Knowledge Management System Analysis of Smart Regency Mobile-Apps Service

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***Abstract*—In the Indonesian context, the number of districts is four times the number of cities, so regency development needs serious attention. However, there are still very few studies that explore districts' existence from the perspective of ICT utility governance. This study aims to measure the mobile-based smart regency information system through usability evaluation. The method applies the adoption of the life cycle of the Knowledge Management System (KMSLC). Evaluation of Existing Infrastructure Analysis, Capture Knowledge, Implementing the Knowledge Management (KM) Model, and Evaluation are the stages used. The measures taken include system analysis, application mapping knowledge, implementation results, and usability assessment. The questionnaire was conducted on ten respondents using the mobile-based smart regency application. The questionnaire was conducted in 5 categories: Effectiveness, Efficiency, Control, Support, and Simplicity. Each of 10 questions, so there are 60 questions and three linkers, namely 4 if all agree, 2 if they don't know, and 0 don't agree. The Median SUMI Scale results for the mobile-based Smart Regency application are 60, 62.5, 60, 60, and 57.5. The usability evaluation results above the average mean that the mobile-based smart regency information system's usability is in a good category. This research helps in determining knowledge management in mobile smart regency services. The study also provides insight into the factors affecting the success of knowledge management of smart regency services for application developers and policymakers.**

***Keywords*—knowledge management system, smart regency, mobile apps, software usability measurement inventory (SUMI)**

I. Introduction

Based on the notes on the code and data for the 2020 government administration area, it is noted that the number of districts (415) is four times the number of cities (93)[1], [2]. This shows that development in the ICT development district or smart regency should be a more serious concern. However, in the research trial, it appears that there are still very few studies exploring the dimensions of Smart Regency in various ways. Cities and districts have substantial differences in the economy, livelihoods, policies, social and cultural factors, economic aspects, laws, geographical conditions, employment problems, solutions, and environmental problems[3]–[5], so they require a different model and approach from the smart city applied in urban areas.

In various Indonesia regions, smart regency has been implemented with the aim of efficient resource management, including the Sumenep district, one of which is by developing the Sumekar-Online mobile-based application. However, in the author's observation, in the application of Smart Regency, especially Sumekar Online, there are various problems in accessibility, usability, and utilization of knowledge, which greatly affect smart regency services' performance. The KMSLC (Knowledge Management System Life Cycle) method is used to determine the use of knowledge in the system.

This research recognizes the significance of KMS in certain fields, particularly in SMEs[6]. Therefore it is important to understand KMS trends through several decades of journals[7]. Further KM studies also illustrate the role of KMS in a business in four phases of information transformation[8]. KMS must also share awareness, for example in the business, of a specific product[9]. Some products include user inputs through the use of technology. Another field of KMS use is intelligent agriculture, in which KMS plays an important role in the storage, treatment and verification of agricultural output[10]. Usefulness testing methods in the tests of Prabumulih City are provided with the study. The outcome is as follows: 100% learning, 66.66% efficiency, 58% usability, 34% efficiency and 27% user satisfaction[11]. Refined a research methodology to analyze the utility of financial reporting systems (DuWIT). The results of this analysis show that the application is more than 72 percent user friendly[12]. Several knowledge management activities will create a competitive advantage for an organization through organizational innovation and services[13]. A new organizational development concept is developed in a knowledge management institution (KM)[14]. The main aim of knowledge management is to capture, store, and disseminate data in the electronic form to help it accomplish strategic, operational, and tactical goals is growing[15]. The integration and dissemination of information in the learning and decision-making process requires knowledge management Systems of software[16].

This study aims to measure the mobile-based smart district information system through usability evaluation. This technique employs the use of an inventory measurement usability software (SUMI), a theory proposed by the Cork College University checklist, to incorporate a knowledge-

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management system (KMSLC) life cycle[16]. This method is comprehensive in evaluating the knowledge management of an information system. The steps taken include Evaluating Existing Infrastructure Analysis, Capture Knowledge, Implementing Knowledge Management (KM) Models, and evaluating usability. The questionnaire was conducted on ten respondents using a mobile-based smart regency application. The questionnaire was conducted in 5 categories: Effectiveness, Efficiency, Control, Support, and Simplicity.

This study contributes to evaluating knowledge management in mobile-based smart regency services and provides input for application developers and policymakers to pay more attention to the factors that affect knowledge management success in smart regency services.

II. Literature Review

A. Indonesia's Smart Regency Development

Smart Regency is a district planning concept focused on ICT, which aims to optimize municipal capital effectively. This is similar to an intelligent city concept but differs in government structures, areas, livelihood changes, population, economy, and socio-culture[3]. There have been many studies on smart regency growth in Indonesia, including testing of e-service efficiency[5], Promoting tourism[17], Group engagement in the online community[18], Smart netizen public services [19], Transport Traffic[20], Information Quality Systems[21], Community readiness measurement[22], Different applications[23], Intelligent rural village model village[24], Adoption of technology[4], Quality analysis of electronic service[25], Models and frameworks smart regency[3], Service maturity identification and differences[26], success-related factors[27], Critical factors identification and ranking[28]. In addition, there have been several previous studies on smart economy development[29], public toilet management, synergy and bureaucratic simultaneity[30], Smart Tourism Destination Management[31], Models of identification and preparedness[32], [33], Comprehension of applications intentions[34], from a Community perspective, holistic and social dimensions[35], Exploring sustainable development factors adoption[36], Determining regional development direction[37], Village development and intelligent tourism concept[38], development of intelligent villages to strengthen intelligent cities[39], Intelligent S.M.E.s[40] and S.O.A. for integration of e-government[41].

B. Software Usability Measurement Inventory(SUMI)

SUMI is a 50-item questionnaire that has been internationally standardized and is available in seven languages[42]. Here are some of the SUMI-related concepts and works: [43][42][44][45][46][47]. It requires approx 10 minutes and questions such as: Learning new functions is difficult to make use of this program.

It is used for measuring user satisfaction and for evaluating software quality perceived by users. For accurate results with the SUMI[44][48][42], It needs at least 10 representative users. SUMI results are based on a large standardization database, founded on data for various product software, such as word processors, laptops, CAD packages and communication programs. The results are based on data. The SUMI results differentiate between different software products of different types and are accurate[42]. As Veenendaal[44][48] states: "The Software Usability Measurement Inventory (SUMI) provides a valid and accurate tool for evaluating (competitive) products and different softwares, as well as diagnostic information for future improvements, to address recurring software usability awareness problems". The study consists a psychometrically constructed 50-point questionnaire[44]. "Accord" or "undetermined" or "disagree" is answered with each question[44].

"At least ten users can effectively use SUMI" Veenendaal says. Based on responses given and statistical principles, usability scores are calculated. Of course, SUMI needs a workable version of the software before SUMI can be determined. This can also operate for a prototype or trial release The version is now available"[49]. SUMI provides an overview and usability profile divided into five sub-scales for the evaluation:

1. *Influence:* the amount of emotional answers the product captures.
2. *Efficiency:* to what extent the consumer will achieve the goals of their commitment to the product explicitly and promptly.
3. *Helpfulness:* the degree of the user's apparent support for the product.
4. *Control:* The level of speed set by the consumer and not the product.
5. *Learnability:* ease of starting up and learning new product features.

As part of MUSIC, University Cork has established the software inventory of usability measures MUSIC [44][48][42].

III. Methodology

The method used for system development is the KM System Life Cycle method[50]. Figure 1 method consists of analysis, knowledge capture, KM system implementation, and an evaluation of existing infrastructure[51][52].

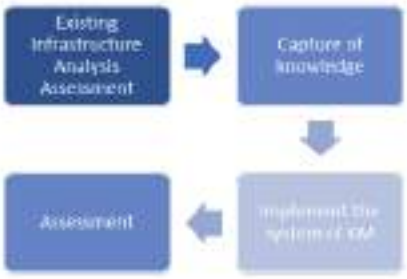

Fig. 1. Life Cycle KM System[50], [51]

A brief explanation of each step in the KM life cycle is as follows.

1. Existing Infrastructure Analysis Assessment

This method is the first stage of the KM System Life cycle for evaluating existing infrastructures. This is achieved by looking at the features of Sumekar Online, the mobile smart regency.

2. Capture of knowledge

The framework is used to build an information folder to capture knowledge. Where each map is connected and integrated.

3. Implement the system of KM

A system screenshot is made to implement the KM system.

4. Assessment

Assessment with ten respondents and 60 questions using SUMI (Software Usability Measurement Inventory) questionnaire.

IV. Result and Discussion

A. Existing Infrastructure Analysis Assessment

The system needs analysis, such as by analyzing data on mobile Smart Regency applications.

B. Capture of knowledge

The science map designed in this system consists of health features, educational features, public facility features, public service features, government features, tourist features, lodging features, restaurant features, area potential features, external features, emergency features, and e-stall features. . The health features consist of hospitals, health centers, polindes, clinics, doctors, midwives, healthy cars, pharmacies. Educational features consist of higher education, secondary education, basic education, early education, special education, Islamic boarding schools, and educational information at a glance. Public facility features consist of worship, social rehabilitation, sports, parks, transportation, finance. Public service features consist of citizen connections and (community) health consultations. Government features consist of offices/agencies, sub-district offices, village offices, defense and security offices, and other institutional offices. Tourism features consist of natural tourism, cultural tourism, religious tourism, artificial tourism, culinary tours, tourism events, shopping tours, and travel agents. The accommodation features consist of hotels, homestays, resorts, and guesthouses. The restaurant features consist of a restaurant, fast food, cafe, cake shop, and coffee shop. Regional potential features consist of industry, markets, agriculture, trade, livestock, plantations, fisheries, and MSMEs. External Features consist of contact numbers. The emergency feature consists of demonstrations, fires, accidents, traffic jams, crime, natural disasters, and the e-booth feature is currently under development.

Fig. 2. Knowledge Map of Smart Regency Mobile Apps: Sumekar Online

C. Implement the system of KM

A KM system and the mobile start page for smart regency apps are shown in Figure 3. Each user using the mobile applications must open this page, in which the user must first login. So users can enjoy all the smart regency mobile app facilities and features.

Fig. 3. Sumekar Online is one of the Smart Regency Mobile Apps Service in Indonesia

D. Assessment

The answer to the questions from the SUMI questionnaire was provided at the next stage. The score per answer was 4 to agree on answers, 2 to dispute answers, and 0 to unaware answers. There are 50 questions from each category, and each has ten questions. The results of the questions are then added and then multiplied by 2.5 in each category. The assessment of the SUMI questionnaire takes the form of a 0-100 scale. Each category's final score is used to obtain the application's results with the median for each respondent's order value. According to the SUMI method's provisions, if the median measurement result is less than 50, it is always under average.

Table 1 is the Table Effectiveness category for smart regency mobile apps. Table 1 has the values of 70, 80, 65, 85, 40, 50, 40, 55, 55, and 65.

TABLE I. EFFECTIVENESS CATEGORY FOR SMART REGENCY MOBILE-APPS

1	2	3	4	5	6	7	8	9	10
70	80	65	85	40	50	40	55	55	65

Table 2 is the Table Effectiveness category for smart regency mobile apps. Table 1 has the values of 70, 65, 60, 75, 30, 40, 65, 70, 45 and 50.

TABLE II. EFFICIENCY CATEGORY FOR SMART REGENCY MOBILE-APPS

1	2	3	4	5	6	7	8	9	10
70	65	60	75	30	40	65	70	45	50

Table 3 is the Table Effectiveness category for smart regency mobile apps. Table 1 has the values of 65, 55, 60, 55, 55, 60, 65, 70, 55 and 60.

TABLE III. CONTROL CATEGORY FOR SMART REGENCY MOBILE-APPS

1	2	3	4	5	6	7	8	9	10
65	55	60	55	55	60	65	70	55	60

Table 4 is the Table Effectiveness category for smart regency mobile apps. Table 1 has the values of 65, 70, 60, 75, 45, 50, 50, 60, 55 and 65.

TABLE IV. SUPPORT CATEGORY FOR SMART REGENCY MOBILE-APPS

1	2	3	4	5	6	7	8	9	10
65	70	60	75	45	50	50	60	55	65

Table 5 is the Table Effectiveness category for smart regency mobile apps. Table 1 has the values of 55, 60, 55, 75, 45, 50, 50, 70, 60 and 70.

TABLE V. SIMPLICITY CATEGORY FOR SMART REGENCY MOBILE-APPS

1	2	3	4	5	6	7	8	9	10
55	60	55	75	45	50	50	70	60	70

TABLE VI. SUMI QUESTIONNAIRE CALCULATION RESULTS FOR SMART REGENCY MOBILE-APPS

Respondents	Effectiveness	Efficiency	Control	Support	Simplicity
1	65	70	70	65	55
2	55	65	80	70	60
3	60	60	65	60	55
4	55	75	85	75	75
5	55	30	40	45	45
6	60	40	50	50	50
7	65	65	40	50	50
8	70	70	55	60	70
9	55	45	55	55	60
10	65	50	65	65	70
Median	**60**	**62.5**	**60**	**60**	**57.5**

Based on the table above, each category's median value is 60 for efficiency, 62.5 for effectiveness, 60 for control, 60 assistance, and 57.5 for convenience, which means that the Sumekar Online application's usability is good.

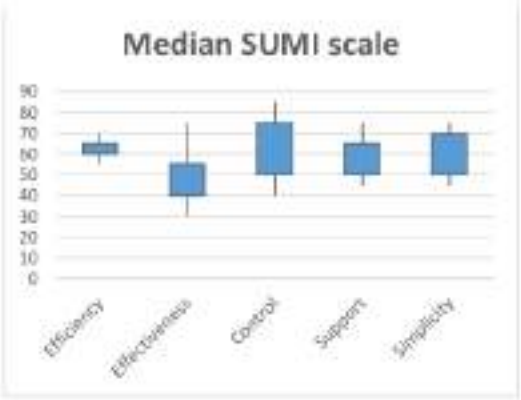

Fig. 4. Median SUMI Scale of Smart Regency Mobile-apps Sumekar Online

Figure 4 shows that each category has a value in the order of open, highest, lowest and close values as follows: Efficiency: 65, 70, 55, 60; Effectiveness 55, 75, 30, 40; Control: 75, 85, 40, 50; Support: 65, 75, 45, 50; and Simplicity: 70, 75, 45, 50;

V. CONCLUSION

The objectives of this research is to conduct a usability analysis of the knowledge management system. Mobile Apps for the Smart Regency The system being analyzed is Sumekar Online. The analysis will be conducted using the Knowledge Management System Life Cycle (KMSLC) method, the Software Usability Measurement Inventory (SUMI), and a minimum of ten respondents who will use the mobile app application. The analysis employs the KMSLC usability technique. Usability results indicated that the online sumekar was in the best category, with 60 efficiency points, 62.5 control points, 60 support points, and 57.5 simplicity points. The results indicated a high level of quality. The respondents' responses are superior to the average, and the application is classified appropriately.

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