Journal of Social Science Studies Vol. 2, No. 2, July 2022, pages 225 – 230

Inclusivity in Technology-Based Services: Access and Skills Challenges

[1]Nur Laila Binti Ramle, [2]Rahayu Mardikaningsih

[1]*Universiti Utara Malaysia*
[2]*Sunan Giri University of Surabaya, Indonesia*

ARTICLE INFO

Article history:
Received 17 April 2022
Revised 22 May 2022
Accepted 22 June 2022

Keywords:
Technology access,
Service equity,
Technology-based business models,
Digital skills,
Digital divide,
Inclusivity,
Product development.

ABSTRACT

Differences in access to technology affect the quality and equity of services in technology-based business models. Limited access to digital devices, connectivity and skills creates inequalities in the consumer experience, with those with better access receiving more efficient and personalized services. Conversely, individuals with limited access are often marginalized from the benefits offered by technology-based services. This digital divide has the potential to exacerbate existing socio-economic inequalities, as groups with limited access may remain dependent on slower and less efficient traditional business models. To address this issue, companies need to develop a more inclusive approach by providing training, technical support and product development that is accessible to different segments of consumers. This is important to ensure equity in the use of technology and optimal services for all consumers, regardless of the limitations they face.

INTRODUCTION

In today's business world, many service industries are adopting new business models that integrate technology to meet growing market demands. The traditional service business model, which generally relies on direct interaction between service providers and consumers, is beginning to face significant changes (Senderek et al., 2019). With the advancement of technology, platform-based and digitalized models are being implemented, providing greater convenience and efficiency. This has brought about major changes in the way services are delivered, from transportation services to banking, which are moving towards more flexible and automated systems (Shakhovskaya & Kamaeva, 2021). The main difference between traditional and technology-based models lies in the way companies operate, which enables faster adoption of market changes and consumer needs (Brynjolfsson & McAfee, 2014).

At the same time, the development of technology-based business models is also creating new patterns in service management and distribution, utilizing big data and algorithms to enhance customer experience. This model prioritizes efficiency and innovation, and provides new opportunities for companies to reach a wider market. In many cases, technology-based services offer advantages in terms of lower costs, increased convenience for consumers, and smarter data processing to provide more personalized services. While there are many opportunities, the transition to a digital business model also faces many challenges, particularly related to issues of data security, privacy, and potential inequality of access (Chesbrough, 2007).

One of the key issues that arises in the adoption of technology-based business models is the reliance on digital infrastructure, which can affect the accessibility of services for different groups of consumers. As companies focus on automation and the use of digital platforms, not all consumers have equal access to these technologies, whether in terms of hardware, internet connectivity or technology skill levels. This imbalance creates serious barriers to equitable access to services, which in turn affects customer perception and experience of the digital services offered. This can lead to disparities in the quality of service received by consumers, depending on their location and economic background (Van Alstyne et al., 2016). Consumers from more affluent groups will find it easier to navigate and utilize the advanced features of digital platforms, while other groups may be left behind or even cut off from such services altogether. Differences in the ability to access and utilize technology can exacerbate socio-economic inequalities, which can further hinder the growth of companies that rely on digital business models.

* *Corresponding author, email address:* ***rahayumardikaningsih@gmail.com***

Another significant issue related to the implementation of technology-based service business models is the challenge of data management and privacy protection. With more and more data being collected for the purpose of personalization and service enhancement, companies must be able to manage customer data carefully. Privacy breaches and data leaks can damage a company's reputation and reduce consumer confidence in the services provided. Uncertainty in data protection regulations also further complicates this process, given the variety of regulations that apply in different regions (Zeng, 2018). This issue is becoming increasingly crucial as consumers' propensity to interact with digital services increases, requiring a more cautious approach to personal data management.

Rapid changes in digital service business models have a direct impact on the way companies operate, as well as consumer experience and satisfaction. With technology becoming increasingly dominant in every aspect of life, it is important to learn how companies can adapt quickly without neglecting important aspects such as accessibility, privacy and data security. Observing this shift can provide insights for companies to formulate strategies that are efficient, and inclusive and sustainable in the long-term.

The purpose of this research is to examine how differential access to technology affects the quality and equity of services in technology-based business models. This research will focus on analyzing the factors that influence the distribution of services to consumers with different levels of access to technology, as well as the socio-economic implications of such inequalities.

RESEARCH METHOD

This research uses a literature study approach to examine various business models in the service industry, especially technology-based and traditional ones. Literature study is an effective method to gain insight into the development of existing theories and concepts, as well as comparisons between business models used by companies in the service sector. In this approach, various relevant sources such as journal articles, books, industry reports, and other academic publications will be analyzed to identify trends, challenges, and advantages and disadvantages of existing business models (Hart, 1998). This approach allows the research to utilize existing knowledge and construct a theoretical framework that can explain the differences and impacts of business model changes in the service industry.

The application of the literature study method also aims to identify existing research gaps, as well as to develop a strong theoretical basis in answering research questions. The literature retrieved will focus on previous research on technology-based business models, comparative analysis between traditional and digital business models, and their impact on consumer experience and accessibility. The literature review also provides an overview of issues related to data privacy and security in technology-based business models, which have been of great concern in academic and practical literature (Osterwalder & Pigneur, 2010). By combining various perspectives from previous research, it is expected that this research can produce comprehensive and relevant findings regarding the dynamics of service business models.

RESULT AND DISCUSSION

Technological infrastructure has become a fundamental determinant of inclusion within the modern digital economy. As business models evolve around platform-based systems and online interfaces, access to technology is no longer a matter of convenience—it is a gateway to participation. Access to infrastructure such as high-speed internet networks, adequate digital devices and reliable technology systems determine the extent to which individuals can participate in various digital economy activities, from online shopping to platform-based work. The extent to which individuals and communities can engage with these systems depends on their capacity to interact effectively with technological tools and networks. In reality, not all community groups have equal access to this infrastructure. This dynamic creates layered disparities within service accessibility and user experience (Balhara & Singh, 2018).

In many cases, technological engagement is conditioned by the availability of reliable devices, stable internet connectivity, and sufficient digital literacy. These three elements function interdependently; lacking one often renders the others ineffective. Consequently, individuals with limited access are disproportionately excluded from services designed under assumptions of universal connectivity. This exclusion is rarely intentional, yet its impact is structurally significant. The quality of interaction with digital platforms becomes a reflection of underlying inequalities (Adam, & Alhassan, 2021). This inequality in access results in inequality in service utilization, whether in education, health, administrative services, or economic activity. This systematically reinforces social and economic exclusion in the digital age.

Organizations that rely heavily on technology-mediated service delivery must confront the reality that their value propositions may not reach users uniformly. Even when platforms are designed with inclusivity in mind, infrastructural asymmetries among users lead to differentiated outcomes. High-access users are positioned to extract greater benefit, while those on the margins face additional barriers. These differences lead to inequities in service outcomes, despite the original intention of service providers to create an inclusive system. Inclusiveness depends not only on system design, but also on infrastructure readiness and the socio-economic conditions of users. These barriers are not only technical but often socioeconomic, deepening pre-existing divisions within consumer bases (Silva et al., 2022). Access to education, digital literacy skills, income, and cultural context shape the extent to which a person can meaningfully engage with technology-based services. When certain groups lag behind in this regard, an organization's value proposition not only fails to reach them, but also risks reinforcing existing exclusion.

The inconsistency in service reception caused by unequal access poses ethical and operational challenges for business systems. When technological assumptions are embedded within service models without mechanisms to accommodate disparity, a two-tiered experience is produced. This fragmentation undermines trust, limits scalability, and reinforces structural exclusion. It highlights the importance of recognizing access not merely as a technical issue but as a systemic factor in shaping business impact (Warschauer & Niiya, 2014).

Hargittai (2010) emphasized that digital inequality manifests through nuanced distinctions in usage, comprehension, and adaptability. It is not only about whether someone is online, but how they engage, what tools they can leverage, and which outcomes are realistically available to them. These differences create a kind of "digital gradient," where individuals or groups fall on various spectrums of digital engagement. Understanding these gradients is critical for businesses aiming to deliver equitable digital experiences and avoid deepening social divides under the guise of innovation. Making a service technically accessible does not necessarily mean that it can be effectively utilized by everyone. Companies should design digital experiences that take into account the different skill levels and preferences of users. This could include intuitive interfaces, easily accessible user assistance options, and digital education initiatives. In this way, businesses contribute to a fairer and more responsible distribution of digital benefits.

Access to technology significantly shapes a consumer's ability to engage with and benefit from digital platforms, including mobile applications and service-oriented websites. As enterprises increasingly shift toward technology-driven business models, they become reliant on automated systems and digital infrastructures that presuppose stable internet connectivity and the availability of functional devices. Individuals residing in regions with underdeveloped internet infrastructure or lacking sufficient technological resources often experience substantial limitations in accessing these services in their intended form (Van Deursen & Helsper, 2015). For instance, users without access to smartphones or high-speed internet may be excluded from premium functionalities offered by digital banking applications or streaming platforms, thereby diminishing their engagement and perceived value.

Disparities in digital access frequently translate into unequal service quality among consumers. In sectors such as e-commerce, telemedicine, and app-based transportation services, companies leveraging digital models offer levels of convenience, responsiveness, and personalization that surpass traditional alternatives. Consumers who lack the necessary tools or digital literacy remain confined to slower, more fragmented service modes, which negatively affect their overall experience and satisfaction (Sarker et al., 2018). These discrepancies are not merely technical inconveniences; they reflect deeper economic and social divides that perpetuate marginalization in access to innovation and progress.

Digital exclusion thus emerges as a multidimensional issue that intersects with systemic inequities. The inability to access or utilize digital services exacerbates existing inequalities, reinforcing disadvantage for populations that are already underserved. This asymmetry undermines the inclusive potential of technology and raises important ethical questions about the design and deployment of digital business models. While digital innovations are often claimed to empower and open up widespread access to resources, the reality is that many digital business models and services are designed without seriously considering the needs of underserved populations (Philip & Williams, 2019). When these models do not take into account access limitations, low digital literacy, or the local context of users, the result is not inclusion, but deepening exclusion. If left unaddressed, such digital divides may crystallize into long-term barriers to participation, further isolating individuals from opportunities embedded within digital ecosystems. Exclusion technologically isolates and narrows social mobility.

At a broader societal level, disparities in technological access reinforce socioeconomic inequality. Communities with lower income levels or those residing in remote areas often lack reliable infrastructure, such as high-speed internet or advanced digital devices. This limited access restricts their ability to interact with technology-based business platforms on an equitable footing. As Bertot, Jaeger, and Grimes (2010) observe, businesses that rely on digital models may inadvertently exclude these populations, thereby limiting their market reach and perpetuating asymmetric service distribution. When access is constrained, individuals in underserved segments are systematically denied equal benefit from services that are otherwise designed for broad public use.

This asymmetry in access has the potential to amplify pre-existing social inequalities, particularly in relation to income and opportunity. As digital services become the primary mode of delivery in various sectors—ranging from finance to healthcare—those lacking adequate connectivity or digital literacy are increasingly marginalized. Helsper (2012) points out that digital exclusion functions as both a symptom and a driver of broader social inequality, creating cycles of disadvantage. Individuals unable to engage with digital tools may remain dependent on legacy systems that are not only less efficient but often more expensive. In areas such as telemedicine, this divide becomes particularly acute, where limited access to digital consultation tools translates into slower, less responsive healthcare delivery for the digitally excluded.

Companies that adopt technology-centric business models must take this inequity into account if they seek to build inclusive growth strategies. The success of digital transformation cannot be measured only by how advanced the technology is or how quickly scalability is achieved. Instead, companies need to realize that people do not access technology from the same starting point. A narrow focus on high-access consumers may undermine both reach and reputation, especially in regions where digital infrastructure remains uneven. Without deliberate adjustments, such as offering alternative access points or simplified interfaces, companies risk alienating segments that could otherwise benefit from their offerings. As Graham and Dutton (2014) argue, meaningful digital inclusion requires intentional design that acknowledges the heterogeneity of user capabilities and infrastructural realities. For businesses aspiring to scale sustainably, adopting inclusive digital frameworks is not merely an ethical consideration—it is a strategic imperative.

Beyond physical access to technology, digital competence significantly influences an individual's ability to engage with and derive value from technology-based services. Even when consumers possess adequate devices and internet connectivity, limited digital skills may hinder their capacity to fully utilize the platforms provided. Digital competence is a determining factor in determining the extent to which individuals are able to engage with and benefit from these technologies. Digital literacy encompasses not only technical knowledge but also the ability to navigate, evaluate, and apply information effectively within digital environments. As Bawden and Robinson (2009) argue, the absence of sufficient digital competence can reinforce and intensify existing disparities, particularly when users are left without appropriate guidance or educational support from service providers.

Technology-based business models frequently incorporate data-driven personalization mechanisms intended to enhance user experience. These mechanisms often rely on behavioral tracking, algorithmic recommendation, and customized interfaces that presume a level of user familiarity with digital interaction. Behind this approach is the assumption that all users have sufficient ability and awareness to actively interact with technology, as well as to understand how the system responds to their actions. Individuals with limited digital fluency may struggle to engage with such features or may not even be aware of their existence. Zwick and Dholakia (2004) point out that algorithmic personalization tends to favor users who are more digitally sophisticated, as they are more likely to generate coherent data trails and manage their preferences proactively. Individuals with low digital skills are often not fully aware that their interactions generate data that is processed to influence what they see or receive within digital platforms.

This imbalance in technological engagement contributes to differentiated user experiences and widens access-related inequities. While some consumers benefit from seamless, intuitive, and highly tailored services, others—despite having similar access to infrastructure—receive less meaningful interaction due to gaps in digital understanding (Azari & Pick. 2009). These discrepancies raise concerns about fairness and inclusivity within digital ecosystems, particularly as companies increasingly delegate decision-making processes to automated systems. If left unaddressed, such disparities may evolve into structural disadvantages that marginalize specific demographic groups and dilute the intended benefits of technological innovation.

Another significant concern is the issue of data privacy and digital security. Consumers with limited technological access or insufficient digital proficiency are disproportionately vulnerable to data breaches, unauthorized surveillance, and online deception. Many users unfamiliar with the architecture of digital platforms lack awareness of how to safeguard their personal information during transactions or service engagement. Smith (2011) emphasizes that low digital literacy often correlates with higher susceptibility to cyber exploitation, especially when users are unaware of consent mechanisms, data sharing protocols, or encryption standards.

This vulnerability exacerbates digital inequality by amplifying distrust toward technology-based services, particularly among populations already marginalized in terms of technological exposure. When users feel that their interactions with digital systems expose them to cannot comprehend or control, they are more likely to disengage from online platforms altogether. This retreat from digital participation widens the gap between those who benefit from innovation and those who remain excluded due to perceived or real threats. In the long-term, this widens the gap between those who actively utilize digital innovations and those who remain behind due to fear or inability to participate.

To address these disparities, businesses must adopt inclusive measures that foster equitable digital participation. This includes not only expanding access to devices and connectivity, but also offering comprehensive digital literacy programs, technical assistance, and accessible user interfaces. Gurstein (2007) argues that "effective use" of technology—not mere access—is critical in ensuring that individuals derive meaningful value from innovation. By embedding inclusivity into service design and outreach, organizations can reduce systemic barriers and democratize the benefits of technological advancement.

Ultimately, disparities in digital access influence both the quality and fairness of service delivery in technology-based business models. When only a small portion of the population has full access and ability to utilize technology, the services provided will not reach their full potential. Companies seeking long-term sustainability must confront these asymmetries and implement mechanisms to ensure that services are accessible, comprehensible, and safe for users across the technological spectrum. Recognizing the heterogeneity of user capability is not only a matter of ethical responsibility but also of operational effectiveness. A digitally inclusive ecosystem is one in which innovation serves as a bridge, not a boundary.

CONCLUSION

In summary, disparities in access to technology within technology-driven business models profoundly affect the equity and quality of services delivered. Limited access—whether in the form of inadequate devices, unreliable connectivity, or insufficient digital skills—translates into restricted participation and diminished service outcomes. Consumers equipped with robust technological resources and literacy benefit from streamlined, personalized experiences, while those without such access are often marginalized in the digital ecosystem. This divide reinforces pre-existing socioeconomic inequalities and raises broader concerns about fairness in an increasingly digitized marketplace. This adds further challenges for companies that rely on technology-based business models to reach a wider audience. The inability to access or utilize digital services exacerbates existing social inequalities and can create feelings of alienation among more vulnerable groups. This has the potential to undermine fairness in an increasingly digitized marketplace and reduce opportunities for all to engage in the growing digital economy. For businesses aiming to thrive in diverse markets, equitable access must become an integral consideration, ensuring that technological innovation is inclusive rather than exclusionary.

To mitigate the effects of digital inequality, companies should introduce deliberate and sustained inclusive initiatives. These may include offering tailored digital literacy programs, extending technical support to underserved user groups, and designing adaptive services that accommodate a range of user capabilities and technological constraints. Product development should prioritize accessibility by simplifying interfaces and minimizing hardware dependency, making platforms operable across diverse devices and user proficiencies. By embedding accessibility into their design philosophy, organizations can reduce the service gap and ensure that all customers—regardless of digital fluency—derive equal value from technological offerings. Ultimately, this approach fosters both social equity and business resilience in a rapidly evolving digital landscape.

REFERENCES

Adam, I. O., & Alhassan, M. D. (2021). Bridging The Global Digital Divide through Digital Inclusion: The Role of ICT Access and ICT Use. *Transforming Government: People, Process and Policy*, 15(4), 580-596.

Azari, R., & Pick, J. B. (2009). Understanding Global Digital Inequality: The Impact of

Government, Investment in Business and Technology, and Socioeconomic Factors on Technology Utilization. *In 2009 42nd Hawaii International Conference on System Sciences*, 1-10.

Balhara, A., & Singh, V. (2018). Digital Inclusion, Digital Behaviour and Digital Economy: A Synthesized View for India. *International Journal of Research*, 5(4), 2562-2570.

Bawden, D., & Robinson, L. (2009). The Dark Side of Information: Overload, Anxiety and Other Paradoxes and Pathologies. *Journal of Information Science*, 35(2), 180-191.

Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using its to Create a Culture of Transparency: E-Government and Social Media as Openness and Anti-Corruption Tools for Societies. *Government Information Quarterly*, 27(3), 264-271.

Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. WW Norton & Company.

Chesbrough, H. (2007). Business Model Innovation: It's Not Just about Technology Anymore. *Strategy & Leadership*, 35(6), 12-17.

Gani, A. & D. Darmawan. (2022). Ethics and Accountability in Artificial Intelligence-Based Managerial Decision Making, *Journal of Social Science Studies*, 2(1), 147 – 152.

Gardi, B. & D. Darmawan. (2022). The Role of Manager Behavior in the Utilization of Accounting Information for Corporate Strategic Decision Making, *Journal of Social Science Studies*, 2(1), 111 – 118.

Graham, S., & Dutton, W. H. (2014). *The Internet and the Digital Divide. In The SAGE Handbook of Digital Technology Research*. Sage Publications.

Gurstein, M. (2007). *Community Informatics: A Social Vision for the Information Society*. Taylor & Francis.

Hargittai, E. (2010). Digital Inequality: Differences in Young Adults' Use of the Internet. *Information, Communication & Society*, 13(7), 1025-1042.

Hart, C. (1998). *Doing a Literature Review: Releasing the Social Science Research Imagination*. Sage Publications.

Helsper, E. J. (2012). A Corresponding Fields Model of Digital Inclusion. *Communication Theory*, 22(4), 409-430.

Mardikaningsih, R. & D. Darmawan. (2021). Business Sustainability Strategies in the Facing of Regulatory Uncertainty and Managerial Challenges, *Journal of Social Science Studies*, 1(2), 111 – 118.

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Wiley.

Philip, L., & Williams, F. (2019). Remote Rural Home Based Businesses and Digital Inequalities: Understanding Needs and Expectations in a Digitally Underserved Community. *Journal of Rural Studies*, 68, 306-318.

Sarker, S., Ahuja, M., Sarker, S., & Kirs, P. (2018). Social Media use in Business-to-Business Relationships: A Research Agenda. *Information Systems Journal*, 28(4), 749-792.

Senderek, R., Kuntz, J., Stich, V., & Frank, J. (2019). Service Engineering Models: History and Present-Day Requirements. *IFIP International Conference on Advances in Production Management System (APMS)*, 1-8.

Shakhovskaya, L. S., & Kamaeva, G. D. (2021). Objective Changes in Business in the Conditions of Economy Digitization. *Socio-economic Systems: Paradigms for the Future*, 1507-1513.

Silva, D. F. F. da, & Oliveira, R. F. V. de. (2022). The Importance of Digital Inclusion in the Educational System. *Revista Científica Multidisciplinar Núcleo Do Conhecimento*, 1, 69-78.

Smith, H. J. (2011). *Privacy and the Informed Consent Framework. In Handbook of Research on Digital Media and Advertising: User Generated Content Consumption*. IGI Global.

Van Alstyne, M., Parker, G., & Choudary, S. P. (2016). Pipelines, Platforms, and the New Rules of Strategy. *Harvard Business Review*, 94(4), 54-62.

Van Deursen, A. J., & Helsper, E. J. (2015). A Nuanced Understanding of Internet use and Outcomes for Digital Skills. *Information, Communication & Society*, 18(7), 741-758.

Warschauer, M., & Niiya, M. (2014). Medios Digitales E Inclusión Social. *Revista Peruana De Investigación Educativa*, 6(6), 9-32.

Zeng, M. (2018). The Impact of Digital Technology on Customer Privacy and Data Protection. *Journal of Business Ethics*, 152(2), 365-376.

Zwick, D., & Dholakia, N. (2004). Consumer Resistance to Commercial Web Sites: The Case of the Online Privacy Controversy. *Journal of Consumer Affairs*, 38(2), 358-377.

***Ramle, N. L. B., & R. Mardikaningsih. (2022). Inclusivity in Technology-Based Services: Access and Skills Challenges, *Journal of Social Science Studies*, 2(2), 225 – 230.**