The Rector's Greeting

Greetings and a warm welcome to the all academic researchers, practitioners, industry and business person as well as policy makers. Thank you for attended this 4rd international conference on Information Technology and Engineering Application 2015 (ICIBA 2015).

ICIBA is an annual event focusing on state of the art technologies pertaining to digital information and communications and its application in business and industry as well as government. The applications of advanced information technology to such domains as networking, security, engineering, education, finance, geosciences, health, transportation, supply chain management and logistics are among topics of relevance to ICIBA. The conference features keynote speakers, the best student award, poster award, technical open panel, and workshops/exhibits from industry, government and academia as well postgraduate student colloquium.

All papers for the ICIBA 2015 on this Conference Proceeding (ISBN) was indexed by EBSCO, Google Scholar, and sent to be reviewed by EiCompendex and ISI Proceedings. Our gratitude to all the participants who has take a part in this conference, I hope we can take the advantage of academic research findings, to have better insight about the importance of IT and business application, to the country's economic development

Sincerely yours,
Prof. Ir. H. Bochari Rahman, M.Sc

RECTOR of BINA DARMA UNIVERSITY

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Study of Wavelet Transformation Method for feature Extraction Characteristics Based In Identifying Authenticity Indonesian Batik

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Abstract

Batik is the cultural heritage of indigenous peoples in Indonesia. The original Indonesian batik cap and tulis has a characteristic in the production process that uses a technique closing malam / wax from wax-resist dyeing process. Currently developing the promotion and online sales through cyberspace. To help viewers and consumers cyberspace recognize the authenticity of Indonesian batik, so in this paper, the authors will review the image processing to be able to recognize batik photo circulating in the virtual world is an original photo of Indonesian batik or not. This is done to discuss and review studies feature extraction prior to recognize characteristic motif using wavelet method.

Keywords : *batik, feature extraction, wavelet*

1 INTRODUCTION

Batik from Indonesia received international recognition by UNESCO on October 2, 2009 as "Reperesentatif List of the Intangible Cultural Heritage of Humanity". In this case UNESCO recognized batik is not the object, but what distinguishes the batik from other countries is technically unique manufacturing process using the closing malam / wax with a canting and cap, as well as produce a pattern in the form of a cultural symbol that became a philosophy of life and identity of the people Indonesia.

One attempt to introduce the authenticity of Indonesian batik on e-supermuseum Indonesian batik (budiman, 2012a) designed an e-museum merging function with the e-marketplace, in an e-museum (budiman, 2012b) can provide knowledge about the authenticity and beauty of the motif of Indonesia to visitors online. But at this e-supermuseum consumer has not received assurance of authenticity of products sold batik artisans in the virtual stalls contained in the e-marketplace, this is because the products offered batik craftsmen online only through media images. Of the batik photo consumers can not see whether the results from the process of batik cap, canting, or screen printing (printing). Printing, screen printing, and through painting techniques have also been carried out in the process of making batik or patterned fabric by other countries, so it is not characteristic of batik from Indonesia. Thus,

to provide customer satisfaction in online shopping batik needed software that can distinguish batik produced from the cap, tulis, or printing of a photograph of batik.

Results interview with the curator of the museum batik batik solo Danarhadi (budiman, 2012a) that the authenticity of batik and write can be seen easily because it almost has a front and rear color brightness are almost the same, this is what distinguishes the batik printing or screen printing has a bright color only on the front side. But this can not be seen through the images show only one side. Batik and writing can also be seen from the nearby has a distinctive character strokes, namely the edge image is not perfect due to overtopping or color leakage at the closing malam / wax from wax-resist dyeing process. This is what can be the problem so it can be raised in this study to be able to recognize the authenticity of batik tulis, cap, and printing through media images using image analysis with the introduction of the character and characteristics of the leakage rate pattern color of the outline drawing on batik tulis, cap, and sablon (printing).

2 BATIK PATTERN RECOGNITION

Digital image processing research in batik today is to recognize the pattern motif (Rangkuti et al, 2014; putra et.al, 2011; Imanuddin et al, 2010; moertini and sitohang, 2005). Indonesia is rich motif that required recognition motif based on the region of origin to identify the origins of batik (Rangkuti et al, 2014).

Batik in Indonesia is recognized worldwide through UNESCO is not the object of batik, but the unique manufacturing process hereditary and contains original Indonesian culture philosophy (budiman, 2012a). Manufacturing process by hand using canting or cap to cover the fabric with malam (wax), so that the cloth that covered the wax is not affected by the color in the color by dipping a cloth in a vessel containing drugs color, it is called with the wax -resist dyeing. The process of making the canting called batik tulis, and with a cap called batik cap.

Batik tulis and cap the original write hereditary made in Indonesia. With the development of time to simplify the process and reduce the price of emerging batik sablon (printing) processes. To distinguish it can be seen directly on batik and cap both sides of the fabric has a color that is almost as bright as through the process of dyeing color, but the only bright batik color printing on one side. In a previous study (budiman, 2012a), has not been able to verify the authenticity of batik through media images in e-marketplace. Further research is to be able to analyze the texture through the photo media characterize the pattern and color leakage rate in the region given the closure of wax. In Batik has a distinctive character because it is done by hand, so that at the edges of the image motif is not too neat, there is overflow or leakage of colors that penetrate the cover of night / wax, this does not happen at the edge of the motif batik printing where the image is very symmetrical and neat.

3 FEATURE EXTRACTION

Batik is a unique characteristic feature of an object image batik. So, we need to be able to distinguish the feature extraction or recognize a batik. In the feature extraction acquired traits distinguishing objects that have to be used as the data set and used in pattern recognition training.

Introduction authenticity and cap batik is very dependent on the quality of feature extraction, to obtain the characteristics karakterikstik batik motif or pattern images to generate

the data set of training with a good degree of accuracy, it is very influential in getting the recognition motif texture analysis for quality. Features a unique characteristic of the characteristics of the texture of the image to be recognized by digital image processing. Feature extraction is performed to find the area that has the characteristic features in the image, the region can didibedakan based on the characteristics of color, shape, texture, size, intensity, or statistical properties. Statistical characteristic features commonly used is standard deviation, correlation, contrast, energy, entropy, and homogeneity.

To measure the characteristics of the texture is done with the method of analysis which is a fundamental feature extraction in image analysis (nixon and Aguado, 2008). Feature extraction is done after the Region of Interest (ROI) is known from the results of the preprocess and segmentation. The results of the statistical characteristic feature extraction form will be used for the classification stage recognition phase. Statistical characteristic features commonly used is standard deviation, correlation, contrast, energy, entropy, and homogeneity. Methods for generating unique characteristic traits of the few studies using wavelet transform method, such as used for recognition motif (Rangkuti et al, 2014; son et.al, 2011; Imanuddin et al, 2010; moertini and Sitohang, 2005). Wavelet transform method is suitable for feature extraction applications involving signals or data that a-periodic, discontinuous (intermittent), full of noise (noisy), and transients. In wevelet transformation time analysis with different frequency from STFT (Short-Time Fourier Transform), and a family of functions generated by wavelet bases y (x) is called the mother wavelet and develop into a variety of methods based on wavelet transform to the analysis of data on the extraction features. Wavelet transformation process data in the form of other changes are more easily analyzed.

As far as I read to study texture analysis and image classification is applied to determine the authenticity of Indonesian batik from a photograph has not been performed, previous studies merely perform pattern recognition motifs native Indonesian batik (Rangkuti et al, 2014; son et .al, 2011; Imanuddin et al, 2010; moertini and Munaf, 2005). Introduction motif identification dilukakan to show the origin of batik (Rangkuti et al, 2014) with a unique texture and shape of the motive, so it can be made to match to identify the origin of the characteristics of the target image in the image database. In that study (rengkuti et al, 2014) in analyzing the character of the texture used Daubechies wavelet transform method type 2 and invariant moment. In the study (moertini and Sitohang, 2005), the use of multiple algorithms dilakukakan to determine the performance of the algorithm is good for cluster and batik classification based on color, contrast, and motifs to match the consumer's personal appearance batik. In research Imanuddin (Imanuddin et al, 2010) was limited to categorize motif pattern features in the database by region of origin using morphologycal processing with methods dilation and erosion, it is also done in the study (putra et al, 2011) with the extraction batik using wavelet transform with a combination of discrete wavelet transform and rotate wavelet filter can produce a more optimal accuracy characteristics compared to using separately.

Character recognition research models the number of pixels of color leakage at the edges of the image batik pattern to produce a dataset based on the class in accordance with batik features, cap, and printing it refers to previous research related to texture analysis algorithm for the extraction and classification pixel based image penyepadanan pattern edge of the image, as shown in Table 1.

Table 1: Related Journals

Researcher name	Research themes	Method	Advantages	Disadvantages
Moertini, Veronica S., Sitohang, Benhard. (2005)	Batik classification based on color, contrast, and motives.	Classification Motif combining Shapebases using mask and texture-bases using wavelet method. With the classification using the K-Nearest Neighbor.	Analysis of the development of algorithms is done in detail by comparing eight kinds of wavelet algorithms. And can be used to test on other issues.	The duration is not too high, and only in test them with a range of sizes and ornaments, not in the detailed test them on motives.
Putra, Ricky Eka., Suciati, Nanik., Wijaya, Arya Yudhi. (2011)	Motif batik documenting.	Texture feature some combination of DWT and RWT. By using the classification method Canberra Distance.	Merger better than the DWT or RWT only.	Results of average accuracy of 70% is required classification by other methods (MLP, SVM, etc.). Only 5 motifs tested.
Arisandi, Bernardinus., Suciati, Nanik., Wijaya, Arya Yudhi. (2011)	Introduction batik motif based image spatial and frekuency.	Feature extraction by decomposition using wavelet transformation (DWT + RWT). And classification with Neural Network Multilayer perceptron variant.	Classification of multilayer perception can be overcome massive parallelism in wavelet decomposition results more quickly.	Accuracy is still low for testing data that is different from the training data.
Rangkuti, A., Haris, Harjoko, Agus., Putro, Agfianto Eko.(2014)	Batik motif Characteristics	Using the wavelet decomposition method with four statistical parameters and variants moment. Classification using fuzzy S Curve.	Made more specific wavelet method using wavelet transform method daubeches type 2 and invariant moment.	Not to use the unique features for image identification. Optimal precision below 95%
Rangkuti, Abdul Haris. (2014).	Image classification for the texture characteristics.	Wavelet Decomposition with three statistical parameters. Classification using Fuzzy Neural Network.	Optimizing precision reaches 95%. simplify parameters without entrophy.	Need to be tested kekarakteristik picture is more complicated and complex.

4 CONCLUSION

From the description above it can dilakukakan research is to develop a model approach to feature extraction through statistical parameter characteristic features with wavelet method, and can be used as a data set that contains the characteristics of texture as a distinguishing characteristic color leakage at the edges of the image batik pattern, cap, and printing. To measure the effectiveness of problem-solving skills can be compared again with the combine wavelet-based texture or by any other method of neural network, GLCM (Gray Level Co-occurrance Matrix), and edge detection.

Good extraction results will largely determine the success of the classification in pattern recognition. With the initial development for introduction and cap batik as Indonesian nation's indigenous culture will produce a contribution to the field of information technology culture in the form of software applications that can provide information to consumers about the authenticity batik offered by e-commerce or e-marketplace with media images. And to contribute to the field of science is the development of the application of the model in classifying batik pattern recognition based on the production process by measuring the unique characteristics as a characteristic texture based on the shape and the number of points widening the color of the edge image patterns of batik.

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Distributed Penetration of Wireless Passwords For Wired Protected Access Type Security

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Abstract

This research is a testing of the wireless password which types tested Security are WPA (Wired Protected Access). The issues raised are how influential the time of the many clients that perform password cracking from 2 clients to 10 clients and a password from 8 characters in length to 12 characters. This research uses experimental research methods that perform an experiment to see a result. That results would confirm how the position of the causal relationship between the variables researched, and using White Box as a test method. The results from this research would confirm that the increasing number of clients who make the process of the cracking password will be produced faster time to get the password from wireless devices that serve as target research.

Keywords : *Cracking Password, Crunch, WPA*

1 INTRODUCTION

Wireless network technology is becoming very popular even though on the other side of this technology still has some problems with the security system. Based on the OSI reference architecture layer, wireless technology works at layer 2 and using the 802.11 protocol to the date data communication standard that is used generally is a family of IEEE 802.11a, 802.11b, 802.11g and 802.11n. Wireless technology can be seen in every aspect of human life starts from education, business, transportation, communication, and so forth. Computer, notebook, mobile phone (mobile phone) and PDA dominate usage of wireless technology. The wireless network is a wireless computer network technology that uses high frequency waves so that the computers can connect to each other without the use of wires and allow for users to perform data and voice communications with ease.

According by Efvy (2014: 192) that, WEP (Wired Equivalent Privacy) is the first safety standard of wireless network created by using the RC4 encryption algorithm. This algorithm is simple and easy to implement because it does not require heavy computation, so it does not require sophisticated hardware. Although the WEP security method still has a lot of

security holes, there are still many people who still use it. WPA (Wi-Fi Protected Access) or also known as WEP WEPv2 aka version 2, which was introduced in April 2003. The WPA is an improvement over WEP, so it is not a new security method, so that the weaknesses found in WEP still exist in where the WPA encryption system used still apply RC4.

The latest generation of wireless security in this time that WPA / WPA2 PSK was still too vulnerable to dictionary attacks. The input required for this attack, with over four directions including WPA handshake between the client and the access point, and wordlist containing general passphrase. Then, using tools such as Aircrack-ng, can also solve the WPA / WPA2 PSK passphrase. The workings of WPA / WPA2 PSK is, came from each session key Pairwise Transient Key called (PTK), using Pre-Shared Key and five other Network SSID parameter, Authenticator Nounce (anounce), Supplicant Nounce (SNounce), MAC Authenticator (Access Point MAC), and the MAC address of the applicant (Wi-Fi MAC Client). This key is then used to encrypt all the data between the access point and the client. An attacker who hearing the whole conversation is that by monitoring the data packets through the air and can get all the five parameters mentioned in the previous statement.

Another opinion from the official site a password cracking software that is www.aircrack-ng.org stated limitations to perform brute-force techniques with a computer can only test 50-300 possible keys per second depending on the computer's CPU. Meanwhile, to make a large dictionary will be greatly needed a long time if it uses all the characters. Based on the previously mentioned some things about security, WPA can be attacked using brute-force techniques that 100% success rate, but it takes time and the device is not small, we conducted research in distributed wireless password cracking in the hope it would be to shorten the time in an attack. This technique is the review of the large number of the client as well as how long the password characters are used. Is said to be distributed as a union of elements systems communicate with each other will act wireless password cracking attack is jointly for one purpose to get a wireless password with WPA security type using a brute force attack.

Follow up the matter contained in the above background, the identification of issues to be raised in this research is focused on the type of WPA security passwords that can be attacked using brute-force techniques but it takes a long time if only using one device to attack with this technique.

In order to research more focused and not deviate from the existing problems, it is necessary to limit the problem. Boundary problem in this study is only a comparison of how much time we need to get the wireless security type WPA password using brute-force techniques in terms of how many clients are distributed and how long the characters for passwords used.

Based on the above, the authors formulate the problem in this study is how the influence of the number of clients who are used to the speed of cracking passwords in a distributed system.

The purpose of this research is to analyze the influence of the number of clients who used the speed of cracking passwords in a distributed system, so that produce the WPA password security profile.

2 RESEARCH METHODOLOGY

2.1 Research Methods Used

In this research, using experimental research methods of conducting an experiment to see some results. The results will confirm how the position of the causal relationship between the

variables investigated / researched. According www.ut.ac.id, laboratory experiments in more "easily" done by because of the special facilities and the existence of a separate situation from outside interference, so that each variable can be manipulated based planning. Experimental research can be interpreted as the research methods used to search for a specific treatment effect against the other in uncontrolled conditions according Sugiyono (2012). Based on direct quotes from Zuriah (2006) that, the purpose of the research experiment is:

1. Test the hypothesis proposed in the research
2. Predicting event or occurrence in the experimental setting
3. Generalize the relationship between variables

2.2 Method Of Collecting Data

The data used in this study were divided into primary data and secondary data. To obtain the data used is done by:

1. Primery Data
   (a) Observation and studied condition of the object of research. Data needed physical and non-physical form of data relating to the condition of the object of research networks.
   (b) Experiment with scanning and network penetration experiments so get data for materials analysis.
2. Secondary Data

   The required data in the form of documents relating to the theme of the study by filing a petition to the authorities officially in the object of study.

2.3 Data Analysis Methods

Methods in analyzing the data using methods Mile and Huberman include data reduction, data presentation and conclusion, A. Salim (2006):

1. Data reduction

   The data has been obtained from various sources are grouped according to categories of data preparation, assessment of data and data reporting.
2. Presentation of data

   Data that has been prepared in accordance with its type is then presented in the form of narrative text so as easy to make a conclusion.
3. Withdrawal Conclusion

   Making the conclusion of each category to draw overall conclusions of the research.

3 RESULTS AND DISCUSSION

To get maximum results and a structured and easy to understand, is needed a testing process scheme which aims to illustrate how the testing process takes place that facilitate research in action and analyze the results and for those who see the scheme without having to look directly at the time of their study can already imagine what it will be like that and the process rather than testing it like it is. Pilot schemes can be seen in Figure 3.1 below:

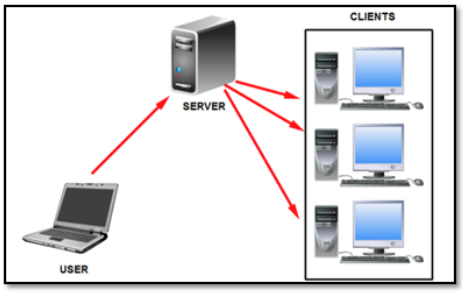

Figure 1: Scheme Testing Process

In accordance with the purpose of experimental the research of conducting an experiment to see some results, which confirms how the results will be a causal relationship between the variables investigated or researched as well as the conduct in accordance with the purpose of experimental research. In a brute-force techniques needed a file that stores the possibility of passwords used by the owner of the access point device. to facilitate the the research then be made using the software crunch that is already present on the operating system or Kali BackTrack Linux.

When the process of cracking the password on the client have been run there will be a notification on the client terminal window if successfully found the password of the target device or not. If the password cracking process is successful then the password of the device will be listed in the terminal window, and if it fails then there is a client terminal window will be writing no luck as seen in the Figure 2 and Figure 3.

Figure 2: Password cracking process successfully

3.1 Design Model Architecture

In the design for application integration architecture to be built with these services webs are epidemiological data integration unit and hospital clinic surveillance. Where the surveillance unit that uses dbms and different applications (My Sql and PostgreSQL). Access will

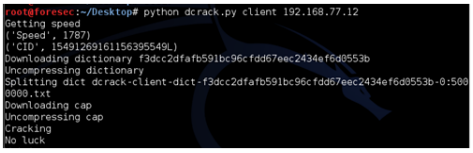

Figure 3: Password cracking process fails

Table 1: Testing Results

Type Password	Total Clients	Capture File Size	Password File Size	Time Testing
Numbers	2	70.9 MB	858 MB	7h 46m
	4	70.9 MB	858 MB	3h 53m
	8	70.9 MB	858 MB	1h 56m
	10	70.9 MB	858 MB	1h 33m

be built in the inter-application communication occurs in both directions, which through web services each surveillance unit will take a local database riding epidemiological data converted into the format of the document in the form of certain parameters (SOAP Services). Then web service to send and request access Atar will forward the application to the health department epidemiology database as a data center epidemiological.

3.2 Implementasi Web Services

In this study we created a prototype data center (dataware house epidemiology) which obtained epidemiological data sources of health centers and hospitals. The data center will obtain epidemiological data sources in the process of making XML Web Services, there are several services or functions that were made to access the database. The services that will be on the call and is used to build the system integration of epidemiological reports of health centers and hospitals to the health department epidemiology data center as a unified data base system integrated surveillance (SST).

Test data to cracking passwords is presented in tabular form as a visual to show that the time required to perform this action more and more clients in a distributed password cracking the time produced fewer and faster in the process of getting the password of the target wireless device such that seemingly on the table 3.1.

Tests conducted on the type of passwords starting from numbers, letters of the alphabet, alphabet uppercase and lowercase letters, uppercase letters lowercase letters of the alphabet and numbers, and the alphabet uppercase lowercase letters plus numbers and symbols. After testing the results obtained only limited types of passwords numbers only with a password length of 8 characters not to test 12 characters. It is based due to the limitations of software testing and the research tools used so that the time needed for this study does not allow resolved in a little time. Given the limitations of the device and knowledge in the research, then the research has not been able to continue in the near future.

Limitations than dcrack.py script capability is becoming one of the factors inhibiting the research should be discontinued as seen in the picture 3.4 which shows that the terminal

window there is a notification server error occurred on several lines of program syntax and too long delivery process dictionary password from the user to the server cause over flow error in the shipping process.

Figure 4: he process of sending the password dictionary server error

This occurs because the file is sent exceeds the capacity contained in scrypt python and delivery time exceeds the maximum limit as well as the limitations of server memory is not sufficient as a first capacity in the delivery process.

4 CONCLUSION

From the results of wireless penetration password conducted in this study, obtained some conclusions as follows:

1. After the test is done to see the comparison between time, the number of clients and the length of passwords used the results as the initial hypothesis that the increasing number of clients and the shorter the length of passwords used in the process of cracking the password then time required will be less too, so the opportunity to obtain a password more quickly and accurately, it is clarified on the tables 1 test results.

2. Character password and the password length affects the size of the dictionary file password. So much attention to the category and length of the password that will be used in the manufacture of dictionary words.

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Abstract

Informatioan technology era support the growth of the organization in making every job done easyly, quickly, and accurately. Archive is a medium that is used by each institution, especially educational institutions such as foundations or university for storage, grouping, organization, control and maintenance of a variety of archival records in particular letter. Bina Darma University has 5 category archives. In order to solve some problems related to arcvhiving correspondence letters, authors develop correspondence archival information systems (CAIS) or electronic Archive (e-Archive). Reason and purpose of this research is to build information systems archives of more structured and computerized in order to speed up the search existing data and making of incoming and outgoing mail and paperwork required. This study will use the method of First In First Serve (FIFS). The research results obtained is that the administration needed a system in search for existing archives and manufacture of incoming and outgoing mail and the mail archives report.

Keywords : *CAIS, e-Archive, FIFS, Information Systems and Administration*

1 INTRODUCTION

Informatioan technology era support the growth of the organization in making every job done easyly, quickly, and accurately. Information technology and/or information systems has been used in many sectors. This is possible because computer technology or information technology is able to collaborate with many other disciplines (Abdillah, Syafei, & Hardiyansyah, 2007).

In this research, author would like to covert the theme of correspondence archival information systems (CAIS) or electronic Archive (e-Archive). This system supports the principles of Good Government and Good Corporate Governance then support the efficiency and effectiveness of the achievement of objectives in educational organizations. CAIS helps streamline neatness archiving letters and documents of institutions such as contract documents, references, invitations and others. Letter of assignment and distribution of work related to the contents of the letter can also be done quickly and real time.

Archive is a medium that is used by each institution, especially educational institutions such as foundations or university for storage, grouping, organization, control and maintenance of a variety of archival records in particular letter. Archives have several usefulness (Sugiarto & Wahyono, 2005) as: 1) the source memory or memory, 2) a decision maker, 3) evidence or legality, and 4) a historical reference.

Correspondence manual filing systems on university building dharma consists of five categories, namely: 1) Academic (Higher Education, Kopertis, Aptisi, etc.), 2) A letter of request or offer, 3) Graduation Invitation letter as an invitation issued to students, faculty, as well as invitations to other universities, 4) Internal letter relating to the activities of organizations such as HIMTIK, HIMSIF, HMI and so on, and 5) General letter if the letter is received or released outside of those categories.

The problems faced by the administration was the large number of letters were made and accepted by the administration of Bina Darma University that makes data retrieval becomes inefficient.This is because the archiving process is still using the conventional system in which every incoming and outgoing mail are recorded in the books and not computerized. Then the letter is scanned into a popular document formats, namely PDF (Abdillah, 2012) and emailed to the leadership (vice rector II) in softcopy. while the hardcopy given to administrative head of the division. Furthermore, Chairman (Vice rector II) will do the disposition of incoming mail to the addressee. While waiting for the letter head of the division of administration approved by the chairman (vice chancellor II) that the letter could be given to the person concerned. This makes the process take longer.

A number of studies related to the archives of the system: 1) Sistem Informasi Persuratan dan Kearsipan Universitas Udayana Menggunakan Paradigma Pemrograman Berorientasi Objek (Putri, 2005) , 2) Pembangunan Sistem Informasi Manajemen Surat Masuk dan Surat Keluar Pada Bagian Umum Sekretariat Daerah Kabupaten Pacitan (Luqman, 2012), and 3) Perancangan Aplikasi Surat Masuk Dan Surat Keluar Pada PT. PLN (Persero) Wilayah Suluttenggo (Ferdinandus, Wowor, Lumenta, & Rumagit, 2012).

To overcome these problems requires the filing of a correspondence management system administration more structured and computerized by applying the method first in first serve (FIFS). FIFS is a behavior related to how to organize and manipulate the data relative to time and priorities. Selection of this method can describe the principle of processing techniques queue incoming and outgoing mail service requests or conflicting with the outgoing mail archiving process.

2 RESEARCH METHODOLOGY

The data collection methods used in completing this research are: 1) Observations in Administration section of Bina Darma University, 2) Interview with administration staff and Head of Administration, and 3) Literature reviews from from handbooks, literature compiled by experts to complete the necessary data in the writing of this thesis.

2.1 Fisrt In First Serve (FIFS)

This research also apply first in first serve (FIFS) algorithm to process incomming mails. FIFS is the simplest method of scheduling used in CPU. In this algorithms, the serve is according to the time of arrival of the incoming mails. The first incoming mails will be processed or executed first ((Masyarakat Digital Gotong Royong (MDGR), 2008).

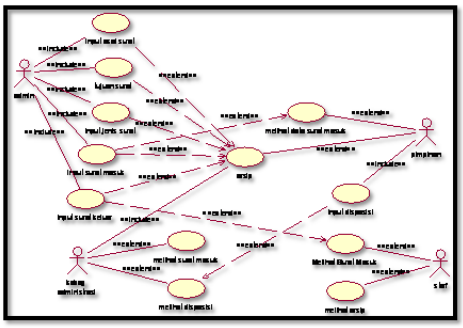

Figure 1: Use Case Diagram

2.2 System Development Life Cycle (SDLC)

Information systems in this article was developed by using System Development Life Cycle (SDLC) (O'Brien, 2010), that consists of: 1) investigation, 2) analysis, 3) design, 4) implementation, and 5) maintenance.

2.3 Use Case Diagram

Use case diagram in this research consists of four actors, namely: 1) Admin, 2) Kabag. Administrasi, 3) Pimpinan, and 4) Staff. Every actor has different login access based on the duty of each actor. Figure 1 illustrates use case diagram in this research.

2.4 Database Design

File design are the collection of interrelated records, where those files could be manipulated (Abdillah, 2006). In this research the design of involved tables are shown in figure 2 (Database of CAIS).

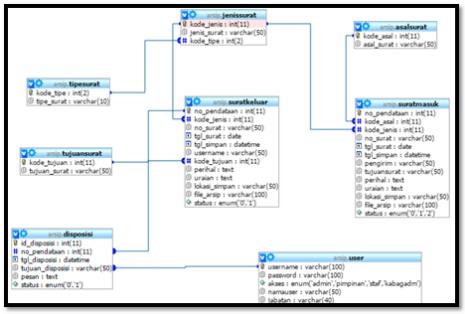

Figure 2: Database of CAIS

3 RESULTS AND DISCUSSION

3.1 Results

This Arcvhieve Information Systems The results of this research Based on research conducted by the author at the University of Bina Darma Palembang final results of the stages of development of the system is done is the implementation of designs that have been described in the previous chapter that consists of design files, design input and output design.

Figure 3: Correspondence Archieve Information Systems

The main result of this research is Correspondence Archive Information System. This CAIS consists of four sub menus: 1) maser data, 2) input incoming mail, 3) outgoing mail, and 4) archieves. This CAIS also produce one database consist of eight tables: 1) asal surat, 2) jenis surat, 3) tujuan surat, 4) surat masuk, 5) surat keluar, 6) tipe surat, 7) disposisi, dan 8) user. This system also produced three group of reports: 1) laporan surat masuk, 2) laporan surat keluar, and 3) laporan disposisi.

3.2 Discussion

After seeing the results of a system that has been described, so in this section the authors will run the processes that occur and how the use of this system has been built using PHP and MySQL database. This system is expected to help provide convenience to the Bina Darma University in processing the data archive.

3.2.1 Input of Incoming Mail

Incoming mail input page displays incoming mail form input consisting of the origin of the letter, type the letter, letter number, the date of the letter, the sender, the purpose of the letter, the title, description and upload documents letters. This page allows administrators to input data incoming mail.

3.2.2 Input of Outgoing Mail

Input page letter out to show the form input outgoing mail consisting of types of letters, numbers letter, the date of the letter, the purpose of the letter, other objectives, subject, description and upload documents letters. This page allows administrators to input data outgoing mail.

Figure 4: Input of Incoming Mail

Figure 5: Input Outgoing Mail

3.2.3 Disposition

Disposition of mails by leader to administration officer. Disposition page displays the number of letters, sender, subject, and the message is forwarded to. This page allows leader to dispose incoming mails from administration staff.

Figure 6: Page Disposition Leaders

3.2.4 Archive Page Leaders

Leadership archives page can display search incoming mail which has been in the disposition of leaders based on the type of letter. This page allows you to view the data report incoming mail that has been in the disposition by the leadership. Incoming mail that has been in the disposition by the leaders will go to the archives after the administration filed by the head of the division.

4 CONCLUSION

Based on the results of the study authors conducted at the University of Bina Darma and discussion conducted by the authors, it can be concluded that:

Figure 7: Archive Page Leaders

1. Correspondence Archival Information Systems (CAIS) able to process incoming mail quickly and easily.
2. CAIS able to help administration saff in managing correspondence archive better.
3. By eploying FIFS method, every incoming mail will be process fairly accoding to the queue.
4. CAIS able to back up the mail archieve and produce some usefull reports.

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Android-Based Bus Ticket Reservation Application

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Abstract

Currently mobile phones are not only used as a medium to communicate to phone and sms only, but also as a medium to communicate directly via the Internet or packet data service (GPRS) to send and receive data. DAMRI is a state-owned enterprises engaged in the transportation field. For existing activities in the company such as booking tickets, search the scheduled departure time, and the price of a bus ticket so prospective buyer can only do it queued through the outlet/counters and via telephone only. The development method used in this study is Mobile Application Development. The authors aimed to create a mobile application android-based ticket reservation (m-Reservation) application in order to facilitate the customer in activity booking tickets, viewing departure schedule, checking the list of reservations and seeing the info posted directly via android smartphone.

Keywords : *Android application, m-Reservation, DAMRI*

1 INTRODUCTION

Computer technology or information technology (IT) is able to collaborate with many other disciplines (Abdillah, Syafei, & Hardiyansyah, 2007). One of the most progreessive applications on IT recently is mobile technology. Mobile phones are not only used as a medium to communicate to phone and sms only, but can be used as a medium to communicate directly with the internet to send and receive data. This led to high interest in a smartphones.

Mobile application development is the set of processes and procedures involved in writing software for small, wireless computing devices such as smartphones or tablets (Rouse, 2011). In this paper, authors would like to discuss how to develop mobile application for bus ticket reservation.

The Department of Motor Transport of the Republic of Indonesia (DAMRI) is a state-owned enterprises engaged in transport. However, existing separately in company activities DAMRI such as booking tickets, search departure schedule, and pay any prospective buyer can do it through the outlet/counter and via the phone just to get information about booking or see the price of the ticket. However, for booking tickets by phone subscribers often have difficulty contacting DAMRI, due to a busy telephone lines used due to the number of incoming calls to DAMRI this annoying and disappointing the buyer, so the buyer will have to wait a long time as well mngantri officer had overwhelmed in serving each subscriber in

order tickets. Based on the above ways are pretty troublesome in service or book tickets over the counter. However, in line with the development of emerging technology, people's lifestyles began to experience a shift, when the first computerized activities, internet and telecommunication limited by place or location (fixed location). Now these things have to do in a mobile, including the use of a smartphone with android operating system.

Several publications have cover mobile application, such as: 1) Ticket reservation in Joglosemar Executive shuttle bus ((Panjaitan, Bahtiar, & Endah, 2012), 2) Al Quran mobile learning (Sobri & Abdillah, 2013), and 3) Cinema ticket reservation (Witono & Susanto, 2014).

2 RESEARCH METHODOLOGY

This study was conducted from October 2014 through January 2015. The place and the location of this research is in Damri Corporation Palembang Jl. Colonel H. Barlian No. 848 Km. 9 Sukarame Palembang.

2.1 Data Collections

In preparing this study, the authors used several data collection methods,among others: 1) Methods of Observation: Direct observation in the field of aspects relating to the system requirements. Data collection was carried out directly on DAMRI. The data obtained from the observation list of reservations, list, etc. sitting position, and 2) Method of Library Studies: A method of data collection is done by finding relevant books, papers and other scientific sources, Internet sites or article text documents related or related to the issues discussed.

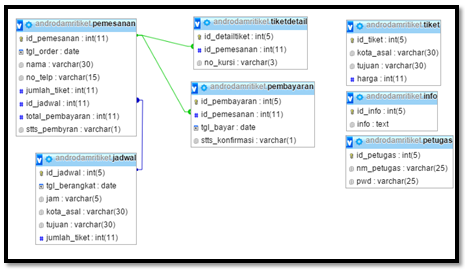

Figure 1: Database of mobile ticket reservation

2.2 Mobile Application Development

Mobile application development method used is a Mobile Application Development, consisting of six steps (Optimus Information, 2012): 1) Identify the Need also known as Requirements Gathering, 2) Create Mockups and/or Prototypes, 3) Finalize the Design and Create a Test Plan, 4) Development and Testing, 5) User Acceptance Testing (UAT), and 6) Deployment and Support.

2.3 Database Design

In this research there are seven tables used in the mobile application: 1) Jadual, 2) Pemesanan, 3) Pembayaran, 4) TiketDetail, 5) Ticket, 6) Info, and 7) Petugas. Those collection of files are interrelated records, where those files could be manipulated (Abdillah, 2006).

3 RESULTS AND DISCUSSION

3.1 Results

The result of this research is a mobile applicatiton for e-ticket reservation (figure 2). This mobile application can help prospective passengers to get information regarding the departure schedule, ticket prices, etc. This application also enrich with database to help administrator in handling reservation data access to DAMRI.

Figure 2: Main menu

Besides an application for mobile android, this research also produce a web application. This web application is used for admin to maintain the data of bus ticket reservations. Web application main menu (figure 2) describes the main menu page that appears after the officer to enter username and password correctly.

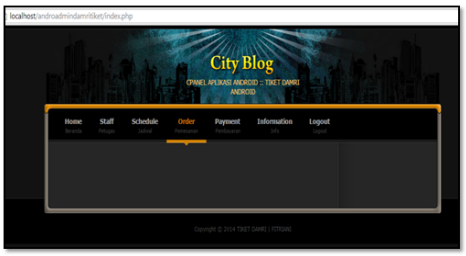

Figure 3: Main menu for web

3.2 Discussion

Developed mobile application able to help passenger to browse, book the bus schedulle. This mobile application also able to help the passenger to choose where they would like to sit in the bus. As follows are some features of this mobile reservation application.

3.2.1 Display the List of All Order

Display a list of orders will show all orders which have been conducted by the passenger, so that they can see the ticket reservation status (canceled, pending or has been confirmed by admin).

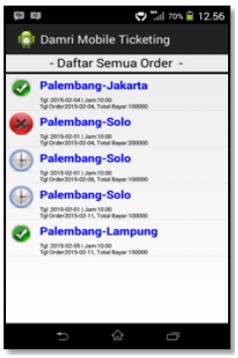

Figure 4: Display a list of orders

3.2.2 Order Ticket

This menu shows the origin and destination of passengers. This menu also used to choose bus departure schedule Figure 4. After passenger selects the destination then it will display the result of selected destination and schedulle.

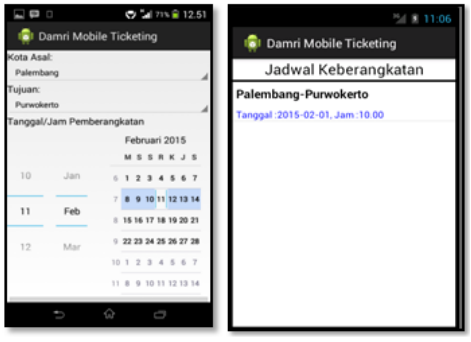

Figure 5: Booking scheduled departure

3.2.3 Choose the Sit

After the passenger select the date for departure, then nest step is choosing where the passenger would like to sit int the bus. Figure 5 shows the posisition of every single sit in the bus (sit no 1 34).

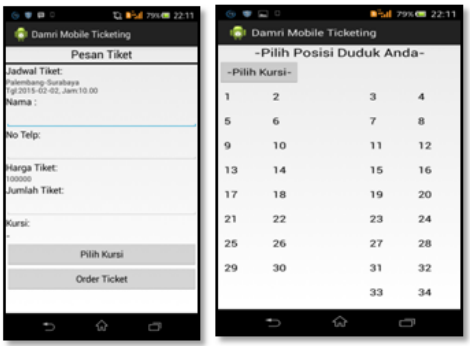

Figure 6: Ticket Order

3.2.4 Payment Confirmation

Payment confirmation displays the message to make the next payment after the passenger set an order. The message contains the amout of ticket price and where the account for payment should be transfered (figure 6).

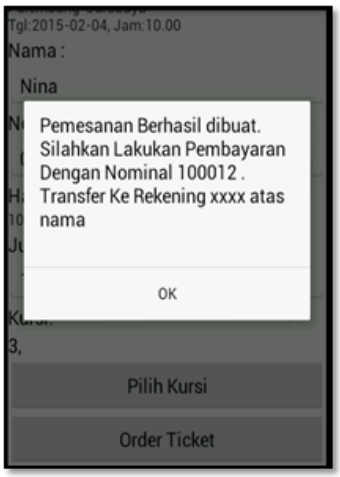

Figure 7: Payment Confirmation

4 CONCLUSION

Based on the results of the study authors conducted at the University of Bina Darma and discussion conducted by the authors, it can be concluded that:

1. Application booking bus tickets android based DAMRI can shorten the time it takes to book a bus ticket, so the bus ticket booking application of DAMRI helps prospective buyer to book a bus ticket.

2. Application DAMRI bus ticket booking can display bus seating plan when the process of booking bus tickets, so the buyer can directly select the number of seats that the customer wants.

3. Applications android-based bus ticket booking is not only useful for the process of booking a bus ticket only, but this application can also display information such as the schedule departure, ticket prices and seating locations will be selected. So that a complete display of Opera- prospective buyer can more easily determine the schedule set out to be addressed.

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Web Design As Support Promotion and Dissemination of Information Using Tabloid B-Smart Rich Internet Application (RIA)

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Abstract

CTabloid B - Smart as media published biweekly by Universitas Bina Darma tabloid contains information about the world of education in Indonesia, and South Sumatra in particular. With limited range and long lag time delivery of information to the public, of course, needed a media information online (website) that is capable of serving a variety of information quickly, with up to date news and information dissemination effective and reach a far wider than ever. To meet the need for adequate information, then the required resources must also be adequate. One of adequate resources and the latest is the internet, therefore tabloid B-Smart should be able to use the internet as a source of information. Methods of information retrieval via the Internet as a source is called Rich Internet Apllication.

Keywords : *Tabloid B-Smart, Web-based, Rich Internet Application*

1 INTRODUCTION

Tabloid B-Smart as media published biweekly by Bina Darma University tabloid contains information about the world of education in Indonesia, and South Sumatra in particular. Currently the range of deployment Tabloid B-Smart only meet Palembang area and some regions, have not touched on the whole territory of South Sumatra.

By utilizing the web as a medium of media dissemination of information, in addition to improving image Tabloid B-Smart as educational media with up to date news , also can provide information not only be read locally, but globally, of course, can increase the confidence and satisfaction for tabloid readers B-Smart. So I lifted the title "Media web design as support promotion and dissemination of information using Tabloid B-Smart rich internet application (RIA)".

Some of the problems identified from the background , and therefore problem of the manufacturing system is How to make use of RIA technology that tabloid website B - Smart become attractive to Internet users so as to widen the base of the tabloid readers ? With the research is expected to provide benefits to the tabloid B - Smart and the authors themselves, these benefits include: Broadening the base of the B- Smart Tabloid readers. Add revenue through advertising on the website.

2 RESEARCH METHODOLOGY

2.1 Rich Internet Application (RIA)

RIA is a technology that will provide a different experience than ever for Internet users because RIA combines the advantages of web-based applications and desktop -based applications.

2.2 Time and Place

This study began in October 2014 until the end of January 2015. The study is located at Universitas Bina Darma Palembang which is addressed at Jalan Ahmad Yani 12 Plaju Palembang .

2.3 Tools and Materials

Hardware tools in this study using X550D Asus laptop with specs Mouse, Printer. While the software used is Microsoft's Windows 8 operating system as the operating system, Adobe Photoshop as an image editing, MySql as database and Netbeans as editor application.

2.4 Data Collection Methods

The techniques used to collect the data are: 1) Interview technique is a data collection was done by questioning and dialogue directly with the parties related to the research conducted specifically on the chief editor of the tabloid B-Smart, and 2) Library Studies Literature study is one way of data collection is done by reading and studying books, papers or other references related to the issues discussed.

2.5 System Development Methods

System development method used in designing and building this software is a web engineering models (web Engeneering). According to Pressman (2001), web engineering model consists of two phases of work. The phases include: 1) Formulation, 2) Planning, 3) Analysis, 4) Engineering, and 5) Implementation (Page Generation) and Testing.

3 RESULT AND DISCUSSION

3.1 Results

After performing system analysis, system design ends and ends with the actual making of the program, the results achieved by the authors is a web media design system to support the promotion and dissemination of information tabloid B-Smart using Rich Internet Application (RIA) to facilitate the dissemination of information tabloid B-Smart while also improving image tabloid B-Smart as educational media with up to date news, also can provide information not only be read locally, but globally, of course, a question and answer service availability, can increase the confidence and satisfaction to the reader tabloid B-Smart.

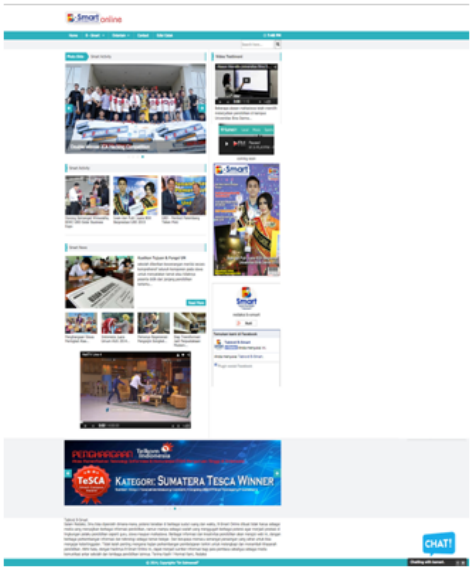
3.2 Discussion

Running a site on Tabloid Media System B - Smart is directly must have a web connection or MAMP server is apache , this system has the main page or the front page is an index page

that serves as a page execution to call other pages automatically when the page this accessible . In this chapter, we discussed that the system is a web media in tabloid B - Smart , there are other pages that can be related to each other . The first step to activate the main page of our first open Mozilla Firefox to turn on the main page . After Mozilla Firefox is enabled then we enter the main page address in the address box contained in Mozilla Firefox . The results of the making of this website are pages of information that will be run using the browser . As this website has a sub menu as follows :

3.2.1 Home page

Home page is the main view website tabloid B-Smart. At home there is a menu B-Smart, Entertain, Contact and Print Editions. Home page also displays video, sreaming radio and TV streaming and breaking news. Display the home page design can be seen in the image below :



4 CONCLUSION

The conclusions in this study are:

1. To design of this website may be effective and useful in accordance with the requirements, the design is based on a request from the tabloids and web design is based on data from the B - Smart as a collection of photographs, interviews and files that exist The tabloid B-Smart.

2. With this web design in terms of design and attractive appearence as well as information that is always up to date are expected to support program promotions taking place in the B- Smart .spread

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Analysis Network Security of Local Area Network (LAN) and Wifi in Dishub Kominfo Banyuasin

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Abstract

Advances in technology have increased very rapidly, especially in the field of computer technology. That's because computer technology can help meet human needs, is why all institutions both government and non-government has a lot to take advantage of advances in computer technology. Advances in computer technology have always hand in hand with the progress of the Internet. As the Transportation Communications and Information Technology Banyuasin, government agencies have been using the Internet in the implementation of their daily activities either LAN or wifi. The existence of the LAN network and wifi gained a lot of convenience, but not necessarily the security of the data / information can be assured of the attacker. Therefore, author will conduct a LAN Network Security Analysis and Wifi on Transportation Kominfo Banyuasin using NIST standards that has three main stages, namely planning, execution, and post-execution. This study successfully tested using a technique Network Sniffing, Ping of Death / DDOS, UDP Flooding, and Social Engineering.

Keywords : *Analysis, Security, LAN, Wifi, NIST*

1 INTRODUCTION

Advances in technology today has increased very rapidly, especially in the field of computer technology. That's because computer technology can help meet human needs, such as data processing, compute, store and present data / information. Therefore, throughout both government agencies and non-government has much to take advantage of advances in computer technology have. Advances in computer technology is always in line with the advancement of internet technology. Internet is now a requirement that must be met. Because of the internet users can get information faster. The Internet provides a lot of convenience. But behind the convenience provided by the internet there are also dangers posed by the Internet. The hazard can occur if the computer network security elements are not met. Thus the computer network security is very important to maintain the confidentiality, integrity, and avalibility, (CIA) of the data. With the use of the internet is a lot of convenience gained by Transportation Kominfo Banyuasin (Dishub Kominfo Kabupaten Banyuasin, 2011), but

not necessarily the security of the data / information in Transportation Communications and Information Technology assured of the threat the attacker. To determine the existing security network so as to provide recommendations for improvement, so in this study, author took the title "ANALYSIS NETWORK SECURITY OF LOCAL AREA NETWORK (LAN) AND WIFI ON DISHUB KOMINFO BANYUASIN" by implementing Information Security Testing and Assessment by NIST Standards.

From the above background, this research, issues to be discussed by the author is the "How to analyze network security Local Area Network (LAN) and Wifi on Transportation Kominfo Banyuasin by applying NIST Standards?" In order to carry out this research is focused on the issues that have been set, then the scope of this study are as follows: 1) Analyzing network security Local Area Network (LAN) and Wifi on Transportation Kominfo Banyuasin to perform penetration tests, 2) Only limited security testing, there is no prototype, 3) Looking for security holes and then make recommendations to the administrator to close loopholes, and 4) Applying NIST Standards.

The purpose of this study was to determine the vulnerabilities that have not been known by the network manager Transportation Kominfo Banyuasin. So that in the future network development Transportation network administrator can perform Kominfo Banyuasin closing loopholes in order to produce a more secure network than ever and can be protected from unauthorized access or interception.

The benefits gained from this study are as follows: 1) For Kominfo Transportation Banyuasin, this research may reveal vulnerabilities that exist, so the convenience of the use of the Internet can be realized, 2) For admin Transportation network manager Kominfo Banyuasin, this research can be a reference to close security holes found networks, 3) For author, this study is as the application of science that has been obtained in college, and as an introduction to the real world, and 4) For readers, the results of this study may be an additional reference materials and knowledge regarding network security Local Area Network (LAN) and Wifi.

2 RESEARCH METHODOLOGY

2.1 Object of Research

Object of research in the Department of Transportation, Communication, and Information located at office complex Pemkab Banyuasin No. 20, Sekojo Pangkalan Balai.

2.2 Method of Collecting Data

Data collected by: 1) a. Observation, author conducted a review directly to the object of research and then make observations, record, and analyze the existing network in the research object, 2) Interview, the author asks questions to the speakers, which have an interest in the network on the research object, and 3) Literature, author conducted a literature study to locate the material on the internet and reading books related to the research conducted.

2.3 NIST Standarization

NIST Standarization consists of: 1) planning, 2) execution, and 3) post-execution is working step by NIST standardization (Scarfone, 2008).

It is important for the success of network security testing, the planning stage is used for

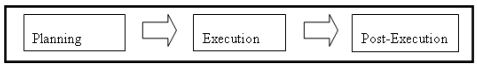

Figure 1: NIST Standarization

gathering the necessary information in the next stage of the testing phase / execution, such assets will be analyzed / security testing, threats to assets, security controls that will be used to reduce the threat and develop a testing approach security. Network security assessment should be carried out like the other project plans, scope / object of research, requirements, test team roles and responsibilities, limitations, success factors, resources, and time.

Various techniques are used by the attacker / researcher in penetrating into the LAN and WLAN networks are applied in this study are as follows: 1) Network Port and Service Identification. Network Port and Service Identification is one of the techniques that are useful for information gathering, to find an open port. The data collection was done by scanning the LAN and WLAN networks using tools that have been available on the operating system Backtrack 5R3, 2) Wireless Scanning. Wireless Scanning is the process of collecting data by scanning wifi wifi network to determine the current to then be able to do the next step is password cracking. Wireless Scanning can be done using airodump-ng tool, 3) Network Discovery. Network Discovery is the process of collecting data by scanning the network to find active devices to then be offensive to the active device and tool for network discovery is net discover, 4) Social Engineering. Social engineering is a hacking technique which utilizes the weakest element is human. The objective of this technique which collects data as much as possible in order to meet the needs of the data when the process is executed and the execution of this technique is usually done manually or using tools, such as network administrators interviewed, 5) System Configuration Review. System Configuration Review is the process of analyzing the configuration of the WLAN network security system. The purpose of this technique is to determine the configuration in stage of security system, a way to open / view the configuration that has been made. With so author can see if wifi is already configured with safe or unsafe, 6) Password Cracking. Password cracking is the process of identifying weak passwords. This technique aims to find a password that is used on a particular network. This technique can be run manually or by using a tool like aircrack-ng, 7) Network Sniffing. Network Sniffing is the man-in-the-middle attacker to install a tool that is in the middle of the track network used by the user. The purpose of this attack is to monitor packets passing through the network, so that the attacker can capture the username and password that the user uses the network. In this study, author used a script ettercap as a tool for network sniffing, 8) Ping of Death / DDOS. Ping of Death / DDOS attack is to send ICMP packets to a computer as many users who are connected to the network is available. The purpose of this attack is to overwhelm the user computer ICMP packets so that the user will have uninterrupted connection to the network as a buffer over flow. This attack can be done manually and by using the tool mdk3, and 9) UDP Flooding. UDP Flooding is the attack by sending a UDP packet to a computer as many users connected to the network is available. The purpose of this attack is to flood the user's computer with UDP packets so that the computer will experience disruption to the network or even disconnect. This attack uses UDP Flooder tool of application NetTool.

3 RESULT AND DISCUSSION

3.1 Execution

3.1.1 Target Identification and Analysis Techniques

Testing techniques can identify a network of potential vulnerabilities. Identification can be done manually and using tools. But in general, the testing is done by using the tools in accordance with the technique and ability of the test team / author.

3.1.2 Network Port and Service Identification

To apply the techniques of network ports and service identification Zenmap author used tool. Zenmap is the same tool nmap but differs in its use. Zenmap is a graphical tool nmap is tool-based and CLI (Command Line Interface). Zenmap useful for gathering information gathering like finding open ports, the router MAC address, operating system used, the router is being used, what version, and others. In this study, author used Zenmap tool that has been found on the operating system backtrack 5R3.

3.1.3 Wireless Scanning

To implement wireless scanning techniques author use airodump-ng tool. Airodump-ng is a tool to identify the current wireless. With this tool, author can know the BSSID / MAC address, channel, encryption, cipher, and the ESSID of the access point. This tool found on the operating system backtrack 5R3.

3.1.4 Network Discovery

To implement network discovery techniques author use tool NetDiscover. NetDiscover is a tool to determine the IP and MAC addresses of users who are connected to a network. This tool has been installed on the operating system backtrack 5R3.

3.1.5 Social Engineering

At this stage, investigators probing the target to find the data that is relevant to the network on the object of research by interviewing the network administrator.

3.1.6 System Configuration Review

To apply technique system configuration review, but author do not use the tool manually. At this stage investigators probing the target by looking out of the wifi network configuration.

3.1.7 Target Vulnerability Validation Techniques

This stage is a test to confirm the existence of vulnerabilities, and can be done manually or by using the tools, depending on the particular technique used and the skill test team. Target validation techniques including password cracking susceptibility, penetration testing, social engineering, and testing of network security.

3.2 Post-Execution

Post-Execution is the final stage of testing by NIST standardization. This stage is the evaluation of the test results of the previous stage. At this stage the priority vulnerabilities or grouped based on the impact caused by the vulnerability. Analyze the root cause of the existence of these vulnerabilities and provide recommendations on how the response. This stage is the final report of the study the author did.

3.2.1 Testing Results

Test results are reports of testing LAN network, wifi KOMINFO, and wifi PPID 2014 by applying the techniques that have been determined in the previous stage.

Table 1. Network security testing results

No	Attack Techniques	Network			Tools	Description
		LAN	Wifi KOMINFO	Wifi PPID 2014		
01	Password Cracking	not success	not success	not success	Manual, aircrack-ng	Matching Password obtained from interviews to related parties
02	Network Sniffing	Success	not success	not success	Ettercap	Capture the network packets that pass through in-sniffing, such as username and password
03	Ping of Death / DDOS	Success	Success	Success	Manual, mdk3	Send package as much as possible and continuously to the network used
04	UDP Flooding	Success	Success	Success	NetTools	Send UDP packets as much and continuously to the user computer
05	Social Engineering	not success	Success	Success	Manual	Utilizing human weakness, to seek information about the passwords on the network used

3.2.2 Identification of Causes and How to cope

1. Password Cracking

   From the use of password cracking techniques investigators failed to get the password from LAN network or wifi network. It can be concluded that the password used either technology or combination of characters is good enough so that the author did not succeed in penetrating.

2. Network Sniffing

   By using the tool Ettercap author succeeded in intercepting or wifi LAN network path. But here which can be monitored only user who uses http protocol only, not the https protocol. Therefore the user must be careful in using the network again. Do not visit

sites that do not have a certificate for security validation. Username and password so that we use can not be monitored by the attacker.

3. Ping of Death / DDOS

   Using the technique of Ping of Death / DDOS author managed to test the security of the LAN network and wifi. Even if done using a laptop and a few a long time, this technique can make down the server or Wifi / Access Point that is used in the research object. Because the technique with this technique, an attacker can easily send packets continuously and as much as possible to make available the network down. When the network is down, then the elements of availability has not met again. How to overcome it is to install the Firewall / IP Tables because when there ICMP packets or packets that can make down the network can be rejected / in-drop so that the package can not create a buffer over flow available networks and availability elements remain unfulfilled.

4. UDP Flooding

   Using UDP Flooding engineering author succeeded in making the user to decrease the performance of your computer. In this technique the attacker sends UDP packets continuously and as much as possible to the user's computer. Even if the attack was allowed to continue for a long time, it can make the user's computer to hang. The solution of this attack is to install a firewall / IP Tables so that such attacks can be rejected.

5. Social Engineering

   Using this technique, the author managed to get the password of wifi but not the LAN network password. In this technique the author exploit human weaknesses in creating a password. Solution of attack using this technique is returned to the user itself. How to maintain the confidentiality of the data created themselves.

4 CONCLUSION

Based on the results of research and discussion that has been described in previous chapters, in this study, entitled Analysis Network Security of Local Area Network (LAN) and Wifi in Dishub Kominfo Banyuasin, it can be concluded that many cracks were found by author that can be executed so as to cause lose one element (CIA), the results of this study can contribute suggestions for improvement in terms network security of LAN and wifi on the next phase of network development and testing techniques in LAN network and wifi Transportation Kominfo Banyuasin still so much that has not been tested in this study and that means not all the cracks in the LAN network and wifi in the Transportation Communications and Information Technology Banyuasin the author found.

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Dictionary of Prabumulih Language-Based Android

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Abstract

Mobile application become one of the most progessive technology nowadays. Android itself is the name of a company engaged in the field of information technology, especially software company named Android Inc. which was established in October 2003 in Palo Alto, California, USA. Android has many advantages such as operating system can be change according to the user's wants and easily develop applications free of charge, so many developers choose Android as the operating system. The main purpose of this Prabumulih dictionary application is to create a dictionary-based Prabumulih android that is expected to assist and provide benefits to the wider community who want to learn the language Prabumulih. Mobile Application Development Life Cycle Model (MADLC) is used to develop the mobile application. This method consists of the identification phase, design phase, development phase, prototyping phase, thase testing, deployment phase, manitance phase. The programming language used is java programming language. This application able to translate Prabumulih language into/from Indonesian and enrich with sentence translation.

Keywords : *Mobile-dictionary, Android, Prabumulih language.*

1 INTRODUCTION

One of the most growth technology nowaday is computer or information technology (IT). Computer technology is able to collaborate with many other disciplines (Abdillah, Syafei, & Hardiyansyah, 2007). Information technology has penetrated into the smartphone, one of which is based on Android handsets. Android is a package of software for mobile devices, including an operating system, middleware and core applications (Shu, Du, & Chen, 2009).

Android itself is the name of a company engaged in the field of information technology, especially software company named Android Inc. which was established in October 2003 in Palo Alto, California, USA. Android has many advantages such operating system can be changed according to the user's wants and easily develop applications free of charge, so many developers choose Android as the operating system. Android have been used in billion of gadgets like smatphones and tablets. In this paper, authors will develop mobile dictionary based on android for Prabumulih languge.

A number of studies related to the mobile application dictionary: 1) Electronic Indonesian and Java Dictionary for Mobile Application by using Interpolation Search (Afifah, Santoso, &

Yuliana, 2010), 2) Mobile Application Dictionary of Psychology Terms (Parno, Dharmayanti, & Rahmansyah, 2011), and 3) Al Quran mobile learning (Sobri & Abdillah, 2013).

One language that is widely used in South Sumatra is the language Rambang Prabumulih community. One factor that makes language Rambang become widely used language is much Rambang society in the city Prabumulih. Rambang language formed from thousands of years ago. Rambang language is a language that one big clump with Malay civilization in Southeast Asia. Indeed many languages Rambang who seems to have a close relationship with the family of languages Siam (point group Indochina). Writing history stated that there are many relics inscriptions Pranagari script with Malay beginning in South Sumatra, but in fact the all population of tribes on the island of Sumatra, all using Kegenge script as written culture (Azhar, 2013).

The benefits of this research are as follows: 1) Expected with the availability of a Prabumulih dictionary, in order to help in presenting Prabumulih language digitally, 2) Hopefully, by the prabumulih dictionary can recognize media Computerized technology, and 3) It can be source of learning to build of Science and Technology in the field of computer which has been accepted for studying in Bina Darma University in Palembang.

2 RESEARCH METHODOLOGY

In this research, authors use three methods to to obtain data and information: 1) Study of literature (Literature): Namely data obtained through literature, conducted a study of the literature to get material from internet and read books that available the observed object, 2) Research (Observation): Data were collected with a view directly from the object under study at Prabumulih community, and 3) Interview: To obtain the data directly from the source to understand in connection with the observation that the author did. In this case the authors pose questions to the original Prabumulih namely with one of the former head of the village in the district Rambang Central.

Software development methods used in this study is the method of Mobile Application Development Life Cycle Model (MADLC) which consists of the following stages (Vithani & Kumar, 2014) : 1) Identification Phase, 2) Design Phase, 3) Development Phase, 4) Prototyping Phase, 5) Testing Phase, 6) Deployment Phase, and 7) Maintenance Phase.

3 RESULT AND DISCUSSION

The results of this research is android-based Prabumulih dictionary application which has been built using eclipse indigo and can run on Android 3.0 (Honeycomb) to android 4.4 (kitkat). This android-based dictionary contains about 500 Indonesian words and Prabumulih words.

To test and run the application, the authors use virtual android emulator, and for the device is mobile android 4.1.2 (jellybean). This application can translate a sentence and have a sound pronunciation of the word.

3.0.1 Splssh Screen and Main Page

Page splash screen applications android based dictionary Prabumulih this as an opening page of the application dictionary based Prabumulih android (figure 1). The main page of the dictionary application android based Prabumulih showing an input and two buttons to

translate the word that has been entered by the user (figure 2).

Figure 1: Splash Screen

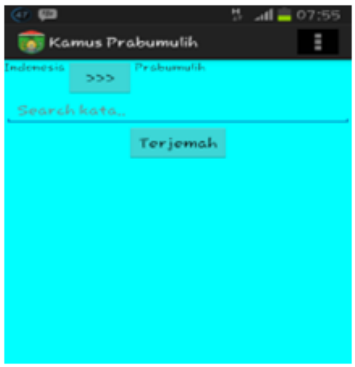

Figure 2: Main Page

3.1 Sound Page

Sounds on the application page Prabumulih android based dictionary provides translations of the text pieces and speak button. If we push the sound button, then android device will sound it.

3.2 Display Options Page Contents Menu

Contents of the application menu Prabumulih android based dictionary provides two menu options must be selected by the user, ie the menu sentence that has the function to translate in the form of a sentence.

3.3 Page Views Sentence

Sentence on page Prabumulih android based dictionary application showing a single input, one column of the translation sentence and three buttons to translate the sentence that has been entered by the user.

Figure 3: Sounds Page Views

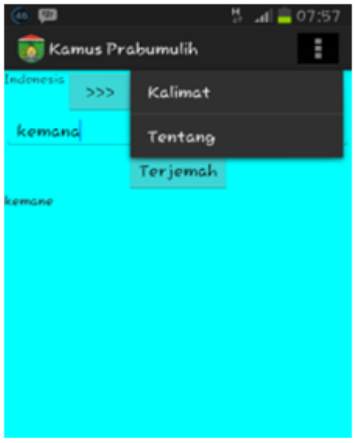

Figure 4: Dsiplay Options Page Contents Menu

3.4 Page Views About

Application page on the android based Prabumulih dictionary is very simple, not a lot of additional features due to the content of the page only contains a brief profile of the application dictionary based Prabumulih android.

4 CONCLUSION

According to the results of the study and the explanations in the previous sections, we could some conclusions as follows:

1. This android-based Prabumulih dictionary runs in android platform from android 3.0 (Honeycomb) to android 4.4 (Kitkat).
2. This application able to help people and new comers in learning Prabumulih language.
3. This application goes offline so users need no data to run it after the installation.

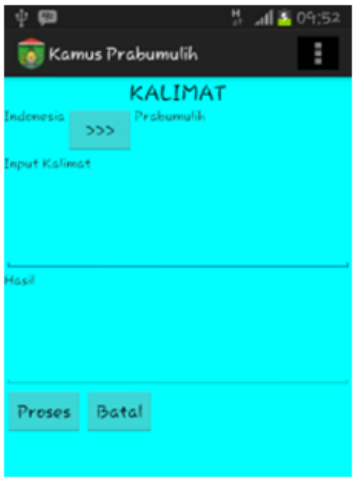

Figure 5: Page Views Sentence

Figure 6: Page Views About

4. This application equipped with text-to-speech and translation of sentence.

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Geographic Information Systems of Android-Based Residential Locations in Palembang

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Abstract

Today many housing were built in Palembang, but yet there is a technology or application that tells about the locations and the specifications of the housing. Technology will continue to evolve, one of the development of technology based mobile phone is android. Android is an operating system based on Linux for mobile devices that includes an operating system, middleware and applications. The features in Android-based mobile phone is the Google Maps API. Google Maps API itself has the objective to find out the location and information about a place that is sought. One software on a computer that can determine the location as the Google Maps API is a Geographic Information System (GIS). Authors plan to facilitate the public in finding out the location of the residential housing via android device (android 2.3, Gingerbread). The authors will make the application of geographic information systems in residential location based android. The method of system development used in this study is mobile-D method. This mobile GIS application able in providing the information of residential locations in Palembang.

Keywords : *Android application, GIS, Mobile-D, Residential locataions*

1 INTRODUCTION

Information technology (IT) is the most flexible technology, because it can collaborate with many other disciplines (Abdillah, Syafei, & Hardiyansyah, 2007). Mobile technology as a part of information technology (IT) has been used for many aspects. The one that is used in various devices is Android. Android is a comprehensive open source platform designed for mobile devices. It is championed by Google and owned by Open Handset Alliance (Gargenta, 2011). Android mobile technology has some features that support the application to access internet services. One of the services available on mobile phone internet service can use the Google Maps API. Google Maps API functions to find locations and information. On the other hand, geographic information systems (GIS) become used widely to access the location information. A GIS is a collection of software, normally manipulated by its user through a single interface, and designed to perform a wide range of operations on geographic data (Goodchild, 2009).

In line with the population growing rapidly, the demand for the availability of various facilities that support the livelihood of communities also increase. One is housing facilities. Housing is a collection of homes as part of the settlement, both urban and rural areas, which is equipped with infrastructure, facilities, and public facilities as a result of efforts to comply with decent housing (Undang-Undang Republik Indonesia Nomor 1 Tahun 2011, 2011).

The Development of housing growth in Palembang and its surroundings grow more rapidly lately. Hundred of new housing located in mamy districts over the city. Demand of new house make authors interested to facilitate the searching of house locations in Palembang and surroundings.

The collaboration of mobile android technology, global posisitiong systems (GPS), and the concepts of geographic information systems (GIS) trigger authros to develop an application tosearch the location of housing in Palembang that displays the specification of the new residential housing.

There some previous research related to GIS: 1) The design of Geographic Information System selection for alternative way in Jakarta based Android (Fajarsari, Halief, Nuryanto, & Haryanto, 2013), 2) Application of GIS-based map of the city property that is integrated on the Google Map on android smartphones (Pertiwi & Suprayogi, 2013), and 3) The development of web-based and Android-sased for property information application (Oeinata, Andjarwirawan, & Handojo, 2014).

The scope of this research are: 1) Android-based GIS application determines the housing 40 in Palembang (7 sub-districts), and 2) This application can be adjusted for android starting from version 2.3 (Gingerbread).

The purpose of this study was to determine the locations of housing in Palembang based on Android, which can be used by the institution and the community to support housing development in Palembang.

The benefit of this research are : 1) Facilitate the public aware of the location of housing in Palembang, and 2) Helps the user to go to the location of housing through the map and the shortest route.

2 RESEARCH METHODOLOGY

This study began in October 2014 to January 2015. Meanwhile, place this study in 40 residential sales offices in the city of Palembang. Authors use some methods to get primary data, such as: 1) Observation to 40 sales offices in Palembang, 2) Interview to the employees in the sales office to obtain the required data. For secondary data, authors looking for brochures on the existing housing in Palembang, reference books, and the result of browsing on the internet related to this research.

Mobile application development methods used in this study is Mobile-D (Abrahamsson et al., 2004) which consists of five stages as follow: 1) Explore (researching). In this step examines the needs of the system, data collection in this stage can do a study like, interview or literature study. This stage produces a document user requirements or can be regarded as data associated with a user desires in the manufacturing system, 2) Initialize (initialize). In this stage of getting the documents obtained from the previous stage. This document will use the programmer to perform system-making activity, 3) Productionize. In this stage the programmer will find and make coding-coding to make this application, 4) Stabilize (Strengthening). After searching and create new coding-coding the coding was written in

eclipse, and 5) The system test and fix (system testing and repair). Before applications are actually used by the public system should be tested. If there are any coding or programmer can fix the errors.

3 RESULT AND DISCUSSION

The end result of all the activities and stages of development of a system that has been done is the implementation of designs that have been described in the previous chapter, which consists of the design process, the scheme would databases, and design of the menu structure. After applying the analysis and design into an application, then obtained a GIS application in Palembang residential location based android. As a result of the manufacture of residential applications based on Android are : 1) Web-based server application. And 2) The client application based on Android.

Web-based server application. On the application server, there are several menu pages include : a) Admin login page on the application server is used to enter the main menu on the application server, b) Housing menu page is a page that is used to increase housing obtained, and c) Page navigation map editor is a page that is used to provide the coordinates of the housing. The client application based on Android : a) The login page on a client application that is used for menu pages into the android based applications, b) Page menu there are 40 residential housing that has been entered by the previous admin, and c) Page navigation map used if the user wants to know where the nearest residential users.

3.1 Home Users and User

The initial view displays multiple images residential users, this display that will take the user to access the menu page for residential applications (figure 1). In this view there are two menus to the user that the housing menus and menu map. Menu featuring 40 residential housing in Palembang, and a menu map showing the housing 40 is closest to the user (figure 2).

Figure 1: Figure 1. Users views, Figure 2. Display menu

3.2 Page Housing

The user can choose the housing that will be known information by pressing one of the housing above, then will appear the information of the selected housing, such as address information, grade, specification and layout of the housing.

Figure 2: Figure 3. Menu display housing, Figure 4. Display house details

3.3 Housing Plan Page

Figure 5-6 showing the floor plan of the housing previously selected, if the plan is small and it is not clear that the plan users can download and save it to the gallery smartphone users.

3.4 Page Menu Map

Page menu map in figure 7, users can also search for housing know which one is closest to the user. When the user selects a menu position nearest housing and turn the GPS, the GPS will direct users to the nearest housing from the user's position.

4 CONCLUSION

Based on the results of the reserach and some information above, Authors have some conclusions as follows:

1. This android-based GIS for residential locations able to help people to search the information about residential and its locations in Palembang.
2. This mobile application was developed by Mobile-D which is very useful for sort term mobile application development.
3. This mobile application uses geospatial from Google in real time.

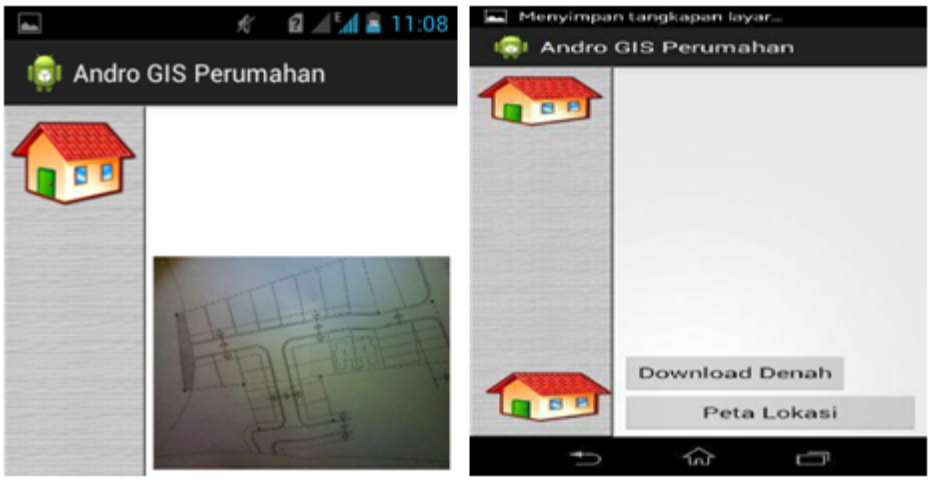

Figure 3: Display housing plan, Figure 6. Display layout download

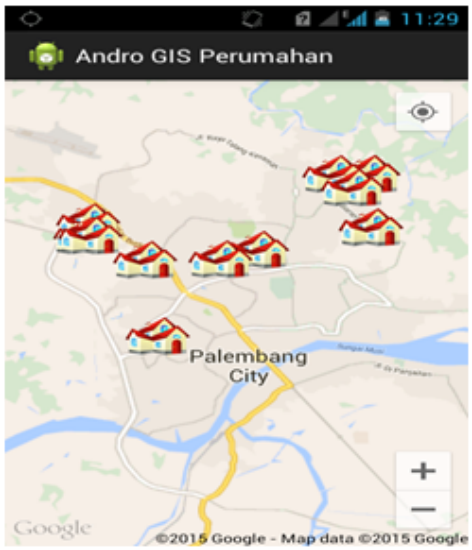

Figure 4: Map display housing

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The Evaluation of Academic System of Bina Darma University on Students Satisfaction

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Abstract

Bina Darma University has applied online academic system that can be accessed on http://sisfo.binadarma.ac.id. In this academic system there are some kinds of information that can be obtained by the students. On the webpage menus,it can be seen that all of the information provided is very important and useful especially for students. In relation to the importance and benefits perceived by the students, the satisfaction of the information obtained from the academic system will arise. To measure the level of satisfaction of students of the online academic system at Universitas Bina Darma, the researchers used the usability testing method with questionnaire distribution

Keywords : *academic systems, students satisfaction, usability testing*

1 INTRODUCTION

The development of technology has become a trigger to acquire data or information quickly and accurately. The development of better technology tools will yield great benefits for an agency or a company. Nowadays Bina Darma has applied online academic system which which can be accessed onhttp://sisfo.binadarma.ac.id. On this online academic system, there are some kinds of information that can be obtained by students, such as academic data, personal data, GPA, study report, short semester study report, the conversion scores, academic advisors and thesis advisors, and tution feeinformation.

There are three previous researches related to this study: 1) First, the study that was done by Camilla (2013) showed that measuring the level of user statisfaction by using the End User Computer Statisfaction method can be seen from five perspectives. They are content, accuracy, format, ease of use and timelines. The variable used to measure the level of statisfaction with the system application used is individual performance. The population in this study were the employees of bussiness service service. Thesampling technique used is probability sampling with theapproach of simple random sampling i.e.taking samples from a population with random members. Then, in analyzing the data, descriptive analysis was used to determine the respondents responds to each question in the questionnaire, 2) Sekundera (2006). He has done an analysis of end user by using the Technology Acceptance Model

(TAM) and End User Computing Statisfaction (EUCS). In his research, Charlesto said that Technology Acceptance Model (TAM) was developed to explain the behavior with two variables. It is useful and easy to use. He applied End User Computing Statisfaction (EUCS) models to measure user satisfaction of information system. The information system of a company can be used if it has a good quality and is able to give satisfaction to the users. It is one indicator of the success of the development of information, and 3) Wahyu Hidayat, A. Yani Ranius and Usman Ependi (2014) also applied usability testing in the evaluation of Prabumulih government website. In their research, they suggests that the method of usability testing or interoperability test is to measure the efficiency, convenience and the ability to recall how to interact without any difficulties or errors. In this research, three respondents were taken to represent the population (users) and also represent the three levels of users who are active users, skilled users and novice users.

Of all the menus provided on the online academic system at Bina Darma University, it can be seen that all of the information prepared is very important and useful, especially for students. In relation to the importance and benefits perceived by the students, the satisfaction of the information obtained from the academic system will arise. The issue on the level of satisfaction is very important, because it relates to the purpose of the academic system that is to provide information to students about their academic results. Therefore, the researcherswere interested in evaluating the level of students satisfaction on the existing online academic system at Bina Darma University.

2 RESEARCH METHODOLOGY

In collecting the data for usability testing, the researchers used several methods: 1) Observation and Interview. Observations made at Bina Darma University who are from different semester. They are first, fifth, and seventh semseter students. The interviews were conducted by asking questions directly the students of the University of Bina Darma, 2) Questionnaire. Questionnaire distributions were done to ask questions to perform usability testing in order determine the level of students satisfaction on the information obtained from the academic system at Bina Darma University, and 3) Library Research. This method was done to find out other researches related to this study. The analysis on the usability testing to measure the level of satisfaction of students to the academic system at Universitas Bina Darma who are from different semester; first, fifth, seventh, or final year students. The selection of respondents is based on which questions and the identity of the respondents.

The analysis done covered five aspects of usability, namely: 1) Learnability. To determine how far the users understand, why the search and identifed the information they are looking for. Here students have the reasons to access the academic system to obtain some information about academic results, payment history and their personal data, 2) Efficiency. It Explains how an efficient website can provide information quickly, here it will be known whether the information about the data that exist in the academic student academic system can be accessed quickly or not, 3) Memorability. It describes whether the website is easy to remember, is easy to learn from her how to run. This aspect explains whether the academic system at the University of Bina is easy to remember, easy to learn and is easy to run and whether it takes a long time or notfor the students to understand it when there are changes in the academic system, 4) Errors and Security. It explains how often a website exeperiences errors occurs on the menus or links. On this aspect, it will be examined whether all menus or

links contained within the academic system are accessible or not, and 5) Satisfaction. This aspect is most desired by each user. The users want a website that can be easily used and studied. In addition, a user also wants to find what they need quickly, knowing where they are and can go anywhere within a site. In the usability testing, this is a very important aspect, because of the satisfaction, that we can see whether a system has great benefits for the user or not.

3 RESULT AND DISCUSSION

After doing some literature review, the researchers chose to apply the methods of usability testing method since the usability of websites is strongly related to the field of Human-Computer Interaction (HCI), which is about how human beings as users of the website interact with the existing system on the website. The website should be designed as economical as possible with the principles of human-centered design, making it easier for users to use the website. All the advantages and disadvantages of users must be considered in designing a website in order to be usable.

The researchers chose to use a method of usability testing in evaluating the academic system at Universitas Bina Darma because this method of usability testing or interoperability test is to measure the efficiency, convenience and the ability to recall how to interact without any difficulties or errors.

4 CONCLUSION

The researchers concluded that the menus or the links on the online academic system of Bina Darma hasmade the students quite satisfied as they provide useful information for the students. The information provided is the information of the academic data, personal data, GPA, study reports, short semester study report, the conversion scores, academic advisors and thesis advisors, and tuition fee information.

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Application of Data Mining to Determine Students Interest in Reading University Library Building Bina Darma Palembang Using Clustering Method

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Abstract

This study was conducted to determine the interest in building a university student reading Bina Darma the clustering method. The data used in this study is a database library Universitas Bina Darma Palembang consist of three tables are tables collection, patron tables and tables of visitors who will be selected to be integrated and combined as a data warehouse. Application of data mining to determine the titles of the most demanding of students and courses are most borrowed books and read a book in the library building dharma. The information obtained is that the course is more interested in information systems to borrow and read books compared to the industrial engineering courses. Titles that most interest is the title of the book basics of programming, while the lowest book is the title of students interested in a practical handbook using Microsotf word.

Keywords : *Clustering, Data Mining, Data Warehouse, Visitor, Collecton, and Patron.*

1 INTRODUCTION

1.1 Background

University of Bina Darma Library was established with the aim to help and support in meeting the needs of scientific information academicians. Library widely used college students to read and borrow books. This can become a necessity what if we always want to know the contents of a text. No amount of library materials owned by the library, if the low student interest in reading the existing library materials in the library will not be useful. And vice versa if the library materials owned by the library a bit high but the interest in reading library materials in the library will be very beneficial and usefull.

1.2 Research Problem

The issues to be discussed include:

1. How is the application of data mining to determine student interest in reading by title of the most borrowed books in the library of the University of Bina Darma using clustering methods?

2. The study program where the most interest to borrow and read books in the library?

1.3 Objectives and Benefits Research

The goal of this research is to determine student interest in reading information grouping based on the title of the most borrowed books in the Library of the University of Bina Darma Palembang. Can provide information-information and knowledge which have probably not known titles that most interest students in the Library at university of Bina Darma.

2 RESEARCH METHODOLOGY

2.1 Interests Read

According Listarion (2009), interest in reading is an interest to be able to interpret or construe the words of media in order to obtain the required information. With the interest in reading can encourage someone to actively expand their knowledge. The higher interest in reading about someone higher the learning outcomes of receipt, which is expected to achieve optimal learning.

2.2 Data Mining

According to Romario (2013), Data mining is a term that is often said to be a way to decipher and seek discovery of knowledge in a database. Data mining is the process of selecting or knowledge of a set of data mining in large numbers.

According to Berry (2004), data mining is used to search for valuable business information from very large databases that are used to predict trends and traits business and find patterns that are not known in advance.

From the above understanding can be concluded that data mining is as manage the data to look for information or knowledge that is interesting.

2.3 Clustering

According to Santoso (2007), this method seeks to place objects that are similar (short distance) in one cluster and create distance between clusters as far as possible. This means that objects in the cluster is very similar to each other and different from the objects in other clusters. In this method was not known in advance how many clusters and how classification. The main goal of clustering is a method of grouping a number of data objects into clusters (groups) so that in each cluster will contain data that is as similar as possible.

3 RESULT AND DISCUSSION

3.1 Analysis of Data Mining

The data comes from a database library that consists of a table of books, tables and table borrowing members to seek linkages between tables. Not all attributes that roughly useful

and not too random, because the data is too random would make mining process takes a long time and its relationship level was low.

3.2 Data Warehouse

Data warehouse used to store data from a database library that consists of several tables are tables of books, tables and tables lending library members. The main objective is the development of a data warehouse so that the database is not compromised in the event of an error, in addition to the data warehouse to facilitate the bringing together data from three tables. Process ETL (Extract Transform Load) in the data warehouse development is an important process for determining a new data warehouse.

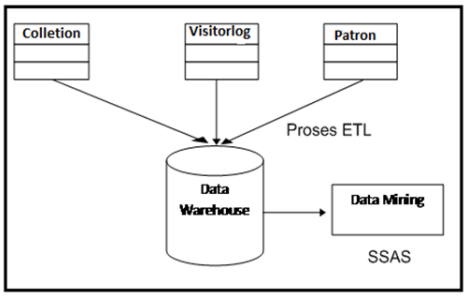

Figure 1: The concept of ETL processes (Extract Transform Load)

3.3 Figure How To Import The Data

Import database right-click on the name of the database that has been created select taks and select import database. Import data is to input the data into a database that has been created and enter the data that will be used.

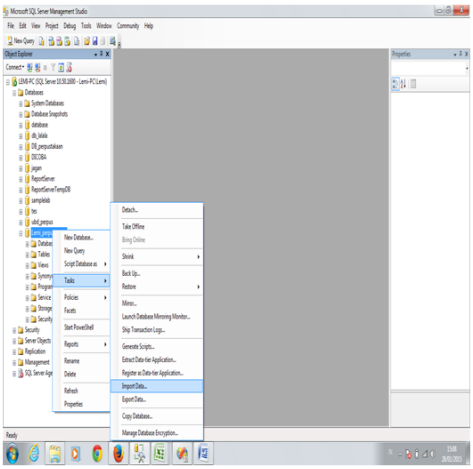

Figure 2: How to import the data

3.4 Figure Displaying The Data Warehouse

How to display a table right-click the table and select the Select Top 1000 Rows. Data collection is displayed to view the data imported with perfect or not so that data can be processed further.

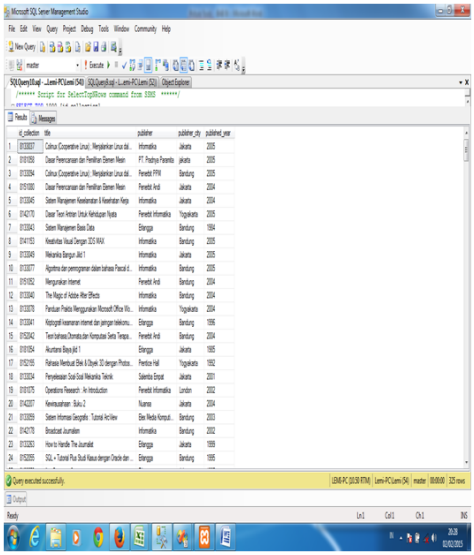

Figure 3: Displaying The Data Warehouse

3.5 Figure Process Data Warehouse

This process is to combine all existing data in the table collection, patron tables, and the tables are combined into a data warehouse visitorlog.

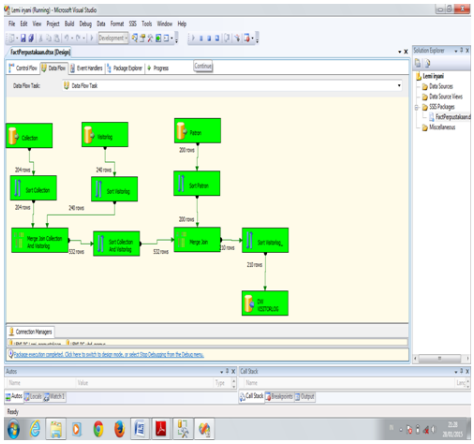

Figure 4: Process data warehouse

3.6 Figure Graph Title And Courses

In this window select the chart and select the title and the course it will show the data graph title and courses. This is a chart to show which courses are most interested in the library to borrow books and what books are most interested students. Here the programs of study are most interested to borrow a book is a study program information system and the least interest in reading is industrial engineering. Books are the most popular is the basics of programming and the least attractive book is a book entitled archiving system and method of access.

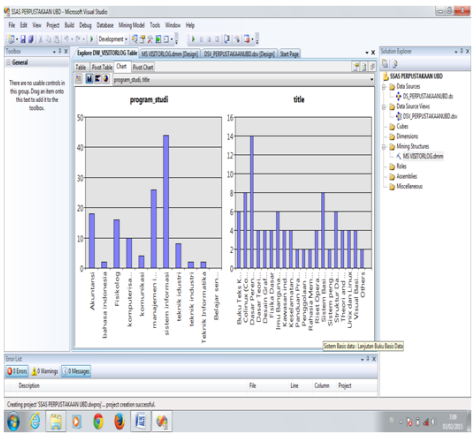

Figure 5: Graph title and courses

4 CONCLUSION

The conclusion in this final project is:

1. The information is displayed in the form of books most demanding students are books and programming algorithms.

2. The result is no difference between the courses that borrow books can be seen that the course is more interested in information systems study visit and borrow books in comparison with industrial engineering courses.

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Decision Support System To Determine The Loan Nominal at KUD Mupakat Jaya Using Decision Tree Method

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Abstract

Koperasi Unit Daerah (KUD) Mupakat Jaya is one of cooperative which has members who often loan some money from it. The KUD has 1.571 members who work as a rubber farmer in Prabumulih. Decision support system (dss) is important for cooperative, its to determine how much money that can loan, and also can speed up the process. So KUD Mupakat Jaya needs a system that can help calculate the nominal that can be loaned. The purpose of this research is to build a decision support system to determine the loan nominal and also to increase the service of cooperative KUD Mupakat Jaya. The method that used in this research is decision tree method which can take a right decision. With the decision supported by the system, we expected can help the cooperative in making a decision and to determine how much money thatwill be given to members of KUD MupakatJaya.

Keywords : *DSS, Loan nominal, Decision Tree, Mupakat Jaya, KUD*

1 INTRODUCTION

The age and technology is growing very rapidly, we can estimated lending money in a credit union will increase. With so many people who apply for loans to cooperatives, it would cause a problem if the cooperative can not organize lending management side.

Regional Unit Cooperatives (KUD) Mupakat Jaya is one of the co-operative distribution of processed rubber in Prabumulih (Sudianto, Abdillah, & Andryani, 2013). This cooperation allow its members to apply a lon in cooperative. The cooperative is located in the Jungai Village, District Rambang Kapak Tengah Prabumulih. With total membership of 1,571 people, whose members are rubber farmers who lived in Prabumulih and surrounding. This cooperative has business such as warung serba ada (Waserda), usaha simpan pinjam (USP), and Marketing BOKAR (Bahan olahan karet) to support the cooperative fund. This KUD applied TPK system (Cooperative Services place) to help serving the rubber farmers according to their respective TPK, tempat pelayanan koperasi. So farmers doesnt need to come directly to the cooperatives but they just need to come to TPK to doing a saving and loan transaction ordering some fertilizer in cooperatives. To support the productivity, cooperatives allow the farmers to loan some money in the cooperative, but the farmers must follow BOKAR,

bahan olahan karet, marketing which carried by the cooperative. So if the member wants to loan some money, they come to TPK in their places, and TPK will submit their loans to cooperatives Mupakat Jaya to fill the form of loan who will be processed by the cooperatives. Then KUD will decide how much money that will be given to the TPK.

In the cash loan process, the cooperative providing loans to each TPK which applied for a loan. The impact for cooperative is having trouble to determine the nominal that given to every TPK. It is because the cooperative has limited budgets and fund. So to make a lending decision requires so many time. So cooperative requires a decision support system (DSS) which can calculating all the criteria that can support to making decision and to help speed up and simplifying the decision making process.

Decision suport method that used in this research is Decision Tree method. Decision tree is a classification and prediction methods are very powerful and famous. Decision tree method to change the fact that a very large into a decision tree that represents the rule . Rules can be easily understood with natural language. And they also can be expressed in the form of data base language such as Structured Query Language to find records in a particular category (Kusrini, 2009), and decision tree in here used algorithm C4.5. This C4.5 algorithm is an extension of ID3 algorithm which has a function to generate a decision tree. C4.5 algorithm is not limited to binary numbers and generating a decision tree with many variables. Attributes in C4.5 by default generate a branch for each branch of the category attribute (Maimon, 2005).

The method that can support the decision is decision tree (DT). This method is used to modeling the problem that consists of complex decisions become simpler so to make decisions to determine the nominal lending will be more easy and efficient. The results of this process will show the approximate loan nominal that given to members of the Mupakat Jaya cooperative. By calculating the tonnage (rubber results), the assurance that given and the farmers income that would borrow some money.

Based on the problem above the researchers want to make a decision support system to facilitating the cooperative to make a decision, with the title "Decision Support System to Determine the loan nominal At KUD Member Jaya Mupakat with *Decision Tree Method*.

2 RESEARCH METHODOLOGY

2.1 Development system methods

The system development method that used in DSS method is a method that provides information, modeling and manipulating the data that used to help making a decision in the semi-structured situation and unstructured situation where no one knows for sure how the decision should be made (Alter, 2002) and decision suport system also mean an interactive information system that provides information, modeling, and manipulating data (Kusrini, 2007).

2.2 Research method

This research is using a descriptive method. According to Zikmund William (2003), descriptive method is a research that design to describe the characteristic from a population or a phenomenon.

3 RESULT AND DISCUSSION

3.1 Result

Based on the research tha thas been done at KUD Mupakat Jaya, the result is a decision support system determines the loan nominal at KUD Mupakat Jaya with Decision Tree method. These systems are expected to help the performance of the employee of KUD Mupakat Jaya in the process of determining the loan nominal to be given to the cooperative members that applying for loans. To make these systems, the writer used the C4.5 Decision Tree Algorithm with PHP programming language.

3.2 Discussion

The result of a decision support system is determines the loan nominal at KUD Mupakat Jaya has an output such as loan nominal consideration that can be given to the members according to the KUD Mupakat Jaya terms.

3.3 Dataset Page

This dataset pages function is to view the data or rule that has been made based on the criteria established by KUD Mupakat Jaya, on this page there are 12 rules that have been set by KUD Mupakat Jaya. This page have an add button, edit and delete its for if there is any change in the rule.

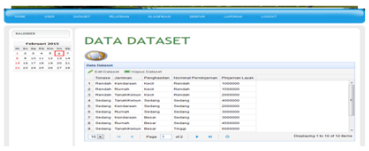

Figure 1: Data Set

3.4 Training Pages

The training pages are the dataset training C4.5 algorithm. This dataset training pages only used once, its when this system started at KUD Mupakat Jaya. And will be used again if there is a change of the rule set.

Figure 2: Training Page

3.5 Classification pages

The classification page is a page for inputting cooperative members data that will apply for loans and calculate how much money that could be given. On this page there is a debtor classification button.

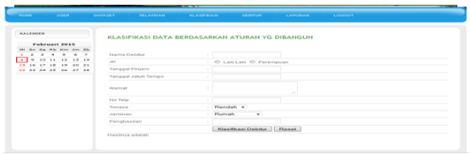

Figure 3: Classification Page

3.6 Notification pages

Notification pages is a page to display the notification member data that has lend every month in KUD Mupakat Jaya and also addressed to the head of KUD Mupakat Jaya. In here administrators will select the month and year to print out the notification.

Figure 4: Notification Page

4 CONCLUSION

Based on the explanation that has been described in the previous sections, it can be concluded belows:

1. This study produced a decision support system to determine the loan nominal at KUD Mupakat Jaya, which can help the employee to determine the loan nominal that will be given to cooperatives members.

2. Producing a decision support system determines the loan nominal at KUD Mupakat Jaya using Decision Tree method, and implemented by using the PHP programming language.

3. With the decision support systems determines the loan nominal at KUD Mupakat Jaya, and can speed up the process of determining the loan nominal so the cooperative members can more quickly receive their loan money.

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SMS Security System With Encryption Decryption Blowfish Algorithm Based on Mobile Android

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Abstract

Short Message Service is known as the facilityto send and receiving short message which contain text (short text message) through the nircable ware, communication device called mobile phones. Although own so many advantages for people, SMS itself also own a minus or weakness in the progress. Build with the same systems a Short Message Service is known as the facility to send and receiving short message which contain text (short text message) through the nircable ware, communication device called mobile phones. Although own so many advantages for people, SMS itself also own a minus/weakness in the progress. Build with the same systems and programs possibly made what-so-called Roaming from the local channel/net until to strange/unknown channel/net happen, which affected to shape SMS Spoofing in the manipulation form. One of the way out is using SMS protector with sms chriptography what take benefit from/using keys to describe enscripted SMS. One of the methods to enscripted data or message is Blowfish algorithm. Blowfish algorithm is included as key-symmetric algorithm what own the same keys to encrypt data. Blowfish algorithm is also included as The Chiper Block what until now still can be claimed as the safe one caused by no attacker who really succeed on solve the Blowfish algoorithm existed till now.

Keywords : *Algoritma Blowfish, Dekripsi, Enkripsi, SMS*

1 INTRODUCTION

The last few years, there have been very rapid development in mobile phone technology (cell phones). One is started popping smart phone with a variety of features and has complex operating systems like computers. Starting from a phone that can only be used to talk and sms to "smart phones" (smartphone) which has various functions such as multimedia, multiplayer games, data transfer, video streaming and others. A variety of operating systems for mobile phones were introduced, including a fairly well known is Android.

One of the facilities used in mobile phones for sending data in the form of short messages via short message service (SMS). However, the SMS facility itself has many weaknesses that

SMS is built with the same systems and programs, and SMS itself can roam the local network to the foreign network that SMS spoofing is possible in the form of disguise or manipulation of information such as addresses or other data that resemble users in general. Other SMS weakness is the content of SMS messages sent in the open system service providers and employees. Abroad use SMS to send a secret message had already been developed. For example, in the UK a mobile operator, staellium UK, issued a service called "stealth text" that can be used to send messages securely, ie by deleting messages automatically as soon as 40 seconds the message is read or known by the name of self-destruct text message. There are also security sms sms using that utilizes cryptographic key to decrypt the text that has been in encryption. One method of data encryption or message is Blowfish algorithm.

Blowfish algorithm including symmetric key algorithms that have the same key to encrypt the data. Through encryption, the data that is important to be encoded by using a key that the key will also be used in the process of reading the data (descript). Based on this, the authors make the application design SMS encryption and decryption using the Blowfish algorithm. Blowfish algorithm including a block cipher and is still considered safe because no attacker who actually broke the Blowfish algorithm. Therefore, the authors will try to make a security sms with Blowfish method to encrypt the data that runs on Android operating system so that owners of Android-based mobile phone that can perform data exchange SMS with a more secure and comfortable.

Problem to be addressed in this research is limited encryption and decryption are performed is SMS data. Two sides users are required to use encryption on the mobile application being used. Mobile devices are used is a phone with Android operating system.

2 RESEARCH METHODOLOGY

2.1 Place and Time Research

This research was conducted at the University of Bina Darma Palembang in September 2014 through December 2014.

2.2 Research method

The method used in this study using the research method Unifed Rational Process (RUP), while the four-phase conducted in this study are as follows.

1. Inception, In this phase, the authors analyze the system, including the determination of the scope, the user needs is divided into two, namely the functional requirements described through the use case diagrams and non-functional requirements, analysis and problem solving procedural logic system with the activity diagram.

2. Elaboration, Based on the analysis results obtained from the analysis phase (Inception), the authors began to design a complete system. Start of designing a package diagram, the display (Interface) as the initial appearance design, design class diagrams, sequence diagrams and design the display interface.

3. Construction, At this stage the author to re-examine the results of the two previous stages, namely stages of analysis and design phase. Is it in accordance with the analysis that has been done. After appropriate then the author will start to implement the making of an application on a hardware design.

Transition, Once the design is completed application is implemented, the authors submit the application to the user (user) that is the target of designing an application that made the author. Furthermore, the authors carried out tests on the application by requesting a response from the user (user), on application use of questionnaires as a medium to see the response from the user (user).

2.3 Analysis System

Before starting the design phase of the system (System Design) first performed the analysis system. At this stage will be determined the scope, the user needs is divided into two, covering functional requirements described in the use case diagrams and non-functional requirements, procedural logic system with the activity diagram.

2.4 Problems Analysis

At this stage of the design development application SMS encryption and decryption using the Blowfish algorithm, the authors found some problems to be analyzed, among others:

1. How to maintain the confidentiality of the data in the SMS using the Blowfish algorithm.
2. Implement the Blowfish algorithm in Android-based mobile.

2.5 Requirement Analysis

Analysis of user needs is divided into two groups: functional requirements analysis and analysis of non-functional requirements.

1. The non-functional Requirement is a requirement that support the work of a system, but does not bring direct influence on the performance of the system itself.
2. Functional requirement provides an overview of system services is available, who begin and how the system responds to this.

2.6 Blowfish algorithm

Blowfish is a symmetric key cryptography algorithm is a block cipher with a block length of 64 bits fixed throughout. The algorithms also apply any technique sized keys. Key size that can be accepted by blowfish is between 32 to 448 bits, with a standard size of 128 bits. Blowfish utilizes the bit manipulation techniques and playback techniques and key rotation performed 16 times. The main algorithm is divided into two main sub-algorithms, namely the expansion and part of the encryption key and a description of the data. Key expansion is done at the beginning of the input of a key with a length of 32 to 448 bits, and the output is an array of sub-keys with a total of 4168 bytes. Part of encryption and decryption of data occurs by utilizing a looping 16 times against Feistel network. Each iteration consists of permutations with the input is the key, and the substitution of data. All operations are performed by using xor operations and additions. Additions made to the four lines lookup is done each revolution, (Aji, 2011).

Discovered by Horst Feistel network Feistel in the design of Lucifer and popularized by DES. Almost all block cipher algorithm works in a Feistel network model. Feistel network is

a general method to transform any function (usually called function F) to the permutation (Ariyus, 2009). Android is an operating system based on Linux for mobile devices that includes an operating system, middleware and applications, (Nazruddin Safaat H, 2011).

Cryptography (cryptography) is derived from the Greek "cryptos" means "secret" (secret) and "graphein" meaning "writing" (writing). So cryptographic means "secret writing" (hieroglyph) (Munir, 2006: 2).

3 RESULT AND DISCUSSION

3.1 Stages Running Programs

The initial phase should be done for the user running the application encryption and decryption of this SMS is choose the applications you have installed on the phone and then the user can start the application.

3.2 Running Programs Menu Display

Menu display page is the page where the user can begin to access the application, by selecting one of the menu, among others, Send SMS and Read Messages. Display menu page can be seen in Figure 1.

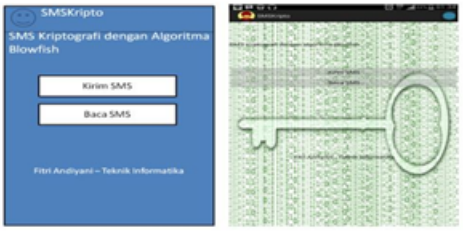

Figure 1: Display Menu

3.3 Starting the Display Program Send SMS

Page send a message is a page where users can write a message to be sent. On this page the user can enter the destination number, contents and key messages. On this page there is an option to send a message and automatically after the user selects the Send SMS will display a message that has been encrypted in the input plaintext form. Pageviews send a message can be seen in Figure 2.

3.4 Running Programs Display Read Message

Read display page is a page message contains the messages received by the user. Read a message directly connected to the SMS Inbox and to access the SMS inbox first user must perform key input. After the user input the key it will show the contents of incoming messages. Display read SMS inbox messages and can be seen in Figure 3.

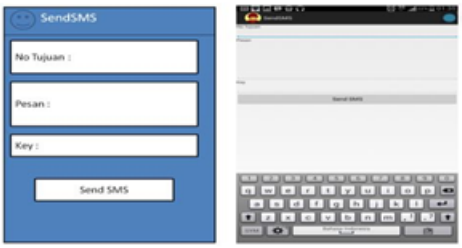

Figure 2: Send Message Display

Figure 3: Read Message Display

4 CONCLUSION

Based on the results of the discussion in the previous chapters in this thesis report, it can be concluded as follows :

1. Blowfish algorithm can be applied to applications based on Android SMS Cryptography.
2. SMS Cryptography Applications can be run on Android version 4.2.2 (Kitkat), the Android version 4.1.2 (Jelly Bean), Android Version 3.2 (Icecream Sandwich), the Android version 3.0 (Honey Comb), Android Version 2.3 (Ginger Bread).

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Implementation of Applications on The Store Hellen Jaya Using Rapid Application Development Method

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Abstract

Store Hellen Jaya is one of the business enterprises engaged in building materials (exit and entry of goods). Hellen Jaya store is still using manual systems that all sales and purchases of goods are recorded by an employee or owner of the store in a book, The constraints occur, the number of errors in the calculation of recording inventory. In making the inventory report is very difficult and takes a long time to do. Because caused by the accumulation of data related to purchases and sales of goods or the occurrence of entry and exit of goods where the process is only recorded in a book and a memorandum of the transaction. Of these issues Store Hellen Jaya require inventory application that will hold all the data and information about these items, this application will be made to the programming language PHP and MySQL as its database. The design of the application of this inventory will be using Rapid Application Development (RAD), where the software development process belonging to the multilevel technique. RAD emphasis on short development cycles, short, and fast.

Keywords : *Application, Inventory, RAD, Rapid Application Development*

1 INTRODUCTION

Human need for information is growing rapidly. Examples that can be drawn from the developments in the field of information technology and telecommunications.Store Hellen Jaya is one of the business enterprise engaged in the field of building materials (purchase and sale of goods). In business development, Hellen Store Jaya using store and warehouse for storage of inventory, the inventory process has several problems, among others, the number of errors in the calculation of inventory records, which led to the recording of inventory still use a manual inventory is recorded only in this book. This inventory will design applications using Rapid Application Development (RAD), which belongs to the software development process multilevel techniques. RAD emphasis on short development cycles, short, and fast. Some time is an important limitation to this model. Rapid Application Development using iteration method in developing the system, in which the working model of the system that

was built in the early stages of development to determine the needs of the user. can be formulated problem that can be taken is how to design an application that can support the processing of inventory, with the purchase, depreciation, sales of goods, purchase returns, sales returns and can generate accurate reports in accordance shopkeeper Hellen Jaya needs quickly, thus formulating limit inventory applications the problem is simply the process of purchase, depreciation, sales of goods, purchase returns, and inventory sales returns this application run offline, because it is only used to store Hellen Jaya alone.

2 RESEARCH METHODOLOGY

The method used in this research is descriptive method of searching for and collecting data related to the existing problems, and discussed in order to get the results in the form of a solution that can later be in implementasikan.Metode Data Collection The data used are primary and secondary data Primary data is data collected directly from the object of research. As for ways to collect primary data is as follows:

1. Methods of Observation

   The data were collected through direct observation to see ocuments about the data transactions. The activities of these observations to see how the transaction took place, starting from incoming goods until the goods are out, resulting in a memorandum of information in the form of the transaction, which involves a notebook goods as a guide to starting any process transactions that occur.

2. Method Interview

The method of collecting data obtained directly through the question and answer process to the store owner who can provide information or information that is needed. The questions raised in this interview about the methods of business processes that occur. In this activity, researchers analyzed and provide questions to identify what my process is happening, how to process incoming goods that happen to purchase, how to process the goods out that occurs in the sales process, and what is needed to facilitate the shop owners know the final stock of goods, as well as any information that is in want shopkeepers.

Secondary data is data collection to study problems associated with the object under study as well as books that are reviewed.

1. Literature Review

   Data obtained through the study of literature (literature) is to find material from the internet, journals and books in accordance with the object to be studied, by reading and studying books, papers or other references related objects examined.

2. documentation

   Author collect the data needed to store Hellen Jaya. The data collected in the form of a memorandum of the transaction, brochures, and notebook goods. The data will be used to support research activities.

3 RESULT AND DISCUSSION

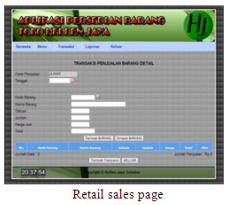
Based on the research that has been done on the shop author Hellen Jaya, the end result of all the activities and stages of development of a system that has been the author did in the previous chapter, which consists of identifying the needs analysis that contains the identification of the purpose of the application, information requirements, techniques or approaches , and user needs. As well as the design process that includes system design, database design, and application design interface design.

Based on the research that has been done on the shop author Hellen Jaya, the end result of all the activities and stages of development of a system that has been the author did in the previous chapter, which consists of identifying the needs analysis that contains the identification of the purpose of the application, information requirements, techniques or approaches , and user needs. As well as the design process that includes system design, database design, and application design interface design.

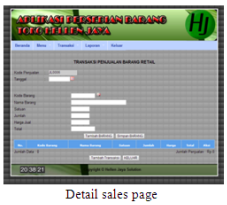
Me

Data Entry of Goods

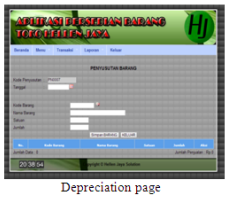
Purchase page



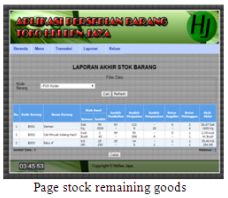
Retail sales page



Detail sales page



Depreciation page



Page stock remaining goods

At the end of the report page inventory inventory application there is a table that menampil overall stock remaining goods, as well as on this page are the fruit combo box is used to perform data retrieval stock remaining items based on the item code that has been set. On this page terbadapat three buttons or keys used to perform processes that need, the

key adapaun are looking for the data, refresh, and print. The results of the final stock of goods in getting from the initial stock purchase amount minus the added sales and further reduce the number of shrinkage.

4 CONCLUSION

Based on research that has been conducted and an explanation on the previous chapters, the authors can conclude, among others:

1. With the application of this inventory will reduce the level of error in the final result provides information on the store inventory hellen
2. This application will facilitate the transaction process that occurs in the store hellen victorious, making it more efficient and more accurate in its calculations.
3. The application can display the overall data items in the store hellen jaya, which becomes an important role in the application process inventory, so that later can be used to check the availability of the presence or absence of goods on store hellen victorious.

4.1 SUGGESTIONS

As for some of the suggestions that had been added to improve the performance of applications on the store inventory hellen getting better jaya order is as follows:

1. In the process of selling goods and Retail Details are still done separately, so that the seller is much efficient data processing, data processing and detail as well as retail sales retail sales returns and details should be in the form of transactions where retail sales and detail to differentiate the unit goods which will determine the selling price of goods by units of goods that have been fed beforehand so well with penjualnnya returns.
2. In the application of this inventory, did not produce a report purchases, sales and stock remaining goods, in detail. In order to produce high quality information, needs to be made of the process to print the results of overall sales, purchases, and final stock of goods, based on the date that has been set from the beginning to the end.

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Website Design Using Responsive Web Design (Case Study: SMK YP Gajah Mada Palembang)

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Abstract

SMK YP GAMA is one of the best schools in the city of Palembang. Current SMK YP GAMA not have a website for information dissemination and is still done manually, thus having difficulty in students or prospective students in getting Operaabout SMK YP GAMA. The authors are interested in creating a web site where the site can be used well, then this is what led to the birth of a concept "Design Website Using Responsive Web Design" and to be able to make the website responsive created using CSS3 and HTML5. Responsive Web Design is a technique used to create a web layout adapts to the display device or devices that use web user, both size and orientation in an upright or portrait display and display horizontally or landscape.

Keywords : *Website, Responsive Web Design, Opera- provider*

1 INTRODUCTION

Internet and smartphones is a unity that cant be separated in providing information to its users and is one of the media information that is effective and efficient in the delivery of information that can be accessed any person anytime and anywhere.

SMK YP Gama is one of the schools in the city of Palembang, which is located at street Banten 2 and including private vocational favorite in Plaju area of Palembang. To publish SMK YP GAMA to the general public and students to vocational YP GAMA known by many, the SMK YP GAMA use the brochure as a medium of publication. But for the time being of any particular community of the students prefer to seek information using internet facilities, for the SMK YP GAMA Palembang want to use the internet facility in the publishing of school information. SMK YP GAMA intends to have a website in order to facilitate students and prospective students to obtain information about the school or the announcement to be published in schools using responsive web design.

Design is the depiction, planning and making sketches or arrangement of several separate elements into one unit to the needs and serves to design a system can be designed in the form of a flow chart of the system (system flowchart) which is a form of graphic tool that can be used to indicate the order - the order of the process of the system (Nafsiah, 2003).

In designing a web site, authors involve some technologies of CSS3 and HTML5. CSS 3 (Jayan, 2010) is an abbreviation of Cascading style sheets. It uses is to set the display HTML documents, for example, as the spacing between lines, text, color and even the appearance of a border format image files. CSS3 is a simplification to give a different portion of the previous css based on the characteristics of the device or devices that may use CSS3 is used to build a responsive or adaptive design of a website, which does not depend on the style or style rules in a browser but is based portion rules viewport size or screen work a device or devices. Meanwhile, HTML5 is the new standard of HTML. previous versions of HTML HTML 4.01 appeared in 1999. The internet is a very significant change since then until now. HTML5 is designed to meet almost any need for user without additional plugins. Those need include animations, launch applications, play music and movies. HTML5 cross-platform also means that it can run in various platforms and devices such as tablets, smartphones, notebooks and laptops. HTML5 is still being developed. but all popular browsers already support the new HTML5 elements.

Based on the background described above which says that vocational SMK YP GAMA want to have a website with technology that can be optimally on any device, the formulation of the problem is "How to design web design SMK Gajah Mada using web technologies responsive?" which is expected to provide comfort and can be optimally adapted to any device that is used to access web pages.

The purpose of this research is to design a website CMS YP GAMA with web technologies that are responsive to adjust zoom the display device or devices used web visitors both size and orientation, so that the display located on the device or mobile device while providing the comfort of the user accessing the website. And the benefits of this research are that visitors easily read, open, use the navigation and features - features of existing websites using various media screen.

2 RESEARCH METHODOLOGY

2.1 System Development Method

To create an application system takes several steps in order to obtain an application that is really useful as needed. According to Pressman (2010) stages in the development of the system are as follows: 1) Planning System (System Planning): Namely the early stages of system development that defines the estimated resource needs such as physical devices, human, methods (engineering and operations) and the budget of a general nature, 2) Analysis System: That phase of the study on the existing system with the aim of designing a new system or updated, 3) Design System: That is the stage after the analysis system that determines the process and data required by the new system, 4) Implementation System: That is the stage where the design of the system is formed into a code (program) that is ready to be operated, and 5) Maintenance System: That step is performed after the implementation phase, which includes the use of or use of, the audit system, maintenance, repair, and improvement of the system

2.2 Responsive Web Design

By Marcotte (2010), in an article on the website "alistapart.com" in the article he proposes how a web design can adjust itself in terms of both size and components of the website on

mobile devices and desktop without having Constructing flexible different designs to content the content is the same, from which it gives birth to the concept of responsive web design is more flexible and can adapt to almost any different screens.

Responsive web design is a web design or site created to provide an optimal web browsing experience, easy to read and navigate with a minimum of resizing, panning and scrolling in a variety of desktop and mobile devices.

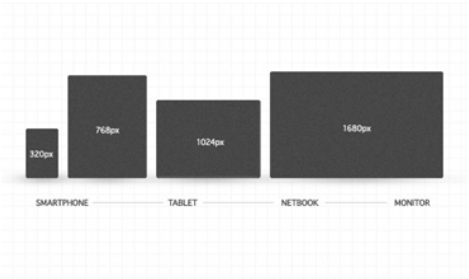

Figure 1: An example of responsive screen size

3 RESULT AND DISCUSSION

3.1 Research Result

The results of this research is a responsive website at SMK YP GAMMA Palembang created using Macromedia Dreamweaver containing one database and five and fourteen table design.

3.2 Discussion

3.2.1 The main page of the website desktops

The main page is the home page of the web smk yp gamma. on this page are the menus that can be selected on the web.

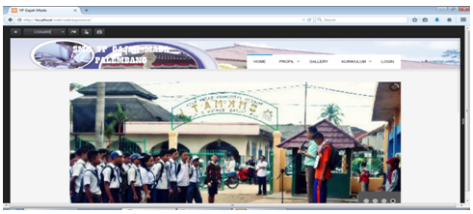

Figure 2: Main Page Website Desktop

3.2.2 The main page of the website tablets

On the main page if the user access through the visitors will get a tablet in accordance with the on-screen display tablet.

Figure 3: Main Page Website Tablets (800px, 1280px)

3.2.3 The main page of the mobile website

On the main page if a mobile user accesses through the visitors will get the display in accordance with the mobile screen.

Figure 4: Mobile Home website (320px, 480px)

4 CONCLUSION

Based on the results and discussions are carried out on the website SMK YP Gamma Palembang with responsive web design. then the conclusion can be drawn as follows:

1. This research resulted in the website SMK Gajah Mada YP Palembang with responsive web design using Macromedia Dremweaver CS6.

2. With the existness of this website are created with technology will be more responsive to give comfort to the users of the website because the look of the website created already adjusting to the device used.

4.1 SUGGESTIONS

As for some of the suggestions that had been added to improve the performance of applications on the store inventory hellen getting better jaya order is as follows:

1. In the process of selling goods and Retail Details are still done separately, so that the seller is much efficient data processing, data processing and detail as well as retail sales retail sales returns and details should be in the form of transactions where retail sales and detail to differentiate the unit goods which will determine the selling price of goods by units of goods that have been fed beforehand so well with penjualnnya returns.

2. In the application of this inventory, did not produce a report purchases, sales and stock remaining goods, in detail. In order to produce high quality information, needs to be made of the process to print the results of overall sales, purchases, and final stock of goods, based on the date that has been set from the beginning to the end.

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Information Systems Digital Library in Senior High School Nurul Iman Palembang Using Methods Zachman Framework

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Abstract

The high school Palembang Nurul Iman is one of the private schools that are under the management of the foundation Nurul Iman. The School Library System Nurul Iman Palembang currently running in everyday activities, students should come to the library in search for titles that libraries often become very crowded by readers and bustle of visitors who are looking for a book or queued in the service catalog information on the collection of books and still use the archive are not computerized. So the data library accumulate more and more, because of the difficulty of finding the data library is not in good order, frequent duplication of data, in addition to reporting the data is still less quickly and efficiently. The solution of the above problems is to build a new information system by creating a website digital library information system to facilitate the workings of this information system using the Zachman Framework. From the above problems, the authors are interested to raise this issue in the study titled "Information System Digital Library At the School Nurul Iman Palembang Method Using the Zachman Framework".

Keywords : *Digital Library, Zachman Framework*

1 INTRODUCTION

The development of technology and science in the age of globalization has been growing rapidly perceived. All this is due to the result of human thought that the more advanced, it can be seen from the development of computer science that is increasingly growing by leaps and bounds.

Currently the system is in high school library Nurul Iman Palembang is the library "normal" in the sense of high school library that provides learning services and resources for all members of the community secondary schools in the form of books, textbooks and books collection.

The solution of the above problems is to build a digital library information system using the Zachman framework to facilitate the workings of the old system to the digital library using the Zachman Framework.

Zachman Framework method describes the objects in the system first, and then build the identity of the object to the system, while at the design stage objects will be described how a user can access the object. It can support the quality and the quality of the high school library Nurul Iman Palembang to become a digital library.

From the description above problems, the writer can formulate the problem that there is to be a starting point in the discussion in the writing of this study. The formulation of the problem in this research is "How to Build a Digital Library Information System In High School Nurul Iman Palembang Method Using the Zachman Framework".

Authors limited the problem only on building a digital library of information systems in the School Nurul Iman Palembang Method Using the Zachman Framework, which includes member registration system, the data book and catalog books, while making program optimization services using PHP scripting language and MySQL database.

The purpose of this research is to build a digital library information system at the School Nurul Iman Palembang using the Zachman framework, and the benefits are: a) to assist and facilitate the process of optimization of library services at the School Nurul Iman Palembang include some data is data admin, data members, the data book, book catalogs the data, the data vision, mission and organizational structure of the data, b) Expected by using the Zachman Framework in this study can improve the quality and the quality of information systems at high school library Nurul Iman Palembang.

2 RESEARCH METHODOLOGY

2.1 Location and Time Research

When the study was conducted in October 2014 to February and the location of this research conducted at Jl. Major Salim Batu Bara Sekip Kebun Semai Number 258 Palembang.

2.2 Systems Development Method

The method used in this research is the method of Enterprise Architecture Planning (EAP) by using the Zachman Framework as a tool for process documentation. Zachman framework identifies a six-level architecture which begins with the conceptual level to the detail design and construction of a system. (Kridanto Surendro. 2009)

1. The Planner Perspective (Scope Context)

   List of the scope of the description of business elements that are recognized by strategists as a theorist.

2. The Owner Perspective (Business Concept)

   Semantic model of business linkages between business components defined by the chief executive as the owner.

3. The Designer Perspective (System Logic)

   A more detailed logic model that contains the system requirements and design constraints are represented by the architects as a designer.

4. The Builder Perspective (Technology Physics)

The physical model that optimizes the design for specific needs within the constraints of a specific technology, people, cost and scope of time specified by the engineer as a builder.

5. The Implementer's Perspective (Component Assemblies)

   The special technology, about how the components are assembled and operated, configured by technicians as implementer.

6. The Participant Perspective (Operation Classes)

   The events of the real functioning system that is used by the technicians as a participant.

3 RESULT AND DISCUSSION

3.1 Results

After doing research on high school library Nurul Iman Palembang, the result obtained is a digital library information system using the Zachman Framework, which is only described in a particular column associated with the information system of the Zachman Framework.

The system is equipped with various catalogs collections of books and e-books as well as information about the high school library Nurul Iman. This system helps users to learn and read books online or digitally, this website can be accessed anywhere and anytime by the user.

3.2 Discussions

3.2.1 Home page or Main Menu

On the front page or the Home display automatically after we enter the website address this. This page contains a menu of home, about, organization, gallery and admin login. In addition to the main menu in the menu contains a catalog of books, books category, as well as members login, catalog of books and navigation menu category books.

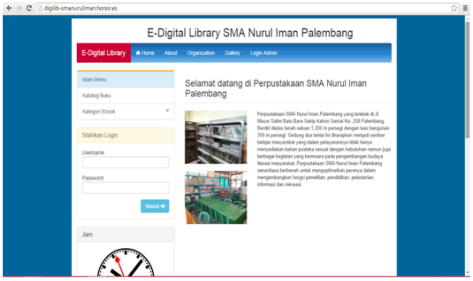

Figure 1: Home page

3.2.2 Page Category E-books

Category page e-book contains member majoring in science and social studies in high school in the digital library Nurul Iman. E-books can be downloaded by members anytime and

anywhere they open the website of digital libraries, digital library also provides information on the number of e-book that has been downloaded by other members.

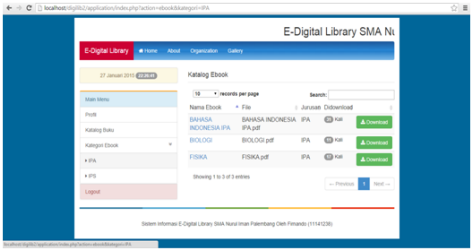

Figure 2: E-book category page IPA Members

4 CONCLUSION

From the results of the data penilitian conducted in the presence of a digital library, it can be concluded that:

1. This system can provide information on the collection of books and e-books in a digital library Nurul Iman School of Palembang.

2. This system can help users develop interest in reading, and this system is so common that not only the high school Nurul Iman has access to the general public but who can access it.

3. The system can help students / members and the general public to search for a book to add science and library provides information on the number of e-books downloaded members so as to provide interest to download and read the time at home through the Internet without having to direct libraries.

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Analysis System Service Application (SAP) Staffing in TASPEN (Persero) Branch Palembang Using Human Organization Technology (Hot Fit) Model

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Abstract

The purpose of this study was to determine whether human factors, organizational and technology together a positive effect on service application system (SAP) staffing. In this study adopts a model HOT Fit Model. Human Organization Technology (HOT) is a model system that provides a new framework that can be used to evaluate the information system that puts an essential component in the information system of Man (Human), Organization (Organization) and Technology (Technology) .From hypothesis testing performed using the F test and t test regression equation Y + 0.653 + 0,282M 0,382O + 0,278T. Hypothesis testing using T test showed that of the three independet variables studied, only one variable is found to significantly affect SAP staffing system, while the F test is known that the human variables, organization, and technology together proved to be influential on the benefits system.

Keywords : *Information Systems, Human Organization Technology (HOT Fit), Human (Human), Organization (Organization), Technology (Technology).*

1 INTRODUCTION

At the time of this current era of globalization, companies must be able to face free competition happens. PT TASPEN (Persero) Branch Palembang is a State Owned Enterprises engaged in the field of management services and insurance savings civil servants. PT TASPEN (Persero) Branch Palembang already has an information system called System Application Services (SAP) Personnel. Service Application System (SAP) Staffing is a computer-based information system that is structured in such a way to service personnel. Service Application System (SAP) Staffing is also an information system that can process and present data TASPEN all employees of PT (Persero) Branch Palembang. The main thing, this model puts an important component in the information system of human, organizational, and technology as well as the suitability of such relations as determinants of the success of the implementation of an information system.

According Komarudin (1994) analysis is the activity of thinking to describe a whole into components, so that they can recognize the signs of the components, their relationships to

each other and each function within a whole. DeLone and McLean (1992) convey a taxonomy of the six factors that form the basis for measuring the success of information systems. The sixth category is the quality of information (information quality), quality information system (system quality), the intensity of the use of information systems (system use), end-user satisfaction information system (end user satisfaction), the impact of the individual (individual impact) and the impact of organizational (organizational impact) of the information system.

Human Organization Technology (FIT HOT) model is a method that provides a new framework that can be used to evaluate the information system called Human-Organization-Technology (FIT HOT) model. This model puts an important component in the information system of Man (Human), Organization and Technology (Yusof et al., 2006).

Based on the description above, the authors take the title "Analysis Service Application System (SAP) Personnel at TASPEN PT (Persero) Branch Palembang Method Using Human Organization Technology (FIT HOT) Model".

Based on the background described above, the formulation of the problem in this research is "How Service Application System (SAP) Personnel on TASPEN PT (Persero) Branch Palembang were analyzed using the method of" Human Organization Technology (HOT Fit) Model ".

The authors limited the problem is only discuss How to Analyze Service Application System (SAP) Personnel on TASPEN PT (Persero) Branch Palembang using Human Organization Technology Fit Model.

2 RESEARCH METHODOLOGY

This research was conducted at PT TASPEN (Persero) Branch Palembang is located at Jln. Sudirman Km. 4.5 732 Palembang Telephone (0711) 312 060 Fax (0711) 312058. The research was started in October 2014 ended in January 2015.

2.1 Data Collection Methods

The data collection techniques are applied or used in the preparation of this research report are as follows: 1) Observations, 2) Interview, 3) Library Studies, and 4) Questionnaires.

2.2 Population and Sample

The population in this study is TASPEN Employees PT (Persero) Branch Palembang in the environment PT TASPEN (Persero) Branch Palembang and employs about 42 people. This reaserach involves all of those employees.

3 RESULT AND DISCUSSION

3.1 Results

In this study will discuss the results of the analysis of human influence, organization, and technology of the system of staffing services to the successful application of the system in TASPEN PT (Persero) through the data processing with SPSS 20.

Table 1: Recapitulation Validity Test Results

variables	r count	r table	information
Human (X1)			
X1_1	**0,181**	**0,312**	**Invalid**
X1_2	**0,390**	**0,312**	**Valid**
X1_3	**0,523**	**0,312**	**Valid**
X1_4	**0,446**	**0,312**	**Valid**
X1_5	**0,195**	**0,312**	**Invalid**
X1_6	**0,304**	**0,312**	**Invalid**
Organization (X2)			
X2_1	**0,324**	**0,312**	**Valid**
X2_2	**0,424**	**0,312**	**Valid**
X2_3	**0,188**	**0,312**	**Invalid**
X2_4	**0,104**	**0,312**	**Invalid**
X2_5	**0,120**	**0,312**	**Invalid**
X2_6	**0,127**	**0,312**	**Invalid**
Technology (X3)			
X3_1	**0,396**	**0,312**	**Valid**
X3_2	**0,580**	**0,312**	**Valid**
X3_3	**0,404**	**0,312**	**Valid**
X3_4	**0,594**	**0,312**	**Valid**
X3_5	**0,269**	**0,312**	**Invalid**
X3_6	**0,263**	**0,312**	**Invalid**
X3_7	**0,182**	**0,312**	**Invalid**
Net Benefits (Y)			
Y1	**0,266**	**0,312**	**Invalid**
Y2	**0,529**	**0,312**	**Valid**
Y3	**0,607**	**0,312**	**Valid**
Y4	**0,702**	**0,312**	**Valid**
Y5	**0,699**	**0,312**	**Valid**
Y6	**0,545**	**0,312**	**Valid**

Table 2: Summary of Test Reliability

Variables	**Cronbachs Alpha** $> 0,6$	**information**
Human	0,607	*Reliable*
Organization	0,364	*unreliable*
Technology	0,671	*Reliable*
Net Benefits	0,797	*Reliable*

3.2 Discussion

From the test results in table F 5:51 obtained significant value of 0.002 which is much smaller than alpha value of 0.05 with a confidence level of 5% or (0.002 < 0.05) over the comparison is so Ha is received, or in other words that between humans, organization and technology and significant effect on the success of the system. Judging from the number of Adjusted R2 of 0.569 indicates that 56.90% benefit system is affected by the independent variable, and the remaining 43.10% is explained by other factors. From the results of the frequency distribution of the average score of respondents provide responses agreed with the score as much as 46.19%.

Hypothesis statement on the contents of the variable t test results are expressed human variable staffing service application system does not give effect to the benefit sistema. This is demonstrated by the significant value of 0.102 is greater than the value of 0.05 or negligent (P-Value = 0.102 > α = 0.05) on this comparison, the hypothesis is rejected Ha1 or in other words the human variable does not give effect to the benefits system , Judging from the value of regression coefficient of 0.282 or 28.20% means that if there is additional staffing service application system will provide system success by 28.20%. From the results of the frequency distribution of the average score of respondents who responded agreed with a score of 50.00%.

Statement of Organization hypotheses on variables t test results are declared variable of organizational staffing service application system does not give effect to the success of the system. This is indicated by the insignificant value of 0.092 is greater than the value of 0.05 or negligent (P-Value = 0.092 > α = 0.05) on this comparison, the hypothesis is rejected Ha2 or in other words the variable organization does not give effect to success system. Judging from the regression coefficient value totaled 0.382 or 38.20% means that in case of an addition of 38.20% in variable organization does not provide benefits to the system's success. From the results of the frequency distribution of the average score of respondents who responded agreed with a score of 49.60%.

4 CONCLUSION

Based on the results and the discussion that has been described in the previous chapter, it can be made several conclusions as follows: 1) In the third hypothesis in this study it can be concluded that the results of the processing of research data obtained significant value of 0.045 which is clearly smaller than alpha value of α = 0.050 *or* (0.045 < 0.050), in this case the findings are quality systems, quality of information and service quality system itself, on the comparison of rejecting hypothesis (Ha) 3 proposed that the variable technology (technology) have a significant effect on the variable net benefits (profits) obtained using the system user in the application service personnel on TASPEN PT (Persero), and 2) On the hypothesis to 4 based on the results of the F test in this study was obtained value of F 6.071 with probability (sig) = 0.002. So it can be concluded that the results of data processing research revealed that human variables, organization, and technology simultaneously affect the Net Benefits or success means the system together.

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Evaluation Human Resourches Information System (HRIS) The University Of Bina Darma Using End User Computing Satisfaction (EUCS)

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Abstract

This study was performed to calculate the level of satisfaction of lecturers and employees in the use of Human Resourches Information System (HRIS) at UBD by using End User Computing Satisfaction (EUCS). The sample in this study amounted to 99 responden.Teknik sampling used in this study was a random sample. Data analysis method used is the method of quantitative analysis using validity and reliability test, the classical assumption test, multiple regression analysis. Of hypothesis testing is done by using the F test and t test. Of testing the hypothesis derived regression equation: $Y = 3.145 + 0145X1 - X20093 + 0174 + 0111X3X4X5 + 0369$ *where satisfaction variable (Y), Content (X1), Accuracy (X2), Form (X3), Ease of Use (X4), and timeliness (X5). Hypothesis testing using t test showed that of the five independent variables studied, only one variable is found to significantly affect the satisfaction variable (Y), ie Varaibel accuracy of Time. While through the f test can be seen that the variable contents, accuracy, Shape, Ease of Use, and Timeliness with the same proven to affect the satisfaction of its users.*

Keywords : *Evaluation, End User Computing Satisfaction system (EUCS), Human Resourches Information System (HRIS)*

1 INTRODUCTION

Application of Human Resourches Information System (HRIS) at University of Bina Darma (UBD) in 2012 or commencing after two years of use to date. This system is used to store the performance of employees and lecturers (Abdillah, Syafei, Hardiyansyah, 2007). So far, there is no evaluation of the system, evaluation system aims to determine the extent to which the success of the system in carrying out its functions. Where the success of a system can be seen from the effects or results achieved during the implementation of the system is running. so that the reactions generated by the users of the system is unknown and can not to predict, while the acceptance of the users will have a positive impact on relationship satisfaction and success of implemented systems. All the major companies have the human resources function that handles many special processes related to company personnel.

Based on the background of the problems that have been described previously, the authors formulate the problem to be in the lift is how to evaluate the system using the End User Computing Satisfaction (EUCS) to measure the level of user satisfaction and employee HRIS is Lecturer in University of Bina Darma.

2 RESEARCH METHODOLOGY

According to Nazir (2005) in book Research Methods, descriptive method is a method in researching the status of a group of people, an object, a set of conditions, a system of thought or a class of events in the present. The purpose of this descriptive study was to create a description, picture, or painting in a systematic, factual and accurate information on the facts, nature and the relationship between the phenomena under investigation.

According Sugiyono (2005) states that the descriptive method is a method used to describe or analyze the results of the study but not used to make broader conclusions. According Arikunto (2006) experimental research method is a way to find a causal relationship (causal connection) between the two factors is intentionally inflicted by researchers to eliminate or reduce or eliminate other factors that interfere.

2.1 Population And Sample

The population of this study is that there are lecturers and employees of the University of Bina Darma Palembang the number of lecturers and employees as many as 249 people. And samples used in this study were as many as 110 people, consisting of 62 lecturers and 48 employees. the method used was simple random sampling, according Kountur (2004; 139) simple random sampling method, namely the election of a sample in which members of the population one by one randomly selected (all have the same opportunity to be selected) where if you have selected can not be selected again.

2.2 Method of Analysis of End User Computing Satisfaction (EUCS)

End User Computing Satisfaction (EUCS) is a method to measure the level of satisfaction of the users an application system by comparing between expectation and reality of an information. Definition of End User Computing Satisfaction of an information system is an overall evaluation of the users of an information system based on their experience using the system (Doll, 1998 and Torkzadeh, 1991).

2.3 Likert Scale

Likert scale is used to adjust the attitude, income, and perceptions of a person or group of people about events or social phenomena (Sugiyono: 2004). To make use of the Likert scale, then the variable to be measured are translated into sub-variables. The subvariable then translated into several indicators and measurable indicators that can be used as a starting point to make items such instruments questions or statements that need to be answered respondents.

3 RESULT AND DISCUSSION

3.1 Validity

Test the validity or the validity of the tools used to determine how precise a measurement tool capable of performing the function. measuring devices can be used in testing the validity of a questionnaire is the number of correlation results between the scores of statements and an overall score of respondents' statements against information in the questionnaire (Haryono, 2008).Validity test is done by comparing with the provision that if rhitung¿ rtabel then the item is valid. In this study, n = 110, and there are six variables, so $df = 110 - 6 = 104$, with a significant level of 0.05 was then obtained r tabel 0.195 (2-tailed) If the value of Pearson correlation > r values for the form-critical or r table, then the item is valid. Or if the Sig. (2-tailed) < 0.05 means that the item is valid and applies vice versa. Here is a table of correlation and test the validity of the analysis results for each variable.

3.2 Reliability

The level of reliability with Cronbach Alpha method measured by the alpha scale of 0 to 1 (Haryono, 2008). Steadiness alpha can be interpreted as follows: Table Interpretation of Value (Alpha) Against Reliability.

3.3 Research Hypothesis Testing

To perform hypothesis tests performed through multiple linear regression test consisting of F test, t test and R2 test, using SPSS 20 software following hypothesis test results in this study.

3.4 Test F

Based on the test results of the F test produced F hitung sum of 24.087 with a significant level (P value) of 0000, compared with a 95% confidence level, with a value of $\alpha = 0.05$, significant value P value = 0.000 less than the value $\alpha = 0$, 05 (0.000 <0.05) on the basis of this comparison, the hypothesis Ha accepted, meaning that the independent variables are the content, accuracy, shape, ease of use and accuracy at the same time proved to affect the dependent variable is the HRIS system user satisfaction.

3.5 Test T

Partial correlation calculate correlation coefficients that describe the linear relationship between two variables by controlling object that appears as one or two additions of other variables (Sarwono, 2006).

Based on the results in the table below in the column Beta (β), the value (Constant) of = 3.145 Content = 0145, Accuracy = -0093, Shape = 0174, Ease = 0111 and Timeliness = 0369.

$$Y = 3{,}145 + 0.145\ X_1 - 0.093\ X_2 + 0.174\ X_3 + 0.111\ X_4 + 0.369\ X_5$$

Variabel	r hitung	r tabel	Keterangan
Content (X1)			
X1_1	0.636	0.195	Valid
X1_2	0.641	0.195	Valid
X1_3	0.64	0.195	Valid
X1_4	0.487	0.195	Valid
Accuracy (X2)			
X2_1	0.563	0.195	Valid
X2_2	0.601	0.195	Valid
X2_3	0.661	0.195	Valid
X2_4	0.548	0.195	Valid
X2_5	0.458	0.195	Valid
X2_6	0.526	0.195	Valid
Format (X3)			
X3_1	0.596	0.195	Valid
X3_2	0.478	0.195	Valid
X3_3	0.562	0.195	Valid
X3_4	0.47	0.195	Valid
X3_5	0.407	0.195	Valid
Ease Of Use (X4)			
X4_1	0.546	0.195	Valid
X4_2	0.578	0.195	Valid
X4_3	0.49	0.195	Valid
X4_4	0.577	0.195	Valid
X4_5	0.594	0.195	Valid
X4_6	0.545	0.195	Valid
Timeliness (X5)			
X5_1	0.521	0.195	Valid
X5_2	0.752	0.195	Valid
X5_3	0.663	0.195	Valid
X5_4	0.681	0.195	Valid
Satisfaction (Y)			
Y1	0.56	0.195	Valid
Y2	0.653	0.195	Valid
Y3	0.588	0.195	Valid
Y4	0.475	0.195	Valid
Y5	0.58	0.195	Valid

α **(Alpha)**	Reliability levels
$0{,}00 < r < 0{,}20$	Less Reliable
$0{,}20 < r < 0{,}40$	somewhat Reliable
$0{,}40 < r < 0{,}60$	Reliable enough
$0{,}60 < r < 0{,}80$	reliable
$0{,}80 < r < 1{,}00$	highly Reliable

Table 1: t Test Results Output SPSS 20 Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
		B	Std. Error	Beta			
1	(Constant)	3,145	1,582		1,989	,049	
	Contents (X1)	,145	,109	,125	1,326	,188	
	Accuracy (X2)	,093	,069	,118	1,352	,179	
	Shape (X3)	,174	,116	,164	1,503	,136	
	Ease of use (X4)	,111	,078	,130	1,428	,156	
	Timeliness (X5)	,369	,087	,369	4,221	,000	

Table 2: Specification Test Results of t

Variable	Value Sign. (5%)	Specification
Contents (X1)	0.188	not Significant
Accuracy (X2)	0.179	not Significant
Shape (X3)	0.136	not Significant
Ease of use (X4)	0.156	not Significant
Timeliness (X5)	0	Significant

4 CONCLUSION

1. Based on the results of the F test states that the variable content (content), accuracy (accuracy), format (format), ease of use (ease of use) and timeliness (timeliness) simultaneously influence the system user satisfaction

2. While based on the test results of T states that only partially precision variables are significant time or affecting user satisfaction signifikanya seen from the level of 0.000.

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ENGINEERING APPLICATION

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Simulation of Catalyst Agglomerates Influences on the Catalyst Performance in Hydrogen Fuel Cells

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Abstract

A multi-scale modeling approach was adopted to reveal the influence of the catalyst layer on the overall fuel cell performance. An agglomerate model was used to describe transport and reaction kinetics within the catalyst layer. The cathode exchange current density of $10Am^{-2}$*, the electrolyte thickness on agglomerate surface of 0.13* μm*, the agglomerate specific surface area of* $1x10^{6}m^{-1}$ *and the agglomerate radius of 1.2* μm *give the best fit with experimental data. Increasing the electrolyte film thickness reduced the oxygen concentration on the agglomeratesurface. This effect was found to besignificant only in the high current density region. On the other hand, increasingthe agglomerate radius lowered the oxygen concentration in the agglomerate at allcurrent densities. At high current density, catalystis used up at the surface so the particles near the centre of the large agglomeratewere not fully used, hence poor fuel cell performance. Athigh current density between 1-1.2* Acm^{-2}*, it is better to use small agglomerates or to form agglomerateswith porous non-catalytic core: to achieve a high utilisation of catalyst.*

1 INTRODUCTION

Global supply of fossil fuels is diminishing and may not be sufficient for our future energy demands. Therefore, an alternative sustainable power generationtechnology is needed. Fuel cells combine fuel with anoxidant in electrochemical reactions. Hydrogen fuel cells produce electricity, waterand some waste heat without producing CO2 in the product (Barbir, 2005).

In early PEM fuel cells, a practical Pt loading was 28 mg cm2which was reduced to 8 mg cm2during the 1990s. Recently, typical values of platinum loading have decreased to 0.2 mg cm2while maintaining fuel cell performance (Larminie and Dicks, 2000, Warshay and Prokopius, 1990).

This paper used multi scale modeling together with visual basic program to study and identify optimum catalyst layer designs at a reduced cost, and shortening the development time greatly in comparison to experiment-only approaches.The optimal catalyst loading has been well studied and so other approach to improve fuel cell performance is needed: investigation of the catalyst layer structure in order to improve fuel cell performance offers the alternative approach.

2 METHODOLOGY

A fuel cell consists of two electronically separated electrodes immersed in anelectrolyte. Fuel (hydrogen) is supplied to the negative electrodes, oxidant (usuallyoxygen in air) is supplied to the positive electrode and there is an external electricalcircuit connecting the electrodes(Larminie and Dicks, 2000).Fuel and oxidant react in electrochemical reactions simultaneously and the overall reactionis:

$$H_2 + \frac{1}{2}O_2 \rightarrow H_2O \ + \ electricity \ + \ heat \tag{1}$$

Reactions occur in the catalyst layer. This layer is about10 m in thickness (Wang et al., 2011). The redox reactions in bothelectrodes are accelerated by use of platinum in the catalyst layer. At the cathode,electrochemical reaction only occurs when the three key components are found atthe catalyst: protons, electrons, and oxygen.

2.1 Modeling approach

An agglomerate model was developed based on scanning electron microscopy (SEM) images from Middelman (2002). Information on the morphologywas used to develop the schematic catalyst layer structure in the PEM fuel cell (see Figure 1). The two main mechanisms involved in the oxygen reduction reaction in the catalyst agglomerates are the reaction kinetics and the internal mass transfer (or the diffusion inside the agglomerate).

2.2 Assumptions

1. The model assumes the catalyst layer is one dimensional and homogeneous.
2. The fuel cell is assumed to be operating at steady state and isothermally.
3. All of the agglomerates are assumed to be exposed to the same oxygen concentration.
4. The ohmic drop in the solid phase is assumed to be negligible.
5. Oxygen reduction is assumed to take place as a first order reaction.
6. The model assumes that the gas concentration in the electrolyte at the surfaceof the electrolyte film is in equilibrium with the gas pressure in the catalystlayer.

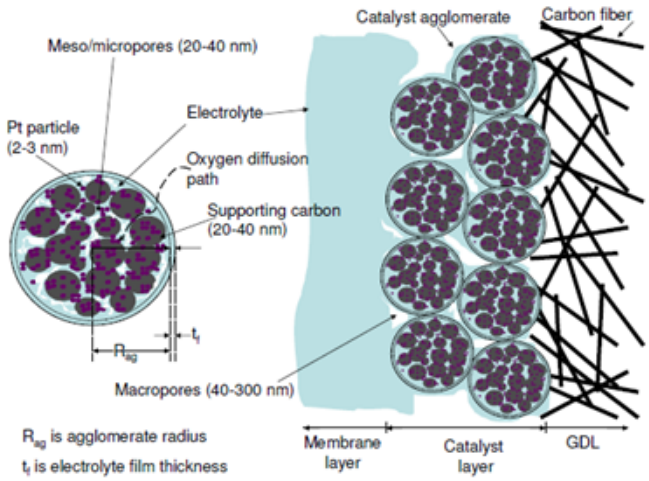

Figure 1: Schematic diagram of catalyst layer

2.3 Agglomerate model development

Ohms law is used to describe the proton transfer and the theoretical Butler-Volmer equation is used to describe the reaction kinetics in the models.The catalyst layer is thin and located between the gas diffusion layer and themembrane.It is assumed to contain identical catalyst agglomerates distributed uniformly throughout the layer. Each agglomerate with radius of Rag is covered by a thin film of electrolyte (t_f). The surrounding gaseous oxygen at the outer surface of the thin film of electrolyte must dissolve and permeate through the film layer into the catalyst inside the agglomerate.

The characteristic length (ς) of the agglomerate model is the ratio of the volume to the surface area of the agglomerate. The model assumes a spherical agglomerate and thus the characteristic length is:

$$\varsigma_{sp} = \frac{V}{A} = \frac{R_{ag}}{3} \tag{2}$$

where V, A and Rag are volume, surface area and radius of the agglomerate(Weber and Newman, 2004).The gaseous oxygen in the macro/meso pores dissolves at the electrolyte interface to an extent usually described by Henrys law;

$$C_{o,b} = p_o H_o \tag{3}$$

where $C_{o,b}$ is oxygen concentration in the agglomerate,p_o is the gas pressure, H_o is Henrys constant for oxygen in the electrolyte membrane.

The oxygen reduction reaction is assumed to be a first order reaction. The oxygen depletion rate is balanced by the change in the cathodic current density which is described by Faradays law. The intrinsic rate constant (k) is derived.Thiele modulus (ϕ) is defined (Bird et al., 2007). The catalyst utilization effectiveness is expressed

as a ratio of the oxygen molar flow when influenced by mass transport $(q_o, 1)$ to that without the transport resistance $(q_o, 1)$. The catalyst utilization effectiveness (Bird et al., 2007)is shown.

$$k = \frac{a j_{0,c}}{4FC_o^{ref}} \exp\left[\frac{-\alpha_c n_e - F}{RT}\eta_{act}\right] \tag{4}$$

$$\phi = \varsigma\sqrt{\frac{k}{D_{o,ag}}} \tag{5}$$

$$E = \frac{1}{\phi}\left(\frac{1}{\tanh(3\phi)} - \frac{1}{3\phi}\right) \tag{6}$$

where k is the intrinsic rate constant, a is specific area, $j_{0,c}$ is exchange current density in cathode, F is Faradays constant, $C_{o,ref}$ is the reference oxygen concentration, α_c is charge transfer coefficient at cathode, n_e^- is number of the transferred electron, R is the ideal gas constant, T is temperature, η_{act} is activation over potential, ϕ is Thiele modulus, ς is characteristic length, $D_{o,ag}$ is diffusion coefficient of oxygen in agglomerate and E is catalyst utilisation effectiveness.

The continuity equation is used to balance both the charge and the chemical amounts. The cathodic activation loss η_{act} was calculated and then used in the interface model. The theoretical electrical potential of the electrochemical reaction (E_e) was calculated based on voltage - current models (Xia and Chan, 2007).

3 RESULTS AND DISCUSSION

The model was used to simulate the polarisation curve of a fuel cell under the experimental conditions. The model was validated by comparing the polarisation curve obtained with the experimentaldata from Du (2010).The cathode exchange current density of $10Am^{-2}$, the electrolyte thickness on agglomerate surface of 0.13 m, the agglomerate specific surface area of $1x10^6m^{-1}$ and the agglomerate radius of 1.2 μm give the best fit with experimental data.

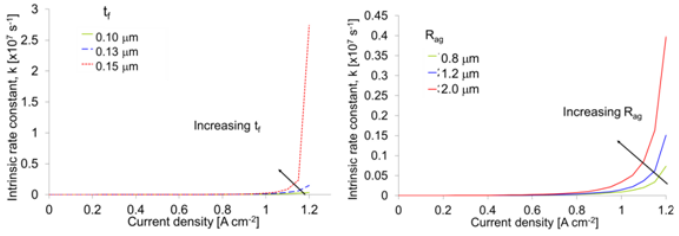

Figure 2: Intrinsic rate constant as a function of current density for various values of the thin film thickness (with t_f = 0.1, 0.13 and 0.15 μm) and the agglomerate radius (with R_{ag} = 0.8, 1.2 and 2.0 μm))

The intrinsic rate constant in the agglomerate varies with the oxygen concentration at each position within the agglomerate. The average intrinsic rate constant increased with the increasing current density, thickness and the agglomerate radius. The thicker film and the larger catalyst agglomerate reduced oxygen concentration in the agglomerate.

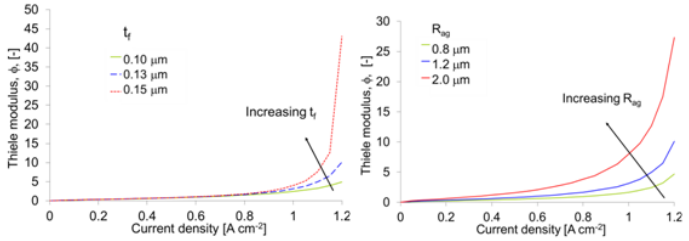

Figure 3: Thiele modulus as a function of current density for various values of the thin film thickness (with t_f= 0.1, 0.13 and 0.15 μm) and the agglomerate radius (with R_{ag} = 0.8, 1.2 and 2.0 μm)

The Thiele modulus of the cathode catalyst layer with large agglomerate and thick electrolyte film were higher than that of the small agglomerate and thin electrolyte layer. The diffusion resistance cause by thick film is observed only when current density is greater than around 0.8 Acm^{-2} whereas effect of large agglomerate is observed over the entire range of current density.

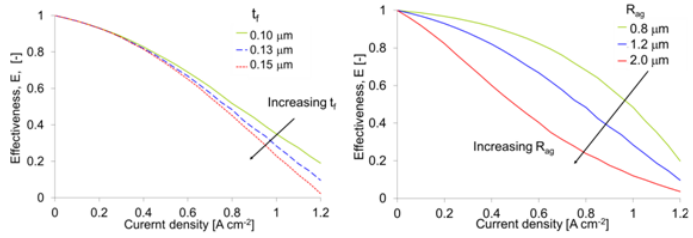

Figure 4: The catalyst effectiveness as a function of current density for various values of the thin film thickness (with t_f = 0.1, 0.13 and 0.15 μm) and the agglomerate radius (with R_{ag} = 0.8, 1.2 and 2.0 μm)

Thecatalyst utilization effectiveness decreased with the increasing current density, film thickness and agglomerate size.A catalyst agglomerate with radius 0.8 μm maintained the effectiveness of 1 - 0.2 forcurrent densities up to 1.2 Acm^{-2}. On the other hand, the larger agglomerate withradius of 2 μm showed a rapid drop in effectiveness to 0.03 at a current density of1.2 Acm^{-2}.

4 CONCLUSION

The electrolyte film thickness t_f and agglomerate radius R_{ag} adversely influenced performance of PEM fuel cell. The changes in the utilization effectiveness (E) with

respect to changes in t_f and Rag were more significant than that in the intrinsic rate constant (k) and Thiele modulus (ϕ).Increasing the electrolyte film thickness reduced the oxygen concentration on the agglomerate surface was significant only in the mass transport limited region high current density region. On the other hand, increasing the agglomerate radius lowered the oxygen concentration in the agglomerate at all current densities. Thus the negative impact of increasing agglomerate radius on the fuel cell performance was observed over the entire range of the operating current density.

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