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# The Implementation of Artificial Intelligence in the Environmental Licensing Process

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**ABSTRACT**
Technology can save time. Artificial Intelligence technology makes the licensing process and spatial information shorter and it can save costs. Artificial intelligence (AI) has been applied in everyday life, such as: prediction, chat bots, object detection, and others. Environmental licensing with various procedures and administration will be completed with the application of Internet/web-based Artificial Intelligence (AI). Almost all fields require automation which can be assisted by artificial intelligence, in addition to the management of environmental permits so far with the tendency of human intelligence that will be immediately replaced by the application of data and location-based artificial intelligence technology. AI products are data/information on environmental permits, spatial planning, appropriate building functions and environmental levies. According to the standard of green building architecture automatically, Information data can be used for further licensing needs or just information on architectural data needs. Legality is obtained through banking transactions for retribution payments and digital certificates are given.

***Keywords:*** *Artificial Intelligence, Licencing process, Spatial licensing, Environmental licensing, Information, Legality.*

## 1. INTRODUCTION

The local government of the Special Region of Yogyakarta is still improving the information system in issuing environmental permits [1] and it still uses human intelligence as the operator and control of its implementation. The community has to complete some stages, including: filling out forms, completing environmental permit files, the screening stage, compiling environmental study documents through consultancy services and stage by stage studies [2]. Licensing policies [3] are regulated and based on laws and regulations which are updated regularly and continuously between regions, both provinces and districts/cities.

Environmental licensing is an obstacle for entrepreneurs and Micro, Small and Medium Enterprises in managing their business activities in urban areas, both the complexity of the management procedures and the amount of costs that must be paid to obtain recommendations for environmental studies according to their business fields [4]. Improvements to the current licensing system require renewal in order to support government programs in increasing the economic growth of the business community and MSMEs. The application of Artificial Intelligence (AI) to the environmental permit system, both directly related to building function permits [5] and the environment has not been realized due to various considerations and problems [6]. Economic activities [7] and other activities related to local government [8] must go through an environmental permit process to prevent impacts [9]. Today, the application of the human intelligence system [10] requires large costs and a long time, so it is not effective and efficient for the purpose of economic growth in government programs [11]. Environmental issues are one of the main goals of the government in sustainable development to be resolved immediately. The implementation of development that pays attention to environmental aspects is in line with the principles of the Sustainable Development Goals [12].

Environmental licensing and architects' activities, in obtaining information and current development

provisions, must go through various procedures that sometimes cause dissatisfaction and incompleteness due to incompetent human intelligence or the confidentiality of data in government agencies. Limited information makes architectural works work over and over again and requires considerable time and cost. Information related to spatial planning, water and air conditions as well as building use and the environment is very necessary in the activities of architects [13] in determining the type of building that is appropriate and appropriate and fulfills the aspects set by the government in supporting the Sustainable Development Goals.

The development of Artificial intelligence (AI) is an important technology that supports daily activities in social and economic life [14]. Attention has been focused mainly on the development of artificial intelligence information communication technology (ICT) [15] and robot technology (robot technology) [16]. The effects of artificial intelligence will only grow in the next decade, as manufacturing, retail, transportation, finance, healthcare, law, advertising, insurance, entertainment, education, and nearly every other industry transform their core processes and businesses to take advantage of machine learning [17]. One of the purposes of this paper is to provide an overview of the benefits of implementing AI in providing information needs for architects and environmental assessment certificates for business actors and MSMEs.

With the application of Artificial intelligence (AI) technology, people are expected to be able to use gadgets and the internet to obtain all information and environmental permits wherever they are. The COVID-19 pandemic [18] requires restrictions on outside activities so that the use of AI is expected to make it easier to obtain information on environmental quality and the type and layout and function of buildings that are appropriate and permitted by the government via the internet. In addition, the amount of retribution that must be paid can be known and paid immediately.

The former studies concluded that the application of technology [19] in Indonesia is lower than other Asia Pacific regions [20-22]. The problem of applying technology to information systems and licensing in local governments is the result of the separation of authority in an activity that is interrelated with one another. For example, to get spatial information, you must access the spatial information system, if in the city of Yogyakarta through the Jogja Smart Service (JSS), environmental information through Silaling and air quality information through AQMS. Each one stands alone and is just static information with the update of human intelligence.

Through this paper, it is intended that there is a system that processes various data into information that is easily accessible on a web basis. AI is applied in processing all spatial, environmental and levy information data in a web-based information media that is easy and accessible with gadgets and computers. With machine learning, the data is processed and presented in the required information format and the output obtained is a certificate with a barcode that can be used for further licensing purposes.

## 2. LITERATURE REVIEW

In a study, the results of previous research are needed to support related research.

From the research conducted by Fitri Yanni Dewi Siregar entitled "Legal Aspects of Simplifying Business Entity Licensing in the Environmental Sector in the Job Creation Act", the study discusses the concept of business licensing in the environmental sector contained in Law Number 32 of 2009 concerning the Protection and Management of the Environment (UUPPLH) uses a license-based approach which will be converted into a standard and risk-based approach (RBA) in the Job Creation Act. The research method used is a normative juridical approach based on primary legal materials. The concept of licensing as regulated in Law no. 32 of 2009 concerning Environmental Protection and Management, namely, first, it is contained in Article 1 number 35 UUPPLH that Environmental Permits are permits given to everyone who carries out business and/or activities for which AMDAL or UKL-UPL is required in the context of protection and environmental management as a prerequisite for obtaining business and/or activity permits. Second, it is contained in Article 1 number 36 UUPPLH that a business and/or activity license is a permit issued by a technical agency to conduct a business and/or activity.

The results of the discussion are the legal construction of licensing arrangements for business entities in Indonesia. In today's environment, we refer to Law no. 32 of 2009 concerning the Protection and Management of the Living Environment or hereinafter abbreviated as UUPPLH and there are implementing regulations of this UUPPLH, namely Government Regulation no. 27 of 2012 concerning Environmental Permits. At this time the three permits are combined and managed simultaneously or become one time in the form of environmental permits. The conditions are clear at the time for the issuance of environmental permits by business entities, namely environmental impact analysis (AMDAL) or environmental management efforts (UKL) and environmental monitoring efforts (UPL). So without these three documents, the environmental permit will not be granted a business permit.

Meanwhile, Eka Sakti's [23] research entitled "Bureaucracy Reform In Telecommunication Organization Licensing Sector Through The Electronic Integrated Business License Service (Oss System)" discusses in Indonesia, bureaucratic reform is carried

out in various aspects and fields, one of which is through the implementation of the licensing bureaucracy for telecommunications operations in Indonesia. The OSS system is an effort to accelerate business licensing in Indonesia based on PP No. 24 of 2018 and Regulation of the Minister of Communication and Information No. 7 of 2018. In this case, the OSS System reforms business licensing regulations in terms of time, stages, and utilization of technological developments as an integrated system in Indonesia. In its implementation in the licensing of telecommunications operations, the OSS System still has problems, both in terms of systems and regulations, but the OSS System is able to shorten the licensing time.

From another book, namely the work of Simarmata et al. [24] entitled "Application Information Technology and Its Application" it is discussed about information technology that can be applied in various fields, but its category is still low compared to countries in Asia due to technical and economic barriers and social.

Thus, licensing according to the current government program will be streamlined by reducing the procedures and regulations through the OSS system. Where OSS is used for entrepreneurs to obtain business licensing legality in the form of barcoded certificates. For the use of technology in the environmental licensing process, it has been stated in the formal legal basis and eligibility standards as well as clear guidelines in Law Number 32 of 2009 concerning Environmental Protection and Management (UUPPLH). This means that the use of artificial intelligence in the environmental permitting process and spatial information is still relevant for further research and study.

## 3. RESEARCH METHODS

This research uses literature study method. The type of research used is a literature study. The literature study method is a series of activities related to the methods of collecting references data, reading and taking notes, and managing research materials [25]. Literature study is required in this research. Literature studies are carried out by each researcher with the main objective of finding the basis for obtaining and building theoretical foundations, frameworks of thought, and determining provisional assumptions or also known as research hypotheses. By conducting a literature study, researchers have a broader and deeper insight into the problem to be studied.

## 4. FINDINGS AND DISCUSSION

Environmental licensing has been regulated by the laws of the Republic of Indonesia as a necessity for government programs in achieving the Sustainable Development Goals. Environmental licensing aims to prevent impacts caused by activities that change environmental functions. Types of environmental permits include UKL-UPL (Environmental Management Scheme and Environmental Monitoring Scheme) and AMDAL (Environmental Impact Analysis), while spatial information is in the form of land conditions, land functions and permitted land use plans as well as environmental information, namely data on air quality, water, waste, waste and environmental infrastructure (See Fig. 1).

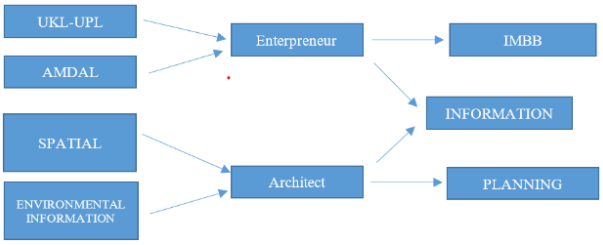


**Figure 1** Information compilation flow.

Source: Writer Illustration, 2021.

From the flow chart, the output of environmental information is obtained from processing and combining environmental permits, spatial planning, environmental information and user fees. The information/data based on location/map is made into a digital-based environmental information system to facilitate the community and government in managing environmental permits and increasing income. One application for all building and environmental permits as well as the levy fees and the function of the building at that location can be accessed through gadgets and computers. The final output is a certificate that can be used for other licensing support purposes.

Environmental permits (UKL-UPL and AMDAL) as well as environmental and spatial information through the application of Artificial intelligence (AI) are created and processed through machine learning to produce integrated information and can simplify and speed up licensing services by the government to the public. In addition, it can also be used as a government control tool against violations that result in environmental damage and pollution [26]. Permits or information can be accessed through gadgets and computers by inputting location data on a google map (coordinates) and filling in the function of the building to be built, the number of occupants and the capacity of the building. The data will be processed by machine learning into information data that users need easily and quickly. It can be illustrated as follows (see Fig. 2):

### *4.1. The Manual Process That Will Be Replaced by AI*

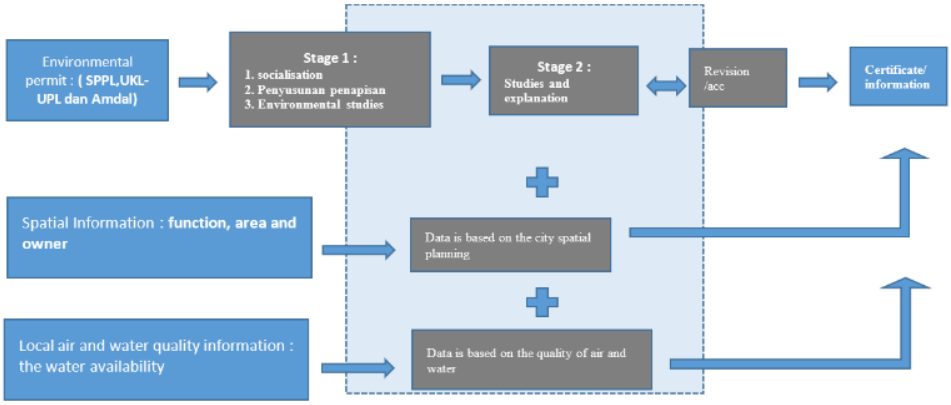


**Figure 2** Environmental licence illustration.

Source: Writer, 2021.

For UKL-UPL permits, AMDAL and environmental information as well as environmental levies are included in the application, complete with environmental information such as air quality, water quality, type of business, and waste generated as well as to find out after construction on site is carried out. Can be used as a medium for government control over environmental functions. This Artificial Intelligence system can be applied by utilizing data that is always updated by human intelligence instruments in related government agencies. The latest information will be captured by machine learning and used as updated information needed by users/community and business people.

The interaction between Google map and machine learning is through a web-based system (web base) where the Google map is the basis for the location while information from the government completes the slots on the Google map. Machine learning processes these two sources and produces integrated information and data according to the required input data. Furthermore, to obtain legality in the form of a certificate, users can carry out financial transactions that have been conveyed in the information through banks. The certificate can be downloaded and used for further licensing arrangements at other agencies that require it.

### *4.2. Framework*

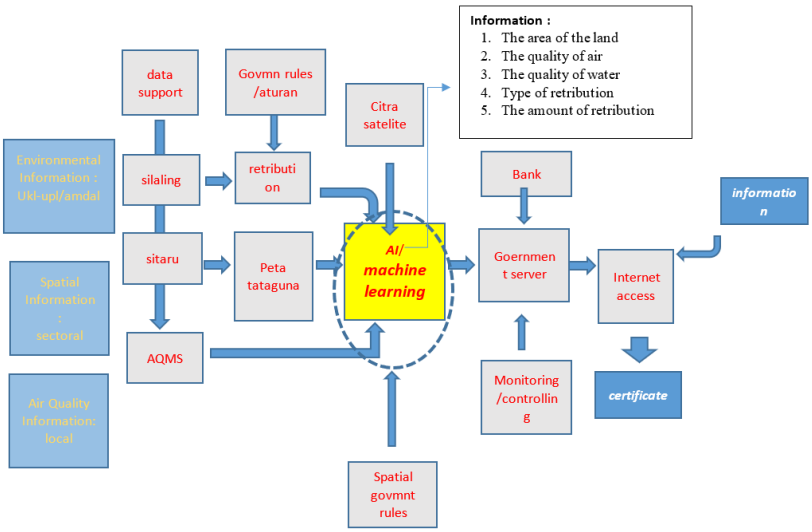


**Figure 3** Framework.

Source: Writer, 2021.

## 5. CONCLUSION

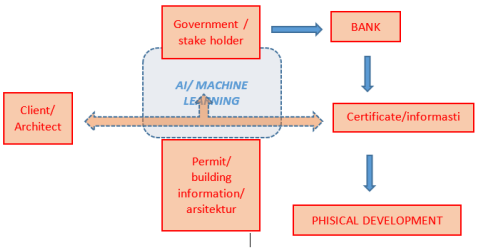


**Figure 4** Information process illustration.

Source: Writer, 2021.

The licensing process with a certain period can be completed quickly and easily with the application of AI in its processes and applications. The results obtained from the use of AI in the licensing process are 2, namely:

- For the community, it can reduce time, cost and energy and according to the principles of the covid-19 process [27], minimize face-to-face meetings.
- Government will be able to control toward the developmental regulation and environmental damage.

The application of technology in the development of the business is very necessary due to the importance of time and business opportunities. The earlier the permit is obtained, the faster the economic growth of a country increases. Technology helps economic growth and makes it easier to monitor an impactful activity and reduce human intelligence costs. However, there is a negative side which is a consequence of the application of this technology, namely the reduction in human resources and the need to increase the capacity of the internet network connection.

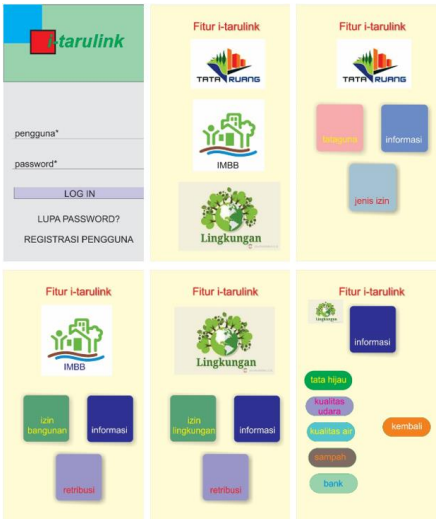


**Figure 5** I-tarulink application.

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