



## Model Development Based on GIS: Culinary Tourism in East Luwu Regency

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### **Abstract**

The rapid development of technology makes human needs for information about tourist attractions require the availability of appropriate information systems, therefore the geographic information system of culinary attractions is developed to help tourists. This study aims to design a website to help tourists find culinary tourism in East Luwu Regency. System or GIS website that has been made, is tested first to see if there are still errors or need to be repaired and then implemented by uploading a file to a place (hosting) so that it can be accessed easily by anyone. The result is that the Website is used by users to successfully display a map of the distribution of culinary attractions, display culinary tourism categories in East Luwu Regency, display lists and general information of each culinary tourism object by category, and see the route of tourist attractions.

**Keywords:** *Tourism; Traditional Food; Culinary; GIS*

### **Introduction**

The importance of the relationship between food and tourism cannot be ignored. Each destination has different levels of attraction that can attract tourists from various countries (Hall & Gössling, 2016). Besides food, authenticity can indeed attract visitors to the destination. On the other hand, destinations use food as the main attraction. That is why some countries develop their destination marketing strategies by focusing on food. Therefore, culinary destination marketers need to know the perception of target consumers about destination culinary and how to influence their intention to visit through an effective marketing strategy.

Hobsbawm and Ranger (1983) argue that dishes that are very well known for their taste and quality can be developed into tourist products. For example, Italian cuisine and wine have driven the Italian tourism industry (Hjalager & Corigliano, 2000).

Besides the potential of the tourist attraction area owned by East Luwu Regency, culinary tourism can be an alternative in developing the tourism industry. Culinary tours lately are increasingly popular with tourists. Not only because it was popularized by various shows produced by almost all private TV stations. A variety of food menus, especially regional specialties, are excellent. Even menus that were previously rare or never known, suddenly become a food menu sought by many people. This is an opportunity to develop culinary tourism in Indonesia because Indonesia has a variety of foods and drinks.

Culinary tourism is an alternative in supporting tourism potential nature, cultural tourism, historical tourism, and marine tourism. This culinary tour becomes part of the types of tours that exist because it is not complete if tourists are not trying culinary specialties in the area (Wijaya, 2016). Although culinary tourism is often considered as a complementary tourism product, potential culinary tourism to be developed because tourists who come are usually interested in trying the specialties of the area (Hornig & Tsai, 2010; Silkes et al., 2013).

The internet as a means of spreading advertisements and promotions has many advantages compared to other mass media. Internet media with a broad nature and are not limited by space and time cause the internet to be the main alternative in the dissemination of local cultural content (Connell, 2013). The internet provides complex facilities in the marketing world of a product, ranging from specific target consumers, special messages, interactive capabilities, access to information, creativity, wide exposure, and competence, (Morrison, 2010).

The main advantage of using the internet as advertising media is its very effective ability to target its target consumers (Coulter, 2012). In consumers of cultural advertising through the internet media are tourists both at home and abroad with specific criteria tourists who like the local cultures of a community. The way the internet media works is by providing all local cultural content to then be visited by anyone who likes it.

Hardiningrum (2014) in his research entitled Information System for determining culinary tourism locations in Kudus, web-based said that this system is a system created to facilitate domestic tourists or foreign tourists to find out where the location of typical culinary locations of Kudus. The system is expected to increase domestic tourists or out-of-town tourists, time efficiency in searching culinary locations, SIG uses computer technology to enter, store, examine, integrate, manipulate and display information in a geographical area related to the position on the surface of the earth.

Kusumawardani (2013) conducted a study aimed at developing a tourism information system application that can provide information about the location of attractions and their supporting facilities in Malang regency. The results of this study are tourism information systems that can run on Website tools. Lack of applications that have been built cannot track the position and distance of tourists to tourist attractions.

Santoso et al., (2014), conducted a study aimed at building a decision support system application for determining DKI Jakarta tourist destinations using the Web-based AHP method. The results of this study in the form of advice about suitable tourist destinations for tourists viewed from the priority distance and price to tourist attractions. The application developed is not based on the Website. Poor website development and less optimal tourism marketing strategies were also found in research (Kristina & Haryono, 2015; Syaiful & Hsieh, 2016).

For the community, a good culinary tourism information system is very much needed, therefore we need a web-based culinary tourism information system application design in East Luwu Regency with good specifications that is in addition to displaying information about culinary places there must also be other components including searching, categorizing places culinary to differentiate maps by using google map to find out the culinary places in detail, user ratings to provide ratings or appreciation for the place and food and customer registration that has been provided.

East Luwu Regency has a very complete culinary archipelago with local flavors, there are several mainstay menus from the people of East Luwu Regency such as kapurung, dange, barobbo, pacco, lawa, dengen juice, Winalu botini, olo flower, dapa opudi, winalu meti, gami kolame, pewo, winalu, binalo, wokeno, and pongasi. All these traditional foods are expected to build an integrated culinary network so

that every tourist who comes can enjoy traditional culinary delicacies in East Luwu. The purpose of this study is to design a Website to help tourists find culinary tourism in East Luwu Regency.

## Methods

This research uses a qualitative approach. This research used two types of data, namely secondary data and primary data. Secondary data were obtained from the Government of East Luwu Regency, the East Luwu Regency Tourism Office, the Industry & Trade Office and the Central Bureau of Statistics. Primary data were obtained by directly interviewing residents, traders, cultural and food entrepreneurs in East Luwu Regency and tourists in tourist destinations in East Luwu Regency. The tools in this study include Laptops, Google Maps for processing and analysis of GIS, GPS Garmin 60CSX to determine the position of coordinates at the time of field observation, Spatial Data namely administrative maps of East Luwu Regency.

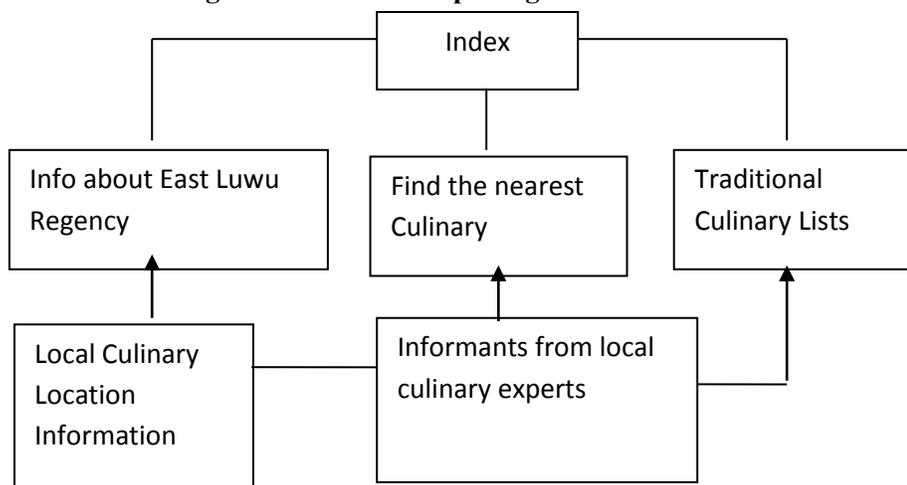
The determination of the informants of this research are the owners of traditional food stalls, and related agencies which are key informants or key informants in obtaining data and information in completing this research, besides that researchers also determine supporting informants such as culinary lovers and local tourists who aim to add data and information needed. Through in-depth qualitative interviews (in-depth interview), researchers were able to obtain specific data regarding the focus of research in this regard related to the Development of GIS-based tourism management in East Luwu Regency. The research was conducted from April-July 2019 in East Luwu Regency.

## Results

### Interface Design

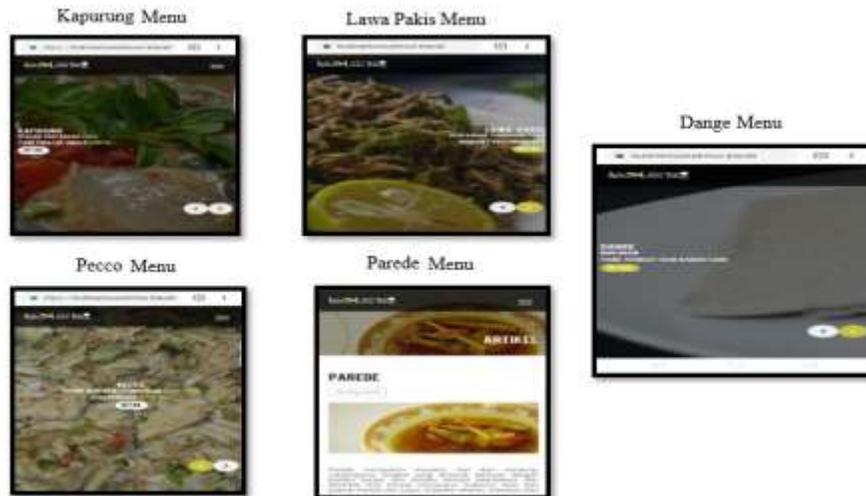
Interface design is a process of describing how a system interface is formed. The GIS application user interface for culinary attractions in East Luwu Regency is divided into 2 parts, namely the web system user interface and the Website application user interface. The interface or better known as the user interface is a medium that connects humans and computers to interact with each other. Before designing the interface of all forms on the Website, then to make it easier to design will be explained in advance the menu structure or site map of the system. The design of the user site map can be seen in the image below.

**Figure 1. Site user map design and information sources**



*Description of Findings Local Menu Available on Website Pages*

**Figure 2. Display menus on the Website**



The GIS application user interface for culinary attractions in East Luwu Regency is divided into 2 parts, namely the web system user interface and the Website application user interface. The interface or better known as the user interface is a medium that connects humans and computers to interact with each other. Before designing the interface of all forms on the Website, then to make it easier to design will be explained in advance the menu structure or site map of the system.

In this traditional cuisine, pouring boiling water on aci sago provides information that the people of East Luwu are very knowledgeable people with simple technology. Because the process of cooking with hot water is high knowledge because it takes into account the level of maturity to size. As for the processed sago, half wet (dry) by burning is a traditional technological innovation that is also quite a high level of knowledge. This illustrates that the East Luwu community is a society that has a high level of intelligence in processing sago.

Sago, which is processed into good food, kapurung, dange, lany, ongol-ongol, and cendol are cultural activities that have been passed on from their ancestors to the current generation. The habit of processing sago is a tradition that is spoken verbally from generation to generation to the present. this condition makes sago-producing communities (tribes) have a very high level of knowledge and utilization. Luwu community's staple food besides rice. In ancient times, lime or there is also called a bugalu / pogalu is preferred over rice (rice). Kapurung or bugalu is made from sago material that has been watered with hot water. The shape resembles a gel, printed in small round shapes (Anwar, 2006).

To get sago, Luwu people usually do Massambe. Massambe is a process of processing sago starting from processing raw materials (sago which is still in the form of stems) into sago which is ready to be processed into various types of food (Anwar, 2006: 240). Once smooth, the sago is then doused with boiling water slowly while stirring until it is thick enough, like porridge. This method is the one who does it is not very advanced, it usually doesn't become (very runny) Because the usual way to use both sago is put into a container and cooked in my rice cooker or stove continue to stir until the thickness is sufficient. After the sago is thick, then removed and made dots using bamboo stems or other tools whose length is about 20 cm. the two ends of the stalk are put into Pogalu sago porridge or lime then rotate to form a circle and put directly into a container that has been filled with cold water that has been previously boiled.

Sometimes the water used is the vegetable sauce, fish, shrimp or meat that has been cooled (Anwar, 2006). Furthermore, after this circle has been finished, only add side dishes that function as flavor such as vegetables, fish, shrimp, meat and so on. Some vegetables that are often mixed with lime are spinach, vegetable nails, water spinach, and banana hearts. In the presentation, several regions in Luwu are also different, some immediately mix it all up and some divide their side dishes (such as in the Masamba area).

Based on the results of the interview confirmed that the process of making lime in almost every region in Indonesia is the same as only side dishes to eat lime is different. This is considered reasonable because kapurung itself is not a native plant of Luwu but a plant originating from Maluku which was spread during the kingdom.

Lawa Pakis is a typical food most commonly found in East Luwu Regency. The main ingredients are vegetable ferns, grated coconut, Lombok seeds, kaffir lime, shrimp paste, and salt. There are also mixed with seashells. So, the boiled fern is half cooked, mixed with the shells that are done. Then grated coconut is stirred and pounded with chili, salt, lime, and flavoring and added a little coconut milk (Purnamai, 2014).

Lawa has a high protein value and is believed to increase stamina for men. Lawa Pakis is a mainstay menu that is never absent brought when East Luwu people do family recreation/picnics. Besides its good taste, this vegetable is also believed to have good vitamin content for the human body. Another typical menu of East Luwu Regency is Pacco, this food is made from Tembang fish or Carede fish. The method is to separate the fish meat from the bones and then crushed and shaped like a ball and mixed with vinegar, coconut fried, chili sauce, lime, plus banana heart vegetables. It tastes sour, savory and spicy. How to make and eat it is similar to making sushi. This dish is usually brought to the guest of honor (Alamsyah et al, 2013).

It is known that the PUFA (polyunsaturated fatty acid) content in this dish is quite high at around 4 g / 100 g. As is well known, one type of PUFA that is widely found in marine fish is omega-3. Omega 3 is one of the essential nutrients, meaning that our body cannot produce itself so it needs to be taken from outside (Bays, 2006). About the benefits, omega 3 has many benefits for the body ranging from brain development in children, anti-inflammatory, to reduce aging cognitive functions, and much more. Pacco is usually served with dange, processed food from sago that resembles rectangular dry bread.

Parede is a dish made from milkfish, Cakalang or cob cooked with soups with turmeric, and other seasonings (Marselinus et al., 2015). Parede comes from the word Parede, Pa shows the verb in the form of cooking activities, and rede comes from the Luwu Bugis language which means to boil. Allegedly this food has existed since the era of the kingdom of Luwu appeared at the beginning of the XVII century during the reign of Patipasaung where the royal center was moved to Wara (now better known as Palopo). Luwu Kingdom is the oldest kingdom in South Sulawesi, this is based on the oldest written source that mentions Luwu in a text known as Sure 'Galigo. The Luwu Kingdom is thought to have arisen around the X century AD during the reign of Batara Guru who was also considered the first human in the Luwu (ancient Buginese) beliefs.

The specialty of parede is the clear, pale yellow sauce with balanced sour-spicy taste. The sour taste has a distinctive spectrum due to the use of Patikala acid and the grater or thin strips of young mango. Patikala acid is also "responsible" for the amazing aromatic aroma that emanates from this dish. All of our senses work to appreciate this simple dish. Based on the interview results explained that the parede consists of two namely fish parede and meat parede. Parede fish can be consumed every day because the price of raw materials is cheap while meat parede is made only when there are certain events such as parties. Parede is cooked almost the same as making cooked fish in general, except that parede is added with patikala which is an endemic fruit that grows in East Luwu Regency.

Parede is a fresh and sour fish dish, at a glance similar to Pallumara. The specialty of parede lies in the pale yellow clear sauce with a balanced spicy and sour taste. Generally, use fresh sea fish such as snapper and lamuru, although there are also people using milk fish. Tamarind soup is produced from pattikala/kecombrang which is a typical plant in Palopo city.

Dange is a traditional Bugis food or cake, especially in the Luwu region. This cake is very popular in the Luwu community, so it becomes a daily meal. Usually, this traditional cake is served during family events or tudang sipulung (suave). Dange is rich in carbohydrates and is a traditional food that has been known several centuries ago. The sugar content is lower than rice is very good for diabetics (Purnamai, 2014).

The dange in East Luwu Regency is different from the dange in Pangkep Regency. Dange in East Luwu Regency is rectangular and flat. Only about 1 cm thick, to eat this food usually with fish sauce and chili sauce. Dange is made from sago flour that has been sifted and put into molds then burned, dange is better eaten while still hot because of its softer texture. when it's cold the dange texture will turn harder. Dange from sago is very rich in carbohydrates. Sago is a staple food for Indonesian people in Sulawesi and other Eastern Indonesian regions such as Papua. Sago foods that contain carbohydrates with very low sugar levels compared to rice. Therefore, sago is often consumed by diabetics as a substitute for rice which has very high sugar levels. Dange is very delicious when eaten with Lawa 'and Pacco'.

Dange feels bland and a bit hard. Generally, the way to eat this dange is by dipping it first in a bowl of fish soup, but don't dip it for too long because the dange can be destroyed. In addition to fish soup, dange is also widely eaten with vegetables. Dange is also a food that is durable and does not stale quickly so it is often used as provisions by the fishermen.

Based on interviews it was confirmed that the types of dange found in East Luwu Regency were different from those in Pangkep Regency. This difference can be seen in the use of raw materials for sago and glutinous rice. This difference in raw material also certainly affects the taste. Dange in East Luwu Regency is thinner and elongated when it is served with Parede, Kapurung, and Lawa Pakis.

**Figure 3. Account settings on the website**



The home page image displays menu features, news, location maps, articles, galleries, and user logins. It also comes with an email address and the address of the website creation office. The account settings page is a page to change the settings owned by the admin. Select the location starts by activating the internet and GPS, after that the user selects or accesses the menu select the location then the system displays a map with a marker of all the location data objects that have been stored in the database.

### *System Testing Stages*

**Table 1. Testing System Black-Box on System Web for Admin**

<b>Scenario</b>	<b>Test Case</b>	<b>Hope</b>	<b>Results</b>
Page button Main Menu	The user chooses the button on the menu page main	System moved to next page	successful
Nearby Cuisine	The user selects the button "5 culinary nearby"	Showing 5 culinary delights The closest of the location of the user are on	successful
Search Name Culinary	Enter name Culinary	Showing list culinary corresponding said key	successful
Culinary list	Push the button "Culinary list"	Showing all list of culinary specialties is there is in the city of Solo	successful
Culinary location	The user chooses culinary	Showing list culinary location	successful
Culinary description	The user chooses culinary	Showing description Culinary	successful
instructions directions	Push the button "Direction" on Culinary	Showing instructions road to location culinary	successful
Application instructions	Push the button application instructions	Showing instructions use of the application	successful

At this stage, after the system or webGIS is finished, it will be tested first to see if there are still errors or need to be repaired then just apply it by uploading a file to a place (hosting) so that it can be accessed easily by anyone. Black box testing is done by the author to show whether the application can run well. Black box testing shows the main function of the software that focuses on the functionality of the device being tested (Mustaqbal et al., 2015).

The use of Geographic Information Systems (GIS) in tourism research is still very little done even though GIS technology has been discussed in the literature tourism over the past decade (Bahaire & Elliott-White, 1999). This technology has been used in research related to ecotourism planning (Bunruamkaew & Murayama, 2011; Mobaraki et al., 2014; Rahayuningsih et al., 2016) visual resource management and management, identification of suitable locations, and even have been used in applications related to tourism marketing.

## **Conclusion**

The geographic information system of culinary tourism objects based on Geographic Information Systems (GIS) in East Luwu Regency was built based on Websites. The web-based system used by the admin succeeded in doing data processing such as adding data on culinary attractions, changing data on tourist attractions, seeing data on tourist attractions and deleting data on tourist attractions. Meanwhile, the Website application used by users succeeded in displaying the distribution map of culinary attractions, displaying culinary tourism categories in East Luwu Regency, displaying lists and general information of each culinary tourism object by category, and seeing the route of the tourist attraction.

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