Web of City or Province Natural Resources Using Geographic Information System-Base (GIS)

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Abstract---The creating of information media is purposed to inform users of information technology. Media-based information by using geographic information system (GIS) maps the natural resources in the region based on the structure of levels of information that can be provided to users. Natural resource information held in each city or province is accurately required by the community. This information is useful for other communities in improving the economy condition in the city or province. Natural resource information on the city or province geographic software is packaged in a web-based information system. Natural resource information city or province is purposed to boost the economy or the popularity of tourism in the city or province. The applications of geographic information system in the form of web-based software that can inform potential of cities or provinces--such as natural resources and tourist attractions--increase the people's income. The revenues increasing may encourage a progress for that particular city or the province. Geographic's software development of web-based information system applies the data stream with the waterfall model and uses the tools of data flow diagram (DFD). While the programming tools uses php 5.0.4 combined with ajax programming languages, and database design data applies the relational model.

Keywords---Potential Areas, GIS, Web, Income

I. BACKGROUND

Cities in Indonesia certainly have the strength that is characteristic of the area in the area. A power that is owned in the city will have an impact on the strength of the country, say Indonesia. These strengths can be in the form of natural resources in the city, culture in the city, and tourism in the city. For example, the city of Singaraja is one of the cities in Bali Province. The city of Singaraja is the second largest city after the city of Denpasar. The province of Bali has a lot of natural beauty that is in demand by foreign tourists. Moreover, the city of Singaraja is in the Province of Bali, the province is already well-known throughout the world regarding tourism places in the province of Bali. Singaraja is a developing area to keep up with the development of other advanced cities in Indonesia, one of them is Denpasar, but Singaraja is always covered by the big names of Denpasar, one of them is its tourist attractions. Though tourist attractions in Singaraja are very much even more beautiful than the beauty of tourism in Denpasar. Singaraja can be said to be less competitive because of the lack of introduction of Natural Resources in Singaraja city and capital support from outside parties such as investment in Natural Resources (SDA). Investors prefer the city of Denpasar because they are less aware of the great opportunities that exist in Singaraja.

The general public will look for tourist attractions to do vacation or refreshing for themselves or with their families, and that place is different from the places that have been visited or still more natural so that it will find its own satisfaction for connoisseurs of tourism places around the world. Even an artist looks for natural places to channel his

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hobbies, either pictured or photographed, and even a producer will find a place to make his film. They often hear about a place that people say is good or in accordance with their shadow but they are doubtful because of the lack of detailed information about the place, they will try to find information either in forums or by email to someone who knows more about their destination. Bali Island is one area that is often a destination for someone to reach the above goals and Singaraja area is one area that is full of natural potential that is so beautiful and mesmerazing.

To comprehend the above needs, in this final project an application can be developed that can handle the problem, that's how a natural resource is informed through the web. So that the web can communicate or discuss information about natural resources in an area. *Geographics Information System*-based natural resources information web that can help someone solve problems in finding places that have natural scenery and natural potential for tourists or investors.

II. METODHOLOGY

The web development of the potential of the city or province's natural resources applies a method as a reference so that the activities are in accordance with the set path (Nuryaman, 2018). The method of this activity is divided into stages that will bring the software development activities.

Software development methods use data flow oriented methods. This method, usually uses tools, it's data flow diagrams in describing the processes that occur in computer systems. While the models used in software development are sequential linear models, classical system life cycles or can also be called waterfall models. This sequential waterfall or linear model, because of a waterfall paradigm that has a structured development stage between the first sub-development with the next, usually includes system analysis followed by design, implementation of the results of design, testing and maintenance.

This development activity is included in the activity stage to find an appropriate solution. The stage of the activity is carried out step by step so that it can produce a solution in the development of web-based software.
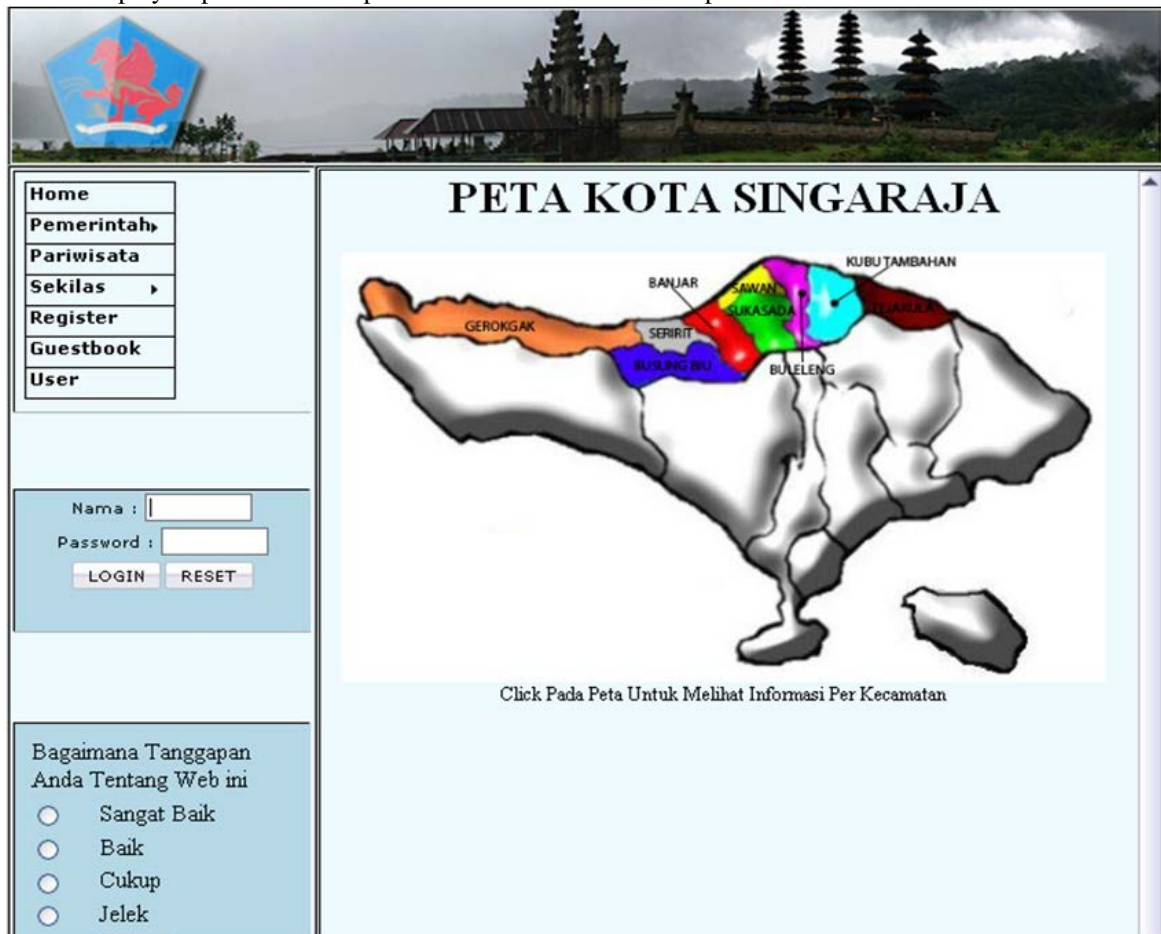

Figure 1:*Web of Natural Resources Potential of City or Province.*

III. RESULT

Identify problems to find out the problems are discussed in the system for natural resources in the city or province. Problems that can be obtained when identifying problems in a city or provincial web of natural resources based on Geographics Information System (GIS), can be disclosed below:

1. Cities usually have a lot of natural potential to be informed to the world, either nationally or internationally.
2. This potential can be published through a web so that it can be known both nationally and internationally.
3. The availability of a media discussion to clarify the development of natural potential in the city or province.

An application requires a user, in this case the user is: super administrator, administrator, operator and ordinary user. Administrators are users who are responsible for the smooth running of the application process to run properly, besides that it also manages applications in general such as managing user data, content data, discussion data, news data, and data administrators. The operator is a person who has a function to answer questions from users. Users are only given access to register themselves and provide questions.

Based on the results of the study by conducting surveys and interviews, the results of the analysis obtained are presented as follows: there are some problems or shortcomings in the introduction of natural resources owned by the city or province in informing the potential of the city or province. There are not many applications that are used to inform the potential of a city or province, so people still don't know much about potential from a particular city or province in Indonesia. For example, the potential of the city of Singaraja in the province of Bali, even though the natural potential in the city is not only tourism, but also other natural potentials. Examples of natural potential in the city of Singaraja in addition to tourism are coffee, rice, and other potential natural resources. With this, a media application to inform the potential of natural resources is expected to be able to provide good information. Media applications are equipped with discussion media that are very helpful for someone to find more detailed information. The application media is based on geographical information system (GIS), which is used to determine the potential of superior natural resources / commodities from the city or province. With the spread of superior commodity information from the city or province will affect the economic impact. Economic impacts that can influence from leading commodity information such as exports from cities or provinces to other cities or provinces will occur. With this export, it is hoped that the emergence of economic activities can affect the region's income. With this income, it can show advanced economic growth from cities or provinces throughout Indonesia.

Media applications for natural potential or resources in the form of geographical information system (GIS) -based web pages. The need for a web page is expected to have an impact on economic growth in the city or province. The preparation of a web page can hold discussions about natural resources in the city or province. With the discussion, information about the potential of nature or natural resources can be renewable well.

In making web pages of potential natural or natural resources requires data, the data used by the system for applications is data relating to the data of an area's layout, data on place names, and data on crops. Whereas the data used for system users is the user needed in the system so that previlage / access rights are applied to the web page system especially to discuss geographical city or provincial information system (GIS) based natural resources, including:

1. Administrators, Operators and users (members) must register themselves first, administrators may only be registered by super administrators who have the largest access rights and cannot be deleted, operators will be registered by administrators and users (members) can do own registration which will have a separate form on the system.

2. Previlage / access rights granted to users (members) are only entitled to use the facilities contained in this system, while for administrators have greater access rights than a user, which has the right to modify the data contained in it, including the process delete, insert, update messages, and be responsible for maintaining this website, because everything starts with an admin. Operators only answer questions from users (members) contained in discussion forums.

With the discussion on the potential web pages of natural resources, an entity is needed, there are 4 entities. These entities are super administrators, administrators, operators and users. The important role of these entities is:

1. Super administrator is the most important party and will not be displayed in the menu to anticipate system security.

2. Administrators are parties who are responsible for the smooth running of the running process of the application and generally manage the system that is running, such as managing user data, discussion data, news data, data administrators.

3. The operator is the party that serves to answer questions from the user or the process of discussion with the user.

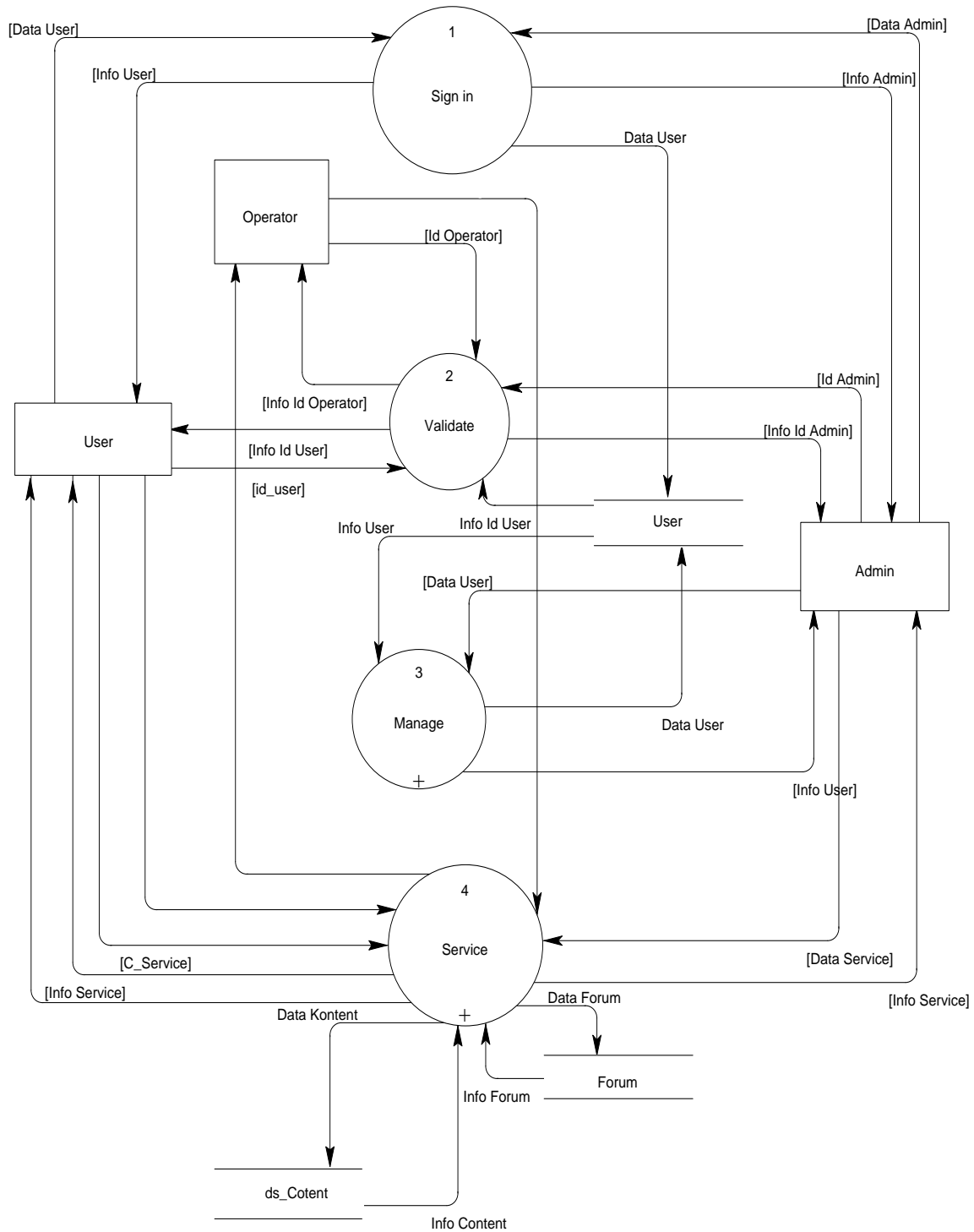4. Users are visitors to this system and are only given access to register and provide questions.

Figure 2 : *Data Flow Diagram*

In Figure 2 shows a Data Flow Diagram of the web page of the potential of natural resources, describing in detail the data flow and system processes that are built, the processes that occur in the system and the entities that enter or receive data flow. Circle shows a process that occurs in the system while an arrow is a sequence of incoming or outgoing data traffic from or to the process that occurs. The process contained in the system is:

1. Registration process, this process serves to register as a member of the geographical information system (GIS) based on the discussion of potential city or provincial natural resources. With the registration process, it is expected to

be able to register the entity as a normal user or member, for registration of the operator is the administrator's right contained in the menu administrator.

2. Login validation process, all application users must do this process to access the menu that matches their access rights.

3. The process of managing members, this process can only be accessed by the administrator who will manage all member data and will be explained at the next level such as edit and delete.

4. Service process, this process is a process of interaction between the user and the operator and the management of data services performed by the administrator.

Databases contained in the web of potential city or provincial natural resources are made into tables used in system databases, attributes contained in the table, as well as relations or relationships between tables used in the application by using Entity Relational Diagram tools (ER-D).

The relation that connects between tables is explained as follows:

1. The relation between User tables and Forum tables is a Redundant Relationship with many cardinalities. Users (members) participate in many forums, and many forums can be followed by many Users (many to many), one user (Administrator) can create many forums and many forums are made by one user (Administrator) (one to many).

2. Relationship between Forum tables and tables Topics with the cardinality of one forum have many topics and many topics can be owned by one forum (one to many).

3. Relationship between tables Topics and tables Text Topics with cardinality of one topic has many Topics and many texts Topic topics can be owned by one topic (one to many).

4. Relationship between tables Text topics and tables Answer with one cardinality The topic text has one Answer and one Answer can be owned by one Text topic (one to one).

Relationship between table User (Operator) and table Answer with cardinality of one User (Operator) can answer many Answers and many Answers can be answered by one User (Operator) (one to many). See picture 3 below.
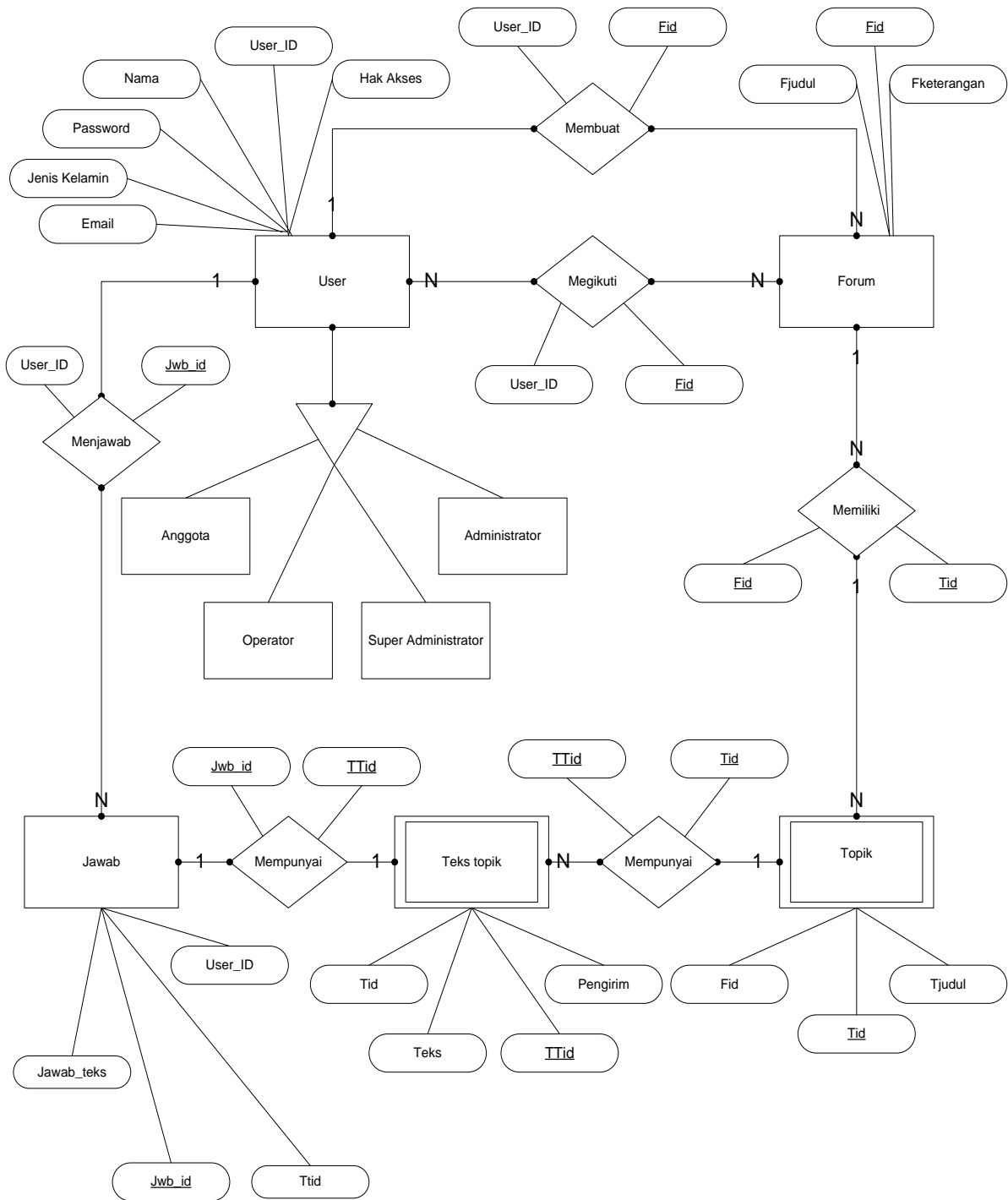
Figure 3. *Entity Connection Diagram*

IV. CONCLUSION

Conclusions that can be taken as a whole from the making on the web of the potential of city or provincial natural resources based on geographical information system (GIS) are as follows: This web can publish natural potential in the city or province. In this application, it can present detailed information on the geographical location of the city or province's natural resources, for example, the city of Singaraja. And this application can increase the popularity of tourism areas in cities or provinces, for example, the city of Singaraja in the province of Bali.

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