

CHAPTER I

INTRODUCTION

1.1. Background

Nowadays, the world has entered the stage of the 4.0 industrial revolution which began with the internet revolution that serves as easy access to information exchange. The internet revolution is in line with the development and application of technology in various fields. Industry 4.0 has opened up opportunities for a world where an activity can operate automatically and improve many processes using some of the latest emerging technologies. The development in the era of the Industrial revolution 4.0 brought progress in various social activities. Technological advances in this era are maintained by integrating automatic machines with internet networks that change various conditions such as economy, education, manufacturing, and others.

Rapid technological advances are currently encouraging the world to take advantage of new digital technology as a model for activities and transactions so they can support industrial activities. The wave of digital system transformation is a common element that encourages every activity by utilizing digital media as the main means so that digital transformation can become the basis of industrial policy in several countries (Danuri, 2019). The use of digital media is inevitable in this era of digital transformation. Digital transformation can be interpreted as a radical process that occurs in organizations in utilizing technology, human resources, and business processes that cause the organization to change drastically. (Hadiono and NoorSanti, 2020). The main goal of digital transformation by an organization is to measure how ready the organization is to enter the digital era. In Hadiono's research, the readiness for digital organizational transformation can be proven by producing better product innovations, exploring and developing new, disruptive business models to remain competitive and generate profits for the organization. The organization referred to in this case can be interpreted as a country, company, university, and others.

According to research conducted by Hadiono and NoorSanti, 2020, digital transformation is not only caused by the current covid-19 pandemic situation. In their researches, four factors are supporting the occurrence of digital transformation, including the following:

1. Regulatory change
2. Changes in the competitive landscape.
3. Industrial change to digital form
4. Changes in consumer behavior and expectations

The application of government regulations in dealing with the spread of the Covid-19 virus by implementing social distancing forces various activities to be carried out using digital media (Hadiono and NoorSanti, 2020). However, before the Covid-19 pandemic situation, various business platforms had sprung up in Indonesia such as online transportation facilities such as GOJEK, Grab with the various easy access they offer, so that business people such as other public transportation using conventional systems are diverted from the competition. In addition to the freedom of access to choose the transportation that consumers will use, they are also given access to provide an assessment of services so that business managers can improve their systems and services. Other supporting features developed such as food ordering, cleaning, and others that support the public to get to know this digital business platform.

The emergence of online shop platforms such as Shopee, Bukalapak, Lazada, Tokopedia, and others provides an advantage for someone to market their products without having to have a physical store. This also supports the development of other types of businesses, namely goods delivery services. Other examples such as the development of the use of video conferencing, previously video conference services have been added before the pandemic, such as skype, zoom, etc. However, during this pandemic, there was a significant increase in the use of video conferences due to social restrictions with the implementation of social distancing rules during Covid-19. (Fajrin, Tiorida and Kunci, 2020).

The emergence of this platform can illustrate the factors supporting the digital transformation that is taking place. So it can be concluded that digital

transformation will still occur regardless of the presence or absence of the Covid-19 pandemic. However, it cannot be denied that the Covid -19 pandemic has accelerated the digital transformation process. (Hadiono and NoorSanti, 2020)

The existence of Industry 4.0 is currently developing digital transformation, all parties involved in the organization need to be integrated horizontally to produce a good performance This good performance is related to the exchange of information that is valid and real-time as well as efficient, flexible, and safe

In the manufacturing industry, this integrated relationship can be exemplified between producers and suppliers. The companies need to determine their inventory needs dynamically, they need to know stock availability. For this purpose, many companies carry out periodic inventory and decide whether to add to their existing inventory. However, in many companies, such inventory is carried out manually, which is a very expensive, time-consuming, and tedious task because there are too many types of assets or items to manage. Although currently, there is an automatic calculation software such as excel, if controlled by humans, the process is prone to bookkeep errors and is not carried out in real-time. Therefore, an ideal inventory should be automated in real-time and efficient, flexible, and safe. In other cases, inventory has similar problems with the asset management system of an institution or company.

One technology that is currently popular is the digital currency, bitcoin. Bitcoin was first introduced by Satoshi Nakamoto in 2008 after the United States Subprime mortgage crisis. The United States subprime mortgage crisis was one of the first indicators of the financial crisis in 2007–2010 (Tasatanattakool and Techapanupreeda, 2018). To run this bitcoin, Satoshi Nakamoto created a database system called Blockchain. Blockchain is a shared ledger technology. A ledger is simply a place where you can record business transactions such as orders, payments, activities, and even maintenance, repairs, and replacements. Blockchain has been quickly popular because of its secured mode of transaction. Blockchain technology is essentially a virtual ledger capable of recording and verifying a high volume of digital transactions, which is now spreading across a wave of industries. These multiple ledgers can be a solution for error, fraud, and inefficiency. By

sharing a common view of the truth that is immutable, it is now possible to view all the details of an end-to-end transaction reducing such variations and vulnerabilities.

The new era of industry 4.0 relies on automation and hyper-connectivity in many activities. This hyper-connectivity is a weakness of Industry 4.0. Currently, the main question in this digital age is cybersecurity. Blockchain embodies this innovation and represents a potential antidote to industry 4.0 cybersecurity risks. There are two specific uses for an industrial context which are as follows:

1. Distribution chain risk management, the associated device of “smart contract” is deal for managing the risk of the distribution chain.
2. Industrial Security of IoT, Blockchain provides a way to register and verify each device in highly connected IoT equipment network.

Blockchain is a database used for data storage in a decentralized network (Tasatanattakool and Techapanupreeda, 2018). However, Blockchain is not only used in financial applications. This technology can also be implemented in other sectors, one of which is archiving. (Noor, 2020). Blockchain can be defined as a fixed and shared ledger to facilitate the recording of asset transactions in a business network. The assets referred to in this case can be tangible (such as land, buildings, machinery, equipment, etc.) or intangible (such as intellectual rights, patents, copyrights, brands, etc). It can be said that all entities that have value can be traced and traded in the Blockchain network (Gupta, 2018). So it can be concluded that any information can be entered into the Blockchain network.

One of the potential areas for Blockchain development is the field of asset management. (Tran, Lu and Weber, 2018) The problem that arises in complex asset management is where and how the state of asset is. To find out this, of course, takes more, expensive and tedious effort when there are no clues regarding asset details. Blockchain offers innovative administrative protocol implementations. Usually, the asset management process requires a third party to record the ownership of assets/shares, making it difficult to manage large shareholders. The application of

Blockchain to asset management can provide benefits by simplifying administration and reducing costs. (Noor, 2020)

In this research, the author aims to explore the implementation of Blockchain technology in the asset recording system at Universitas Andalas. This is expected to facilitate the asset transparency, availability, grouping of asset types in at Universitas Andalas and realtime information related to asset at Universitas Andalas

1.2. Problem Statement

The problem statement of the research is How to implement blockchain technology in the design of asset recording system at Universitas Andalas?

1.3. Research Objective

This research aims to design Universitas Andalas's asset recording system using blockchain technology. In case of facilitating asset transparency, asset type grouping, and realtime information related to asset management at Universitas Andalas.

1.4. Scope of Problem

The scope of this research is that the data used are tangible assets at Universitas Andalas.

1.5. Outline of Project

The outline of this research is consists of an introduction, literature review, research methodology, sign and implementation, result and analysis, and Conclusion that can see as below:

CHAPTER I INTRODUCTION

This chapter contains the background, problem statement, research objectives, limitations, and systematics of writing in research

CHAPTER II LITERATURE REVIEW

This chapter contains the theoretical basis associated with the topic of the problem in this study.

CHAPTER III RESEARCH METHODOLOGY

This chapter describes the preliminary studies, literature review, Research Goals and Scope, data collection, data processing, study stages, and analysis

CHAPTER IV DESIGN AND IMPLEMENTATION

This chapter contains the results and discussion of information system design beginning from the system design until the system implementation.

CHAPTER V RESULTS AND ANALYSIS.

This chapter contains an analysis of the results of Blockchain-based system designs, including testing and analysis of the implementation of blockchain technology, as well as analyzing the advantages and disadvantages of the design.

CHAPTER VI CONCLUSION

This chapter contains conclusions from the design that has been implemented and suggestions for further research.

