The Design, Implementation And Quality Assessment Model For Android-Based Msmes Catalogue System In Gianyar Regency, Bali

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Abstract: Tourism sector is the largest and strongest sector which is one of the main drivers of the world economy. The collaboration of strategy in tourism development with supporting sectors such as food and beverages businesses, Micro, Small and Medium Enterprises (MSMEs), hotels and accomodations, transportation, induced a multiplier effect which later accelerates economic growth and job creation. Gianyar Regency is noted World Craft City in 2019 and has the largest number of MSMEs compared to other districts in Bali. However, the growth of MSMEs in Gianyar Bali still faces problems in terms of digital strategy and management. The presence of technological innovations and breakthroughs to support MSMEs is highly favored to support the potential of local crafts industries in Gianyar Regency. This research presents the development of an Android based MSMEs Catalogue System in Gianyar Regency, Bali namely Bilocraft Application. The Research and Development (R&D) method is adopted as the development methodology. s. The quality of the application is assessed based on 4 categories described in the ISO 25010 quality standard. The adoption of these categories are based on Ben David's theory. The results of this study that the Bilocraft application has been successfully developed with a quality assessment value on the Functional Suitability aspect which is declared very appropriate, the aspect performance efficiency declared appropriate, the portability aspect declared very appropriate and the usability aspect following the system usability scale questionnaire yields a value of 91.3% declared in the Acceptable range, grade A and is on the Best Imaginable scale.

Index Terms: MSMEs, Gianyar, Research and Development (R&D), Android, ISO 25010, Location Based Services, Geographic Information System

1 INTRODUCTION

Detailed The Bank of Indonesia stated that the tourism sector is the most effective sector to boost Indonesia's foreign exchange. One of the reasons is because the resources needed to develop tourism are located in the country[1]. Based on data from the Central Statistics Agency of the Republic of Indonesia, the amount of foreign exchange in the tourism sector in 2018 was recorded at $16,424 million, an increase of $3,287 million from the previous year which was US $13,139 million[2]. The increase in the contribution of tourism to GDP was driven by the increased number of both foreign and domestic tourists. Also tourism investments contributed to the increment of Indonesia's GDP. The brilliant strategy of integrating tourism sectors with the supporting sectors such as food and beverages businesses, MSMEs, hotels and accomodations, transportation, and so forth, has induced a multiplier effect which later accelerates economic growth and job creation.

The Ministry of Cooperatives micro, small and medium enterprises Republic of Indonesia regarding the development of data on micro, small and medium enterprises, stated that in 2018 the growth of micro, small, and medium enterprises has increased by 2.02% from the previous year, which was 64,194,057 compared to 2017, which was 62,922 .617 [3]. Bali is stated as one of the cities that contributes to the growth for MSMEs development in Indonesia. The number of micro small and medium enterprises at the end of 2018 in Bali reached 326,000, an increase from around 312,000 previously with the entrepreneurial ratio at 8.38%, higher than the national figure at 5% [4]. In their research in 2014, Hartono and Hartomo stated that the major stumbling blocks of MSMEs development in Indonesia are related to: 1) the low quality of human resources, especially in terms of management, organization, technology, and marketing. 2) the inadequate entrepreneurial knowledge. 3) market orientation still focuses on low level economics. 4) conventional innovations. 5) short access to capital, information technology, markets and other industrial factors [5]. As a major tourist destination for the central part of Indonesia, the existence of MSMEs in Bali is absolutely necessary in providing various needs of the community, both for local people and foreign tourists. Micro Small and Medium Enterprises (MSMEs) exist to support people's lives in conjunction to the tourism sector. The small business that is developing in Bali is mainly in the Small Handicraft Industry (SHI). SHI serves as one of the key sectors of export commodities in Bali besides livestock, textiles, garments and paper. Gianyar, Bali has the largest number of MSMEs compared to other districts in Bali. In addition, Gianyar Regency has been named the World Craft City in 2019 by The ministry of cooperatives small and medium enterprises in the province of Bali . The coronation was marked by the submission of a World Craft Council (WCC) certificate by the President of the World Craft Council Asia Pacific Region, Madam Ghada Hijawi Quddumi. By the end of 2018, the number of handicraft industries in Gianyar Regency reached 36,890 units and was able to accommodate a workforce of 81,946 people from almost all types of craft industries ranging from wood, gold, silver, weaving, endek and others [6]. According to the Performance Report of The Ministry Of Cooperative and MSMEs in 2018, MSMEs in Gianyar Bali still face problems with low technology utilization, lack of marketing access and visibility branding. Therefore, the presence of technological innovations and breakthroughs to support MSMEs is highly favored to support the potential of local crafts industries in Gianyar Regency. Sunariani, Suryadinatha and Mahaputra stated that in 2015, the problems faced by the MSMEs in Gianyar are low access on capitals, marketing strategy inadequacies, business competition, limited raw materials, lack of technical production knowledge and expertise, inadequate managerial skills, financial management knowledge and a discouraging business climate [7]. The advancement of technologies, and telecommunications supported by the development of internet technology. The

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presence of the internet enables them to obtain information for their business activities. The use of the internet in business has changed from a function as a tool for electronic information exchange to a tool for business strategy applications, such as: e-Commerce [8]. However, the challenge in today's era is not to get access to information, but to find the most relevant information to solve our problems. Although e-Commerce may help to increase market exposure, tourists are most likely not surfing local products through e-commerce, rather to explore the origin itself. Language is an important aspect that supports the tourism sector. In a country such as Indonesia, where English is not the main language of conversation, language becomes one of the stumble blocks when the tourists want to explore areas that sell local products. In this research, which entitled "The Design, Implementation And Quality Assessment Model For Android-Based Msmes Catalogue System In Gianyar Bali" describes the design process, implementation and quality assessment of an Android-based mobile application called Bilocraft. Bilocraft is designed to provide information and catalogue MSMEs. The 4 criterion of ISO 25010 quality model is adopted to assess the quality of the Bilocraft application. The criterion adopted are Functional Suitability, Performance Efficiency, Portability and Usability.

2 LITERATURE REVIEW

2.1 Gianyar Regency, Bali

Gianyar Regency is one of the nine regencies / cities in Province of Bali. Astronomically, Gianyar Regency is located between 80 18'52" South Latitude, 1150 05' 29" - 1150 22' 23" East Longitude.Gianyar Regency has an area of 368 km2 or about 6.53% of the total area of Bali Province. Administrative borderline of Gianyar regency describe as follows [9] :

TABLE 1
ADMINISTRATIVE BORDERLINE OF GIANYAR REGENCY

Side	Borderline
North side	Bangli Regency
East side	Klungkung / Bangli Regency
South side	Denpasar City and Badung Strait
West side	Badung Regency

In addition, based on the news reported by the news portal of the ministry of cooperatives small and medium enterprises in the province of Bali, Gianyar Regency has been named the World Craft City in 2019. The coronation was marked by the submission of a World Craft Council (WCC) certificate by the President of the World Craft Council Asia Facific Region, Madam Ghada Hiijawi Quddumi. It is hoped that later Gianyar regency will always digitally develop, considering that Gianyar regency is productive in producing a variety of crafts. Until the end of 2018, the number of handicraft industries in Gianyar Regency reached 36,890 units and was able to accommodate a workforce of 81,946 people from almost all types of craft industries ranging from wood, gold, silver, weaving, endek and others.

2.2 Micro, Small and Medium Enterprises (MSMEs)

Based on Undang Undang number 20 of 2008 concerning Micro, Small and Medium Enterprises (MSMEs), the meant of Micro, Small and Medium Enterprises are [10]:

1. Micro Business is a productive business owned by an individual and / or an individual business entity that meets the criteria of a Micro Business as regulated in this Law.
2. Small Business is a productive economic business that stands alone, which is carried out by an individual or a business entity that is not a subsidiary or branch of a company that is owned, controlled, or is a part, either directly or indirectly, of a Medium or Large Business. criteria for Small Business as referred to in this Law.
3. Medium Enterprises are productive economic enterprises that are independent, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or are part of, either directly or indirectly, with Small or Large Businesses with total assets. net or annual sales proceeds as regulated in this Law. Based on the above definition, in essence, Micro, Small, and Medium Enterprises are a form of productive economic business carried out by individuals or individual business entities that meet the criteria of Micro, Small and Medium Enterprises.

2.3 Geographic Information System (GIS)

Geographical Information System is a computer system used to collect, examine, integrate, and analyze information related to the earth's surface. GIS is a system that emphasizes the elements of geographic information. The term "geographic" is part of the spatial (spatial). These two terms are often used interchangeably or interchangeably until the third term, geospatial, appears. These three terms contain the same meaning in the context of GIS. The use of the word "geographic" implies a problem regarding the earth: a two or three dimensional surface. The term "geographic information" contains the meaning of information about the places located on the surface of the earth, knowledge of the position where an object is located on the surface of the earth, and information about the information (attributes) contained on the surface of the earth whose position is given or known [11].

2.4 ISO 25010 Model

The domain of ISO 25010 model divided into eight feature which shown by figure 1 below :

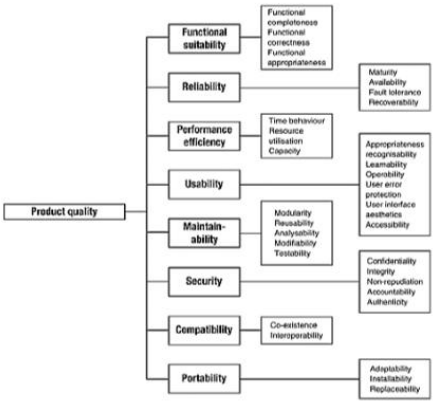

Fig 1. *ISO 25010 Model*

Description of functional suitability, reliability, performance efficiency, operability, security, compatibility, maintainability and transferability is explaind below (Wattiheluw, Rochimah and Fatichah, 2019) :

1. Functional suitability. It is the level at which the software can provide the functionality needed when the software is used in

certain specific conditions, in this case the software can fulfill the feasibility of a function to do specific work for the user and can provide precise results and accuracy to the level of user needs.
2. Reliability. Is the level where the software can survive at a certain level when used by users in specific conditions, in this case the software can operate and be ready when it is needed to be used and can also withstand a certain level of resistance against failures, errors and software returns at a certain level in restoring data returns due to software failure or errors.
3. Performance efficiency. It is the level at which the software can provide performance against a number of resources used in certain conditions, in this case the performance efficiency can provide the reaction and time required when carrying out an action from a function and the software can use a number of resources when carrying out an action from a function.
4. Usability. Software can be understood, studied, used, and attracts users when it is used, in this case the software is easy for users to learn, the software can be used and operated by the user, the software can provide assistance when the user needs guidance, the software can attract the user's attention, The software meets the needs of users with limitations and the tool allows users to analyze whether the software meets their needs.
5. Security. It is protection against software from various threats or anomalies, in this case the software has protection against data or information from users and is from the completeness, accuracy of a number of assets that have been preserved so that the action or action taken has been proven and it cannot be denied.
6. Compatibility. This factor is the ability of two or more software components to exchange information and perform the required functions when used on the same hardware or software environment.
7. Maintainability. Is the level at which a software can be modified. In this case, modifications are improvements, changes or adjustments to the software to be able to change in the environment, requirements and specific functionality. In addition, the software can be analyzed to find out what caused the failure of the software to identify the parts that can be modified.
8. Portability. It is the ease with which a system or component can move from one environment to another, in this case the software can adapt quickly to different environmental specifications without implementing any action or other means than giving specific goals to existing software [12].

3 RESEARCH METHODOLOGY

The Research and Development (R&D) method proposed by Sugiyono in 2009 was adopted in the development of Bilocraft application [13]. The R&D steps described in figure 2 below :

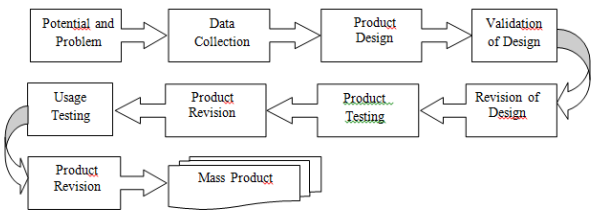

Fig 2. *Research and Development Method*

3.1 Potential and Problem

Potential and problems in this research illustrated using the SWOT analysis shown in table 2 below :

TABLE 2
SWOT ANALYSIS

Strength	Weakness
- Gianyar Regency has been named the World Craft City in 2019. - Gianyar Regency has the largest number of micro, small and medium enterprises compared to other districts in Bali	- The low quality of human resources, especially in terms of management, organization, technology, and marketing. - Limited capacity of MSMEs to access capital, information technology, markets and other industrial factors.
Opportunity	**Threat**
- There is support from the Ministry of Cooperatives and Small and Medium Enterprises and the Ministry of Communication and Information Technology, namely initiating a program entitled 8 Million MSMEs Go Online to accelerate the transformation of MSMEs in Indonesia to digital - Increasing internet users and smartphone users in Indonesia every year.	- The emergence of competitors in the same field.

3.2 Data Collection

Data regarding the location and information of MSMEs in this application is taken from the central statistics agency for Gianyar Regency in 2018. Hardware and Software requirements are also described in this step. User modelling in this research using persona approach. The following is the target user described using the persona : 1) Foreign Tourist : Foreigners from abroad who come to Gianyar, Bali for vacation or business. 2) Domestic Tourist : An Indonesian citizen residing outside the Bali Region on a vacation tour to Gianyar, Bali. 3) General User : The intended general user is a potential user who resides in the Bali area 4) MSMEs Owner : The owner of the Micro, Small and Medium Enterprises in Gianyar, Bali.

3.3 Product Design

At the product design step, it is described using the Unified Modeling Language (UML) for modeling application systems, designing interfaces for application displays and user modelling using persona approach. Types of diagrams used are use case diagrams, activity diagrams and class diagrams. User modelling in this research using persona approach. The following is the target user described using the persona :

a. Foreign Tourist : The user persona in terms of foreign tourists is described as being 25 - 50 years old from abroad, familiar with technology, using a smartphone with an Android operating system, knowing and using English fluently, being interested in handicrafts from MSMEs in Gianyar Bali and keen to local adventures and cultures.
b. Domestic Tourist : Indonesian citizens who live outside the Bali Region with an age range of 17 - 50 years, know and are fluent in English, understand technology, use a smartphone with an Android operating system and interested in local arts crafts from MSMEs in Gianyar Bali.
c. General User : The intended general user is a local person

who lives in Bali, with age range 20 - 50 years, actively uses technology, uses a smartphone with an Android operating system, knows and understands English well, looking for local crafts or is interested in local arts crafts from MSMEs located in Gianyar Bali,

d. MSMEs Owner : The owner of the Micro, Small and Medium Enterprises in Gianyar, Bali, with an age range of 20 - 50 years, actively using technology, using a smartphone with an Android operating system, knowing and using English fluently, dedicated to advancing and improving existing arts crafts with the advancement of developing information technology.
e. Admin : The admin in this persona is described as a person who will operate, process, add, delete and edit MSMEs data in the bilocraft application. It is estimated that the age of 20 - 50 years, understands technology, understands operating websites, is easy to work with and understands English fluently.

3.4 Validation of Design

The design validation is done by 5 people which represents persona group that has been defined in the design phase. The users who will validate the bilocraft application include two experts, general user, admin and MSMEs owner. This stage is used to assess and validate the design so that further weaknesses and strengths can be found.

3.5 Revision of Design

Revision of the design are made based on comments given by experts, admin, local craft owner and general user when they have checked the designs that made by researchers.

3.6 Product Testing

In this phase, it aims to implement the design form that has been made into the existing program code in Android Studio. Product testing here contains program coding that will be carried out in the Android Studio software and will be tested using the Samsung Galaxy Note 8 smartphone.

3.7 Product Revision

In this stage researcher will see some errors / bugs in the bilocraft application that researcher built. After product testing is done, if there are some errors or bugs, the researcher immediately revises the program. This stage ensures that the program code that is applied to this application has been running very well.

3.8 Usage Testing

In order to simulate the use of application in the real case scenario, the developed application has to pass another testing in this usage testing phase. In this case, a survey based on the 4 categories of ISO 25010 quality model is adopted to test the functional suitability, Performance Efficiency, Portability and Usability. The questionnaires are given to 100 people that represents the persona that has been defined in the product design phase. An explanation of each point explained at the point below :

a. Functional Suitability. Data analysis techniques on the functional suitability aspect are based on black box testing table documents. The black box testing document in the bilocraft application consists of 12 test scenario menus with a total number of questions are 23 items. The suitability of the functionality of a system can be said to be very good if all the results of blackbox testing are valid.
b. Performance Efficiency. Quality analysis for the performance efficiency aspect is carried out by calculating the average response time of the application to retrieve data from the Google Maps API and display it. Users get the highest satisfaction if the response time is in a 0 second delay, while satisfaction remains in the range of 3 to 9 seconds and decreases if it is more than 12 seconds. If the results of the calculation of the average response time are less than 9 seconds, it can be concluded that the application developed meets the aspect of performance efficiency.
c. Portability. Analysis of the portability aspect is carried out by installing the tested applications on five various Android devices with different type of phone, screen size and android version. The results of this test will then be documented in a table and the percentage score of the test results is calculated with the following formula [14]:

Percentage Eligibility = (Score Obtained)/(Maximum Score) x 100% (1)

After getting the score data from the test results, the percentage is calculated using the formula. After that, the percentage is converted into a statement according to the following table 3 below [15] :

TABLE 3

INTERPRETATION OF ELIGIBILITY PERCENTAGE

No.	Percentage of Achievement (%)	Interpretation
1	0 – 20	Very Inappropriate
2	21 – 40	Inappropriate
3	41 – 60	Passably
4	61 – 80	Appropriate
5	81 – 100	Very Appropriate

d. Usability. For the usability aspect, the data analysis technique used is to calculate the value of each questionnaire in accordance with the SUS questionnaire calculation, namely for odd-numbered or positive questions, the score answered on the questionnaire is reduced by one (n-1). For even number or negative questions, the score of 5 minus the user score (5-n). Then all the scores are added up and then multiplied by 2.5 and after that the results are compared with Figure 3 below :

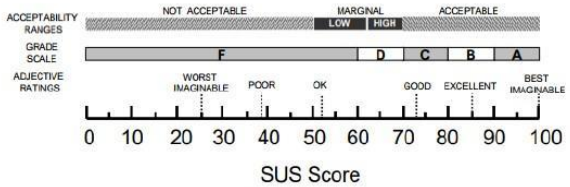

Fig 3. *SUS Score*

3.9 Product Revision

The final revision is performed by analyzing the feedback generated by the usage testing phase. The revision is necessary as the usage testing represents how the users are experiencing while using the product in real case scenario. Product revision is done if there are unsatisfactory usage trial results. This product revision is carried out if in real condition there are advantages and disadvantages. In usage tests, the

researcher should always evaluate how the product is performing.

3.10 Mass Product

The mass product step is the last step of the research and development method. Mass product here means that the application that has been made by the researcher is ready for use and has successfully passed the tests from various kinds of tests and revisions in the previous step. If then this application will be mass-produced by researchers, the application that has been made is ready and quality guaranteed.

4 Discussion

Bilocraft application is an android based application that provides information about cataloging location and information from the MSMEs in Gianyar Bali. This application has been done through all stages of development starting from potential and problems analysis to mass product or build release. The potential and problem analysis stage starts from analyzing the existing problems described using the SWOT analysis, collecting data starting from analyzing device requirements to validator analysis using user persona. The next step is the validation of the design by two experts, one general user, one admin and one local craft owner. After this stage, a revision is made based on the comments given by the validator. After a revision is made to the design, then the design is built into an android application using the android studio. After becoming an application, then the usage testing stage is carried out, usage testing based on the ISO 25010 standard following Ben David's theory consists of four instead of eight aspects. In the functional suitability aspect, based on the feedback it receives the all functions in the application are executed 100% as expected. Therefore the quality of functional suitability of bilocraft can be considered as very high or very appropriate. In the Portability aspect based on the feedback it receives applications can run completely on five different types of phones, screen size and versions of Android. Therefore the quality of portability of bilocraft can be considered as very high or very appropriate. In the performance efficiency aspect, based on the feedback it receives the application has an average response time of 5.2283 seconds tested with three different connections. Therefore the quality of performance efficiency of bilocraft can be considered as appropriate because it can pass the performance efficiency standard which must be less than 9 second. In the usability aspect, based on the feedback it receives the application obtained a usability score of 91.3% after being tested on 100 respondents. Therefore the quality of usability of bilocraft can be considered as in Acceptable range, Grade A and Best Imaginable ratings. Description the each aspect describe as follow :

4.1 Functional Suitability

From the table of black box testing results it showed that all functions are running as expected. The result of calculating the percentage of eligibility is 100%, so it can be concluded that all the features of the application can run 100% as expected. Based on the results of calculation of the percentage of eligibility, the quality of the application in terms of functional suitability aspect has a value "Very Appropriate"

4.2 Portability

The testing on the portability aspect is carried out by installing the application on five different android devices. The results of these tests will be presented in the table below.

TABLE 3

PORTABILITY ASPECT RESULT

No	Type of Phone	Android Version	Screen Size (Inches)	Result (%)
1	Samsung Galaxy Note 8	7.1.1 (Marshmallow)	6.30	100
2	Xiaomi Redmi Note 8	10 (Android 10)	6.30	100
3	Vivo 1902	9 (Pie)	6.35	100
4	Oppo F1S	5.1 (Lollipop)	5.5	100
5	Oppo A5s	8.1 (Oreo)	6.20	100

The result of calculating the percentage of eligibility is 100%, so it can be concluded that the bilocraft application can run 100% well in any different type of phone, android version and screen size. Based on the results of the calculation of the percentage of eligibility, the quality of the bilocraft application in terms of portability aspect has a value "Very Appropriate".

4.3 Performance Efficiency

The testing on the performance efficiency aspect is carried out by testing the respon time of the bilocraft application using Jmeter tools. Testing is performed three times with three different connections. This is done in order to obtain an average response time from the bilocraft application. A summary of the three performance efficiency tests above is provided in the table below :

TABLE 4

PORTABILITY ASPECT RESULT

No	Performance Efficiency Test	Respon Time (ms)
1	First	2854
2	Second	3897
3	Third	8934
Total		15685
Average		5228,3
In Second (s)		5,2283

From the table above, it can be seen that the total average response time of the bilocraft application is 5.2283 seconds. From the standards that apply on testing of the performance efficiency aspect, which must be less than 9 seconds, it can be concluded that the bilocraft application can meet the aspects of performance efficiency and has a value "Appropriate".

4.4 Usability

The requirement for a validity test questionnaire item is when the rcount > rtabel. The value of rtabel with a significance level of 5% and a total of 100 respondents is 0.195. The results of the validity test using system usability scale of the bilocraft application showed that all the Pearson Correlation values are more than 0.195. It can be conclude that all the questions that were scattered in this study were valid. The validity test result data is attached on the attachment page. Reliability test is carried out by comparing the rtabel value with the results of Cronbach's alpha. The requirement for a reliability test questionnaire item is when the alpha > rtabel. The value of rtabel with a significance level of 5% and a total of 100 respondents is as same as the validity test

is 0,195. The results of reliability testing using the SPSS application as follows :

Reliability Statistics

Cronbach's Alpha	N of Items
,301	10

Fig 4. *Reliability Test*

The cronbach's alpha result above shows 0.301 which is greater than the r table which is 0.195. This shows that the questionnaires distributed in this study are consistent. The calculation result of the percentage using the SUS questionnaire is 91.3%. Viewed from the standard set by the SUS score, it can be concluded that the bilocraft application in the Acceptability Ranges scale is included in the "Acceptable" category, on the Grade Scale it is included in the "A" grade and on the Adjective Ratings scale include a "Best Imaginable" rating. Usability test is the final application test in the development process. With various input and suggestions, this application will continue to be developed based on the evaluation of the user so that the application will eventually reach the maximum feasibility level.

5 Conclusion and Suggestion

Based on the results of the research and discussion above, it can be concluded that the bilocraft application in order to mapping local craft locations and information in Gianyar Bali has been successfully developed. The results of the quality analysis of the bilocraft application using ISO 25010 standards obtained a very appropriate functional suitability aspect because all functions were running well and as expected. For the portability aspect, it showed very appropriate because the application can be run on five different types of phones with different phone types, screen sizes and android versions. For the aspect of performance efficiency, it is declared appropriate because the average response time of the bilocraft application is 5.2283 seconds and it can be said that it is fulfilled in terms of performance efficiency because the average response time is less than 9 seconds. For the usability aspect, the calculation result of the percentage using the SUS questionnaire is 91.3%. Viewed from the standard set by the SUS score, it can be declared that the bilocraft application on the Acceptability Ranges scale is included in the "Acceptable" category, on the Grade Scale it is included in the "A" grade and on the Adjective Ratings scale include a "Best Imaginable" rating. In general the Bilocraft application is very appropriate as an application for mapping local craft locations and information in Gianyar Bali. Based on the research that has been done, researchers can suggest further application development, which are 1) Directly pull the data from the statistics center agency website so that the data in the application is updated automatically following the statistics center agency website. 2) Fix the registration flow of MSMEs stores by directing the owner to register the shop online then the admin can verify the store whether the data entered is in accordance with the existing format or not.

References

[1] A. A. Rahma, “Potensi Sumber Daya Alam dalam Mengembangkan Sektor Pariwisata di Indonesia,” J. Nas. Pariwisata, vol. 12, no. 1, 2020.

[2] Badan Pusat Statistik, “Jumlah Devisa Sektor Pariwisata (Miliar US $), 2016-2018,” Official Website of BPS, 2018. [Online]. Available: https://www.bps.go.id/indicator/16/1160/1/jumlah-devisa-sektor-pariwisata.html. [Accessed: 09-Oct-2020].

[3] Ministry Of Cooperatives And SMES, “Perkembangan Data Usaha Mikro, Kecil dan Menengah dan Usaha Besar 2017-2018,” Official Website of Ministry Of Cooperatives And SMES, 2020. [Online]. Available: http://www.depkop.go.id/data-umkm. [Accessed: 11-Oct-2020].

[4] Cooperatives and micro small and medium Enterprises Province of Bali, “Data Koperasi Tahun 2018,” Official Website of Cooperatives and micro small and medium Enterprises Province of Bali, 2020. [Online]. Available: https://diskopukm.baliprov.go.id/data-dan-informasi/data-koperasi/. [Accessed: 11-Oct-2020].

[5] Hartono and D. D. Hartomo, “Faktor-Faktor Yang Mempengaruhi Perkembangan Umkm Di Surakarta,” J. Bisnis Manaj., vol. 14, no. 1, pp. 15–30, 2014.

[6] Ministry Of Cooperatives And SMES, “Gianyar Dinobatkan sebagai Kota Kerajinan Dunia,” Nusantara MedCom, 2019. [Online]. Available: https://nusantara.medcom.id/bali-nusa/peristiwa-bali-nusa/8kowozrk-gianyar-dinobatkan-sebagai-kota-kerajinan-dunia. [Accessed: 11-Oct-2020].

[7] N. N. Sunariani, A. O. Suryadinata, and I. I. R. Mahaputra, “Pemberdayaan usaha mikro kecil dan menengah (umkm) melalui program binaan di provinsi Bali,” J. Ilm. Manaj. dan Bisnis, vol. 2, no. 1, pp. 1–20, 2017.

[8] O. Y. Yuliana, “Penggunaan Teknologi Internet Dalam Bisnis,” J. Akunt. dan Keuang., vol. 2, no. 1, pp. 36–52, 2015.

[9] Regional development planning and development research agency of Gianyar regency, “Gambaran Umum Kabupaten Gianya,” Official Website of Regional development planning and development research agency of Gianyar regency, 2020. [Online]. Available: http://bappeda.gianyarkab.go.id/index.php/baca-artikel/3/Gambaran-Umum-Kabupaten-Gianyar.html. [Accessed: 27-Oct-2020].

[10] Indonesian Goverment, Undang Undang Number 20 Of 2008. Jakarta, 2008.

[11] K. M. Wibowo, I. Kanedi, And J. Jumadi, “Sistem Informasi Geografis (Sig) Menentukan Lokasi Pertambangan Batu Bara Di Provinsi Bengkulu Berbasis Website,” J. Media Infotama, vol. 11, no. 1, 2015.

[12] F. H. Wattiheluw, S. Rochimah, and C. Fatichah, “Klasifikasi Kualitas Perangkat Lunak Berdasarkan Iso/Iec 25010 Menggunakan Ahp Dan Fuzzy Mamdani Untuk Situs Web E-Commerce,” Juti J. Ilm. Teknol. Inf., Vol. 17, No. 1, Pp. 73–83, 2019.

[13] S. Sumarni, “Model Penelitian Dan Pengembangan (R&D) Lima Tahap (Mantap),” Universitas Islam Negeri Sunan Kalijaga Yogyakarta, 2019.

[14] R. Bramantara, “Pengembangan Dan Analisis Kualias Aplikasi Finding Moo Sebagai Pemetaan Lokasi Museum Di Yogyakarta Berbasis Android,” 2015.

[15] R. D. Jayanto, “Pengembangan Aplikasi Mobile Kamus Istilah Jaringan Komputer Pada Platform Android,” Universitas Negeri Yogyakarta, 2017.