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The Use of Internet of Things (IoT) in e-Commerce

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ABSTRACT

Internet of thing (IoT) is a concept of technology that has a purpose or benefit in providing access to information and communication on a large scale and also allows controlling several objects that can interconnect and form systems that can help human work in various fields and in various fields. profession.

Key words: IoT, technology, information system.

1. INTRODUCTION

Today, the rapid development of technology makes all of the needs quickly fulfilled. The presence of sophisticated devices such as laptops, smartphones, tablets, computers, and others, makes humans more engaged in all activities. In the work, the needs of the devices are very helpful, especially in matters that affect business processes. IBM noted that 90% of data is processed through the devices, almost all of which are generalized by the software or hardware available on these devices [5]. In addition to these sophisticated devices, internet also affect the pattern of interacting of human life, both in terms of work or business affairs. Nearly 30 billion device users in this world, carry out their activities via the internet [5], such as liking, looking for information, sending news, etc.

E-commerce is one of the many business activities that use the internet as a necessity for business process transactions. All business process activities such as online selling, more rely use internet than you have to come to a direct store to see and buy something. Users are made easy to see pictures and read information quickly and in detail without having to visit the store and they can do interaction between seller and buyer through chat, email, WhatsApp, etc.

In a case, industry 4.0 are really needed, for example is IoT (Internet of Things). IoT is a relationship between physical objects with network, so that it can produce information from the object that is being connected [5]. IoT is also defined as a global infrastructure for social information, a service provider in terms of communication and information technology that has developed [3]. So, we can access this data flexibly without having to connect many unnecessary devices [4].

In e-commerce, this kind of thing is necessary for the effectiveness of data storage. We can imagine a house that contains important information, where the information can be accessed by all devices with different access ways. So that's how the use of IoT in the world of e-commerce is like. By applying some of the characteristics of IoT, it is not impossible if IoT in the world of e-commerce is increasingly being needed by start-up companies.

However, security considerations also need to be considered so that the data stored in the database can be maintained and stored safely so that outside interference can be resolved properly. IoT provides things that are far from the reach of the human mind because it connects many objects via the internet which allows users to exchange data or information in the form of images, text or sound that can provide images and some creative innovations in the world of e-commerce [1].

Data available on IoT such as product development that is trending in society, data about customer interest in what goods and also the performance of an item sold on e-commerce [1]. IoT is an intermediary in transforming some data and information into useful knowledge for its recipients and creates many new business opportunities for entrepreneurs and also some organizations that are just starting their business [1].

2. THEORETICAL FRAMEWORK

2.1. IoT Characteristics & Architecture

In this case, the application of EA uses 5 characteristics which are divided into several types:

- Interconnected.
  Facilitating an interconnection between humans and devices or vice versa. With any IoT that can be connected to the internet and can communicate widely and without boundaries [2].
- Smart sensing.
  Has modern capabilities in doing a sensor. Sensors allow information to be connected to each other in a timely manner and of course the data is processed

into this information on time where the sensor is divided into several groups that will capture information in accordance with their respective group tasks [2].

- Intelligence.
  Having intelligence in capturing and managing information.
- Save energy.
  Save energy in doing sensors and managing information.
- Expressing.
  Has a unique capability to tell an information to another device.
- Safety.
  Can ensure the security of a device's data.
- Security becomes important when we are given easy access to everything on the internet and it is one thing that cannot be separated from attention because security must be properly maintained for personal and common interests in information in the organization [2].

SOA's role in creating an IoT architecture is indispensable. An overview of the architecture is illustrated through Figure 1.1 below:

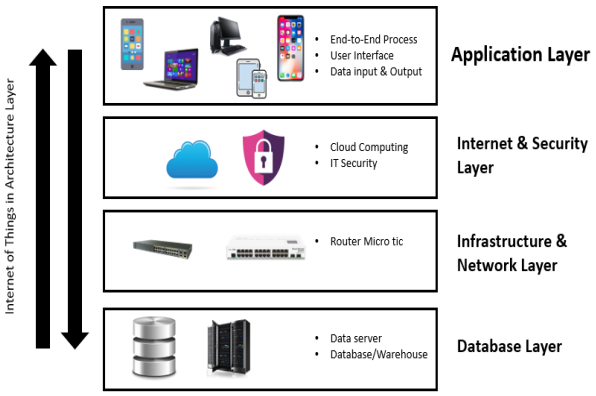

Figure 1: Architecture of The Internet of Things.

From the architecture above, it is illustrated how these layers are interconnected. Starting from the application which describes the interface used to access and enter data. Then in the middleware layer, the information is drawn between input and output. At the access gateway layer, you can see how the information is adapted and processed based on its type. And on the edge technology layer, where the data is stored and can be reused for the next period.

2.2. IoT Trend and Technology Implementation

The trend of using IoT at this time is very much in the majority for all organizations. It is noted that almost several fields have started to implement the presence of IoT in supporting the business processes that occur. It could be in terms of health, manufacturing, agriculture, traffic monitoring, etc. [3]. The concept is quite unique and the application is flexible to use, making some companies want to implement IoT for ease of running ongoing business processes. We can imagine a house as a warehouse database, surrounded by devices that try to access data from the house. From the house, we can imagine how the information process is obtained, starting from opening the door, passing through the living room, living room, to the information center we need.

- Embedded intelligence: Every activity or activity that occurs in the system, is carried out automatically. This is because of the role of sensor technology in capturing signals that are around the system environment
- Connectivity: Another term is smart connected where all devices are connected and connected to each other. This makes the IoT concept clear about the process of data transactions and the flow of data in and out.
- Interaction: There is an interaction between devices that results in the exchange of information. As we retrieve data from the database, that's where the transaction process occurs between the active device and the system that stores the data.

In an overview of the development of IoT trends, the image below shows how IoT is evolving.

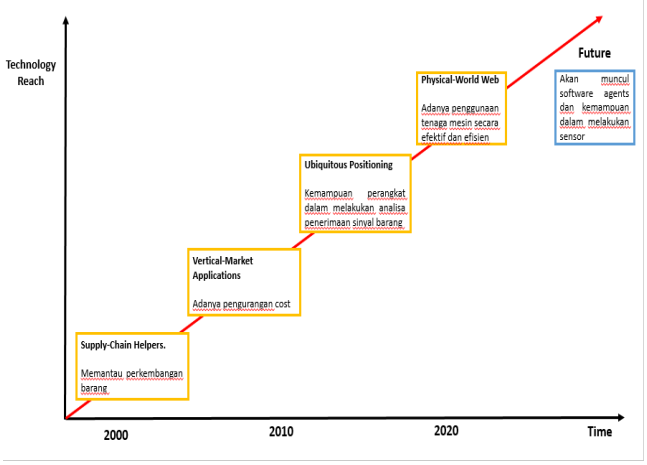

Figure 2: Trends of The Internet of Things.

In a growing trend based on the picture above, the role of technology in the form of sensors can help one device to recognize another device. For example, when a smartphone transfers data with another device, the smartphone will recognize the identity of the device connected to the smartphone. Likewise, with the use of IoT for the purposes of identifying the device received. Hardware or software technology that plays a role in data reception and other identification, including:

- WSN (Wireless Sensor Network): Is a device to detect transaction signals that occur during the data transfer process or data communication

- Smart Sensors: Used to view and monitor data developments in real time, fast response and avoid issues to the network that occur.
- Big Data Analytics: the existence of big data is used to analyze data and is efficient and timely in identifying trends and parts / matrices of data and output parameters. This can help in making decisions and provide a good profit for the business.
- Cloud Computing: Used in several industries to access data flexibly. Cloud computing can be used for big data purposes and the data can be accessed anywhere and anytime. This can be applied to manufacturing as cloud manufacturing.

3. FRAMEWORK

IoT is also one of the foundations and determinants of internet life in the future and in a very big role so that security must be created so that users can have confidence when adding or exchanging information data with other users [2]. Data privacy and security issues are quite a challenge in facing the ease of accessing quality data and information globally, so a good IoT is an IoT that can provide good data security and give users trust and provide secure data exchange [2].

When we talk about security, so there are several factors that we need to be considered in designing a security solution for IoT devices where these factors must have the following characteristics:

- Integrity: When a data transaction occurs, integrity ensures that data does not change while it is in transit
- Information Protection: Is confidential information where not all objects can access the data. This is what needs to be done to keep data safe.
- Anonymity: Protect data by eliminating data sources so that the data can be confidential and private.
- Non-repudiation: Guarantee where someone cannot use data carelessly and irresponsibly
- Freshness: Received data is always new and replaces old data that is not used. This means that the data is always up to date and ready to use.

From the requirements that apply above, the author reflects on global requirements in the application of IT Security. Any data that will be included in the IoT diagram, IT / IS Security will do its job according to the five running requirements. From a functional side, IS Security also supports maintaining data security from outside parties. Among the requirements involved:

- Exception Handling: is a way to resolve or confirm the IoT Network to keep running and continue the transaction process when unexpected happens, such as compromise nodes, hardware malfunction, dislocation, etc.
- Availability: ensures that the IoT Service is still running and authorized during an attack.
- Resilience: When implementing communication between devices in the IoT environment, the scheme will create a strong protection scheme when an attack occurs.
- Independent organization: There is collaboration between devices (both for software and hardware) to prevent attacks.

One example is when a virus attack occurs to destabilize user data, both on a large and small scale, the security system will threaten the virus threat and categorize it into levels that are vulnerable to the virus. The system will also handle, which files are affected by viruses and the various viruses that spread throughout the system. Another example is user login access where each user who wants to access the data he will use will be asked for authorization in the form of a username and password. Each user who accesses systematic information, the system will read and search for data from that user. If the data is given access by the user, the user is given free access to search, store and receive the data. If the given access is wrong, the system will automatically return the authorization request to the authorized user who has been registered on the system.

4. DISCUSSION

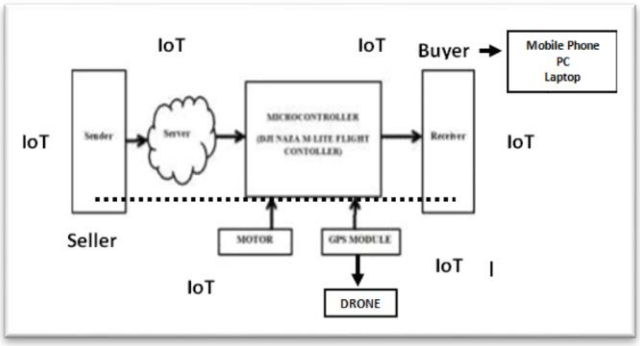

Figure 3. Block Diagram Drone Delivery.

The role of the internet of things (IoT) in the development of e-commerce was initiated in 2016 by Amazon by introducing drone delivery. With the convenience of shopping anywhere and anytime including fast delivery, it can provide an interesting experience for customers. On the other hand, because IoT technology is increasingly being adopted as a business solution, the need for proper data protection is urgently needed.

Figure 4. E-Commerce with Drone Delivery.

We can add security based location tracking security which is most important. If in worst fetch the drone at the time we can get notified that location being changed by real time monitoring. Here the scope of Internet of Things can Work Module GPS which is used to having limitation that the building comes in the picture at that it will consider same longitude and latitude for the top floor to the bottom floor.

In terms of appearance and recommendations that we provide for IoT, it is illustrated as follows

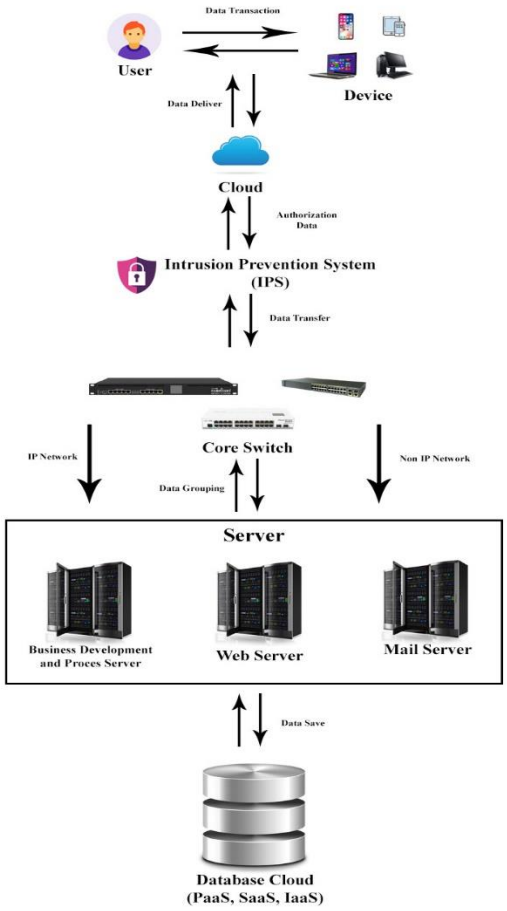

Figure 5. IoT Architecture for E-Commerce.

This picture describes the simple application of IoT in some e-commerce. By involving the interaction between the user and the device, the data that has been input into the device will be stored by the cloud system. The cloud system will deliver the data and will be detected by the routers available at the e-commerce company. The router will also detect related devices, bandwidth, bandwidth speed, network status, etc. On the server side, the data will be stored depending on the data category, which will then become information based on the type of information in the database.

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