Visualization Model of SMEs Telematics Services Potentialy Map in Indonesia

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***Abstract*—Telematicsis study is a priority science for Indonesian development. The increasing of Small Medium Enterprises (SMEs) telematics potential is must be supported to have more competitive, especially in facing free trade in Asia in 2015. But there are lot of difficulties in accessing data which are not integrated and cause several department of ministriesare not easy to decide optimality rules to develop the SMEs telematics in Indonesia. One effort to cover this, is prepared a vailable visualization model of SMEs telematics potentialy based upon area, potential business prospect and their obstacles. This model is equipped by a graphic visualization technicque, so it is easy for the ministry to examine some factors of SMEs telematic development in Indonesia. The examination of the model is conducted by using Black Box Testing and Usability Testing by giving Software Usability Management Inventory (SUMI) questionaries that included common people, the IT staffs of Ministry of Industry, of the Ministry of Cooperation and SME practicioners. This portrays that validation model increases into 65 global satisfactions.**

Keywords—Telematics services; SUMI; visualization (*key words****)***

I. INTRODUCTION

Telematic industry has recently change their focus on providing service, and the increasing telematics PDRB grows approximately 18.2% annually [1]. Telematics consumers market is dominated by comunication technology, as amount of 57%, followed by services sector as 20%, hardware (13%) dan software (10%) market sectors. Indonesian participation in bilateral, regional, multilateral and free trade (FTA),seems to have some inmplications in products and services exchanges. There is no barrier in FTA, and it will make national economy dercease if the government is not ready for this situation. Of course it should be some efforts to prepare national telematics industry or to keep the barriers in order to endure a strong flow from abroad.

The exchange condition toward digital communication services was launched as an initiative rule of information society [2]. It is hoped to be a key contributor to get easily in access at every organization or household. The result of the reasearch can show potentiality and competency of national telematics enterprises. The preparations of telematics industry as a national priority industry are the study of telematic enterprises potentiality by optimatimalizing classificatio model of telematics services enterprises [3] and th implementation classification model of Indonesian telematic services enterprises in developing identified enterprises much better than before [4].

The result by using *Multi Sectoral Qualitativ Analysis*(MSQA)portrays that tilled bussiness telematic market focuses on restricted area and is dominated by SMI The practicioners of Indonesian telematics enterprises recentl are more dominated parts of an international group so th products can not be bundling as an Indonesian trademark.Th enpowerment of Indonesian telematics service competitiveness is still needed to go international market [1 The keyword of business development telematics services how ICT capital becomes a catalist for business orientatio development. The researchs identify two differenti orientation services : S*ervices in Support of Product* an *Services in Support of Client Action*. This research found tha an adoption of ICT is held by many enterprises that operate in stability business community, with organizational, financia and the owner readiness, who was in charge in ICT adoptio Social networking play an important role, specifically in sma enterprises with limited resources [5].

Government support to enpower telematics SME hampered by hard to accessing data. The involved ministry very shortage in optimalizazing government rules to force th competitiveness of telematics SME. Actually the da resources are available in National Economics Censu prepared by Statistic Center Bureau (Biro Pusat Statistik/BPS towards practitioners enterprises, included telematics SMI Those resources data are included some details condition involved obstruction, development prospect, and economic comprehensive indicators. Recently those data above are n optimally used, they are only available in tabular whic required a complex process, so it can be complicated t translated for make a decision.

Based upon those details, it was needed to desig Visualization Model of Telematics SME Potentiality Map i Indonesia, which each has potentiality based on digital ma

and comprehensive SME condition. It's hopefully can help the ministry involved to make a decision making to determine some importantfactors in managing a development strategy for competitiveness national telematics SME.

The objective of the research is todesign Visualization Model of Telematics SME Potentiality Map in Indonesia, which completed by important factors to support competitiveness based on area. The modelare used by people who searching an update information and telematics enterprises included its details. Another objective is that authorities such as The Ministry of Information, The Ministry of Industry and all enterprises association as a quide in planning a rule and technique strategy increasing the competitiveness and developing sub sector of national telematics industry.In addition, it is hopefully becomes one of media to support strategic development and increasing competitiveness of telematics SME initially and generally for national telematics industry.

II. CORE COMPETENCIES OF INDONESIAN TELEMATICS INDUSTRIES

The development of telematics enterprises group was tied to the developement of telematics enterprises group which is involve a transaction products of goods form. However the study of national telematics enterprises condition can be conducted by approaching entirely the condition observed of telematics enterprises. The growing information technologymarket in (million US$) 2005 was 1.476, 2006 was 1.683, in 2008 was 1.901, 2009 was 2.724, so it is said that the growing average of information technology market was 15-20% annually. The information technology market in Indonesia is 100% open without any limitations, except taxes and employments and some related terms of information software certification [6].

The telematics enterprises are categorized as : 1) hardware industry; 2) software industry; and 3) telematics industry and non-telematics industry.MultySectoral Qualitative Analysis (MSQA) concludedthe importance of development telematics enterprises in Indonesia. The result becomes a basis to arrange map resource model which one of telematics role model investation. The result of a priority determination of strategic development telematic resources in Indonesia is using Analitical Hierarchy Process (AHP) shows that the strategy of Education Curriculum Development becomes priority. According to potentiality map department in Indonesia, the suggestion curriculum is adjusted to Information Technology Department [7].

Specifically the study of classification telematics enterprises in Indonesia conceal in 3 categories such as Business Services, Communication Services and Education Services [3].The model is gained by studying a classification comparative model using an Delphi's expert acquisition method.The early based development model is MTN.GNS/W/120 document, which involved Indonesian preparing design to be liberalized telematics study. Those studies have a branch that is characterized in details by numbering systematically follows Kelompok Baku Lingkupusaha Indonesia (KBLI).

According to telematics enterprises development group i Indonesia, the most important focus is the programm computer reservation and other speciliazized designsan programmer enterprises in Indonesia are supported internall and externally by the government. Those enterprises are par of creative economicswhich will be priority to develop. Thes Communication Enterprises Groups focus on Programme Computer Reservation and Special Design.

These Educational Enterprises Groups is more important t develop an information course included software, hardwar multimedia, roboticsand*computer networking* [1].It will be rule to predict telematics enterprises employees.

The characteristics of these enterprises can be explored b any formulation strategies based on *clustering*[8]. Based on [9 the telematics study or *Information and Communicatio Technology* (ICT) is full of innovation, however it startegically conducted by clustering any technologies based o the growing pattern involved techology innovation [10]. It hoped that the stakeholders will help to characterize th enterprises groups or any other supporting groups and analyze the innovation process.

III. METHOD

The process of making on-line visualization of the model suitable carried out through the development of a systen known as System Development Life Cycle (SDLC), as show in Fig. 1.

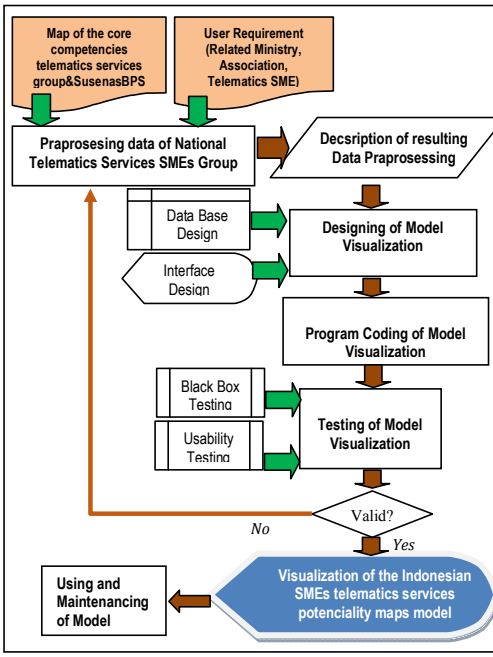

Fig. 1.Stage of designing and constructing visualization model

The process of designing and constructing of a media dissemination in the form of a model visualization potential Indonesian SMEs telematics services area-based On-Line needs to be supported by the development of Internet technology which higher access. Web-based applications (online) can improve the socialization process of a program and was able to increase the added value of the program[11]. The method is supported by in-depth study through field studies, literature studies, brainstorming, in-depth interviews as well by using models of both qualitative and quantitative decisions that have been tested through many related research.

IV. PRAPROCESSING AND DESIGNING

A. The Data Praprocessing

The data of Indonesian SMEs telematics services was based Susenas 2006, which processed for visualization purposes of cover a large data, therefore require steps of data preprocessing. Preprocessing stages can be seen in Fig.2 .Data cleansing is the process of eliminating noise and inconsistent data or data irrelevant.Data integration is do by merging data from multiple databases into a new database. Data selection isprocessing by attribute election, as a results dominant interviews with stakeholders, include: province, county, employer name, business name, type of business services, legal entities, address, amount of capital, constraints, business prospects, revenues, and expenses. The database making is done based on the data that has been selected, using Mysqland visualization models built using Adobe Dreamweaver. Visualization is equipped with *Google Map API* on parts distribution map area-based presentation.

Fig. 2. Stages of Data Praprosessing

B. The Designing

The designing was the stage of making the specification of the program architecture, style, appearance and material requirements / materials for the program. Stage in th designing of this model system was done by using UM approaches, including use case diagrams which can be seen i Fig. 3.

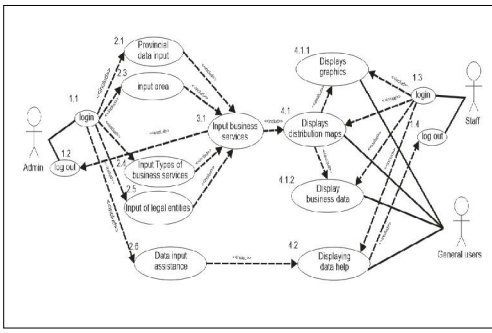

Fig. 3. Use Case Diagram

V. RESULT AND DISCUSSION

This researchwasproducing a model visualization ma potential SMEs telematics service in Indonesia with th discussion is focused on the provinces of Jakarta. The initi view of this visualization was formed of a map of Indonesi which is given a different color in each province to facilita the general users (community) and staff (both of the Industri Ministry or Kemenkominfo) looks at the data business in eac province presented with graphs / percentage .

This visualization models are distinguished by three us access, namely general users / public, general staff an administrators (designated staff from the Industrial Ministry eligible for manipulating data according to Susenas data base On the general user page, there is a map of Indonesian publ users, selection assistance, log in staff and admin login. On th staff page is same with a common user, however the gener user is limited only to look at the chart table of busines services, and legal entities, while the staff can see the enti attribute data. On the admin page, there is a choice hel logout, edit facility data, such as provincial, district, type business services, legal entities, business service administrators, and staff.

A. General Main Page

The main page of the display (Fig. 4), there is a map Indonesia, which has four main menu that isIndones telematics data, helpdesk, admin login and login staff. On th main page staff isdistingushed into the three menus that is th Indonesia telematics data, helpdesk and logout. When th pointer directed to the respective provinces, it will display th name of the province as well as the distribution of SME along with the condition of a comprehensive telematic services on the SMEs.

Fig. 4. Presentation of Main Page

B. Visualization SMEsTelematics Services Model

The display maps found on the main page, for general user and also staff is displaying bar graphs, pie charts and maps the distribution of efforts. For the general user, page chart is shown only chart type of business services, and graphs legal entities.On page staff chart, all the attributes displayed, it is for the institutions needed in facilitating the formulation of policies in accordance, with the conditions of SMEs are visualized in this model. In this model is equipped with a support that can be used to provide information on how to use visualization to general users and staff.

One of examples of a distribution map visualization model SMEs telematics services in Indonesia is shown in DKI Jakarta province.

1. Percentage of Business Type, Constraints, Prospects and Economic Indicators

For the starting page, after selecting DKI Jakarta then the visualization model showing the percentage of SMEs telematics services in Jakarta in the form of pie charts , and presentations of nine other attributes that include things such as shown in Table 1. Sample view in Fig. 5.

TABLE 1.DATA ATRIBUT

No	Kode	Information
1	BU	Enterprises / Legal / Licensing
2	K5	Constraints and Prospects
3	K6A	ever got counseling / education / training
4	K6B	organizers guidance / counseling / training
5	K6C	Type of guidance / counseling / training
6	K8	Condition of Company/business
7	K9	Estimates state of the company's prospects/ future business
8	JM	the amount of capital
9	JP1	The amount of profit
10	JP2	The amount of cost

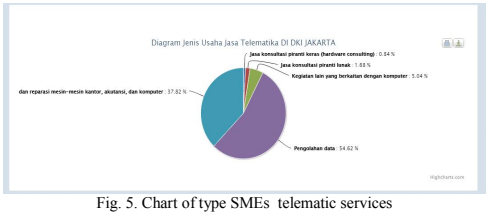

Fig. 5. Chart of type SMEs telematic services

2. Distributions Map

This appearance of distribution map visualizatio modeluses *Google Maps API*, so that users can easily see th distribution of types of services business, and legal entities i each province.*Google Maps API* works with a viewing poi coordinate efforts in the form of latitude and longitude whic are entered by the admin. At this visualization models use decimal degrees coordinate point as input data locatio determination of SME telematics services. Distribution ma was displayed with symbols that are useful to facilitate th distinction type of SME services or legal entity. The followin maps display of the distribution services business, and leg entities which can be seen in Fig. 6 and 7.

C. System Testing

This was a test phase visualization models that have bee implemented by Adobe Dreamweaver and mysql. With th existence of this test, it can be seen the modeldeficiencies, bu it also can be known whether the model is functionin properly or as desired.

Fig.6. Map of the distribution of SMEs telematic services in DKI Jakarta

Fig. 7. Map of the distribution of corporation types

1. Blackbox Testing

Black-box testing performedwas according to software functional requirements. This test allows engineers to use a series of input conditions that is fully on the functional requirements for an application[13].Some descriptions of black-box testing are shown in the notification process that allows users to perform data transactions.

This test also demonstrated specifically by displaying data validation through the examination of the accuracy of the data that has been incorporated into the model. The test is done by comparing the data on the type of business telematics visualization models with manual calculations using Excel. Data types of SMEs telematic services in Jakarta can be seen in Table 2.

2. Usability Test using SUMI Questionnaire

Usability test for the visualization model is done using questionnaire SUMI (sumi.ucc.ie/en) by means of a user survey [14], which aims to measure the quality of usability of the software / application based on user satisfaction [15].This questionnaire consists of 50 statements, which leads to a more positive statement against the system are given a value of 4, 2, and 0 for responses agree, disagree, and absolutely disagree. On the other hand, which leads to more negative statement against the system then rated 0, 2, 4 to responses agree , disagre , and do not know.

SUMI assessment standards must be over 50, if the results of the test produce a value of more than 50, then the user is considered to have been satisfied. This model still requires improvement, so that users can achieve the better level of assessment. Especially in the category of control (score of 53), which shows that users feel difficulty in browsing software, it can be caused by monotonous of the information given in graphical form.Othercategories such as efficiency (score 65.5), affect (score 66.0), helpfulness (score 75.5), and learnability (64.5) shows the level of satisfaction is quite good, although still in need to be revised. Globally, the test results showed a score of 65. The results of tests are using a questionnaire SUMI shown in Fig. 8.

TABLE 2.DATA OF DKI JAKARTA's SMEs TELEMATICS SERVICES

Type of Services SMEs	Total of SMEs
Hardware consulting	1
Software constulting	2
Data processing	65
Maintenance and repair of machines office and computer	45
Other activities related to computers	6
Total	119

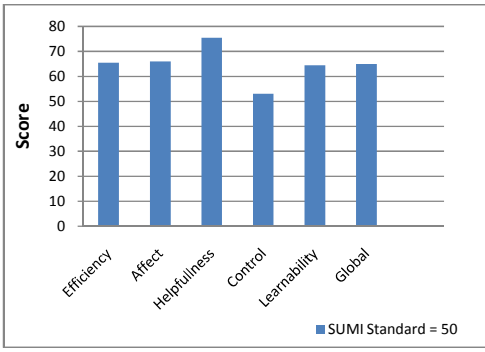

Fig. 8. SUMI test result

VI. CONCLUSION

Model visualization of potential SME's Telematic Services are built using the facility as well as th synchronization of *Google maps api*graphical is still require improvements to the higher level of user satisfaction. Th model can be used to optimize the BPS Susenas data resource in order to assist the stakeholders, especially the Ministry o Industry and the Ministry of Communications and Informatic in the selection policy of empowering SMEs telematic services based on the business prospects condition constraints, as well as the distribution of types of SME Limitations of this study related to the data Susenas 200 which is not up to date, but still prospective becaus SUSENAS by BPS will be held back in 2016, so that thes models can be integrated with real data and has novelty.

ACKNOWLEDGMENT

1. **DP2M DIKTI Educational and Cultural Ministry** as th main sponsor, which gives us Competitive Grants Scheme
2. **Computer Science Department, Mathematics an Natural Science Faculty, Pakuan University,**an **Research Institute Pakuan University**, for supportin coordinating and facilitating to achieve this grants.
3. **Industrial Ministry, Communication & Informatio Ministry, Cooperation and SMEs Ministry an Bandung Technopark** for active participation in th activities of interviews anduser requirement.

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