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Improving Batik and Dropship SMEs Market through Geographic Information System

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Abstract : The information providing about dropship, Small and Mid- size enterprise (SMEs), in Pekalongan city recently is done by brochure, banner and social media. Nevertheless, other than social media, the promotion media is possible to be seen when visitor is on the spot. The research is aimed at supporting the troubleshooting matters by adapting the Geographic Information System (GIS) in mapping about Batik SMEs dropship in Pekalongan city. The web based GIS will ease the market player, tourists or visitors as well as the society to get such information about dropship, SME centre and Batik market. The providing of web based GIS in informing the dropship, SME centre and Batik market in Pekalongan city is expected to give positive impact to Batik businessmen and to improve the economic rate in Pekalongan city.

1. Background

Pekalongan City [1] is on the main route of the North Coast of Java (pantura) that connects various cities in the island of Java. Many vehicles transit or stop over in Pekalongan City hence it has the potential to make Pekalongan City as a business city. SMEs Batik in Pekalongan City is growing rapidly with various Models, Motives and various marketing methods. SMEs Batik centres are scattered in several sub-district locations. The production happen in aJmost all districts, there are even some batik villages in Pekalongan such as Kauman Batik Village, Pesindon Batik Village and Banyurip Batik Village. For the marketing of SMEs Batik in the Wholesale Markets Batik Setono.

By the development of information technology, the ways of transactions are developing. In recent years, the drop-ship system is used in online selling[2]. The drop ship system is well-developed in the city of Pekalongan especially in the southern part or South Pekalongan district. The Buaran Batik Center (BBC) shopping area and several shops nearby have declared themselves as Drop Ship and Reseller of Batik. Since the development is quite rapid and busy doing transactions, researchers are eager to map out drop-ship [3] and SMEs batik as a supporter of existing drop ship activities, besides that researchers mean to determine the value of drop ship transactions. The Drop-ship marketing area was initiated by the batik SME community themselves without the support of. Research on drop-ship in the city of Pekalongan is still limited or not even there yet. Drop ship phenomena existed such an icebergs appear only at the top.

Data retrieval was done on location by visiting objects in the field and with the help of some application software to map the object under study in addition, researchers also to data from Trade and Cooperation Officials Department of SMEs in Pekalongan City, as well as existing literature studies. Data is analysed and processed to be entered into MySql database to be presented in the form of a mapping website. This mapping can later be used as a study by relevant agencies in carrying out Batik marketing improvements in Pekalongan.

The Question of the Research is about Marketing or sales with this drop ship method is new, especially for batik products, most of the young people are still not spread evenly, thus How is the distribution of batik drop ship and SMEs in Pekalongan City and some of the prospects of trading using the drop ship method ?

The objective of this study is to make the application of the Geographic Information System for Drop Ship Distribution and SMEs Batik in Pekalongan city and the prospect of trading using the drop ship method among SMEs Batik. The benefits to be achieved in this study, is to facilitate tourists and the public society to obtain information about the Mapping of Batik and Drop Ship of SME centres in Pekalongan City accurately and facilitate related parties and managers of SME and drop ship mapping centres.

2. Literature Review

2.1 Dropship

The dropship scheme emerged because of the social commerce [4]., [2] stated that social commerce is a form of evolution from the e-commerce. If in the past transactions could be observed directly, now it is not visibly seen that there is an economic transaction somewhere. One of them is a sales scheme using dropship.[5]. Dropshipper (intermediary seller and buyer) [6] but they don't own the goods being sold, so their job is only to find consumers, then report orders to suppliers. After that the supplier will send it to the consumer, and the dropshipper gets a commission.

2.2 Geographic Information System

Geographic Information System [7] is defined as a computer-based system that has the ability to handle geographically referenced data that includes data entry, data management (storage and retrieval), data manipulation and analysis, as well as output as the final result (output). The final result (output) can be used as a reference in making decisions on issues related to geography.

2.3 SMEs

Micro, Small ands Medium Enterprises (MSMEs)[8] have a strategic role, because apart from playing a role in economic growth and employment, it also play a role in the distribution of development outcomes. Micro, Small and Medium Enterprises (MSMEs) have proven to be more resilient in facing the crisis. Nevertheless there are also weaknesses of MSMEs, that is the difficulty in accessing especially in capital and marketing. MSMEs have a fairly large market share in the international world, but consumers are not yet widely known. Batik is a cultural heritage of the Indonesian nation, almost every region in Indonesia has its own art and batik motifs. Pekalongan is one such of that, which has the characteristics of Pekalongan batik. The problems faced by MSE Batik Pekalongan are due to constraints on marketing and limited human resources.

3. Research Method

This section describes the case study, data collection and development of the GIS. Case Study Stages in the research used include understanding the problem. At this stage, to understand the problems faced by conducting interviews directly with speakers related to SMEs Batik, the Marketing Place and Drop-ship.

3.1. Data Collection

Data sources consist of primary data and secondary data. Primary data is data obtained by research hers directly in the field or in research objects, while secondary data is data obtained by researchers from existing sources. The methods used in this study include: a. Observation, namely data collection techniques done by recording the various phenomena that occur (the circumstances), b. Interview, which is a data collection technique that is done through direct interviews with respondents who experienced the incident, c. Sampling, which is a data collection technique that is done by taking a number of examples such as the Location or Production Center of Batik in Pekalongan (Kampung Batik), Location of Batik Marketing in Pekalongan City and Drop ship Locations in Pekalongan.

In researching data and information about SMEs Batik, Marketing Place and Drop ship, while for spatial data taken using the GPS Application on the Smartphone and non-Spatial data taken directly from observations in the field. Data collected in the form of photos and supporting information from various sources then processed.

3.2. Deployments of GIS for SMEs

MySQL is a Relational Database Management System (RDBMS) that is distributed free of charge under the GPL (General Public License). Where everyone is free to use MySQL, but may not be used as a derivative product that is commercial. MySQL is a derivative of one of the main concepts in the database for a long time, namely SQL (Structured Query Language). SQL is a database operating concept [9] for selecting or selection and entering data, which allows data operations to be done easily.

At this stage, a proposed system will be designed based on a system analysis that has been done by making a user interface design that suits the needs of the system to be made. Stages of modeling design in geographic information systems using Unified Modeling Language (UML) [10] [11].[12].

Use Case Diagrams explain the relationship or interaction between systems and actors. Use Case can be spelled out that the user can see SME Mapping, Marketing Place, Drop-ship, Location reading news and commenting. The System Design is reflected in the Drop-ship Business Use Case Diagram as the following:

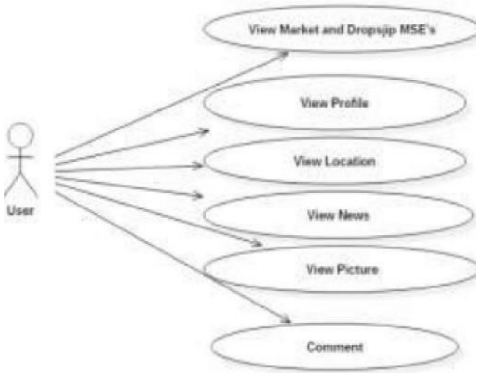


Fig.1. Use Case Diagram

The Drop ship Business Use Case diagram explains the system flow chart between the user and admin in an application that is made where the admin carries out his activities in Drop-ship business data management, file management, print reports while the user can view the distribution of assets, profiles, galleries, news and download files. Based on the data that has been processed will produce data and information on the spread of the Drop-ship business in Pekalongan City that can be seen by the user.

Activity Diagram is a diagram describing various activities that can be done by the system [13] [14]. Example Activity diagram for Admin login on the website system created, shown in the following figure:

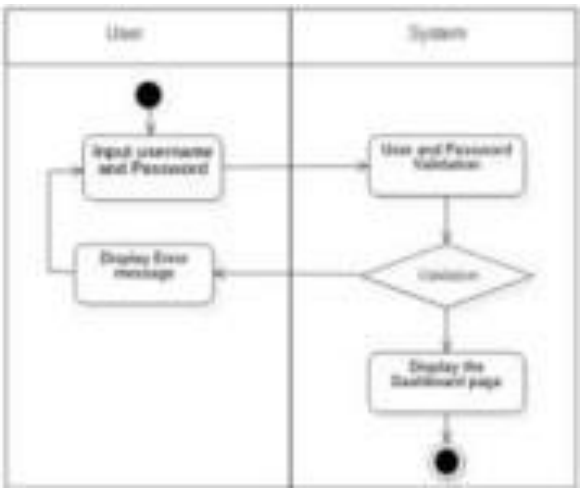


Fig.2. Activity Diagram

Admin Login Activity can be spelled out that the Admin activates the application to log in as Admin, by entering the Username and Password, If the Username and Password is incorrect the message appears Username and Password is Wrong and Repeat to fill in the username and password again. If true, you will enter as Administrator and the Dashboard menu will appear. Choose options according to your needs.

3.3. Polygon Curve

Closed polygons are the starting and ending points at one. This polygon is the most preferred polygon and the most widely used in the field because it does not require many binding points which are difficult to find in the field. Nevertheless, the results are quite appropriate. Closed polygon figure are as follows :

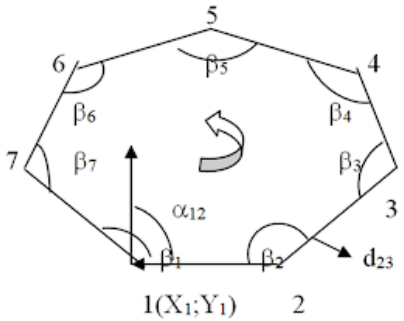


Fig. 3. Inner angle closed polygon/inner beta

The formula of this inner angle closed polygon is : (n – 2) x 180°

Figure Details :

b	=	measure of angle
a12	=	intial azimuth
$X_1;Y_1$	=	A point coordinate
n	=	amount of angle points
d_{23}	=	distance between point 2 and point 3

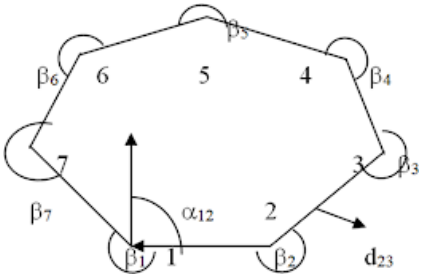


Fig. 4. closed poygon outer corner/ outer beta

The formula of this closed polygon outer corner is: (n + 2) x 180°

Figure Details:

- b = measure of angle.
- a12 = initial azimut.
- n = amount of angle points.
- d_{23} = distance between point 2 and point 3.

Because of its closed shape, it will form a polygon or n-sided, where n is the number of points of the polygon. Therefore, the geometric conditions of a closed polygon are :

1. angle conditions :
   ß = (n-2) . 180^{O}, for an inner angle / inner beta
   ß = (n+2) . 180^{O}, for an outer corner / outer beta

2. Abscission requirements

The calculation procedure is the same as the calculation procedure for perfectly bound polygons. In unilateral bound polygons and unbound open polygons, these geometric conditions do not apply here. This results in a very weak position due to the absence of measurement control and calculation control. Thus it is best to avoid this kind of polygon. The position of the polygon points determined by calculating their coordinates that is called a numerical solution or a polygon count.

The Frame work of Thinking is as the following:

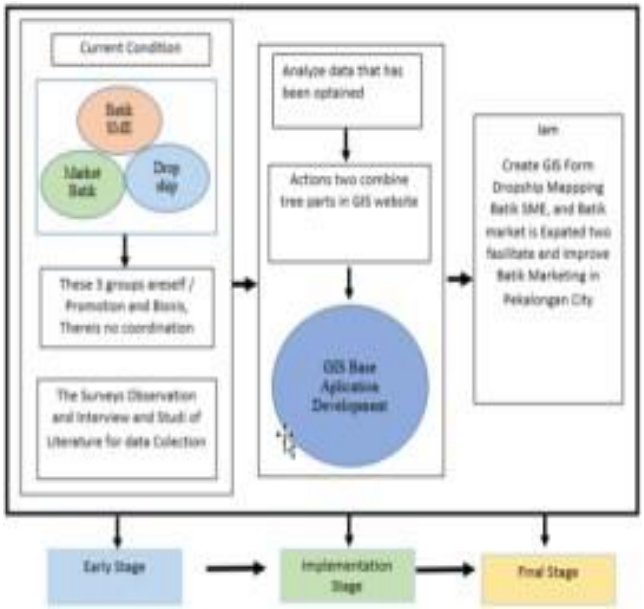


Fig.5. Framework of Thinking

3.4. Review of Hybrid Cryptographic Approaches

Drop ship [16][17] [18] or commonly referred to as drop shipper is a way of trading where the retailer of goods or reseller does not have to have their own stock of goods [19] . Drop shipper only promotes goods, if there are consumers who will buy goods at the drop shipper, the drop shipper will order the items ordered for those who have the goods. With the drop shipper it can help the SMEs Batik in the field of promotion, marketing and sales at the company. Profits can be obtained from the price agreement between the producer or Supplier and Drop shipper. With the drop shipper involve in the company not only will greatly assist the company in terms of marketing and sales but there also been a constraint concerning the difficulty that is the slow respond in obtaining information about the Batik in the SMEs. The slow respond resulting a delay in the sales process to consumers.

The impact of the late sales process between the drop shipper and the consumer is the dissatisfaction from the consumer: I. Drop Shipper makes a joint venture with the producer (supplier of goods) about the mechanism of buying and selling, 2. Drop Shipper promotes product sales using websites or social media (including address and contact person), 3. Buyers who are interested in making a copy transaction will contact the drop shipper to make payment, 4.Transactions and payment processes carried out by the drop shipper to suppliers of goods by giving discounts based on existing agreements, 5. The supplier of goods then will deliver the goods to the party purchaser.

Some advantages [16] sales with drop ship schemes are: I. Drop Shipper does not require a large initial capital, most importantly, has a lot of relationships and friends so that it can expand the market, 2. Delivery is done directly by the supplier to the buyer 's address with the name of the sender, namely the name of the drop shipper, 3. Can be done anywhere and anytime for 24 hours, 4. Does not require large operational costs because it only uses internet data or a large room, 5. Various types of products.

Some disadvantages [16] for drop ship are: I. A drop shipper gets relatively small profits because he usually takes a small profit margin so that he can still compete with others, 2. Item stock information is less up to date because usually a drop shipper depends on suppliers for stock items, 3. Information regarding the quality of goods sometimes does not match the existing product, 4. Control over the process of shipping risk -prone because the delivery of goods carried out by suppliers.

Community empowerment in the people's economy really needs to be the common concern, especially in today's period of time, where people are increasingly demanded to actively play a role and work harder to meet their daily needs. Small and Medium Enterprises [8] are business activities that are in great demand after the economic crisis that has resulted in layoffs on large companies. Support the SMEs sector provides employment opportunities for those who are not absorbed in the world of work and mid-sized companies and large. The concept of SMEs is very different from one country to another. SMEs [20] in Indonesia has received attention and fostered by creating a portfolio of ministries namely the Ministry of Cooperatives and SMEs. With the presence of a ministry that deals specifically with the field of SMEs, it is expected that SMEs in Indonesia will develop and be in demand by most of the Indonesian workforce.

GIS is a system that presents data and location information based on mapping *[21]*. This G[S application is usually applied in activities for planning, implementing, and controlling relating to

geographic areas. The parts in making GIS *[22]* include:

a. Software, The software used is a GIS software, (GIS Arclnfo) as well as Operating System and other database software (Oracle). As for the software are: Tools to input and change the geographic information, DBMS), and supporting tools for geographic questions, analyze and describe the GU[(Graphical User interface).
b. Hardware, Computer hardware is used to support the operation of GIS and other supporting hardware components including plotter, printer, scanner and digitizer.
c. Human resources. The human resources needed to operate GIS are programmers, analysts, system design and others.
d. Data, The data used will determine the quality of information produced including spatial reference systems (coordinate and datum systems). So that the GIS produced is useful, valid and up to date.
e. Method, The method is a method used in building an application in GIS. The success of the application used also depends on the planning, design, methods, testing and application used.

GIS *[22] [23][24]* is used in determining the decisions on the planning process so that the process of decision making will be easier in the analysis of existing data using GIS. GIS applications that will be used include: a. GIS in the form of roads: location (address), traffics, location analysis and evacuation, b. GIS-based Zoning: forest, land, public areas, recreational areas and other, c. GIS based on land parcels: territorial division, land registration, taxation, land allocation/land search and others.

4. Result and Discussion

In the process of data collection that was done in this research by conducting interviews with Drop ship business which is in the town of Pekalongan and by conducting a survey to the field to retrieve the data location and Drop ship business in the city of Pekalongan. Documenting Drop ship done by going to the site to take pictures along with inserting layout Drop ship based on latitude and longitude in each business by means of auxiliary Coordinator.

The analysis phase consists of identifying problems and identifying needs. After the data collection activities are carried out, the next step is to identify the prob le m. As for the identification of existing problems, namely the existence of a number of Drop ship businesses that do not have an information board as an indication of existing infom1ation, making it difficult to carry out an inventory, not all Drop ship businesses are well-documented and complete, there are several Drop ship businesses that have switched status but have not done data policing overall.

Activity identification needs are carried out to determine the functional requirements and non-functional requirements of the application. Based on the identification of existing problems, the functional requirements of the system are as follows: a. The application can manage (add, edit, delete) Drop ship business data in the Pekalongan city area, b. The application can manage Drop ship business reports, c. Application can manage the distribution of Drop ship business distribution in Pekalongan city area based on certain criteria, d. The application has an authentication page (user login page), e. Application can manage Drop ship businesses owned by the city of Pekalongan, f. The application can be run on a smartphone by visiting the available page, g. Based on the problem and the identification of the problem carried out , it is necessary to make a GIS Web-based Drop ship business.

The design phase is carried out as a guide in the creation of a web-based system. At this stage will be determined user authority, database design, design interface. Following is the User Authority Design:

Table 1. User Authority Design

No.	User	Authority
1	Admin	Manage Asset Types Manage Disclosure Managing the Village Manage Account Manage Galleries Manage Info at a Glance Manage Downloads Manage Reports
2	User	Know the location of the asset Knowing Asset Distribution Downloading Files

The Interface Design are as the following



Fig. 6 . Location Map in Satellite Form

Figure 6 displaying the dropship and reseller location in sa tell ite mode in Pekalongan city that

located in Gatot Subroto street, Pelita street and Suprapto street. The dropship and reseller center that located in B C (Buaran Batik Center)

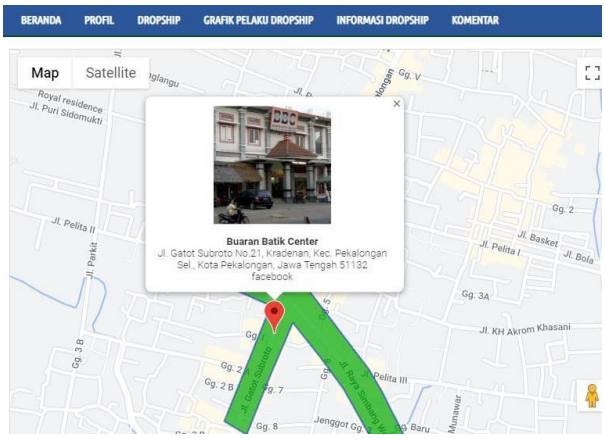
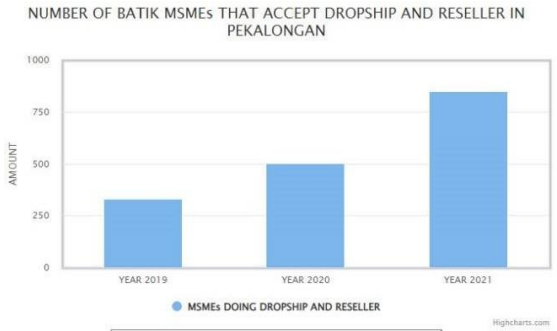


Fig.7. Map of Dropship location and Reseller Center Locations

Figure 7 displaying the map mode of dropship and reseller center in Pekalongan



YEAR	NUMBER OF DROPSHIP AND RESELLER
2019	330
2020	503
2021	850

Fig. 8. Graphic Number of Dropship and Reseller Stores

Figure 8 displaying the number of dropshipper and reseller in 2021. The amount is growing rapidly.

5. Conclusion, Limitations and Suggestions

5.1 Conclusion

GIS Drop-ship business generated based on analysis and utilization has been in line with expectations and has become one of the solutions to find out the distribution and inventory of Drop ship businesses as a step to develop business and increase PAD in Pekalongan city. The system test results show that the unit or functions of functional requirements are running well, so that the objectives and expected benefits of the application have been met.

5.2 Limitation

This research has several limitations. The research case study SMEs Dropship in Pekalongnan City. As for the data, the data presented and processed are the data for SMEs Dropship year of 2019, 2020 amd 2021.

5.3 Suggestion

The existing Geographic Information System (GIS) Drop ship web based business for further research can be developed for other types of businesses and can estimate the trade value generated.

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