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Innovation and Technological Adaptation of Business Actors in the Digital Age: A Digital Sociology Perspective

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ABSTRACT

The advancement of information technology has changed many aspects of human life. Technology has entered various spaces of human life, so technology and humans are an integral unit. In the modern economic sector, the market has transformed business digitalization. This is both a challenge and an opportunity for business people. For this reason, this study aims to analyze the space for innovation and technological adaptation of business actors in responding to advances in information technology. In addition, this research also intends to outline the relevance of developing digital sociology studies. A qualitative approach through field studies and literature review is the method of choice for this research. Operationally, the research was conducted through two stages, namely the context determination stage and the concept selection stage. These two processes are in line with the principle of inductive logic in qualitative research which prioritizes empirical narratives and then develops conceptual narratives. This is intended to obtain a comprehensive understanding of the facts and theories about technological innovation and adaptation in the business world. The results show that digital technology has become a major catalyst for improving operational efficiency, expanding market reach, and creating competitive differentiation. Therefore, digital technology adaptation is not just an option but has become a necessity in an increasingly digitally connected era. Digital technology adaptation is one of the keys to success in a world that is undergoing a massive transformation from real space to digital space.

INTRODUCTION

The rapid development of technology in recent years has brought many changes in various aspects of life, including in the economic field (Oborin, 2021; Silva et al., 2021). Adaptation to technological developments is very important for businesses to remain competitive and develop in the digital era. One form of innovation and adaptation of information technology in the business sector is the use of digital technology, such as the Internet, computers, and mobile devices. This mechanism has changed the way humans interact and transact in various ways, including in the business world (Umanets & Danylina, 2022). Today, many companies use digital technology to optimize their business processes, improve efficiency, and expand their markets.

One of the uses of digital technology in the business sector is e-commerce. E-commerce allows buyers to purchase goods or services online, without having to go to the store directly. Buyers can choose and buy products online (either through websites or social media) and the products will be sent directly to the buyer's address. E-commerce has become an increasingly popular trend around the world, especially during the Covid-19 pandemic (Bhatti et al, 2020; Godara, 2022; Jílková & Králová, 2021), where many people choose to buy goods online to avoid crowds and the risk of exposure to the virus.

Innovation and adaptation of digital technology have an impact on increasing competitiveness and benefit not only the industry but also consumers (Nováckova & Wefersová, 2021). Digital technology innovation has enabled

businesses to develop more effective marketing and promotion strategies, thereby increasing sales. By adopting digital technology smartly and effectively, businesses can achieve significant benefits and remain competitive in the increasingly advanced digital era. Based on eCommerce Statistics 2022 data, the five largest sales through e-commerce are (1) food and drinks products, (2) fashion, (3) household needs, (4) cosmetics, and (5) transportation services (Central Bureau of Statistics, 2022).

Adapting to today's digital technology, businesses can use social media and other digital platforms to promote their products and services to a wider audience. Businesses can use data from digital platforms to understand consumer preferences and behavior and develop more effective marketing strategies. The use of digital technology has also enabled businesses to optimize production and distribution processes. By using databases from information technology, businesses can find out product trends that are in demand by consumers, so that businesses can increase production according to consumer expectations. Likewise, in the distribution process, businesses can use logistics technology to monitor inventory and organize deliveries. Through logistics technology, consumers can find out the position of their orders through tracking applications.

Innovation and adaptation to technological developments require adequate skills and competencies. The use of good information technology can help businesses adopt new technologies more quickly, increase efficiency, and expand markets (Vinichenko et al., 2020). In addition, adapting to technological developments also requires attention to data privacy and security. In the digital era, data has become a very valuable asset for businesses. Therefore, data security from digital security threats is a very important matter (Buzianu, 2020; Park, 2019). Businesses must ensure that customer data is secure and well-protected, to maintain customer trust and business integrity. In addition to data security challenges, the use of digital technology in business requires a significant initial investment, both in terms of hardware and software. Businesses must invest in human resources to develop the necessary skills and competencies in the use of digital technology. Sousa & Rocha (2019) mentioned three important things that need to be considered in disruptive business management, namely innovation, leadership, and management.

Although there are still various challenges in the innovation and adaptation of digital technology as outlined above, in general, digital technology has significantly changed the socio-economic system of life. The internet and digital technology have built unprecedented global connectivity. Through this system, people from different countries can communicate, collaborate, and do business more easily. This has fuelled the growth of international trade and opened the door for cross-border co-operation (Carballo et al., 2022; Robbins, 2018). Digital systems allow businesses and consumers to shop and sell products online. E-commerce has created new opportunities for businesses, increased access to global markets, and influenced the way people shop.

Social change due to technological development is interpreted by Castells (2010) as a new form of social identity and a new form of social organization that relies on the power of information. Castells also said that the development of society influenced by the development of technology and information produces a network society with communication flows that run in any direction at any level of structure. In the network society, economic transactions are directed by organizations that are regulated as information networks and internet-based communication becomes the main tool for cyber community interaction. DiMaggio et al. (2001) asserted that technology is not just a tool to facilitate a person in business transactions, but rather changes the nature of human existence in society.

The description above emphasizes that digital technological innovation has influenced aspects of contemporary human socio-economic life. One branch of study in contemporary sociology is the perspective of digital sociology, which is concerned with understanding the use of digital media in all human activities. Digital sociology is a study that discusses various problems due to human interaction with technology in modern society (Shank, 2020). Digital sociology analyses and understands the impact, development, and use of computerized technology in the social world (Lupton, 2020). For this reason, this study aims to analyze the space for innovation and technological

adaptation of business actors in responding to advances in information technology. In addition, this research also intends to outline the relevance of developing digital sociology studies.

METHODS

Methodologically, the approach used in this research is a qualitative approach through literature and field studies. The consideration for choosing this approach is to obtain a comprehensive understanding, both empirically and theoretically. The empirical context of the business actors that are the focus of this study are food and drinks, fashion, and household needs products. This is based on the consideration that these three businesses are currently trending using e-commerce (Central Bureau of Statistics, 2022). While theoretically, the various references used are based on the perspective of digital sociology, with the consideration that the development of digital sociology studies is still relatively limited in Indonesia. Thus, operationally, the research was conducted through two stages, namely the context determination stage and the concept selection stage. These two processes are in line with the principle of inductive logic in qualitative research (Azungah, 2018) which prioritizes empirical narratives and then develops conceptual narratives.

The first stage was to determine the contemporary issues by selecting three business sectors (food and drinks products, fashion, and household goods) in Kendari City, Southeast Sulawesi Province as the empirical setting. The determination of this context is based on the consideration that these three issues are a concern in the digital era, where many people represent their eating style, fashion, and luxury goods on social media. In line with this, business actors are also intensely promoting their products through digital platforms. Businesses, both individuals and companies, appear to have successfully adopted and adapted technological innovation as a business strategy through the use of information technology. The data obtained from the case studies were analyzed in depth, including the identification of patterns, findings, and discussions regarding technological innovation and adaptation in the digital era. Data from the case studies were also linked to findings from the literature review to gain a more holistic and comprehensive understanding (Ningi, 2022).

The second stage is determining the relevant perspective, namely using the perspective of digital sociology. The first step taken at this stage is to identify relevant literature sources that use a digital sociology perspective. The literature sources used include scientific journals, books, and related news articles. The identified literature sources were then comprehensively analyzed. The analysis involved interpreting the content of the literature, identifying important findings and concepts, and extracting information relevant to the research topic. Finally, data processing and synthesis were conducted, where data was grouped based on relevant themes and then synthesized to produce significant findings based on the research objectives (Cooper et al., 2019).

RESULTS AND DISCUSSION

Digital technology adaptation is not just a choice but has become a necessity in an increasingly digitally connected era. Digital technology adaptation seems to be the key to success in a world that is undergoing a massive transformation from real space to digital space. This has an impact on all dimensions of human life, including business life. Today's business world cannot be separated from technology, which is growing rapidly. The benefits of technology such as connectivity have now become more widespread. Through the use of the internet, all entities, ranging from businesses, people, and systems, to devices are connected in real-time. This article presents three important descriptions, namely the characteristics of digital technology adaptation in the business world, various considerations in digital technology adaptation, and the prospects for digital sociology studies.

Digital Technology Adaptation in the Business World

Technology adaptation is an important step in maintaining business continuity and utilizing the opportunities that exist in the digital era. Various economic actors from all over the world transact more easily and quickly by using technology. Product sales can be done through the internet network, or what is called eCommerce. The existence of eCommerce has had a major impact on various aspects of people's lives, such as new

economic opportunities for people to start businesses (Xia et al., 2023). This section outlines three forms of technological adaptation in the business world, namely based on the type of platform used, payment methods, and age segmentation of digital technology users.

First, based on the type of platform used by business actors in the three business sectors in this study, they generally use a marketplace. A marketplace is a platform or place where sellers and buyers can interact to conduct buying and selling transactions of products or services (Almunawar et al., 2021). Here sellers provide their merchandise, and buyers can search for and buy the products or services they need. Marketplaces can operate in many forms, including online shops, e-commerce platforms, mobile apps, and personalized websites.

Marketplaces have become a popular business model in e-commerce, as they connect sellers and buyers in a larger ecosystem, create access to a variety of products and services in one place, and often make it easy to compare prices and product quality (Derave et al., 2021). Some of the trending marketplaces used in fashion and home goods products include Shopee, Tokopedia, Lazada, Blibli, and Bukalapak. Meanwhile, food and drinks businesses are more likely to use Grabfood and Maxim.

Besides marketplaces, businesses in the digital era also use social media. Social media is quite effective in supporting businesses with several advantages. (1) Social media allows the business system to speak in a more personal and human way, (2) Social media allows the business system to reach a worldwide audience, and (3) promotion on social media is more cost-effective, especially for small and medium-sized businesses. Thus, with the right use of social media, businesses can increase their online presence, interact with customers, and build a strong brand in the digital era.

There are many social media platforms used by businesses in the digital age. The choice of the right platform depends on the type of business, target audience, and marketing objectives. Some of the social media that are widely used by businesses are as follows:

1. Facebook. Facebook is one of the most popular platforms for businesses of all kinds. It provides many marketing tools, including highly segmented adverts and the ability to interact with customers through business pages.
2. Instagram. Instagram, which is owned by Facebook, focuses on images and visuals. This is perfect for businesses that can capitalize on visual appeals, such as food and drink products, fashion, and home goods.
3. TikTok. TikTok is a short video platform popular with the younger generation. Through TikTok, businesses can utilize their creativity to create interesting and trending content.
4. WhatsApp and WhatsApp Business. WhatsApp is an instant messaging platform that can be used to communicate with customers directly and provide customer support.
5. YouTube. Although not widely used by the three types of businesses in this study, YouTube still has a role in the business world for posting product reviews and other visually orientated-content.

Secondly, in terms of payment methods, the three businesses in this study generally provide payments using the Cash on Delivery (COD) system. This payment method allows buyers to pay directly to the courier when the goods arrive. This method offers many conveniences, especially for those who do not use electronic payments. Not all consumers have access to electronic payment facilities, such as credit cards or bank accounts. COD payments allow anyone with cash to shop online. COD payments give shoppers a sense of security as they can inspect the goods before paying. This increases customer satisfaction as they know that they will only pay if the goods received match expectations.

The second payment alternative is through bank transfer. Payment by bank transfer in the digital system is a commonly used method to send money from one bank account to another through an online banking platform or application. This is one of the safest and most efficient ways to make payments in the digital sphere. In addition to payments through bank transfers, a small segment of businesses apply payment methods through e-wallets. E-wallet is a software application that allows users to store, manage, and use money electronically. Although the E-wallet utilization segment is still relatively limited, this method plays an important role in the digital system. Some e-

wallet applications used in digital transactions include OVO, DANA, and GoPay.

Third, the adaptation of digital technology based on the age segment of users comes from the millennial generation and Gen Z. Millennials (1981-1996) tend to be more familiar with technology and social media because they grew up with the development of information technology and the internet. Most of them have a good understanding of how to use digital tools and social media (Akre et al., 2019; Madara et al., 2018). Likewise, Gen Z (1997-2012) is one of the age segments of business actors in the digital era. Generation Z grew up in a mature digital technology era with greater access to the internet and digital tools than previous generations. They generally have a better understanding of social media platforms, e-commerce, and various other digital tools. Generation Z also tends to have an interest in entrepreneurship and capitalizing on business opportunities in the digital world (Hinduan et al., 2020; Verma et al, 2021).

In general, the characteristics of innovation and adaptation of digital technology for business actors who are the focus of this research can be seen in the table below.

Table of Characteristics of Innovation and Technology Adaptation

No	Characteristics of Technology Adaptation	Categories
1	Platform Used	– Marketplace – Social Media
2	Payment Methods	– Cash on Delivery (COD) – Bank Transfer – E-wallet
3	Age segmentation of users	– Millennial Generation (1981-1996) – Gen Z (1997-2012)

Source: Primary Data (processed)

The Rationality of Digital Technology Adaptation

In this modern era, technological developments are increasingly advanced, thus encouraging all business activities to adapt immediately. One way to adapt is by digitalizing the business, which is the integration of technology in conducting business activities. Through the digitalization system, business activities that were originally conventional are transformed into digital and more modern (Bessonova & Battalov, 2021). The results show that the use of digital technology has many benefits and important reasons that make it a must in the business world in today's digital era. The following presents some of the main reasons for the importance of digital technology adaptation in business.

1. Business Operational Efficiency

The use of digital technology has great potential to improve the efficiency of business operations in various aspects. Digital technology automates routine tasks and business processes (Ivancic et. Al, 2019), such as order processing, inventory management, and scheduling, reducing time allocation and costs. In addition, digital communication tools such as email, instant messaging, and video calls, make it easier for businesses to work together in teams. This was felt during the Covid-19 pandemic when there was a social distance policy (Mukhlis et al., 2022). Through information technology, business actors conduct meetings, discussions, and so on online. Likewise, convenience is felt in communicating with customers more efficiently, without having to come to the store physically.

2. Easier Marketing Process

The business world is already very competitive where there is a lot of competition to keep growing. Therefore, creativity and knowledge are needed in a responsive marketing system. The utilization of digital technology by businesses makes it easy to expand consumer reach. E-commerce, for example, makes it easy for businesses to sell their products and services widely, even allowing for the whole world. Innovation and adaptation of digital technology make it easier for businesses to carry out product marketing activities for 24 hours, unlike

offline stores where all activities are very limited by time and space (Gauri et al., 2021).

The utilization of digital technology by businesses significantly facilitates the marketing system in various ways, including (a) Targeting and Personalisation. Digital technology makes it easier to target very specific consumers based on demographics, interests, online behavior, and geographic location, so that messages are more relevant to each customer, (b) Digital advertising campaigns. Digital advertising makes it easier for businesses to reach consumers at a lower cost than traditional advertising. This is generally done through social media platforms, such as Facebook, Instagram, TikTok, and others as mentioned in the section above, (c) Email Marketing. Email marketing is one of the most powerful digital marketing tools. With email marketing tools, businesses send messages to customers on a scheduled basis.

3. Minimising Operating Budget

Digital technology contributes greatly to reducing business costs in various aspects. (a) Paper cost reduction. The shift to digital documents, emails, and e-signatures significantly reduces the cost of printing, postal delivery, and storage of physical documents, (b) a reduction in marketing costs. Digital marketing through online advertising, social media marketing, and email marketing is more cost effective than traditional advertising such as TV or print advertising, and (c) reduction in archiving costs. Using a cloud storage system reduces the cost of maintenance, updates, and data storage rather than physical server infrastructure. Rows of filing cabinets containing company documents are now no longer needed by some businesses. Today, most companies store digital versions of documents on servers and storage devices (Jordan et al., 2022). Through the utilization of technology, document files can be made available to everyone in the company, regardless of their geographical location.

The Industrial Revolution and the Prospects of Digital Sociology

In human history, revolutions occurred when new technologies and ways of seeing the world triggered profound changes in economic systems and social structures. In this context, the term revolution means radical and sudden change (Schwab, 2016). Technological changes make major changes in every line of human life, both in a large range and even down to the small habits that occur in life. Technological innovations were created to make it easier for humans to complete their work from traditional times to the development of modern technology. More than centuries ago, humans created hunting tools from stone and natural materials to live nomadically and survive with their groups and tribes. The ability of humans to survive has been illustrated by the long series of civilizations created by humans.

Starting from the Industrial Revolution 1.0 that occurred in the 18th century (1760-1840). In that year, the invention of the steam engine by James Watt was the beginning of this era in the UK that brought about major changes in various sectors (Sharma & Singh, 2020). This coal-fuelled steam engine was run through a machine that was used for textile production in England. Over time, the steam engine also developed in various other industries ranging from agriculture, mining transport, to manufacturing. In this era, production was carried out on a large scale to fulfill needs and increase profits. The first industrial revolution transformed life and the economy from an agrarian and handicraft economy to one dominated by industry and machine manufacturing (Xu et al., 2018).

Furthermore, the Industrial Revolution 2.0 occurred in the early 19th century with its focus on machines in every line and the invention of electric power (Fuchs, 2018). The invention of electricity triggered the Industrial Revolution because electricity was much more effective than steam engines by working on production very quickly and could replace human work. This era also triggered the massive production of cars, which was not easy. The production process no longer requires a lot of manpower to assemble from start to finish. The Industrial Revolution 2.0 had a huge impact on the invention of electric current, telecommunication devices, and mass-production machines (Loy et al., 2021).

The Industrial Revolution 3.0 is an era that occurred around the beginning of the 20th century, triggered by computerization based on automation technology (Kurt, 2019) that slowly replaced human roles in the field. It was in this era that digitalization became known in the industrial era. With the Industrial Revolution 3.0, changes and patterns of relations and communication occur in contemporary

society. The product created by this industrial revolution is the emergence of integrated chips that make computers smaller in size with small electricity usage and increasingly sophisticated commands.

Meanwhile, the industrial revolution 4.0 has become the talk of the town. Governments, industries, and companies are mobilizing strategies to deal with it. The era we are living in today is one where digitalization is evolving rapidly, artificial intelligence, information analytics, and autonomous vehicles are not only focused on production but also sustainability. These technologies are creating co-connectivity between humans, data, and machines. These new technologies also give rise to a wide range of applications in alleviating many human activities. According to Schwab (Rotatori et al., 2021), the fourth revolution is characterized by the development of increasingly complex technologies that bring together the physical, digital, and biological worlds. Collectively, these capabilities impact all sectors of the economy and challenge existing social systems. Industry 4.0 is based on three technological innovations that drive transformation: Artificial Intelligence, Specialised Manufacturing, and flexible automation (Potluri et al., 2022). The series of industrial revolution processes outlined above emphasize the fundamental change in the industrial sector from manual manufacturing to automated and intelligent manufacturing (Bula & Niedzielski, 2021). The industrial revolution 4.0 has changed the way we live, work and relate to other humans. Schwab (2016) emphasizes that in its scale, scope, and complexity, this fourth industrial revolution has never been experienced by humans before.

The development of technology experienced by humans will certainly not only have a technical impact. Technology that is certainly related to the livelihood of many people also enters the realm of social life. Moreover, the Industrial Revolution 4.0 focuses on accelerating the flow of information so that it is very closely related to human interaction. Such rapid developments reflect the fact that contemporary society is increasingly organized and managed through digital systems, services, and applications. Digital technology is now a key element in all aspects of human life.

The radically moving conditions of the times are recognized as inevitable by some social scientists so many of them try to adapt their studies to the digital world. The existing classical sociological disciplines with their various criticisms and debates are not sufficient to explain the social phenomena that occur due to digitalization. Therefore, a contemporary sociological perspective is needed, namely digital sociology. Digital sociology is not only the progress of the discourse of social scientists interested in the sociology of technology and social technology but also answers various questions about the relevance of sociology in the digital era.

Initially, the term digital sociology was not very popular as a specialized branch of sociology. The term was only used as the name of a course taught at a university in London. At that time, this digital-labeled vocabulary was also still inferior to several other contemporary sociology vocabularies, such as the sociology of the internet, the cybersociology, the sociology of social media, the sociology of online communities, and so on (Lupton, 2015). This condition gradually changed when sociology scholars began to discuss and popularise this term in their academic works.

The first known scientific writing that contains the word digital sociology is an article written by an American sociologist named Jonathan R. Wynn (2009). In his writing, he sees that there is a very clear connection between technology and sociology. Furthermore, many digital sociology studies were carried out by Deborah Lupton, a sociologist and researcher from Australia who studied media and digital, social, and cultural aspects.

Interest in digital sociology continues to increase and the study is getting more attention from scholars. This can be seen in the work initiated by Orton-Johnson and Prior (2013) who discuss digital sociology from a critical perspective. The rise of digital sociology studies is an answer to the development of technology in various parts of the world. In the Indonesian context, digital sociology studies are still relatively limited, therefore this article can be said to be an effort to voice the scope of digital sociology studies.

Lupton (2015) divides the study of digital sociology into four concepts, namely (1) professional digital practice, namely the use of digital technology for professional activities such as virtual teaching, establishing academic relationships, and others; (2) analysis of digital

technology, namely the use of digital media by individuals to regulate self-concept and social relations; (3) digital data analysis, namely the use of various digital data for social research; and (4) critical digital sociology where things obtained from digital media can be analyzed critically and reflectively by the theory of social science humanities.

This emphasizes that the study of digital sociology is not simple, but in practice has a large scope. Therefore, the discussion in the study of digital sociology is not only limited to technology, digital media, and how to use them, but includes various influences from the use of digital technology on human sociological aspects, including interaction patterns, social behavior patterns, individual attitudes and actions, understanding of identity and human self-concept, and of course many others.

CONCLUSION

Based on the discussion above, it can be concluded that various digital technology innovations have influenced many aspects of modern human life. Contemporary society is increasingly organized and managed through digital systems, services, and applications. Digital technology has become a key element in human life. Therefore, digital technology adaptation is not just an alternative but has become a necessity in an increasingly digitally connected era. Digital technology adaptation seems to be the key to success in a world that is undergoing a massive transformation from real space to digital space.

Specifically, in the socioeconomic aspect, as the context of this research shows, business actors in food and drinks, fashion, and household products have shown to adopt technology in their business in the form of the use of various digital platforms such as marketplaces and social media, as well as the use of digital payment methods. Generally, users of digital technology from the three business segments come from the millennial and Gen Z generations. The results also show that the use of digital technology has many benefits and important reasons that make it a must in the business world in the current digital era, namely business operational efficiency, easier marketing processes, and being ability to reduce operational budgets.

The results of this study have implications for the development of contemporary sociological studies, especially digital sociology. Digital sociology is not only the progress of discourse from social scientists who are interested in the presence of technology in society but is the answer to various questions regarding the relevance of sociology in the digital era. In addition, this research also has practical implications in encouraging business actors to immediately adapt to advances in digital technology. The rise of online business should not be seen as a challenge and barrier, but rather as an opportunity to develop business in the digital era.

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