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THE IMPACT OF IMPLEMENTING TECHNOLOGY IN THE DEVELOPMENT OF OPEN INNOVATION AND ENVIRONMENTALLY FRIENDLY INNOVATION ON DIGITALIZATION IN MSMES

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Abstract

In the current digital era, the application of technology has brought significant changes and opportunities for micro, small and medium businesses. This has also led to the development of open innovation, where companies collaborate with external partners to create and share new ideas and solutions. The application of digital technology has facilitated innovation in overcoming environmental challenges. This technological progress has also paved the way for digitalization in MSMEs. By adopting digital technology, MSMEs can streamline their operations, automate processes, and increase productivity, thereby enabling MSMEs to increase their competitiveness and performance in the market, as well as accelerating the digital transformation of MSMEs that allows them to adapt and thrive in the digital economy. This research uses the literature review method, literature review aims to solve problems. We can draw conclusions from the results of the literature review. By developing technological solutions to social and environmental problems, MSME owners have the potential to become a positive force in creating sustainable social and economic change.

Keywords : *Technology, Open Innovation, Environmentally Friendly Innovation, Digitalization*

1. Introduction

In the current digital era, the application of technology has brought significant changes and opportunities for micro, small and medium businesses (Dasgupta, 2021) . The use of digital technology has had a positive impact on companies in terms of cost savings, reduction of greenhouse gas emissions, and identification of energy-efficient products (Bednarčíková & Repiská, 2021) . This has also led to the development of open innovation, where companies collaborate with external partners, such as customers, suppliers and even competitors, to create and share new ideas and solutions. The application of digital technology has facilitated innovation in overcoming environmental challenges. For example, companies can leverage technology to improve their production processes, develop sustainable products, and reduce waste and environmental impact. In addition, digital technology has played an important role in promoting the development of environmentally friendly innovation in MSMEs. For example, MSMEs can utilize social media platforms as a digital marketing tool to reach a wider audience and promote their environmentally friendly products. These technological advances have also paved the way for

digitalization in MSMEs, with the adoption of digital technology, MSMEs can streamline their operations, automate processes, and increase productivity, thereby enabling MSMEs to increase their competitiveness and performance in the market, as well as accelerating the digital transformation of MSMEs that enables them to adapt and thrive in the digital economy.

Micro, Small and Medium Enterprises (MSMEs) play an important role in the global economy as drivers of economic growth, job creators and innovators. However, MSMEs often face challenges in competing in an increasingly complex and dynamic market. In facing this challenge, the implementation of technology has become the key to increasing the competitiveness and sustainability of MSMEs.

In this context, the implementation of technology not only impacts operational efficiency and the ability of MSMEs to reach wider markets, but also plays a key role in the development of open innovation, environmentally friendly innovation and digitalization processes. This introduction will discuss the important impact of technology implementation on the development of open innovation, environmentally friendly innovation, and digitalization of MSMEs.

Undoubtedly, technological capability (TC) has become an important element in accelerating innovation activities in companies and is considered one of the most relevant dynamic capacities for achieving sustainable competitiveness (Ramadani et al., 2017). This approach makes it possible to eliminate internal Boundaries and involve all organizational stakeholders (managers, employees, clients, suppliers and society), thereby developing innovative behavior and motivation towards cultural change based on creativity and innovation.

Overall, the application of technology in MSMEs has had a positive impact on open innovation, the development of environmentally friendly innovation, digitalization and company performance. The application of technology in MSMEs has had a positive impact on open innovation and the development of environmentally friendly innovation. This has enabled collaboration with external partners and facilitated the sharing of new ideas and solutions, leading to innovative and sustainable product development. Apart from that, technology has also played an important role in helping MSMEs adopt environmentally friendly practices (Almunawar et al., 2022) .

2. Literature review

Technology.

Technology is a whole means of preparing goods that are used for continuity and comfort in human life. The use of technology used by humans is prioritized by converting natural resources into simple tools.

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According to (Teece, 2010) innovative business models are based on technological capacity, open innovation capacity, sustainability, or ecological innovation. Technological capacity is understood as a company's ability to design and develop new processes and products, increase the knowledge and skills of human resources, and transform knowledge into inputs (products and services) with high added value to improve organizational performance (Wang, Y et al, 2006). Several studies have explained the strong relationship between technological development and capacity and open innovation activities in MSMEs. Therefore, it is considered a dynamic capacity that helps competitiveness. Currently, technological capacity and the increasing use of new technologies determine a company's innovation capacity because the collection of information and knowledge from customers, suppliers and employees is carried out through digital tools that help direct two-way interactions.

At the same time, new technologies are providing a strong boost in green innovation and green supply chains. Some MSMEs are also adopting new technologies (procedures, machines and equipment) with cleaner and more ecological processes, which enable energy savings and cost reductions as well as the development of environmentally friendly products. Likewise, a company's technological and innovation capacity determines the level of financial and corporate performance. In the same way, MSMEs that have greater technological equipment and utilize digital tools such as social media (Facebook, Instagram, TikTok), online marketing (websites, e-commerce) and artificial intelligence (Chatbots) and have a better approach to their markets and consequently improve customer satisfaction, market share, and financial performance. However, other research shows that sometimes low technological capacity and incorrect implementation of TC have little impact on the innovation process, economic growth and company performance (Fernández-Portillo, et al, 2020). Meanwhile, more recent research reports that digitalization and increasing technology adoption are crucial in improving the competitiveness and financial performance of MSMEs.

Open Innovation.

Open innovation is a new strategy that allows managers to have access to the organization's external capabilities to develop their technology (West et al, 2014; Tucci et al, 2016). New business models based on open innovation enable the integrity of technology management and organizational innovation management. This approach makes it possible to eliminate internal Boundaries and involve all organizational stakeholders (managers, employees, clients, suppliers and society), thereby developing innovative behavior and motivation towards cultural change based on creativity and innovation.

The study of open innovation is a relatively new subject in business science and innovation management. This type of innovation uses incoming and outgoing knowledge to accelerate internal innovation and increase competitiveness. However, given the high complexity and deployment of resources (dynamic capabilities) to

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achieve maximum efficiency and high and sustainable financial performance, SMEs gain little benefit from this type of innovation strategy. On the other hand, SMEs face obstacles in developing environmentally friendly innovation practices; These obstacles can be government policies, high costs, demanding markets, and lack of knowledge (Chesbrough, HW 2006). However, companies that successfully break through these barriers and become sustainable and innovative can gain many organizational and financial benefits (Barbieri, R.; Santos, DFL 2020).

Environmentally Friendly Innovation.

This concept of environmentally friendly technology explains that technology is a system, product and equipment that can contribute to the preservation of environmental resources. Other than environmentally friendly technologies are technologies that reduce environmental damage and greenhouse gas emissions, promote renewable sources and resources, conserve natural resources and energy, are safe to use, and improve the health and sustainability of the environmental context for all forms of life that depend on them.

Green economic growth generally represents a type of prosperity that is defined as quality-oriented, based on low-carbon initiatives and low-carbon and energy-saving actions, with a focus on value creation through clean new, as well as through natural infrastructure and innovation, especially in developing countries. developing countries (Vazquez-Brust et al., 2014). In this concept, environmentally friendly innovation is considered the main character. Environmentally friendly innovation originates from the concept of sustainable development (OECD, 2008), consisting of innovations that contribute to the advancement of sustainability (Li et al., 2017). Therefore, companies investing in ecoinnovation seek to differentiate themselves from their competitors in terms of environmental efficiency, both in terms of general environmental performance and the impact of specific products (Andersen, 2008). Additionally, environmentally friendly innovations may be implemented for reasons other than potential reduction of negative impacts, such as to increase understanding of environmental change on a global scale and its impact on social and economic systems (Rennings, 2000), or to increase resource yields. (OECD, 2009).

The application of environmental innovation by companies is very important in efforts to produce change towards sustainability in both business and society (Pujari, 2006). According to El-Kassar and Singh (2018), environmental innovation is an important component of energy saving, pollution prevention and waste recycling initiatives. Environmentally friendly innovation can also explain why some countries are greener than others (Song et al, 2018b). To unlock green innovation, emerging technologies – such as big data – will be a critical success factor (Song et al., 2018c).

Digitalization.

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Digitalization is the technological push of the fourth industrial revolution, not yet showing a standard pattern for application in industry: being a relatively new domain,, and the focus of the research community is on "creating" new ways of achieving the early promises of that progress: namely increasing productivity and quality by using data as "new oil" or "new ground". This approach is in line with the current industrial work paradigm, which is largely unaware of the need to respect natural capital and ecological systems as part of their business logic (Antonio Maffei, 2019).

3. Methodology

The approach used in this article involves conducting a literature review to examine the subject matter at hand. The aim of a literature review is to address a particular problem by thoroughly analyzing related materials found in the library. This process requires the collection of data and information from various library sources, which serve as a valuable resource for generating fresh insights and ideas. By building on existing knowledge, literature reviews enable the development of new theoretical frameworks or serve as a foundation for problem solving. The library sources studied in this paper are: books, research results, journals, and other scientific articles.

The process of creating a literature review involves several steps: first, identifying sources that are appropriate and aligned with the research topic; second, critically evaluate the contents of the selected sources, including the basic assumptions and limitations that form the framework for thinking; third, summarize the main findings from the literature study; and finally, generating new insights and ideas regarding the research topic to build a conceptual foundation for future investigations.

4. Results and Discussion

Technopreneurship is a dynamic and innovative business approach that combines technology and entrepreneurship. Technopreneurship is about using technology as a means to solve problems, create value, and generate profits. Technopreneurs are very enthusiastic about utilizing the latest technology to build successful businesses. This business is not only driven by profit, but also by the desire to have a positive impact on society and the environment. Technopreneurship requires a clear vision, the ability to manage money creatively, and excellent social skills to persuade others to join the venture.

Sustainable business models are an important area of research that requires further investigation. The expansion of e-commerce in the era of digitalization has changed the retail industry in a major way, but its impact on environmental sustainability is still not fully understood. The literature review conducted in this

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literature identified the need for a comprehensive analysis of environmental sustainability commitments and achievements made by leading e-retailers.

In research (Luis Enrique et al, 2021) analyze the impact caused by TC on open innovation practices, eco-innovation and company performance results. The results show that SMEs' technological capabilities have a more significant impact on open innovation activities because they help them collect information, transfer it within the company, and improve processes and products. These findings are in line with empirical studies showing that SMEs with greater technological capacity and who are on the path to digitizing their processes are more likely to adopt open innovation and become more competitive.

On the other hand, TC has the same impact on environmental innovation activities carried out by SMEs. With the new environmental and ecological regulations set by global organizations, these types of companies are adopting these new business models to comply with regulations and meet the needs of the green and/or ecological market. The determining factor in adopting environmentally friendly innovations is the drive to use technology, because developing cleaner innovations is more complex and requires better technological capabilities. These results are in line with the empirical studies analyzed in this paper because disruptive technologies and digitalization help SMEs improve their production processes, save energy, and improve product designs with less polluting materials.

Apart from that, research (Samwel Macharia Chege, 2019) shows that SME performance depends on the entrepreneur's capacity to analyze the business environment through technological innovation. The research results show that business performance improves when following different technological innovation strategies in the operating environment. These findings indicate a significant relationship between technological innovation and SME performance. Thus, technological innovation plays an important role in narrowing the gap between business organizations in developed countries and developing countries. The primary benefit of technological innovation in a performance business is that it helps owner-managers understand markets, customers, products, and competitors. Second, it reveals the link between technological dynamics, product quality and the level of innovation at all stages of business growth. Third, help entrepreneurs take a forward-looking perspective, promote strategic planning and continuously update existing technology to improve business performance.

Furthermore, research (Antonio Maffei, 2019) states that digitalization of current production systems focuses mainly on how the promise of this trend technology can improve current processes towards traditional processes towards current industrial goals: namely quality and productivity. In this case, digitalization itself can tend to produce a “rebound” effect, where increased efficiency creates more consumption, rather than the other way around. However, Digitalization has also

been recognized as a key element of the paradigm shift towards sustainable business models and this research confirms these findings. In detail, the analysis shows the mostly positive impact that digitalization has in enabling BMI towards sustainable manufacturing for the proposed scenario. It also takes into account the specific contribution of digital technologies in each area of BM and by distinguishing them can then be used as a reference for further studies.

5. Conclusion

In the context of technopreneurship, technology is not only used as a tool to improve operational efficiency, but also as a means to create new products and services that can change the way people work, interact and live. Technology enables MSME owners to create products and services that are more efficient, innovative and affordable. For example, by using digital technology, technopreneurs can develop mobile applications to facilitate access to their services. This not only improves people's quality of life, but also reduces the costs and time required to obtain products or services.

Apart from that, technology also allows MSME owners to create more inclusive and sustainable business models. By utilizing digital platforms, technopreneurs can connect business actors with wider markets, both at the local and global levels. This opens up new opportunities for small and medium businesses to expand their reach and increase their income.

By developing technological solutions to social and environmental problems, technopreneurs can help reduce social inequality, improve people's quality of life, and maintain environmental sustainability. In addition, by creating an inclusive and sustainable business model, technopreneurs can also provide economic opportunities and benefits to more people. Thus, MSME owners have the potential to become a positive force in creating sustainable social and economic change.

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