Submission and Web-based Decision Support System Web Using Analytical Hierarchy Process (AHP) In PDBPR Kerta Raharja

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Abstract *The need for information is increasing not only to corporations but also to government agencies. Therefore required information system to assist employee performance in managing data effectively and efficiently. One of them in credit lending activities running on PD BPR Kerta Raharja Branch Balaraja which is still manual and not computerized properly. In this case the use of Decision Support System is needed in the credit lending decision. Supporters of the crediting decisions used in PD BPR Kerta Raharja Balaraja Branch based on survey and surveyor results and have not used the accurate method of selecting creditor candidates. Therefore it is necessary to use a method capable of supporting decision making more quickly, precisely and accurately. One of them is using Analytical Hierarchy Process (AHP) method because this method is one method that can perform multiple criteria and detail with a comprehensive framework of thinking in the consideration of hierarchy process which then performed weight calculation for each criterion such as (condition of economy, Character, capital, capacity, collateral) compared to sub-criteria (good, good enough and less) in determining creditworthiness. This research was conducted by observation method, interview and literature study. And the data obtained in the analysis using the Strength Method, Weakness, Opportunities, Treatment (SWOT) in describing the running system diagram procedure. The result of this research by applying new system to PD BPR Kerta Raharja Branch Balaraja, and make the process of credit submission become more effective and data obtained more accurate.*

Keywords*: Submission and Web-based, Decision Support System, Analytical Hierarchy Process (AHP)*

I. INTRODUCTION

Regional Enterprise of Rural Banks (PD. BPR) Kerta Raharja is a Regional Company owned by the Tangerang Regency Government together with the Government of Banten Province, West Java Province and PT Bank Jabar Banten, in accordance with the Tangerang Regency Regional Regulation which is engaged in providing credit to the community [1]. PD BPR Kerta Raharja is a bank that operates a computer system in its banking service activities. Many service programs given to prospective customers are one of them is the submission or credit activity, where a program managed by PD BPR Kerta Raharja in providing assistance to prospective customers in managing a business [2]. In lending services still use manual systems and for making decisions often occur delays, as a result there are parties who feel aggrieved, especially in the report process per day customer data that submits and granting credit. Thus giving rise to inaccurate data, so that the bank's service process will become hampered. Therefore we need a system that can be used to determine the creditworthiness of loans. In this case, the use (SPK) of Decision Support Systems is needed in the decision of

lending loans. Because it is too risky for a credit given by a bank to prospective creditors, so that in its implementation must pay attention to the principle of prudence. So that in the future it does not cause problems that make it difficult for the bank or the customer [3][5]. Decision support used by PD BPR Kerta Raharja based on the results of a survey of surveyors and analysis of customer guarantee data submitted have not used the accurate method in selecting customers. Therefore we need a method that is able to support decision making more accurately. One of them uses the Analytical Hierarchy Process (AHP) method because this method is one method that can carry out multiple and detailed criteria with a comprehensive frame of mind considering hierarchical processes which is then carried out by calculating the weights for each criterion in determining creditworthiness [4]. Recognizing the importance of an information innovation to facilitate the granting of customers' credit, the author makes this problem an object of journal research with the topic "Decision Support System for Web-Based Submission and Crediting Using Analytical Hierarchy Process (AHP) Method at PD BPR Kerta Raharja, Balaraja Branch" which is a development of an ongoing system, thus this study aims to design a support system for lending decisions to help employees avoid delays in selecting customers who apply for credit. This web-based design is expected to facilitate prospective customers so that they can save more time in applying for credit at PD BPR Kerta Raharja, Balaraja Branch.

Based on the analysis that has been carried out, there are several problems faced, namely the system of lending that runs at this time in PD BPR Kerta Raharja Branch Balaraja still using the manual system that is credit still using manual systems and for making decisions often occur delays, consequently there are parties who feel disadvantaged, especially in the reporting process for the day the customer data submits and grants. Thus giving rise to inaccurate data, so that the bank's service process will become hampered. Therefore we need a system that can be used to determine the creditworthiness of loans. In this case, the use (SPK) of Decision Support Systems is needed in the decision of lending loans. Because it is too risky for a credit given by a bank to prospective creditors, so that in its implementation must pay attention to the principle of prudence. So that in the future it does not cause problems that make it difficult for the bank or the customer. Decision support used by PD BPR Kerta Raharja based on the results of a survey of surveyors and analysis of customer guarantee data submitted have not used the accurate method in selecting customers.

The purpose of making this credit decision support system is to create a database-based lending data management application. The objectives to be obtained from the information system for data collection of customer credit include: Save time in processing data filing and giving credit to customers, obtaining more information accuracy than processing credit data submissions manually, and for credit filing data that is included is the submission information in acc and submission rejected. The following is a SWOT analysis presented in the table:

Tabel 1 : SWOT Analysis

STRENGTH	WEAKNESS
HR with information field qualifications are quite good.	Less optimal use of Information Technology for office administration purposes
An internet-connected computer and printer are available to support performance	Sorting customer data requires more time and effort.
The leadership, namely the Board of Directors plays an active role in controlling the flow of credit applications.	Data update does not have an automatic backup system so it is prone to loss.
Available internet connection in the form of LAN and WLAN	
OPPORTUNITY	**THREAT**
Technology development is quite rapid	Many companies have used computerized systems.
Access to information can run more effectively	The threat of crackers that can damage the system.
Increasing number of customers applying for credit	There is negative competition between companies.
The performance process can increase	The threat of weather conditions such as floods and being struck by lightning

(Source: Kusrini, 2013 SPK Concept and Application)

Analytical Hierarchy Process (AHP)

The Analytical Hierarchy Process Method is a functional hierarchy with the main input of human perception [2] [6]. With hierarchy, a complex and unstructured problem is solved

by one of the frequently used decision-making models. AHP is used with the aim of arranging the priorities of various alternatives or pilke in these groups arranged into a hierarchical form. Analytical Hierarchy Process (AHP) is one method to help compose a priority of various choices using several criteria (multi criteria) [9] [15]. Because of its multi-criteria nature, AHP is quite widely used in 6 priorities. Besides being multi-criteria, AHP is also based on a structured and logical process. AHP has many advantages in explaining the decision making process. One of them is to be graphically illustrated so that it is easily understood by all parties involved in decision making.

The advantages of AHP compared to the others are:

1. hierarchical structure, as the consistency of the criteria chosen, to the most sub-criteria
2. Calculating the validity up to the tolerance limit of inconsistencies in various criteria and alternatives chosen by decision makers.
3. Taking into account durability or resistance to output analysis is sensitive to decision making. Quantitative scales 1 to 9 in the assessment of the comparison of the importance of one element to another:

Element Weight Calculation

Basically the mathematical formulation in the AHP model is done using a matrix. Comparisons are made based on decision-making policies by assessing the importance of one element to another element Pairwise comparison process, starting from the top level hierarchy, is intended to select criteria, for example A, then the elements to be compared are taken, for example A1, A2, and A3 [10] [11] [12]. Then the composition of the elements compared will look like in the matrix image below:

Table 2: Example of a Paired Comparison Matrix

	A1	A2	A3
A1	**1**		
A2		**1**	
A3			**1**

(Source: Kusrini, 2013 SPK Concept and Application)

If an element is compared to itself then given a value of 1. If element i is compared to element j gets a certain value, then element j compared to element i is the opposite. In this AHP, alternative assessment can be done by direct method, which is the method used to enter quantitative data [13] [16]. Usually these values come from a previous analysis or from experience and a detailed understanding of the problem of the decision. If the decision maker has a great experience or understanding of the problem at hand, he can immediately enter the weighting of each alternative.

Priority Determination (Synthesis of Priority)

The synthesis of the assessment results is the final stage of AHP . Basically, this synthesis is the sum of the weights obtained by each choice on each criterion after being weighted from these criteria. In general, the value of a choice is as follows:

ibop=……....(1) Σ−*niijbo*1*jbc**

ibop= value / weight for choice to i

The formula can also be presented in table form. To make things easier, it is assumed that there are four criteria with four choices.

II. RESEARCH METHODOLOGY

The research method carried out in this study is to collect data about the situation directly, and analyze the situation in order to obtain a final result that is useful for the study. Data collection techniques used to search for or collect data and process the information needed are methods of observation, interviews and literature. The analysis technique uses the SWOT analysis method.

III. LITERATURE REVIEW

Many previous studies were conducted with regard to the support system for lending decisions. In an effort to process and develop the credit granting system, a literature study is

needed as one of the methods of research to be carried out. In an effort to perfect the research, the writer needs to do a literature study (Literature Review), including the following:

1. Research in a Journal conducted by Hidayat [15] from Dian Nuswantoro University, Semarang, entitled "Supporting Decision Support System for Credit Provision Using AHP (Analytical Hierarchy Process) in BTM Kajen, Pekalongan Regency". This study aims to create a Credit Provision Decision Support System that facilitates faster, precise and accurate decision making. Therefore, using the AHP (Analytical Hierarchy Process) method because this method is one method that can consider the hierarchical process and determine the feasibility of giving credit.
2. Research in a Journal conducted by Angga [5] from STMIK Tasikmalaya, entitled "Feasibility Decision Support System for Providing Customer Loans with the AHP (Analytical Hierarchy Process) Method at Karya Manunggal Cooperative". This study aims to design and apply and develop a decision support system (SPK) that is able to provide credit worthiness decisions to prospective customers.

III. RESULT AND DISCUSSION

Decision support and credit decision support systems attempt to analyze data input or data flow systematically, process or transform data, store data, produce information and there is an analysis form for AHP (Analytical Hierarchy Process) assessment of criteria and calculations. System design is used for functional improvements that can be achieved through the use of computerized information systems.

1. Display of the Main Page

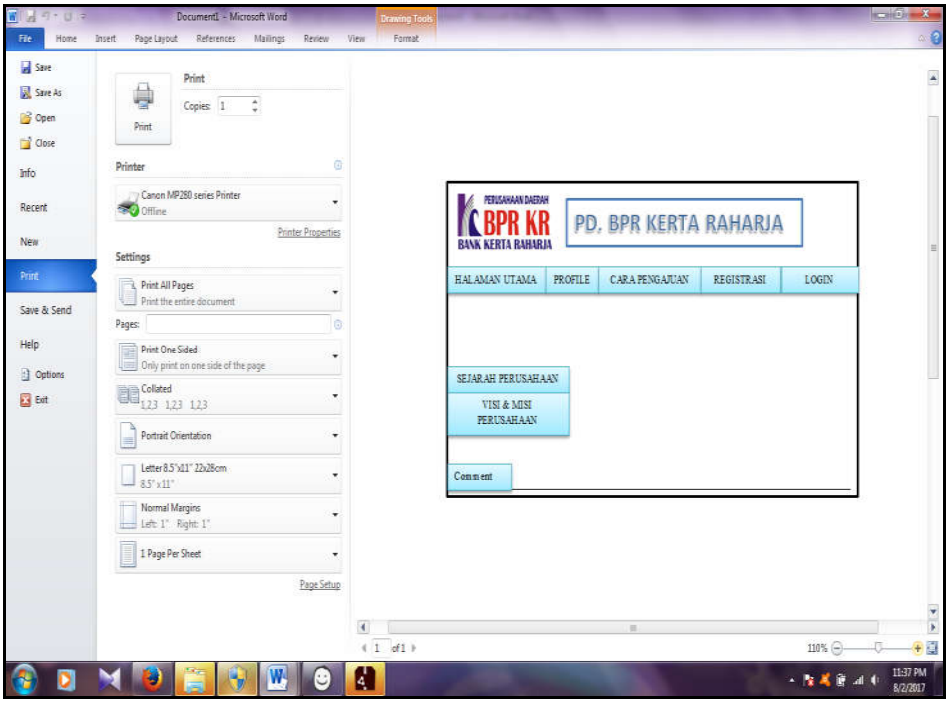

Figure 1. Display of the Main Page

In Figure 1 describes the main page of the application that displays the profile menu, how to submit, register and login. The main page view is used to enter the web system and as a first step if a customer wants to register and login

2. Display of Registration Page

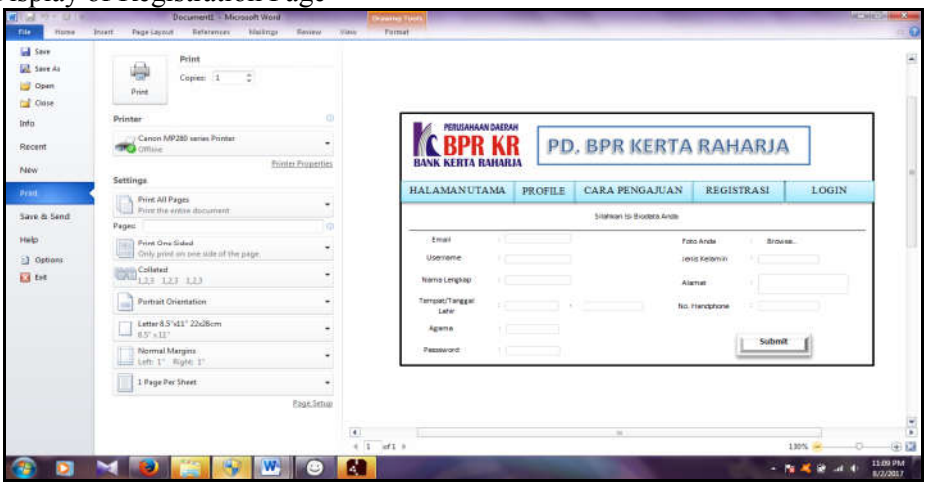

Figure 2. Display of the Registration Page

In Figure 2, the registration page for a prospective customer registering, especially filling out all available formats on the page column and functioning as the creation of a prospective customer account if you want to log in.

3. Login Page View

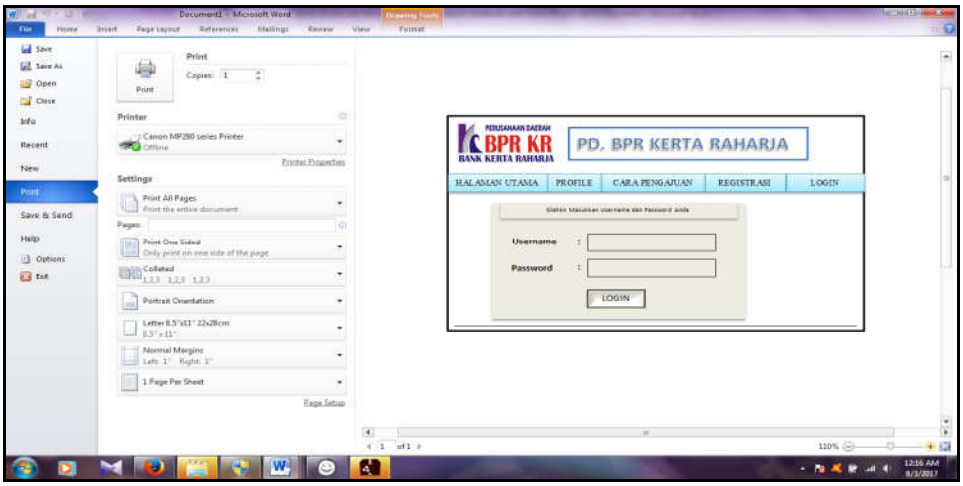

Figure 3. Login page view

In Figure 3 describes the login page of a prospective customer to do the step into the credit application form. In this login system only customers who have registered account registration and passwords are listed so that the security level is maintained and irresponsible people will not be able to enter the system.

4. Display of Credit Request Form Page

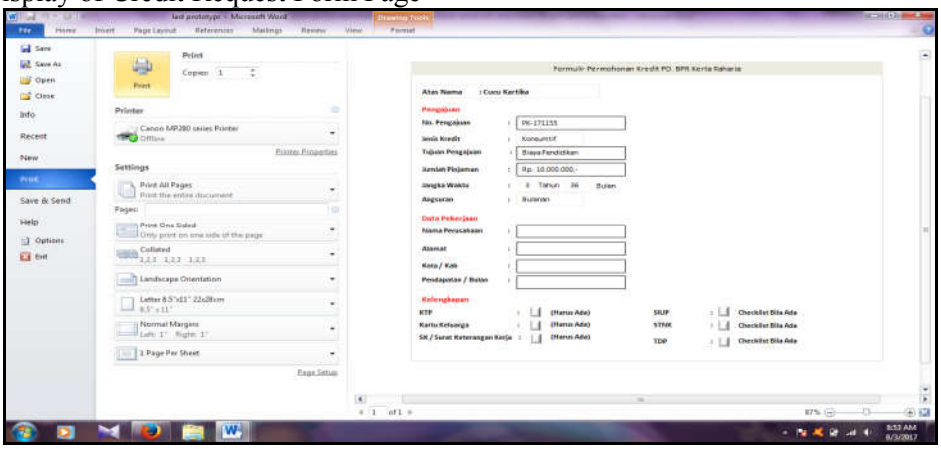

Figure 4. Display of Credit Request Form Page.

In Figure 4, explain the page of the credit application form for a prospective customer by filling out the form available on the web. In this credit application form system, only prospective customers have registered through the previous account registration and password.

5. Display Credit Submission Status

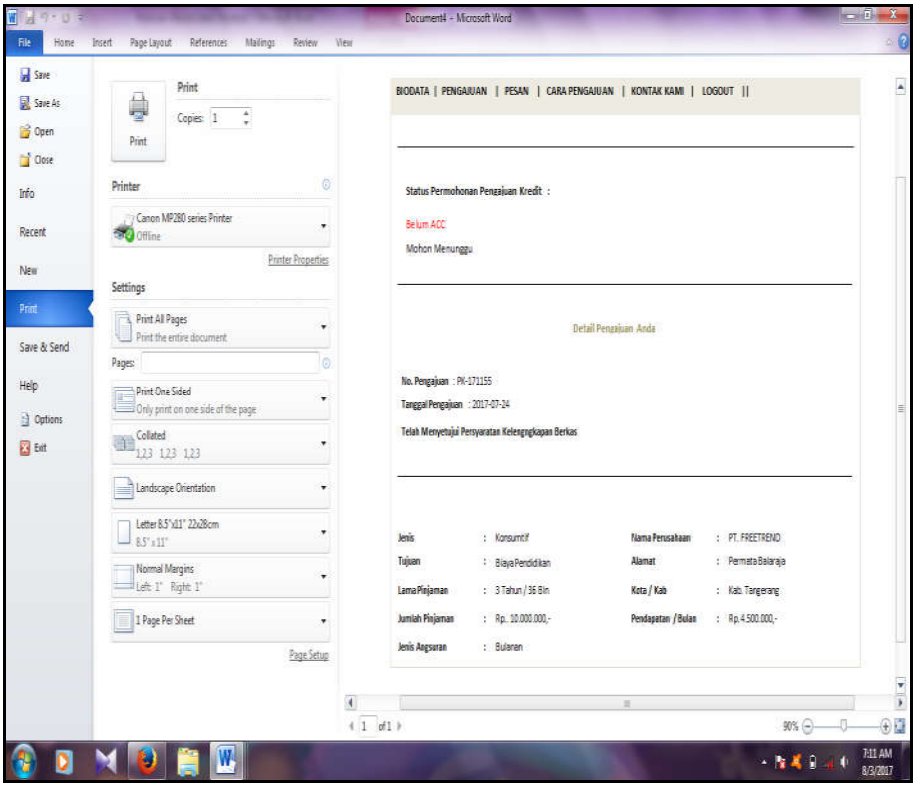

Figure 5. Display of Credit Submission Status

In Figure 5 describes the page for credit application status for a prospective customer after completing the credit application form. In this credit status submission system, prospective customers wait for the results of the report file on acc or not after being confirmed by account officers and directors.

6. Display of Admin Login Page and Leader

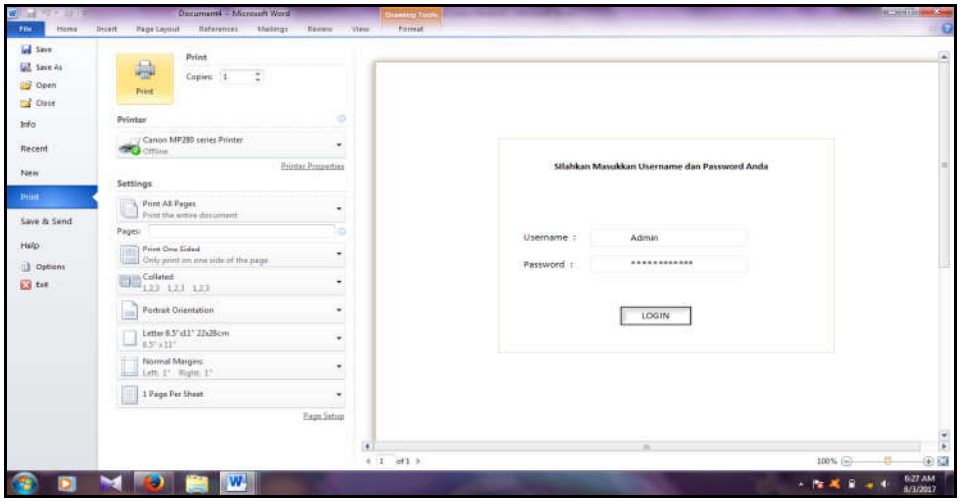

Figure 6. Display of Admin Login Page and Leader

In Figure 6 describes the admin and leadership login page to see and review the customer's files that have filled out and complete the file on the credit application form.

7. Page Views at the Account Admin Officer and Leader

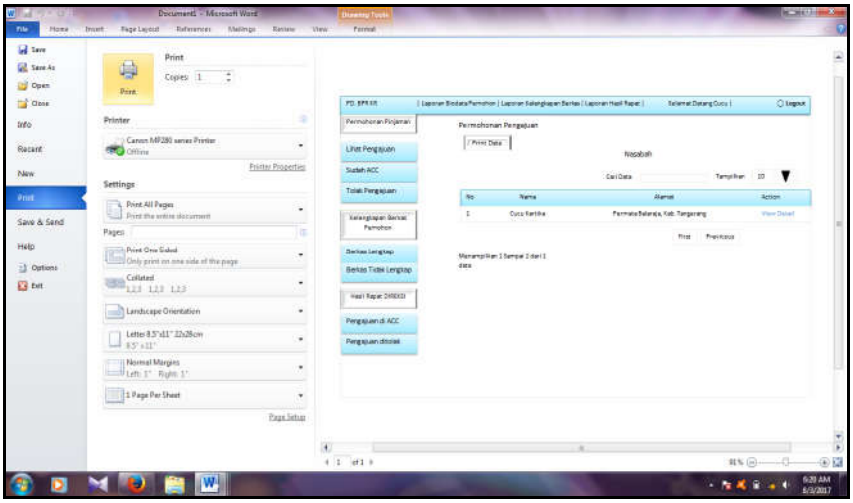

Figure 7. Display page at the Admin Account Officer

In Figure 7 describes the page on the admin account officer to see and review the customer's files that have filled out and complete the file on the credit application form. In this system can display customer files that have been uploaded then the admin account officer and the leader conduct a meeting then the filing decision is

taken in acc when filling out the complete credit application form then the admin gives information to the customer. But if the submission is rejected there may be some files that have not been completed and then the admin informs the customer to complete the file again.

8. Display of Pages on the Leader

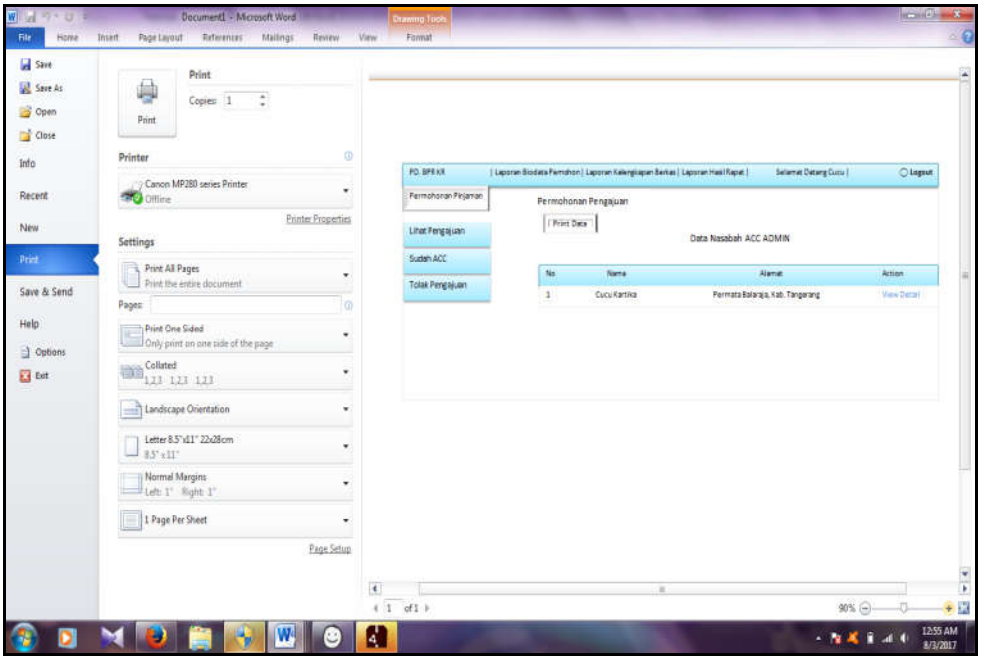

Figure 8. Display of Pages on Leaders

In Figure 8 explains the page to the leader to see the results of the admin review on the customer's file that is complete in filling out the credit application form. In this system, it can display customer files that have been accredited by the admin, then the leader performs accreditation on customer files that have been accredited by the admin account officer.

9. Display Credit Analysis Criteria Grading Form

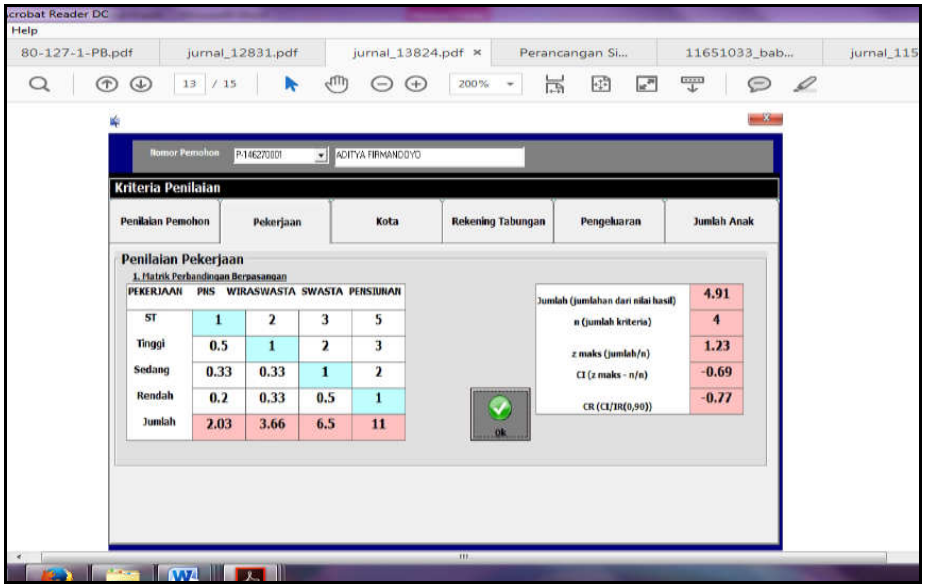

Figure 9. Display of the Credit Provision Grading Criteria Analysis Form

In Figure 9 it explains that the assessment criteria for prospective creditor customer data are OK.

10. Display of AHP (Analytical Hierarchy Process) Calculation

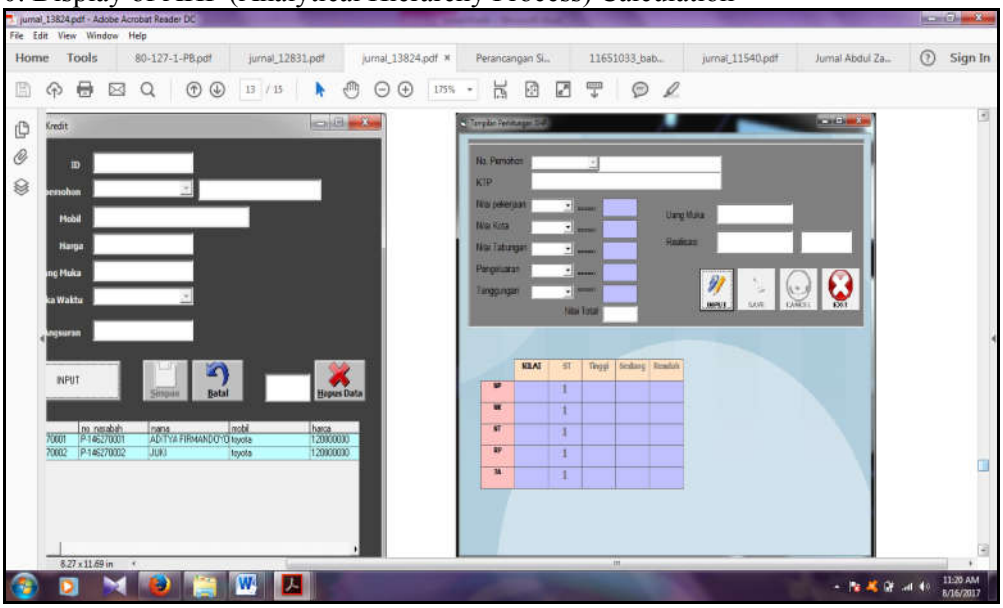

Figure 10. AHP Calculation Display

In picture 10, it can be explained that the credit decision support system uses the AHP method (Analytical Hierarchy Process) which contains the input of the applicant's data in advance and there is an assessment of criteria which will later be used as a reference for credit decisions.

IV. CONCLUSION

Supporting Systems This web-based decision for submission and crediting is a medium that can be used to convey information especially to customers and leaders. Application support system for decision submission and credit provision is designed by the author using a website, xampp as a web server, PHP scripting language, MySQL as a database management system (DBMS) and AHP Method (Analytical Hierarchy Process) this method is one method that can do compound and detailed criteria with a comprehensive framework in consideration of the hierarchy process which then calculates weights for each criterion such as (condition of economy, character, capital, capacity, collateral) compared to sub-criteria (good, good enough and less) in determining creditworthiness.

The use and utilization of application support system for decision submission and credit use the web-based AHP (Analytical Hierarchy Process) method in PD. BPR Kerta Raharja can provide convenience for PD account admin officers. BPR Kerta Raharja to conduct attendance, customers, leaders and admin account officers and leaders can see first hand information on submission and credit, besides that customer data for credit applications is more structured and will not be scattered again. Because it has been stored in an integrated manner through good database processing.

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