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Transformation of Licensing Governance in Facing the Industrial Revolution 4.0 at Bandung City

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Abstract

Key words:
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Apparatus, Public
Services.

This study aims to investigate the transformation of governance in Bandung City in response to the Fourth Industrial Revolution and its effect on the competency of the State Civil Apparatus in public services at the Bandung City One-Stop Investment and Integrated Licensing Service. This study was done by examining governance in public services at the Bandung City One-Stop Integrated Investment and Licensing Service using a qualitative descriptive methodology. The results demonstrated that the 4.0 Industrial Revolution had a global impact on the Bandung City One-Stop Investment and Licensing Service. This is seen in the transformation of licensing services, the transformation of institutions, and the modification of physical buildings. This transformation affects the apparatus's competency, allowing them to perform high-quality public services at the Bandung City One-Stop Integrated Licensing and Investment Service. Using the Industrial Revolution 4.0 idea in the government sector creates conditions for developing and improving government employees' skills. These conditions were satisfied so that government authorities could implement the new concept. This study focuses solely on the alteration of government machinery caused by the Fourth Industrial Revolution. Future research should examine the types of government positions being eliminated by technology.

Introduction

Artificial intelligence, supercomputers, genetic engineering, nanotechnology, autonomous automobiles, and inventions characterized the period of the fourth industrial revolution ([Skordoulis et al., 2020](#)). These developments will exponentially impact the economy, industry, government, and politics. The term was coined in Germany in 2011 when the Federal Government announced Industrie 4.0, an initiative involving industry-science alliances. It detailed the influence that the 'Internet of Things' would have on production organization due to a new interaction between humans and machines and a new wave of digital applications for manufacturing production ([Jescovitch et al., 2021](#); [Liu, Wan, Tu, Chen, & Wang, 2021](#)). Industry 4.0 is a digitally connected industrial process that involves 3D printing and robotics and is anticipated to boost productivity ([Al-Frijawy, Militaru, & Ali, 2018](#)). The development of the industrial revolution in Indonesia has also taken on considerable significance and is attempting to catch up to that of other nations. Currently, the industrial revolution has had an impact on a variety of occupations and industries in Indonesia.

The closure of several Giant Department Stores ([Ray, Bala, & Dasgupta, 2019](#)), Ramayana ([Abumalloh et al., 2021](#); [Jescovitch et al., 2021](#); [Kroll & Stieglitz, 2021](#); [Liu et al., 2021](#)), etc., and the development of tokopedia.com, Bukalapak.com, etc. are examples of conventional shops being replaced by online shop system models. Similarly, transportation systems such as online-based taxi services are beginning to pose a significant challenge to the taxi business ([Singh, 2021](#); [Yin, Goh, Yang, &](#)

Xiaobin, 2021). There are insolvent taxi companies among them (Wesley, 2021). The development of the industrial revolution in Indonesia has also grown significantly and is attempting to catch up to what other countries have accomplished (Murad, 2022). To tackle the difficulties and repercussions of the industrial revolution 4.0, city governments in Indonesia must adjust their governance. Bandung is one of the cities preparing for the effects of the fourth industrial revolution. Faced with the 4.0 era of the industrial revolution, the city of Bandung has produced numerous innovations in its administration. The Office of Investment and One-Stop Integrated Services (IOIS Office) of Bandung City is one of the regional apparatuses that conducts community-facing service operations in Bandung City.

No prior research has been undertaken to determine the significance of industrial transition in Bandung City. The primary objective of this study is to expand the existing literature with substantial data collected to establish how the industrial revolution has affected the Bandung City licensing department. In addition, this work's theoretical and practical implications are essential for advancing the literature and practice for future government department reforms. Undoubtedly, the majority of individuals are directly involved with the licensing agency. Therefore, this study will effectively underline the significance of industrial change for the public sector. In addition, this study's future directions are significant for future research in industrial transformation for the public good.

Literature Review

The globalization process that has expanded to numerous countries gives an industrial era 4.0; this impacts social, economic, political, governmental, and cultural aspects of human existence (Alper, Alper, Ozayturk, & Mike, 2022; Lacombe, 2019). The development of industrial governance transformation in various parts of the world utilizes innovative, fast-connected, real-time information and telecommunications technology that can support faster and more targeted decision-making through extensive data analysis, thereby improving the production of goods and services. Even Kergroach claimed that automation is no longer limited to physical or manual duties, dirty, dangerous, or tiresome tasks, but can negatively impact a great deal of intellectual, cognitive, or analytical white-collar work, such as transportation, office assistance, and customer service. The competitiveness of organizations and/or countries in terms of the competence of their human resources can be a crucial factor in the 4.0 industrial revolution. The transformation process is a change that closely relates to the dynamic (value system) that exists in a society. It develops gradually or slowly, which is initially unexpected, and its conclusion depends on the variables that impact it. The transformation process incorporates the dimensions of time and the socio-cultural transformations of the occupants, which emerge over time and are always tied to the activities occurring at that time (Herrero-Crespo, Viejo-

[Fernández, Collado-Agudo, & Sanzo Pérez, 2022](#); [Vacchi et al., 2021](#); [Wesley, 2021](#)).

Therefore, a transformation is a transition from one state to an entirely new state. These changes result from alterations in community conditions, which internal and external influences, such as people's attitudes and the environment, can bring about. The Indonesian government has established a human resource development strategy to be competitive in this age of industry 4.0. Human Resource Competence ([Abumalloh et al.](#)) is essential for a developing nation to enter the next generation of industry ([Anjum, Farrukh, Heidler, & Díaz Tautiva, 2021](#); [Hew, Jia, Gonda, & Bai, 2020](#); [Skordoulis et al., 2020](#); [Wu, Yu, & Gu, 2020](#)). In addition to demanding investment and technology, skilled labor is also prepared to accommodate Industry 4.0. Competence is the fundamental attributes of an individual that are directly related to effective reference criteria and/or superior performance in a job or scenario ([Aboramadan, 2022](#)). Each government agency's apparatus competency has a more significant impact on improving the institution's quality. Competence with apparatus will affect performance, which will have a constant and substantial effect on the output resulting from employee performance.

Data and procedures. This research was conducted utilizing a qualitative descriptive technique by examining a collection of individuals, objects, situations, and phenomena, followed by a systematic description and factual analysis of the gathered data. Researchers selected research subjects to acquire precise data regarding the transformation of licensing service governance in response to the 4.0 industrial revolution, particularly at the IOIS Office in Bandung. So that researchers can collect information as the primary data for this study, the researcher has concluded that the subjects picked are individuals who know more about Apparatus Competence at the IOIS Service and can provide information about it. The subjects are the Head of the IOIS Office, the division heads of the IOIS Office, and the Bandung City IOIS Office's service customers. ([Garca-Lázaro et al., 2022](#)) describes the concept of the origin of library data utilized as research material. Data was acquired via interviews and a review of the literature. The researchers will use an Interactive Model to analyze the data, as explained by ([Gemeda & Lee, 2020](#)).

The Gadget Mobile Application for License (GAMPIL) application, the HAY.U application, and the Web-based online licensing system are a few of the electronic-based online government service applications that the IOIS Office has developed for the dpmptsp.bandung.go.id website to assist residents in managing various licensing services. In addition to these online services, the IOIS Office offers shuttle services for permit or non-licensed files by officers to the office or the applicant's residence by mail ([Henry, Flynn, & Powell, 2020](#)). This service is intended to improve the efficiency of licensing activities and enhance community services. Based on the Detailed Community Satisfaction Survey Report for the period of 28/08/2019 to 27/09/2019, it can be seen that of the 1,427 survey

participants, the average community satisfaction index for the quality of service at the IOIS Office was 80.14 with good quality ([Hamid, 2019](#)). This is made possible by automating IOIS Office's web-based apps and services.

This is a problem for the competency of the apparatus at the IOIS Office, as technological advancement minimizes the quantity of work that the apparatus will perform. Following what Kaushik Das et al. mentioned, data collection and processing, as well as physical activities in predictable situations, have a high potential to be automated in Indonesia, exceeding 70 percent. Predictable physical tasks and data gathering account for over 20% of work hours in the Indonesian economy, while data processing accounts for approximately 10%. ([Deligianni, Voudouris, Spanos, & Lioukas, 2019](#); [Ray et al., 2019](#)). This shows that work, including data collection and processing tasks, as well as physical effort, has a solid potential to be automated by more than 70 percent. Physical activity and data gathering are anticipated to account for approximately 20% of working hours in the Indonesian economy, while data processing accounts for about 10%. In addition to physical activities, the IOIS Office is responsible for data gathering and processing.

Thus, with automation and the internet of things, some work at the IOIS Office can be performed by applications and the internet. The Bandung City Integrated Licensing Service Agency has, since May 2015, built an online licensing service system to fulfill the demands of the digitalization era and the Internet of Things and enable the execution of novel licensing service operations. This service system is anticipated to facilitate public access in handling permits and prevent illegal levies (extortion) in processing permits that were formerly traditional and conventional in nature up until the IOIS Office of Bandung City with Regional Regulation Number 08 in 2016. Since its inception in 2002, the IOIS Office has undergone organizational reorganization and apparatus competency development to meet organizational needs and community service demands in online service delivery ([Crivelli, Fronda, Venturella, & Balconi, 2019](#)).

Methodology

About government performance and efficient management, there are studies based on primary data and qualitative descriptive methodology. Consequently, this research was conducted utilizing a qualitative descriptive technique by examining a group of individuals, things, situations, and events and then providing a systematic description and factual analysis of the gathered data. Researchers selected research subjects to acquire precise data regarding the transformation of licensing service governance in response to the 4.0 industrial revolution, particularly at the IOIS Office in Bandung. So that researchers can collect information as the primary data for this study, the researcher has concluded that the subjects picked are individuals who know more about Apparatus Competence at the IOIS Service and can provide information about it. The subjects are the Head of the IOIS Office, the division heads of

the IOIS Office, and the Bandung City IOIS Office's service customers. The concept is utilized by the source of library data used as research material (Weng, 2018). Data was acquired via interviews and a review of the literature.

Additionally, the previous research in the body of literature is considered for this study's data. The researchers will utilize an Interactive Model to analyze the data, as explained by (Nawaz, Chen, Su, & Zahid Hassan, 2022). In addition, research professionals were consulted for assistance with the research. In this sense, all the information gathered from the subject of this study was precise and carefully recorded. A study's conclusions are more realistic and plausible when the research subject is chosen correctly, and information is obtained from appropriate resources. This study has adhered to all of the latest protocols for data analysis.

Findings

Recommendations by Hameed et al. (2018) that are integrated into governance are studied as they pertain to the transformation of government in response to the industrial revolution. Researchers can describe changes in control attributable to the industrial revolution through this topic. IOIS City Office of Bandung IOIS Office Bandung City is one of the offices established by Regional Local Number 8 of 2016 About the Formation and Composition of local Apparatus for Bandung City. Bandung City's IOIS Office is a component that organizes government issues in the realm of investment and integrated one-stop services. As part of its duties and responsibilities, the IOIS Office offers several licensing services to the community. There are four permission types, the first of which, Licensing and Non-Licensing Services A, governs the operation of four licensing services. Licensing and Non-Licensing Services B comprise nineteen licensing services. Third, Licensing and non-licensing services C contains fourteen licensing services. Licensing and Non-Licensing Services D, which consists of eighteen licensing services, is the fourth licensing and non-licensing service. This service continues to adapt to modern trends. The manner of service has also seen numerous modifications throughout time, first with the use of typewriters, followed by the use of computers, and currently with an Android application. The IOIS Office of Bandung City has launched several applications to meet the licensing and non-licensing demands of the local community. Since 2011, the IOIS Office of the City of Bandung has developed service innovations such as the BOSS, HAYU, GAMPIL, and OSS applications.

Bandung City got a smart city award in 2017 from various parties in recognition of the city's numerous accomplishments. Innovations that make it easier for citizens to utilize government services. Bandung City is one of the regional government agencies that provide the most community service activities, both in the form of licensing and non-licensing services, according to the IOIS Office. The IOIS Office in Bandung City provides services that evolve with the times. Upon entering the era of the Industrial

Revolution 4.0, which emphasizes automation, the internet of things, and big data, the IOIS Office of Bandung City has attempted to adapt its services to the period's parameters. Various service apps are developed to automate internet-related and data storage-related tasks to affect these modifications. Since 2011, IOIS Office Bandung City has developed the Bandung One-Stop Service. In 2015, the service became accessible via the website with the HAYU application. In 2018, IOIS Office Bandung City developed an android-based application for licensing services to the community via GAMPIL and the OSS application. With the gradual change in the services provided by the IOIS Office in the city of Bandung, the work performed by the apparatus has also changed gradually. Services that were previously performed manually by service personnel have steadily evolved.

Even as technology and innovation have advanced, the office has undergone several institutional reforms to ensure its efficient operation and to satisfy the community's requirements. The City of Bandung approved a policy of establishing a One-Stop Service Unit in 2002, per Bandung City Local Regulation No. 02 of 2002. However, this unit is not yet optimal. Thus, it has not been able to match society's and the times' expectations. Following Bandung City Local Regulation No. 12 of 2007 on the Establishment and Organizational Structure of Local Technical Institutions, the Board of Investment and Integrated Licensing Services was established in 2007. The institution of the Investment Board and Integrated Licensing Service is still not optimal, so with the issuance of Bandung City Regional Regulation No. 12 of 2009, which refers to the Regulation of the Minister of Home Affairs No. 20 of 2008, at the end of 2009, the Investment Board and the Integrated Licensing Service A were established. Bandung City forms an institution that is expected to serve the community's interests based on the philosophy that, to meet the community's expectations in the licensing process, various improvements must be made, including simplification of the licensing system, improvement of public services, eradication of corruption, and enhancement of the investment climate. In improving permit management. Based on Mayor Regulation No. 1396 of 2016, this entity was transformed back into the IOIS Office in 2017.

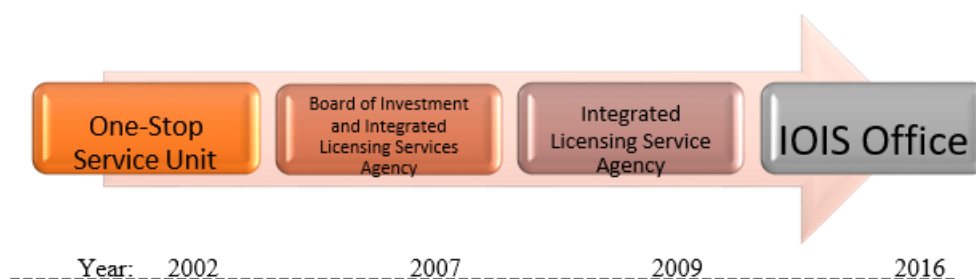


Figure 1. Institutional Transformation of the IOIS Office

These institutional changes resulted in modifications to the services and tasks provided by the IOIS Office in Bandung City. This change brought about significant changes for the IOIS Office in Bandung City, which began

as a small organization, grew into a large organization under the agency's umbrella, and then became the office to simplify the licensing system, improve public services, eradicate corruption, and enhance the investment climate. These modifications modified the authority of the State Civil Apparatus at the IOIS Office in Bandung City. Before the Industrial Revolution 4.0, more officers were needed for field personnel and general administrative tasks. Still, now the IOIS Office in Bandung City requires more Computer Technicians and front office personnel, as stated in the announcement letter of the Head of the IOIS Office in Bandung City dated January 1, 2020, and titled Recruitment of Personnel Front Office and Computer Technicians at the IOIS Office. Due to the need for employment and community services, the Bandung City IOIS Office has a more critical requirement for Computer Technicians and Front Office staff. Required front-desk personnel focusing on Communication, Science Education, International Relations, and English competence.

Meanwhile, Computer Technicians are expected to have an Information Engineering and Computer Science education and proficiency with computer hardware and software. The institutional modifications of the IOIS Office in the city of Bandung indicate the replacement of Apparatus capabilities with digital service competencies. Government affairs services at the IOIS Office in Bandung City have included licensing and non-licensing services at local government entities in Bandung City, except doctor and nurse services. Therefore, if local government organizations can consolidate digital services in a forum, the necessity for apparatus-based work in each service may decrease. Local government organizations can ultimately be simple, requiring few local institutions such as offices, offices, and agencies.

The administration of the government has undergone several modifications due to the rapid development of the times. These modifications also affect the maintenance of government structures and infrastructure. This also occurred at the IOIS office in the city of Bandung. Before the growth of digital-based services, the Bandung City IOIS Office provided several physical structures and infrastructure to support licensing and non-licensing services, stretching as far as sub-districts and villages. As an example, consider a mobile automobile service. At the IOIS Office in Bandung City, six mobile automobiles are used for socialization and services in predetermined subdistricts and other sites. The six (six) automobiles comprise one large car and five tiny cars previously used to reach out to the community about licensing education and services. However, the vehicle is currently not being utilized properly. When one of the officials inquired about the use of the car on September 24, 2020, he stated that the vehicle was no longer being used for socialization and services. The IOIS Office of Bandung City has transferred its socializing and service efforts to online social media. On Twitter, Instagram, YouTube, Facebook, etc., social media is used as a venue for socialization. On this basis, it is clear that the use of online media for licensing services and socialization media has revolutionized several spheres of work at the IOIS

Office in Bandung City. The previously utilized socializing officers and their drivers have been replaced with police with expertise in information and communication technologies. Similarly, the supporting infrastructure and facilities. The Bandung City IOIS Office prioritizes the procurement and development of hardware and software over purchasing automobiles and other field equipment to support government service activities.

Discussion

Current developments in licensing and non-licensing services necessitate a reevaluation of the knowledge, skills, and dispositions of the implementing apparatus. For this reason, a system that comprehends the Industry Revolution 4.0 developments that have occurred and have an influence on government services is required. Changes in licensing services, institutions, and physical buildings are observable manifestations of IOIS Office governance alterations. Essential assets in the administration of government services are equipment resources. The implementation of government actions requires apparatus resources to be carried out effectively. To promote the success of an endeavor, it is necessary to have competent equipment with the knowledge, abilities, and attitudes associated with the 4.0 industrial revolution, as depicted in the image below.

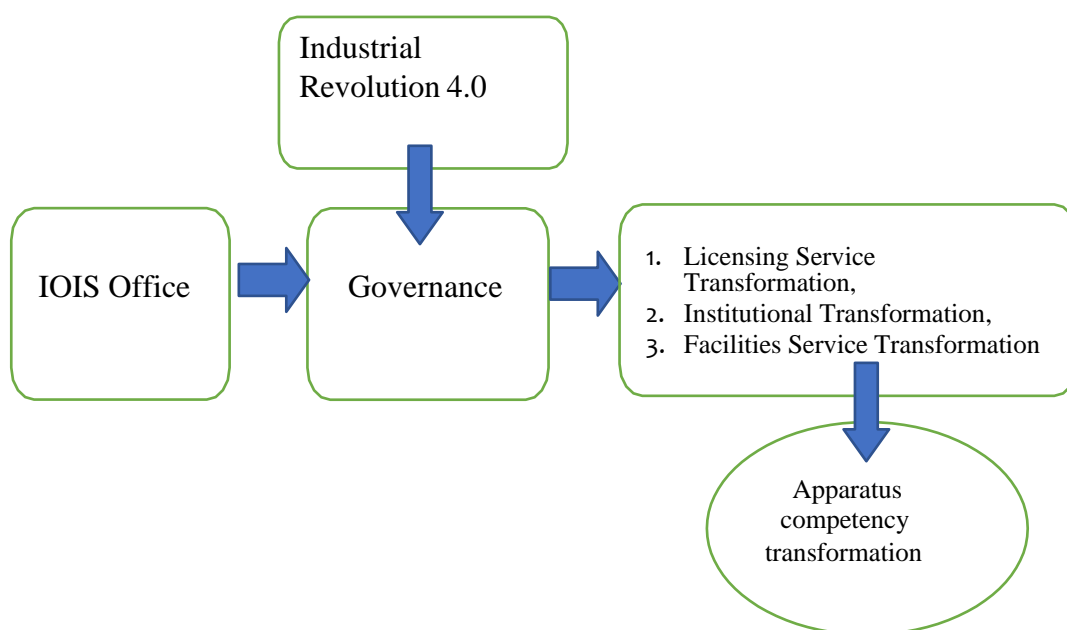


Figure 2. Transformation of Licensing Governance in Facing the Industrial Revolution 4.0

The IOIS Office, which provides licensing and non-licensing services, focuses primarily on document services for the public and private sectors. The IOIS Office of Bandung City has created a digitally-based service system for Automation, Artificial Intelligence, the Internet of Things, and Big Data. These services are accessible via the website and the Android app. The

online service provides a separate service room. The public can access the program by preparing files and following the front desk clerk's instructions. The front desk personnel will explain and direct residents who wish to acquire permits. IOIS Office Bandung City's licensing and non-licensing services provided via websites and android applications demand competency knowledge, abilities, and attitudes in digital-based services such as computer technicians, IT, and communication. This year, the IOIS Office offers the chance to fill its licensing and non-licensing service formations and needs. We require personnel in the front office and as computer technicians. We require officers with specialized talents and knowledge, not administrative personnel with generic abilities. Each business's competencies must be supported by personnel with the requisite knowledge and digital skills, as well as an understanding of ethical boundaries in the digital world, such as ensuring the security and confidentiality of public data.

The evolution of information technology influences the organizational structure in the following ways: 1) automation, disintermediation, and integration; 2) growing skills and work, employee habits, cooperation, or collaboration; and 3) self-directed dominance. The Fourth Industrial Revolution affects the evolution of government. Government administration in several universes has begun to adapt the Industrial Revolution 4.0 concept and apply it to public services. The application of automation, the internet of things, artificial intelligence, and big data in the government sector can aid in apparatus decision-making, accelerating public services, and administering government-useful information. ([Chou, Shen, Hsiao, & Shen, 2019](#); [Dwivedi, 2011](#); [Lin et al., 2022](#)) Using the Industrial Revolution 4.0 idea in the government sector provides the prerequisites for government employees to develop and increase their competence. These conditions were satisfied so that government authorities could implement the new concept. The required transformation of apparatus competence comprises the change of knowledge, abilities, and attitudes ([Hamid, 2019](#); [Hew et al., 2020](#)).

Conclusion

In response to the Fourth Industrial Revolution, the One-Stop Integrated Licensing and Investment Service in Bandung was found to have undergone adjustments. These changes include modifications to licensing services, amendments to institutions, and improvements to physical structures. Due to these alterations, the types of work performed at the Bandung City IOIS Office changed in response to the Industrial Revolution and the community's requirements. Therefore, the Bandung City IOIS Office requires Apparatus competence to face the Industrial Revolution 4.0, specifical competence in knowledge, skills, and attitudes on digital-based services such as technicians and communication fields, as well as competencies following the service sector, such as competence in the fields of economics, law, planning, and public administration.

Implementations

Theoretical Implications

Evaluating this study's theoretical ramifications is crucial because the entire government about the industrial revolution is discussed. In prior research on the industrial revolution 4.0, the licensing department's departmental regulation was not explored. To improve the department's personnel performance, the culture of innovation adoption must be adopted to a greater level to foster a practical working environment. The study demonstrates that digital transformation is crucial for people since they can satisfy their basic demands quickly. On the other hand, the digital transformation can boost the licensing organization's working performance with organizational functionality-appropriate equipment. Similarly, the study's theoretical ramifications enhance the current literature and provide pertinent information regarding the crucial industrial transformation of the present day. Indeed, the interaction between employees and visitors in the licensing department can be strengthened if the visitor's needs are promptly met. In this regard, it is the responsibility of the licensing department management to work on the industrial transformation to increase customer and visitor satisfaction by offering the finest possible old-fashioned services.

Practical Implications

This study demonstrates that the government and licensing department stakeholders should implement innovative behavior to improve employee performance. When an organization's personnel are performing optimally, they will be eager to implement change and adopt innovation for the organization's optimal performance. With the aid of digitization and the internet, organizations of the modern kind must establish organizational structure and functionality. Firms whose primary objective is to increase their productivity must implement innovation into their daily operations. Similarly, this report underscores the need for a stronger emphasis on the digital transformation of organizations. The digital mode of operation would give clients licensing services efficiently, hence increasing their level of organization satisfaction. In addition, the outcomes of this study indicate that a greater emphasis must be placed on government and licensing department coordination for the implementation of digitalization. Effective management and industrial transformation to enhance organizational functionality can improve the licensing department's performance.

Future Directions

The purpose of this study was to investigate the impact of industrial revolution 4.0 on the transformation of governance in Bandung City and the competency of the state civil apparatus in public services at the Bandung City One-Stop Investment and Integrated Licensing Service. Future research should explore the role of technology acceptability in the

context of technological transition in the industry. In addition, future research should explore the role of innovation acceptance in industrial and technological development. Lastly, future research should explore the role of innovation resistance in the context of industry's technological transformation in the city of Bandung.

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