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Implementing Digital Literacy Policies and the Challenges of Towards Smart City in Palembang City

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Abstract: This research examines digital literacy's role in supporting smart city development in Palembang City by focusing on four key aspects, including digital skills, digital safety, digital ethics, and digital culture. This study uses a qualitative descriptive approach to use primary and secondary data. The analysis tool used is Nvivo 12 Plus. These findings successfully analyze the challenges faced in integrating digital literacy in smart city development, including digital literacy gaps, privacy concerns, lack of awareness of benefits, technical challenges, and cultural changes. In addition, the role of government and regulation and cross-sector collaboration are also explained as important factors in creating an environment that supports holistic digital literacy. The results of this study provide a comprehensive view of how digital literacy can play a key role in facing challenges and optimizing the benefits of smart technology in the development of inclusive and sustainable smart cities. This research contributes to stakeholders involved in planning and implementing smart cities, as well as providing directions for effective digital literacy efforts in the future.

Abstrak: Penelitian ini mengkaji peran literasi digital dalam mendukung perkembangan smart city di Kota Palembang dengan fokus pada empat aspek kunci di antaranya adalah digital skills (keterampilan teknis), digital safety (keselamatan siber), digital ethics (etika digital), dan digital culture (budaya digital positif). Penelitian ini menggunakan date primer dan data sekunder, dengan menggunakan pendekatan deskriptif kualitatif. Alat analisis yang digunakan yaitu Nvivo 12 Plus. Temuan ini berhasil mengurai tantangan yang dihadapi dalam mengintegrasikan literasi digital dalam konteks pengembangan smart city, termasuk kesenjangan literasi digital, kekhawatiran privasi, kurangnya kesadaran akan manfaat, tantangan teknis, dan perubahan budaya. Selain itu, peran pemerintah dan regulasi serta kerjasama lintas sektor juga dijelaskan sebagai faktor penting dalam menciptakan lingkungan yang mendukung literasi digital yang holistik. Hasil penelitian ini memberikan pandangan komprehensif tentang bagaimana literasi digital dapat memainkan peran kunci dalam menghadapi tantangan dan mengoptimalkan manfaat teknologi cerdas dalam pengembangan smart city yang inklusif dan berkelanjutan. Penelitian ini memberikan kontribusi bagi pemangku kepentingan yang terlibat dalam perencanaan dan implementasi smart city, serta memberi arahan bagi upaya literasi digital yang efektif di masa depan.

INTRODUCTION

A smart city uses information and communication technology to improve the quality of life of its residents and the efficiency of public services (Hu & Zheng, 2021; Rifaid et al., 2023; Verma, 2022). To realize a smart city, digital literacy in society is a key factor that must be considered (Kaluarachchi, 2022). Digital literacy is an individual's ability to use digital technology to access, evaluate, and use information effectively (Bejaković & Mrnjavac, 2020; Pangrazio et al., 2020). However, many people in Indonesia, especially in Palembang, still need to have adequate digital literacy (Hati, 2022). This can be an obstacle to realizing a smart city in the city. Based on the data, the percentage of the population accessing the Internet in 2017 (45.39%), 2018 (53.44%), and 2019 (57.13%). For this reason, a serious response is needed to identify the obstacles faced by the people of Palembang in increasing digital literacy. In addition, finding a

solution to overcome these obstacles is necessary. Regarding conditions in the city of Palembang, according to information from the Palembang city government in 2021, the number of people using the internet has reached around 1.1 million people, with an internet penetration percentage of around 62.9 percent of the total population of Palembang city.

In addition, there is no accommodative law at the Palembang City level for implementing digital literacy policies. In this case, the application of digital literacy is only based on Law Number 11 of 2008 concerning Information and Electronic Transactions and its Regulations. Regulation of the Governor of South Sumatra Province Number 6 of 2022 concerning the Regional Literacy Movement still needs to improve its implementation. Another empirical problem is the unavailability of an internet network in Palembang City, especially in suburban areas. For this reason, a serious response is needed to identify the obstacles faced by the people of Palembang in increasing digital literacy. In addition, finding solutions to overcome these obstacles also needs to be done.

The Government of the Republic of Indonesia, through the Ministry of Communication and Informatics, and the Directorate of Informatics Empowerment, designed the Digital Literacy Program, which is contained in the 2021-2024 Digital Literacy Road map. This Road Map is formulated in 4 (four) digital literacy frameworks: Digital Skills, Digital Culture, Digital Ethics, and Digital Safety (Rizkinaswara, 2022). The focus of this research is the implementation of digital literacy in the people of Palembang City towards a Smart City by exploring digital literacy toward a Smart Society as one part of a smart city. However, the need for an adequate legal framework for implementing the Digital Literacy Program in Palembang is a normative problem that needs to be taken seriously. Although several laws and regulations form the basis of program implementation, implementation still has obstacles. This shows that although there have been efforts to design and implement the program, the legal aspects that regulate it have yet to provide a strong and clear foundation fully.

However, obstacles to implementation arise from clearer interpretations of how laws and regulations apply in the context of digital literacy. These regulations do not comprehensively cover all the aspects needed to overcome digital literacy challenges in Palembang. In line with the terminology developed by UNESCO in 2011, digital literacy refers to literacy activities, such as reading and writing, and mathematics related to education. Therefore, digital literacy is a life skill that involves the ability to use technology, information, and communication devices, as well as social skills, learning abilities, attitudes, critical thinking, creativity, and inspiration as digital competencies (Falloon, 2020).

In a modern era that is increasingly connected and driven by information technology, the smart city concept has emerged as a promising vision for increasing the efficiency of public services, infrastructure, and residents' quality of life. A smart city does not only involve the use of information and communication technology but also involves the active participation of the community in using technology to solve urban problems (Cheela et al., 2021; Nitoslawski et al., 2019; Rifaid et al., 2023). Amidst this vision, digital literacy plays a very important role. Digital literacy, or the individual ability to use digital technology to access, evaluate, and use information effectively, has a major role in realizing the smart city vision (Das & Zhang, 2021; Hassankhani et al., 2021; Masucci et al., 2020). The smart city concept is related to the application of technology and the community's involvement in understanding and using this technology (Goodman et al., 2020). Therefore, digital literacy is a necessary basis for urban residents to participate in the transformation toward a smart city actively.

The link between digital literacy and smart cities is very close. People with a high level of digital literacy can better access relevant and up-to-date information through various digital platforms. They can also use technology to access public services, communicate with governments and agencies, and participate in decision-making that impacts their cities. Digital literacy enables people to use smart applications, understand complex data and information, and interact with increasingly sophisticated technologies (Das & Zhang, 2021; Goodman et al., 2020; Masucci et al., 2020). However, to achieve the goal of a smart city, digital literacy must extend beyond technical skills. In addition to basic skills in using digital devices, people also need to

understand digital ethics, cybersecurity, and positive social media culture. Holistic digital literacy will help people overcome challenges associated with using technology, such as privacy risks, disinformation, and access inequality.

Therefore, the government and related institutions must ensure that digital literacy programs not only focus on technical teaching but also on developing critical thinking skills, information analysis, and a positive attitude towards technology. Thus, digital literacy will become a powerful tool to accelerate the transformation toward an inclusive, efficient, and sustainable smart city. In previous literature reviews, research highlights digital literacy programs in the context of people's journey toward smart cities. However, there still needs to be research that specifically explores digital literacy programs for people moving towards smart cities, with an approach that includes the four pillars of digital literacy: digital skills, digital safety, digital ethics, and digital culture (Rizkinaswara, 2022).

In this novelty, research will fill the knowledge gap by analyzing how digital literacy programs can be applied to people on their way to a smart city. This research will identify unique challenges and opportunities in adopting comprehensive digital literacy in a smart society by considering important aspects such as digital skills, security, ethics, and culture. The key to innovation in this research is to combine the four pillars of digital literacy with a focus on smart society. A deep dig into how people internalize digital skills, maintain cybersecurity, practice digital ethics, and form a positive digital culture will provide deeper insights into how digital literacy can drive transformation toward a more effective and sustainable smart city.

RESEARCH METHODS

This study uses a qualitative descriptive approach using primary and secondary data. Data collection techniques through observation, in-depth interviews, and documentation studies. Informants in this study are policymakers, experts, and the general public who have experience in participating in digital literacy, in this case, students. The results of the interviews were transcribed. Specifically for documentation, several important sources were selected, such as online data sources, web pages such as *sekota.id*, and other news sources, including *uzone.id, Republika.co.id, merdeka.com, ampera.co, and infosumsel. id*. This data is then transcribed and classified thematically. This is maximized by using the Nvivo 12 Plus analysis tool. The data obtained is then coded using the available unit of analysis. The unit of analysis used is case classification. The data coding results were then visualized and analyzed to support this discussion.

RESULTS AND DISCUSSION

Digital Literacy Implementation: Supporting Smart City in Palembang

In an era where information and communication technology (ICT) has underpinned almost every aspect of life, the smart city concept has emerged as an ambitious goal that focuses on improving the quality of life and the efficiency of public services in modern cities (Treiblmaier et al., 2020; Wirtz et al., 2021). Smart cities are not just about sophisticated infrastructure but also involve the active participation of the community in optimizing technology to meet daily needs and address urban challenges (Caputo et al., 2023; Nisi et al., 2020). In this context, digital literacy plays a very important role. In this context, implementing digital literacy in the people of Palembang City is an important concern in the journey towards a competitive smart city. Implementation of digital literacy can be built by understanding the four main pillars, including digital skills, digital safety, digital ethics, and digital culture.
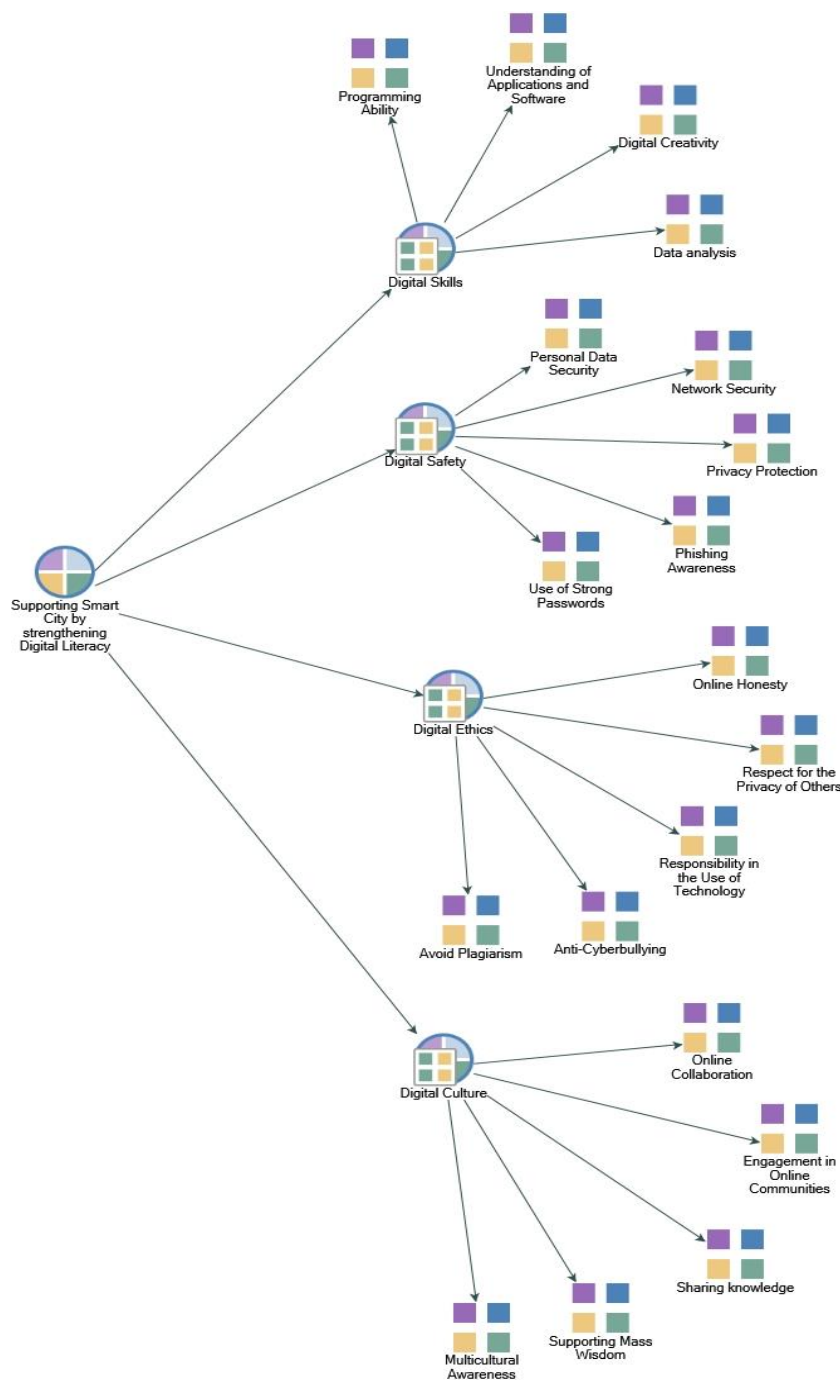
Picture. 1

An important aspect of digital literacy supports smart cities
Source: Processed by researchers using Nvivo 12 Plus, 2023

Programming ability is a key element in technical skills because it teaches how to design, develop, and maintain software and applications (Kateryna et al., 2020). Programming allows one to turn creative ideas into real and innovative solutions (Kobsiripat, 2015). These capabilities are invaluable in today's technology environment, full of new challenges and opportunities. An understanding of applications and software is also crucial. Amidst the rise of digital tools and software, understanding how to use and utilize them effectively is a prerequisite for success in any field. This skill includes the use of commonly used tools and the ability to understand the concepts behind software and applications, which can assist in adaptation to new technologies (Nelson et al., 2011).

In addition, digital creativity is also one of the driving factors for innovation in the digital environment. The ability to create engaging visual, audio, and interactive content provides an added dimension to technical skills. Creativity enables individuals to produce engaging and relevant content, whether in attractive web designs, entertaining animations, or ergonomic design solutions (Hartley et al., 2008; Syefrinando et al., 2022). In addition, data analysis is an indispensable skill in dealing with the data explosion in this digital era. Collecting, processing, and analyzing data is critical to evidence-based decision-making. These capabilities assist individuals in identifying trends, capturing insights, and making smarter and more strategic decisions (Bhatt et al., 2015; Dabbous et al., 2023; Tinmaz et al., 2022).

In developing the smart city concept, digital skills such as programming, understanding of applications and software, digital creativity, and data analysis play a central role (Komninos et al., 2013). Programming skills are required to design intelligent traffic and waste management solutions. Understanding applications and software aids the integration of complex technologies, while digital creativity supports interactive and intuitive designs. Data analysis enables an in-depth understanding of urban trends, which guides evidence-based decision-making. By combining these skills, smart cities can improve their efficiency, citizens' quality of life, and the interaction between government and society.

In addition, digital safety is also a crucial aspect of the digital environment which includes several important variables, including personal data security, network security, privacy protection, phishing awareness, and strong passwords. Personal data security involves protecting personal information from unauthorized access and ensuring that personal data does not fall into the wrong hands. Network security is also important to protect technology infrastructure from malware and hacking that can disrupt important services. Privacy protection focuses on controlling how others use and share personal data. Phishing awareness also helps individuals identify hacking attempts via fake emails or messages trying to reach sensitive information. Strong passwords are the first defense in protecting accounts, with complex and unique passwords reducing the risk of hacking (Adil & Khan, 2021; Ismagilova et al., 2022; Rifaid et al., 2023; Thilakarathne & Priyashan, 2022).

In the context of smart city development, digital safety aspects are important. With systems and devices connected throughout the city, citizens' personal data and infrastructure information security is critical. Network security and privacy protection are the foundation for avoiding disruption to essential services and preventing misuse of sensitive data. Phishing awareness is an additional layer of defense against cyber threats. Using strong passwords is important in protecting access to smart city systems and data from hacking attempts. By prioritizing digital safety in the development of smart cities, the government and the community can ensure that the technology contributes to the comfort, safety, and better quality of life for city residents.

Digital ethics are the moral principles and values that guide individual behavior in the digital world (Floridi, 2019). This includes several important aspects, such as online honesty, respect for the privacy of others, responsible use of technology, anti-cyberbullying, and avoiding plagiarism. Online honesty involves integrity in interacting and sharing information on the internet. Respecting the privacy of others means respecting privacy rights and avoiding disclosing information without permission. Responsible use of technology emphasizes that technology must be used consciously and responsibly, including in the case of spreading fake news or harmful content. Anti-cyberbullying encourages individuals to avoid bullying or harassing behavior in digital environments while avoiding plagiarism ensures respect for copyright and intellectual integrity (Coghlan et al., 2021; Harrison, 2016; Stephens et al., 2007).

The importance of digital ethics must be addressed in developing smart cities. With the increasing interconnection and use of data in the smart city environment, protecting the privacy and ethical use of data is critical. Honesty and responsibility in using technology are the foundation for governments and service providers to build beneficial and fair solutions. Anti-cyberbullying is integral to creating a safe and inclusive digital environment for city residents. Avoiding plagiarism and ensuring recognition of true contribution contributes to positive

intellectual growth and innovation in the smart city context. In developing a smart city, digital ethics must be a solid foundation. By implementing these principles, smart cities can become places where technology and innovation thrive in line with moral values and integrity. Strong digital ethics can help prevent data misuse, protect citizens' privacy, and promote an inclusive and harmonious digital environment.

Online collaboration, engagement in online communities, knowledge sharing, supporting mass wisdom, and multicultural awareness are important aspects of a positive digital culture. Online collaboration involves working in a digital environment to achieve a common goal. Involvement in online communities helps individuals connect, share ideas, and participate in fruitful discussions. Sharing knowledge facilitates the exchange of information and skills, encouraging innovation and collective growth. Supporting mass wisdom reflects support for positive ideas and ideas from many people. Multicultural awareness promotes respect for diverse cultures and views in a digital environment (Baharuddin et al., 2022; Jubba et al., 2020; Moser & Deichmann, 2021; Ngai et al., 2015).

In the context of smart city development, positive digital culture has a key role (Borda & Bowen, 2019). Online collaboration can encourage various parties, including governments, citizens, and the private sector, to work together to design and implement comprehensive smart solutions. Engaging in online communities enables citizens' active participation in urban planning, while knowledge sharing accelerates the adoption of new technologies and solving urban problems. Supporting mass wisdom helps ensure that smart city development is based on the aspirations of society as a whole. Multicultural awareness ensures that the solutions and services developed reflect different citizens' diverse needs and perspectives. Successful smart city development requires a positive digital culture based on collaboration, engagement, knowledge sharing, mass wisdom, and respect for diversity. By implementing these principles, smart cities can become inclusive environments that empower their citizens, encourage innovation, and create a better quality of life for all.

In developing smart cities, various aspects of digital skills, ethics, and positive digital culture have a central role. Digital skills such as programming, understanding of applications and software, digital creativity, and data analysis form the technical foundation that enables the implementation of intelligent solutions. Digital ethics, including online honesty, respect for privacy, responsible use of technology, and anti-cyberbullying attitudes, provide moral direction in developing and applying smart technology. Positive digital culture, such as online collaboration, community involvement, knowledge sharing, supporting mass wisdom, and multicultural awareness, ensures that technology is geared towards inclusive and harmonious goals.

Smart city development links all these aspects into a single unit that supports the growth of smart cities. Digital skills form the basis for designing, developing, and managing diverse technology solutions. Digital ethics ensures that technology is applied ethically and fairly, protecting privacy and social values. A positive digital culture promotes active citizen participation, sharing, and respect for diversity within a smart city environment. In combining these aspects, smart city development goes beyond just applying technology. It is about creating an ecosystem that supports a better life for its citizens, integrating smart technology with positive ethics and culture. In this way, smart cities can become a tangible form of collaboration in technology, morals, and social values that produce sustainable, efficient, inclusive, and highly competitive cities.

A challenge: Implementation of Digital Literacy in Supporting Smart City Development

Smart city development has become a major goal in many regions, integrating technology to improve citizens' quality of life. However, the success of a smart city depends not only depends on more than technological infrastructure but also on the readiness of citizens to face digital change. This is where the importance of digital literacy emerges. Implementing digital literacy is a key challenge in ensuring that citizens can take full advantage of the potential of smart cities by

understanding, interacting, and contributing effectively in an increasingly complex digital environment.
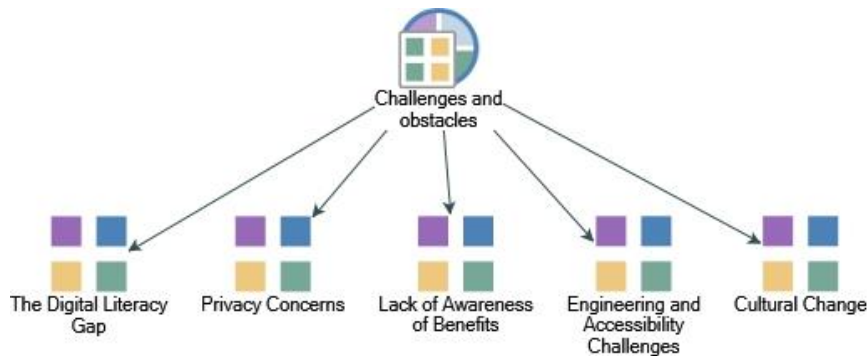
Picture. 2
Challenges in supporting smart cities in the context of digital literacy
Source: Processed by researchers using Nvivo 12 Plus, 2023

To implement digital literacy to support smart city development, efforts are needed to overcome several challenges. One of the key challenges is the digital literacy gap which can affect the adoption rate of smart technology in various walks of life. This gap spans between a generation that has grown up with technology and a generation not used to digital devices. In addition, differences in educational levels and socioeconomic backgrounds can also complicate digital literacy efforts. Furthermore, privacy concerns are a serious obstacle to building public trust in smart cities (Hatuka & Zur, 2020; Shin et al., 2021; Wang & Wu, 2022). While smart technology can provide significant benefits, a lack of understanding of how data is collected, managed, and used can raise privacy concerns. Ensuring citizens understand these aspects is a key step in overcoming these barriers.

Equally important is the challenge of raising awareness of the real benefits of smart technology in everyday life. Many citizens may need to fully realize the potential of a smart city to increase the efficiency of public services, reduce environmental impact and improve quality of life. Raising this awareness requires effective communication and easy-to-understand information (Khan et al., 2020). However, technical and accessibility challenges also require serious attention. Not all residents have equal access to technological devices or stable internet connectivity (Rifaid et al., 2023). This can be a major obstacle in teaching digital literacy and fully exploiting the potential of smart cities.

Remember, cultural change is also a challenge. Especially among communities unfamiliar with technology, cultural changes are needed so that citizens feel comfortable and actively participate in the digital environment (Hatuka & Zur, 2020; Rifaid et al., 2023; Shin et al., 2021). Raising awareness and understanding requires a holistic education approach involving various parties, from educators to local government. In overcoming all these challenges, collaboration between the government, educational institutions, the private sector, and the community is key. Structured digital literacy programs, inclusive training, and ongoing awareness campaigns must be implemented to address these obstacles. By addressing these challenges, digital literacy can become a powerful tool in supporting the development of inclusive and sustainable smart cities.

In this case, the government's role in implementing digital literacy to support smart city development has significant implications. The government has a strategic role in facilitating the adoption of digital literacy by supporting broad education and training programs. These steps involve allocating resources, partnerships with educational institutions, and awareness campaigns that stimulate community participation. In addition, the government also plays a role in designing data protection policies that provide clear direction in managing sensitive information in the context of smart cities. By regulating digital ethics and responsibility, governments can steer the development of smart technology toward more ethical and sustainable

goals. Through this approach, the government becomes an important driver in creating a smart city ecosystem that is inclusive, safe, and beneficial for all citizens.

In addition to the role of government and regulation, it is important to recognize that the successful implementation of digital literacy in supporting smart city development also depends on cooperation with various stakeholders. Collaboration with the private sector, educational institutions, civil society, and non-profit organizations ensures a holistic and integrated approach. Private sector involvement can facilitate broader access to technology and provide insight into the latest technology trends. Educational institutions can play a role in integrating digital literacy into the curriculum and teaching relevant skills to future generations. Meanwhile, the participation of civil society and non-profit organizations can provide diverse perspectives and help bridge the digital literacy gap among more vulnerable groups. Through cross-sectoral synergies, digital literacy efforts can be more effective and impactful in creating inclusive and intelligent smart cities.

CONCLUSION

Implementing digital literacy to support smart city development in Palembang City faces various challenges. The digital literacy gap between generations, education levels, and socio-economic backgrounds is an obstacle to adopting smart technology. Privacy concerns, lack of awareness of the benefits of smart technology, technical challenges, and cultural changes also require serious attention. However, the role of government and regulation emerged as an important element. Governments have a responsibility to support digital literacy programs, create data protection regulations, improve technology accessibility, and lead public awareness campaigns. In addition, collaboration with the private sector, educational institutions, civil society, and non-profit organizations is also important in ensuring a comprehensive approach that strengthens digital literacy and supports the positive transformation towards an inclusive and intelligent smart city.

Implementing digital literacy to support smart city development requires a comprehensive understanding of various aspects. Technical or digital skills are the main foundation, enabling citizens to interact effectively with smart technology. However, these skills must be accompanied by awareness of cyber safety or digital safety to protect personal data and avoid cyber threats. In addition, digital ethics is important in directing the responsible and ethical use of smart technology, preventing misuse and violation of privacy. All of these efforts align with forming a positive digital culture that promotes collaboration, respect for diversity, and responsibility for the use of technology. Integrating these four aspects is the key to building a skilled, safe, ethical, and connected society in the smart city era.

The results of this study can be used to formulate more comprehensive and effective policies in supporting digital literacy as an integral part of smart city development in Palembang City. A good policy must include a clear implementation strategy, monitoring, and ongoing evaluation mechanisms to ensure these goals are achieved. For further studies on the sustainability of digital policies in the context of smart city development in Palembang City, it is recommended to implement a multidisciplinary approach. Research could focus on evaluating the effectiveness of existing digital literacy programs and identifying successes and obstacles faced in addressing digital literacy gaps, privacy, and technical challenges.

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