (2020) mention that SLR is used more in this present situation, where the SLR provides concrete guidelines. Melo et al. (2023) utilize SLR to measure the SMEs' performance through digital transformation. The result shows that SLR successfully indicated digital transformation performance from 74 peer-reviewed studies. Fabrizio, et al. (2022), through SLR, discovered a conceptual typology for competitive advantage and dynamic capability in SMEs.

The rest of the study is structured as follows: Section 2 presents the theoretical concept. Section 3 describes the methodology, followed by the results and discussion in Section 4. Finally, Section 5 provides the conclusion and future research.

II. ANALYTICAL FRAMEWORK

The interplay between cultural dynamics and technological innovation reveals a deeply interconnected and multifaceted relationship. Technological innovation incorporates phases of invention, technological development, and commercialization (Nieto, 2020). At the same time, Malerba, et al. (1997) defines invention – as the process of putting forth an original idea or the processes concerning scientific novelty. According to the OECD (2005), Innovation is defined as the process of developing a new or an appreciably improved product, service, process, marketing system, or an organization's structure. In the context of technological innovation, according to Nieto (2020), it refers to the development, deployment, and distribution of technology. Things also include new or significantly altered technologies and processes that combine technology with non- but are more effective than ever previously observed in the execution of a particular task (OECD, 2002). Previous studies have been conducted concerning the importance of technological innovation and economic development. Achmad et al. (2023) and Bekun (2024) indicated that technological innovation leads to sustainable economic development in China and South Africa, respectively. Economic growth can be achieved with the help of technological innovation and at

the same time, environmental protection is possible. Most importantly, the authors argue that financial factors exert considerable influence on the process of sustainable development.

Just as cultural dynamics have been at the interface of cultural dynamics and technological development which has been the concern about the new dynamics between global and local cultures. This point highlights the significance of how people operate on both international and local, or regional, levels. Technology is understood as a change agent in cultural transformation when looking at its possible change indicator. Technology is taken as an invention where it is dependent on the quick transmission of cultural ideas, norms, and practices beyond the borders of states. We noted that the possibility for individuals to physically engage with a broad range of cultural performances manifests a strong unity among them. This shifted emphasis to the physical culture of the people has opened new frontiers and avenues for appreciation and expression of cultural forms. Nevertheless, this facilitated access has at the same time brought about the expansion of the global mass culture where at times it replaces or even threatens local cultures thus making the issues of cultural imperialism even more relevant to people (Castells, 2010). This offers a lens through which we can understand these influences, emphasizing how values and norms within a society impact organizational behaviour. The orientation toward individualism or collectivism further shapes the approach to technology. Individualistic cultures tend to focus on tools that enhance personal productivity and efficiency, while collectivist cultures emphasize technologies that foster teamwork and collective success. Similarly, societies that exhibit high uncertainty avoidance may be cautious about adopting new and unfamiliar technologies, preferring proven solutions that align with their structured environments.

The introduction of digital technologies has significantly changed the way people consume cultural content. People have become accustomed to the content contained in streaming services, e-books, and online exhibitions regardless of geographical barriers. While this improvement in the availability of cultural content has enhanced the participation of people in cultural activities, it has raised concerns about cultural content getting lost in the process. Artists and creators may find it very difficult, if not impossible, to make a living when films and other

forms of media are generally sold for nearly no money at all (Hesmondhalgh, 2013). Besides those numerous advantages, embracing technology in every facet of life perhaps has a disadvantage as well, that is, culture might be lost. With the digitalization of communication and entertainment, people's interaction with cultural practices might have lessened. This change carries a great danger of cultural blandness, that the specific culture might slowly lose its identity and thus diversity will be no more. Such communities awaiting the digital dividend may become sidelined, excluded, and devoid of recognized services from global cultural exchanges, thereby struggling to preserve and promote their unique cultural traditions (Nardi, 2015).

The interconnection between culture and technology is highly dynamic and multifaceted; it draws far-reaching consequences. As it is with other nations of the world, technology has shifted the dynamics of cultural practices for the better in Indonesia through presenting opportunities in arts, learning, and economic growth. However, these opportunities are not without threats such as cultural imperialism, and the issues of divide and rule of information technology. Addressing these challenges is imperative for protecting cultural diversity and for the need to provide equal access to broadcasting and participating in cultural processes that the technology offers. Thus, awareness of the historical and topical nature of this interaction will help societies in their search for solutions to global issues and manage the possibilities and threats that evolving technologies present in the development of new cultures. In organizations, these cultural influences manifest in decision-making processes, training approaches, and attitudes toward innovation and standardization. Recognizing and understanding these cultural dimensions allow organizations to align their technological strategies with cultural preferences, ensuring smoother adoption, enhanced utilization, and greater alignment with employee expectations and societal norms. This cultural alignment is critical for global organizations working across diverse cultural landscapes, as it facilitates effective collaboration and maximizes the benefits of technological innovation.

Small and medium enterprises (SMEs) remain the key drivers of innovation and economic growth. However, SMEs often face limited access to financial support and technology which may influence their ability to innovate successfully. In response to these challenges, governments and

policymakers have developed various innovation programs focusing on SMEs.

The first key aspect of innovation policy is financial support. The financial support may include grants, subsidies, tax breaks, or loans. Access to finance for SMEs enables them to engage in research and development (R&D), develop new technologies, and recruit competent workers. As an example, the European Commission's Horizon Europe offers funding for SMEs to collaborate for innovation with research centers and universities (European Commission, 2021).

Secondly, another key aspect of innovation policy is supporting the ecosystem for SMEs. Supporting ecosystems for SMEs includes establishing networks, incubators, and accelerators for mentorship, investment, and market access. In addition, collaborations between SMEs and large firms are often facilitated by the Governments through partnerships and joint ventures. Such initiatives can help SMEs tap into the knowledge, experience, and capital of larger enterprises to develop new products and services (OECD, 2016).

Lastly, a strong innovation policy should enable SMEs to overcome the shortage of information and skills. This is possible through training programs, workshops, and technology transfer activities. Governments play an important role in providing relevant information and skills on new technologies to enhance SMEs' performance and new solutions. Investment in entrepreneurship education could assist SMEs to create innovative and risk-taking culture (World Bank, 2022).

III. METHODOLOGY

An SLR is now widely accepted as a comprehensive and methodologically rigorous approach to synthesizing primary research in each field of study. Unlike the classical systematic literature review, it is structured by a specific format and flow that is intended to minimize bias that might compromise the authors' systematic review of the materials. The following is a breakdown of SLRs' methodological strength based on how they approach the task of identifying, evaluating, and integrating the selected literature. As mentioned earlier, the systematic approach, inherent within an SLR commences with the development of a precise research question. This question is often developed with the assistance of a template resembling the PICO (Population, Intervention,

Comparison, Outcome) acronym used in health sciences or its counterparts in other branches of knowledge.

It is paramount to formulate the research question since it will shape the overall conduct of the review for the study by providing direction and relevance to the objectives. Kitchenham and Charters (2007) opine that identifying clearly and accurately the research question enhances the development of deep and precise definitions of both the inclusion and exclusion criteria to be used in other stages of the review. It is most helpful where it is difficult to distil evidence, or where there are many studies available in a particular subject area. As a form of meta-analysis that reckons the findings of a myriad of studies conducted to date on a particular topic, an SLR affords a rigorous and comprehensive articulation of the state of knowledge in a given field. This synthesis is also helpful in determining where future studies can occur and in directing evidence-based practice. Before mentioning the method of conducting research that involves data collection and analysis, the authors outlined the criteria for paper inclusion. The paper needs to contain several main syntax searches as follows: ((technology AND innovation AND policy)). These should be papers in English and published in international journals between 2015 to 2024.

The systematic review methodology represents a well-established and esteemed strategy for meticulously consolidating the existing literature concerning a specific subject matter, employing a systematic approach to discern, assess, and amalgamate all pertinent investigations transparently and impartially. A notable framework in this context is the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), which delineates an extensive array of guidelines aimed at guaranteeing the integrity and uniformity of the review process (Moher et al., 2016).

The initial phase of the PRISMA methodology encompasses the identification of pertinent literature via a comprehensive search strategy, which may entail querying diverse electronic databases, perusing reference lists, and engaging with subject matter experts (Moher et al., 2016; Uchendu et al., 2021). In this phase, data is exclusively extracted from the SCOPUS database for the period spanning 2015 to 2024. All publications must be in the English language. We utilize SCOPUS, given its status as one of the most prominent and expansive databases comprising peer-reviewed publications. A specific search syntax employing the terms

technology AND innovation AND policy yielded a total of 19,147 publications. The subsequent phase involves the meticulous screening of the identified articles to evaluate their suitability for inclusion, guided by pre-established criteria encompassing study design, population characteristics, and outcome measures (Benachio et al., 2019). In this segment, we apply the search syntax of small and medium enterprises AND SMEs AND culture AND emerging countries, which has resulted in a total of 187 publications. The following screening entails the application of an additional search syntax incorporating technological process AND digital marketing AND digitalization. Furthermore, we integrated these three research strings, culminating in 15 fully accessible publications within the designated timeframe.

Upon selecting the relevant studies, the subsequent step entails the extraction of essential data from each article, encompassing study attributes, methodologies, and findings. This data is then synthesized and analysed to discern patterns, trends, and knowledge gaps within the existing literature, to provide a comprehensive and insightful perspective on the research landscape.

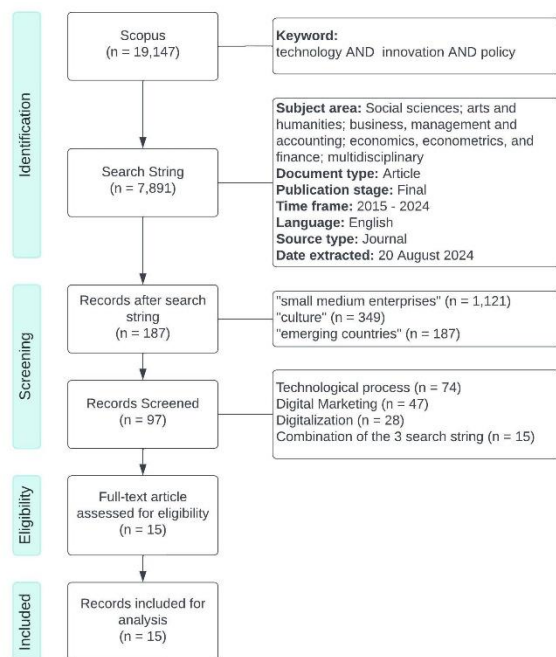


Figure 1. PRISMA Technological Innovation Policy in Creative SMEs Literature

IV. RESULTS

A. Descriptive Analysis

As indicated in the PRISMA figure above, initially, the publication year included in this study is between 2015 and 2024 due to the nature of the systematic literature review study which took into account the most recent studies. However, during the search, this study found a lack of literature between 2015 - 2018. Therefore, 15 relevant articles with the intended keywords string within 2019 - 2024 are included in this study, as presented in Figure 4.1. This figure shows that almost every year the number of publications increased, except for 2020 with no publication at all. Since then, the number of publications gradually increased by 1-2 articles per year and the highest number of publications is in 2024 (this year) with 6 articles. This means that the topic (technology and innovation policy) has gained more attention from social sciences researchers.

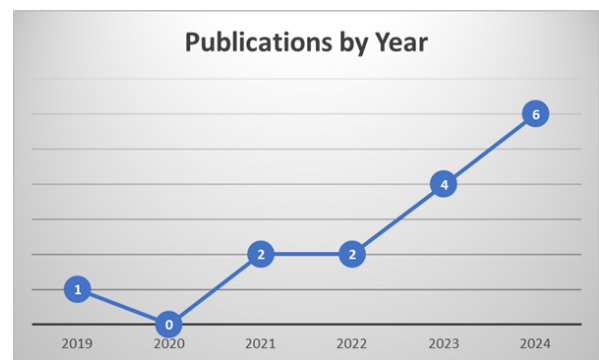


Figure 2. Distribution of publications by year

Scopus-indexed journals such as Sustainability, Brazilian Administrative Review, Cogent Business and Management, Frontiers in Energy Research, International Journal of Entrepreneurial Behaviour and Research, International Journal of Information Management, International Journal of Innovation and Technology Management, Journal of Innovation and Knowledge, Journal of Open Innovation Technology Market and Complexity, and Serbian Journal of Management publishes the articles. Most journals have published 1 article between 2015-2024. However, the Sustainability journal has published 4 articles within the time frame, as shown in Figure 4.2. It indicates that the Sustainability journal has a growing interest in technology and innovation discussion compared to the other journals found in the literature.

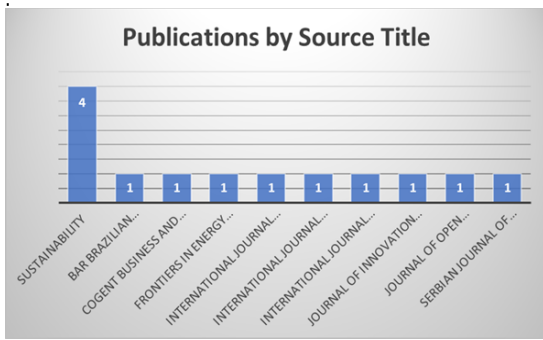


Figure 3. Distribution of publications by source title

Moreover, based on the subject area, Business, Management, and Accounting account for 28% of the total number of articles included in this study. Followed by Social Sciences (21%), Computer Sciences (15%), Energy (15%), Environmental Science (12%), and Economics, Econometrics, and Finance (9%). The high number of publications in Business, Management, and Accounting confirms that technology and innovation especially concerning small and medium enterprises are commonly found in this domain of knowledge. Additionally, to be more precise, this study found there is only 1 article that studied the creative industry as the context. This implies that studies on technological innovation policy remain underexplored.

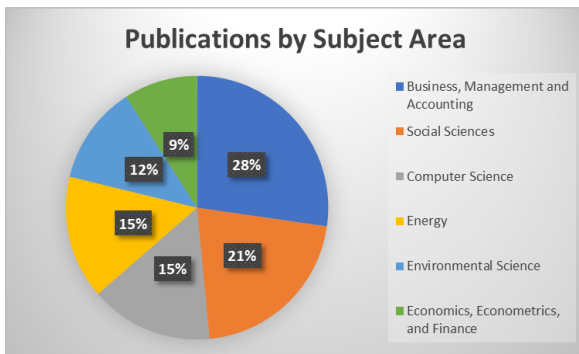


Figure 4. Distribution of publications by subject area

In terms of research methods, the current literature majorly employs quantitative methods (8 articles), qualitative methods (5 articles), and mixed methods (2 articles). Most of the research that used quantitative methods used Structural Equation Modelling (SEM) to analyse the data. Regarding the qualitative method, two studies used Systematic Literature Review (SLR) and three others used empirical evidence such as

interviews. Lastly, two studies used mixed methods combining qualitative and quantitative data. This implies that quantitative studies dominate the current literature as indicated in Table 4.1.

Table 1. Publications by Research Methods

Methods	Quantity
Quantitative	8
Qualitative	5
Mixed	2

B. Thematic Analysis

Based on our findings, there are four key themes within the search stream of technological innovation policy, namely technology, culture, innovation, and sustainability. Table 4.2 below shows that publications that focused on technology mainly discussed digitalization including digital culture, digital transformation, digital maturity, digital competence, digital adaptability, digital adoption, digital innovation, digitalization readiness, big data, information technology investment, augmentation, algorithmic machine learning, autonomous decision-making, and strategy alignment. Publications that focus on culture mainly highlight cultural diversity, institutional logic, open business environment, growth, effective collaboration, communication, reorientation and synergy. Moreover, publications with innovation themes include innovation exploitation, innovation exploration, green innovation, team innovation performance, sustainability innovation balance, and open innovation. Lastly, sustainability is also found to be an emerging theme in the technological innovation policy search string. The articles include the following dimensions in their study, such as sustainable development, sustainable business model, sustainable resilience strategies, sustainable performance, renewable energy, survival, continuity, environmental sustainability, sustainability performance, sustainability innovation balance, sustainable economic performance, environmental responsibility, and environmental regulation.

Table 2. Technology and Innovation Policy

No	Themes	Dimensions	Author (Year)
1	Technology	<ul style="list-style-type: none"> - digital culture, - digital transformation, - digital maturity, - digital competence, - digital adaptability, - digital adoption, - digital innovation, - digitalization readiness, - big data, - information technology investment, - augmentation, - algorithmic machine learning, - autonomous decision-making, - strategy alignment. 	Astuty, et al. (2024); Bhatta, et al. (2023); Chen, et al. (2022); Dwivedi, et al. (2021); Forliano, et al. (2023); Ghobakhloo, et al. (2023); Mahyarni & Okfalisa (2024); Martínez-Peláez, et al. (2023); Mutambik (2024); Ochinanwata, et al. (2024); Sharma, et al. (2022); Xiude, et al. (2021)
2	Culture	<ul style="list-style-type: none"> - cultural diversity, - institutional logic, - open business environment, - growth, - effective collaboration, - communication, - reorientation - synergy 	Bhatta, et al. (2023); Martínez-Peláez, et al. (2023); Ochinanwata, et al. (2024)
3	Innovation	<ul style="list-style-type: none"> - innovation exploitation, - innovation exploration, - green innovation, - team innovation performance, - sustainability innovation balance, - open innovation 	Bhatta, et al. (2023); Mahyarni & Okfalisa (2024); Mutambik (2024); Sağ, et al. (2019); Salamzadeh, et al. (2024); Sharma, et al. (2022); Xiude, et al. (2021)
4	Sustainability	<ul style="list-style-type: none"> - sustainable development, - sustainable business model, - sustainable resilience strategies, - sustainable performance, - renewable energy, - survival, - continuity, - environmental sustainability, - sustainability performance, - sustainability innovation balance, - sustainable economic performance, - environmental responsibility, - environmental regulation. 	Astuty, et al. (2024); Bhatta, et al. (2023); Ghobakhloo, et al.; (2023); Kwilinski, et al. (2024); Mutambik, et al. (2024); Sharma, et al. (2022); Xiude, et al. (2021)

V. DISCUSSION

A. Technology

In this study, out of 15 papers assessed, 11 discussed technologies. The most researched technological category areas are digitalization technologies, which are followed by big data, augmentation, automation of machine learning, and information technology. Information technology and digital strategy are necessary for digital transformation (Chen, et al., 2022). A study by Astuty, et al. (2024) mentioned the opportunities and challenges for SMEs in the creative sector, fashion, food and beverage industry. It makes clear that SMEs frequently need help putting new ideas and digital processes into practice. Intelligent automation (IA) was introduced by Ghobakhloo, et al. (2023) as the direction that corporate automation will go. This IA could improve the ecologically sustainable and financial performance of businesses. While Xiude, et al. (2021) investigated the effects of information

technology investment on green innovation in Chinese heavy-polluting companies, Kwilinski, et al. (2024) investigated ecological technologies and renewable energy for sustainable transportation. Taken as a whole, this research shows that technology can be used to mitigate carbon emissions. These findings align with the study from Achmad, et al. (2023) and Bekun, 2024), in which technological innovation plays a major role in forming sustainable practices and future industries. Further, businesses need to develop and adapt as digitization continues to change to be competitive in today's fast-paced world.

B. Culture

We discovered that the term "culture" is employed erratically in these articles, despite its crucial role in shaping the dynamics of an open corporate environment, especially when it comes to fostering cultural diversity (Bhatta, et al., 2023). This diversity brings people with different

backgrounds and skills together, which is essential for promoting growth and commercialization. According to several of these articles, navigating through this diversity calls for skilled cooperation and communication to ensure that all parties involved are working toward common goals (Martínez-Peláez, et.al, 2023). Understanding how cultural factors affect corporate conduct requires an understanding of the concept of institutional logic. Effective cooperation is essential in an open corporate environment (Ochinanwata, et al., 2024). It includes more than just information sharing; it also involves combining a variety of skills and knowledge. This combination can boost output and inspire creative solutions. One essential component of effective teamwork is communication. It involves the ability to clearly and concisely communicate complex information so that all parties involved understand their roles and obligations.

Communication in a culturally diverse setting needs to be sensitive to the nuances of other cultures to avoid misunderstandings and misinterpretations. Synergy is the result of interactions between people or groups that produce a result that is larger than the total of their contributions. We discovered that companies could encourage growth and commercialization while improving productivity and advancing economic development by cultivating cultural variety, utilizing institutional logic, facilitating skilled collaboration and communication, and creating synergy.

C. Innovation

Out of 15 publications, 7 explore innovation and highlight various keywords including open innovation, sustainability innovation balance, team innovation performance, green innovation, innovation exploitation, and innovation exploration. To achieve sustainable performance in the quickly changing business environment marked by growing competition among large, small, and medium-sized firms, open innovation is crucial (Sağ, et al., 2019); Mutambik, 2024; Xiude, et al., 2021). Additionally, it makes it possible to quickly adjust to significant developments, such as the COVID-19-related worldwide health crisis (Sharma, et al. 2022). The findings align with the study from OECD (2005), which states that innovation can vary in various dimensions. Moreover, from the result, we can find the key factor that impacts innovation, such as the effectiveness of a team (Bhatta, et al., 2023), cooptation (Salamzadeh, et al., 2024), and strategic approaches including exploration and exploitation (Mahyarni & Okfalisa, 2024).

Therefore, to succeed in the fast-paced business environment of today, one must have a thorough awareness of the numerous facets of innovation as well as the crucial growth aspects.

D. Sustainability

Sustainable development, sustainable business models, sustainable resilience strategies, sustainable performance, renewable energy, survival, continuity, environmental sustainability, sustainability innovation balance, sustainable economic performance, environmental responsibility, and environmental regulation are just a few of the keywords that are highlighted in seven major papers that discuss sustainability. These articles demonstrate how the idea of sustainable development, which has attracted growing attention lately, encompasses an all-encompassing framework meant to guarantee the long-term survival and welfare of our planet and its various inhabitants. The business community's efforts to address environmental concerns have turned their attention to sustainable business models, which have emerged as a crucial component of an all-encompassing framework (Astuty, et al., 2024; Bhata, et al., 2023). However, sustainable business practices are more than only minimizing environmental damage (Ghobakhloo, et al., 2023; Kwilinski, et al., 2024; Sharma et al., 2022). Sustainable resilience strategies (Mutambik, 2024) are becoming increasingly popular as a means of enhancing a company's ability to withstand and adjust to changing market conditions and environmental challenges (Xiude, et al., 2021). Therefore, renewable energy is essential to sustainable resilience since it reduces carbon emissions while simultaneously providing a consistent and reliable energy source, which keeps operations running smoothly even in the face of disruptions.

E. Technology, Innovation, and Culture

Among the 15 articles used in this study, only one article is identified using the three themes at once. Bhatta, et al. (2023) used the themes to explain the relationship between digital technology applications, firm sustainable performance, organization digital culture, and team innovation performance. Using 319 samples of employees from the IT sector in China, the study used a quantitative approach by employing SEM for data analysis. Nevertheless, the study did not work on culture as values embedded in creative products, it rather used the concept of organization digital culture to explain the phenomenon of digitalization among tech-savvy generations. Therefore, the study appears to be irrelevant to the

research objectives of this study and it is evident that the topic is less discussed.

VI. CONCLUSION

This study found that within the past ten years, publications on technological innovation policy have been limited. It is shown by the limited number of articles published in Scopus-indexed journals which shows only 15 articles between 2019 - 2024. Most publications are published in 2024 (six articles) and four articles are published in the Sustainability journal. Additionally, this study also found that 28% of the articles are published in the scope of business, management, and accounting subject areas, whereas 8 out of 15 articles used quantitative methods. Finally, within the search string technology and innovation policy, it is found that sustainability and culture are emerging themes. However, the articles are still limited with less than 7 articles within 5 years.

This study contributes theoretically and practically. Theoretically, the potential to explore technology policies is widely open and full of promise. In addition, based on the findings, this study highlights the lack of literature on technological innovation policy in the creative industry context. The only literature in the context of the creative industry does not emphasize cultural aspects in technological innovation policy but rather on sustainability. Practically, this study gives insight for practitioners in the advancement of SMEs, especially for policymakers; this study can be utilized to adapt and develop technology policies in emerging countries for SMEs' creative sector.

In the course of this investigation, we have identified a deficiency pertaining to the absence of cultural components that are deemed essential for inclusion in policy recommendations. Consequently, one of the trajectories of this inquiry is to elucidate the necessity of incorporating the notion of culture into the policy framework for technology adoption. Our findings indicate that culture exerts significant influence, particularly in certain emerging nations, where micro-level factors, such as the degree of engagement with specific issues, are substantially shaped by cultural dynamics. Hence, it is imperative to regard culture as a critical variable in the formulation of policy recommendations. As a result, various aspects warrant consideration for inclusion.

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All authors contributed equally.

REFERENCES

- Ahmad, N., Youjin, L., Žiković, S., & Belyaeva, Z. (2023). The effects of technological innovation on sustainable development and environmental degradation: Evidence from China. *Technology in Society*, 72, 102184. <https://doi.org/10.1016/j.techsoc.2022.102184>
- Astuty, E., Sudirman, I. D., & Aryanto, R. (2024). Sustainable resilience strategy: unleash the micro-businesses' potential in the digitalization and sustainability era. *Cogent Business & Management*, 11(1), 2313672. <https://doi.org/10.1080/23311975.2024.2313672>
- Bekun, F. V. (2024). Race to carbon neutrality in South Africa: what role does environmental technological innovation play?. *Applied Energy*, 354, 122212. <https://doi.org/10.1016/j.apenergy.2023.122212>
- Benachio, G.L.F., Freitas, M.D.C.D., & Tavares, S.F. (2020). Circular economy in the construction industry: A systematic literature review. *Journal of cleaner production*, 260, 121046. <http://dx.doi.org/10.1016/j.jclepro.2020.121046>
- Bhatta, D. D., Sarfraz, M., Ivascu, L., & Pislaru, M. (2023). The nexus of corporate affinity for technology and firm sustainable performance in the era of digitalization: a mediated model. *Sustainability*, 15(12), 9765. <https://doi.org/10.3390/su15129765>
- Bonfanti, A., Del Giudice, M., & Papa, A. (2018). Italian craft firms between digital manufacturing, open innovation, and servitization. *Journal of the Knowledge Economy*, 9, 136-149. <https://doi.org/10.1007/s13132-015-0325-9>
- Castells, M. (2010). Globalisation, networking, urbanisation: Reflections on the spatial dynamics of the information age. *Urban studies*, 47(13), 2737-2745. <https://doi.org/10.1177/0042098010377365>
- Cirera, X., Comin, D., & Cruz, M. (2022). Bridging the technological divide: Technology adoption by firms in

- developing countries. World Bank Publications.
- Chen, Q., Zhang, W., Jin, N., Wang, X., & Dai, P. (2022). Digital transformation evaluation for small-and medium-sized manufacturing enterprises using the fuzzy synthetic method DEMATEL-ANP. *Sustainability*, 14(20), 13038. <https://doi.org/10.3390/su142013038>
- Choi, J. & Sim, Y. (2024). From Adoption to Innovation: State-Dependent Technology Policy in Developing Countries. *IMF Working Papers*, 2024(154), 1. <https://doi.org/10.5089/9798400281341.001>
- Dwivedi, Y.K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International journal of information management*, 57, 101994. <https://doi.org/10.1016/j.ijinfomgt.2019.08.002>
- European Commission. (2021). Horizon Europe: A new framework for research and innovation. https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en. Retrieved on 5th August, 2024.
- Fabrizio, C.M., Kaczam, F., de Moura, G.L., da Silva, L.S.C.V., da Silva, W.V., & da Veiga, C.P. (2022). Competitive advantage and dynamic capability in small and medium-sized enterprises: a systematic literature review and future research directions. *Review of Managerial Science*, 16(3), 617-648. <https://doi.org/10.1007/s11846-021-00459-8>
- Force, C.I.T. (1998). *Creative industries: Mapping document*. Creative Industries, Department for Culture, Media and Sport. Gov.UK
- Forliano, C., Orlandi, L.B., Zardini, A., & Rossignoli, C. (2023). Technological orientation and organizational resilience to Covid-19: The mediating role of strategy's digital maturity. *Technological Forecasting and Social Change*, 188, 122288. <https://doi.org/10.1016/j.techfore.2022.122288>
- Ghobakhloo, M., Asadi, S., Iranmanesh, M., Foroughi, B., Mubarak, M. F., & Yadegaridehkordi, E. (2023). Intelligent automation implementation and corporate sustainability performance: The enabling role of corporate social responsibility strategy. *Technology in Society*, 74, 102301. <https://doi.org/10.1016/j.techsoc.2023.102301>
- Hesmondhalgh, D., & Saha, A. (2013). Race, ethnicity, and cultural production. *Popular Communication*, 11(3), 179-195. <https://doi.org/10.1080/15405702.2013.810068>
- Kitchenham, B., & Charters, S. (2007). *Guidelines for performing Systematic Literature Reviews in Software Engineering* (Vol. 2). Keele University and Durham University Joint Report.
- Kitchenham, B., Brereton, O.P., Budgen, D., Turner, M., Bailey, J., & Linkman, S. (2009). Systematic literature reviews in software engineering—a systematic literature review. *Information and software technology*, 51(1), 7-15. <https://doi.org/10.1016/j.infsof.2008.09.009>
- Kominfo (2024). Kemenkop UKM: 3,79 Juta UMKM Sudah Go Online [Ministry of Cooperatives and SMEs: 3.79 Million SMEs have been Online]. https://www.kominfo.go.id/content/detail/11526/kemenkop-ukm-379-juta-umkm-sudah-go-online/0/sorotan_media. Retrieved on 10th August, 2024.
- Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal*, 16, 1023-1042. <https://doi.org/10.1007/s11365-020-00635-4>
- Kwilinski, A., Lyulyov, O., & Pimonenko, T. (2024). Reducing transport sector CO2 emissions patterns: Environmental technologies and renewable energy. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(1), 100217. <https://doi.org/10.1016/j.joitmc.2024.100217>
- Mahyarni, M., & Okfalisa, O. (2024). SMEs digitalization readiness in supporting Sharia

- fintech: framework development using quadruple perceives in fuzzy analytical hierarchy process (FUZZY AHP). *Serbian Journal of Management*, 19(1), 71-97. <https://doi.org/10.5937/sjm19-44971>
- Malerba, E., Orsenigo, L. (1997). Technological Regimes and Sectorial Patterns of Innovative Activities. *Industrial and Corporate Change*, 6, pp. 83-117. <https://doi.org/10.1093/icc/6.1.83>
- Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V. G., Ostos, R., Brito, H., ... & Mena, L. J. (2023). Role of digital transformation for achieving sustainability: mediated role of stakeholders, key capabilities, and technology. *Sustainability*, 15(14), 11221. <https://doi.org/10.3390/su151411221>
- Maryunani, S. R., & Mirzanti, I. R. (2015). The development of entrepreneurship in creative industries with reference to Bandung as a creative city. *Procedia-Social and Behavioral Sciences*, 169, 387-394. <https://doi.org/10.1016/j.sbspro.2015.01.324>
- Melo, I. C., Queiroz, G. A., Junior, P. N. A., de Sousa, T. B., Yushimito, W. F., & Pereira, J. (2023). Sustainable digital transformation in small and medium enterprises (SMEs): A review on performance. *Heliyon*, 9(3). <https://doi.org/10.1016/j.heliyon.2023.e13908>
- Moher, D., Stewart, L., & Shekelle, P. (2016). Implementing PRISMA-P: recommendations for prospective authors. *Systematic reviews*, 5, 1-2. <https://doi.org/10.1186/s12916-016-0284-2>
- Mutambik, I. (2024). Digital Transformation as a Driver of Sustainability Performance—A Study from Freight and Logistics Industry. *Sustainability*, 16(10), 4310. <https://doi.org/10.3390/su16104310>
- Nardi, B. (2015). When fieldnotes seem to write themselves: ethnography online. *eFieldnotes: The makings of anthropology in the digital world*, 192. <https://doi.org/10.9783/9780812292213-012>
- Nieto Cubero, J., Consolación Segura, C. M., & Adebayo Gbadegeshin, S. (2020). Commercialization process of disruptive innovations in corporate ventures and spinoff companies: a comparison. *Advances in science, technology and engineering systems journal*, 5(2), 621-634. <https://dx.doi.org/10.25046/aj050278>
- Ochinanwata, C., Igwe, P.A., & Radicic, D. (2024). The institutional impact on the digital platform ecosystem and innovation. *International Journal of Entrepreneurial Behavior & Research*, 30(2/3), 687-708. <https://doi.org/10.1108/IJEER-01-2023-0015>
- OECD. (2016). *Innovation Policy for SMEs*. OECD Publishing.
- OECD. (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*.
- OECD (2002). *Proposed Standard Practice for Surveys on Research and Experimental Development*.
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know?. *International business review*, 29(4), 101717. <https://doi.org/10.1016/j.ibusrev.2020.101717>
- Pilliang, Y. A. (2014). Transformasi budaya sains dan teknologi: Membangun daya kreativitas. *Jurnal Sositologi*, 13(2), 76-83. <https://dx.doi.org/10.5614/sostek.itbj.2014.13.2.1>
- Raya, A. B., Andiani, R., Siregar, A. P., Prasada, I. Y., Indana, F., Simbolon, T. G. Y., ... & Nugroho, A. D. (2021). Challenges, open innovation, and engagement theory at craft smes: Evidence from Indonesian batik. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 121. <https://doi.org/10.3390/joitmc7020121>
- Rubera, G., Ordanini, A., & Griffith, D. A. (2011). Incorporating cultural values for understanding the influence of perceived product creativity on intention to buy: An examination in Italy and the US. *Journal of International Business Studies*, 42(4), 459-476. <https://doi.org/10.1057/jibs.2011.3>
- Rujirawanich, P., Addison, R., & Smallman, C. (2011). The effects of cultural factors on innovation in a Thai SME. *Management Research Review*, 34(12), 1264-1279. <https://doi.org/10.1108/01409171111186397>
- Sag, S., Sezen, B., & Alpkın, L. (2019). Determinants of open innovation and their

- interrelations. *International Journal of Innovation and Technology Management*, 16(04), 1940001. <https://doi.org/10.1142/S0219877019400017>
- Salamzadeh, A., Dana, L.P., Rastgoo, N., Hadizadeh, M., & Mortazavi, S. M. (2024). The Role of Coopetition in Fostering Innovation and Growth in New Technology-based Firms: A Game Theory Approach. *BAR-Brazilian Administration Review*, 21(1), e230097. <https://doi.org/10.1590/1807-7692bar2024230097>
- Sharma, G. D., Kraus, S., Srivastava, M., Chopra, R., & Kallmuenzer, A. (2022). The changing role of innovation for crisis management in times of COVID-19: An integrative literature review. *Journal of Innovation & Knowledge*, 7(4), 100281. <https://doi.org/10.1016/j.jik.2022.100281>
- Statista. (2024a). Global ranking of technologies to be adopted by companies from 2023 to 2027. <https://www.statista.com/statistics/1382924/technology-adoption-forecast/>. Retrieved on 10th August, 2024.
- Statista. (2024b). Digital technologies adopted by SMEs in the European Union in 2020. <https://www.statista.com/statistics/1254451/digital-technologies-adopted-by-eu-smes/>. Retrieved on 2nd August, 2024.
- Uchendu, B., Nurse, J. R., Bada, M., & Furnell, S. (2021). Developing a cyber security culture: Current practices and future needs. *Computers & Security*, 109, 102387. <https://doi.org/10.1016/j.cose.2021.102387>
- UNCTAD, 2022. Outcome Report: Data and Digitalization for Development. https://unctad.org/system/files/information-document/eWeek-2022-Outcome-Report-FINAL.eng_.pdf. Retrieved on 8th August, 2024.
- UNCTAD. (2024). Creative Economy Programme. Retrieved from <https://unctad.org/topic/trade-analysis/creative-economy-programme>. Retrieved on 8th August, 2024.
- The World Bank. (2022). Small and Medium Enterprises across the Globe A New Database. <https://documents1.worldbank.org/curated/en/819161468766822276/pdf/multi0page.pdf>. Retrieved on 10th August, 2024.
- Xiude, C., Yuting, T., Miaoxin, L., Guangyu, Z., Wencong, M., Shiwei, Y., & Yulian, P. (2021). How information technology investment affects green innovation in Chinese heavy polluting enterprises. *Frontiers in Energy Research*, 9, 719052. <https://doi.org/10.3389/fenrg.2021.719052>
- Yadav, U. S., Tripathi, R., Kumar, A., & Shastri, R. K. (2024). Evaluation of factors affecting women artisans as entrepreneurs in the handicraft sector: a study on financial, digital technology factors and developmental strategies about ODOP in Uttar Pradesh to boost economy. *Journal of the Knowledge Economy*, 1-54. <https://doi.org/10.1007/s13132-024-01837-9>