

Green computing on registration system and transaction report in Serviam credit union

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Abstract. One of the cooperatives in Indonesia is Serviam Credit Union. Serviam Credit Union was established on August 25, 1985 in Kupang, East Nusa Tenggara, Indonesia. Until this time, the Serviam Credit Union has had fourteen thousand members, spread across several cities on the island of Timor, East Nusa Tenggara. In order to improve efficiency and performance to be able to face the globalization of the economy and contributing to contribute to national development and therefore Serviam Credit union provide registration service facility members and report transactions such as borrowing, deposits, withdrawals are made online through the system website of the Serviam Credit Union (<http://kopditserviam.com>). The purpose of this research is Also helping and encouraging people to be able to adjust changes in attitudes and behaviors that are better suited to the demands of environmental changes, such as changes in technology, market and community dynamics in the era of economic globalization; Simplify and shorten the registration and reporting process flow of the transaction process so that the estimated time required to perform the service in the Serviam Credit Union be faster; Supports the concept of green computing by contributing to reduce paper usage in the process of registration and reporting of transactions; Contributed to the whole cooperative to compete with state-owned enterprises private company Nor so that cooperatives could become a major driver of national development in the future. This research used qualitative research methods in data collection and in the development of a system of web-based Serviam Credit Union used a prototype method. The results showed that with the use of the system on the new website, there has been an average decline in the amount of paper in the process of registration, withdrawal, deposit and lending amounted to 70,5% in a month. Whereas the estimated time (in minutes) used in the service of the registration process, withdrawals, deposits, and loans made directly at the office of the Serviam Credit Union, there has been a decrease in the amount of time required for the entire process is that the estimated average decline was 68,4% in the services performed for each person.

1. Introduction

One of the most appropriate economic institutions to be applied and developed in Indonesia is cooperative, because principle of cooperative is kinship (Laws of Republic Indonesia, Number 25, Year 1992). According to the Head of Bappenas [1], in the last four years, the development of cooperatives has been heading in a positive direction with an average of 2.5 percent active cooperative



growth rate in the period 2012 to 2016. Based on government data, until July 5, 2017, Indonesia has 26.8 million cooperative members and 152,282 cooperative units. In carrying out its functions, the cooperative is expected to make a real contribution to the national economic development through the management of more professional cooperatives in the future. One form of management is more professional is through the use of facilities and infrastructure possessed optimally for the improvement of efficiency.

Examples of the utilization of facilities and infrastructure in the case of asset management can also be done by using the model of the formation of cooperative assets [2], the resources basis, built on capability basis (consumer cooperative capability), in the process, consumers will conduct search information, Learn new technology and then Participate.

Utilization of infrastructure means is through the use of cooperative website in order to be able to face the impact of economic globalization or "the universalization of the economic system" so that it can support activities, that are multinational. In its development, the use of website can be directed to the process of web banking adoption on credit union [3].

One of the cooperatives in Indonesia is Serviam Credit Union, that was established on August 25, 1985 in Kupang City, East Nusa Tenggara. Until now Serviam Credit Union already has fourteen thousand more members, spread across several cities on Timor Island, East Nusa Tenggara. In order to increase the efficiency of performance in order to be able to face the economic globalization and contribute to the national development, kopdit serviam provide member registration service facility and transaction report (borrowing, deposit, withdrawal) online system through Serviam Credit Union website system (<http://kopditserviam.com>).

The system of website has been successfully used through testing performed by the Serviam Credit Union. The test is performed on a Local Network of Serviam Credit Union (Client-Server). The pattern of Local Computer Networks in Serviam Credit Union consists of Dynamic IP Addressing (DHCP) and IP Addressing models using Subnetting pattern [4, 5].

The purposes of this research are 1). To help and encourage people to be able to adapt changes in attitudes and behaviors that are more suited to the demands of environmental change, including changes in technology, markets and the dynamics of society in the era of economic globalization; 2). Simplify and shorten the flow of registration process and reporting of transaction process; 3). Supports green computing concept by reducing paper usage in registration process and transaction reporting; 4). To encourage all cooperatives to be able to compete with State-Owned Enterprises and Private Companies so that cooperatives can be a major driver of national development in the future.

2. Literature review

LESS is a JavaScript-based CSS preprocessor created by Alexis Sellier. As mentioned, LESS is used by Bootstrap. LESS allows us to compose styles with some programming features [6]. Less is a simple and easy-to-use CSS technology, which exists within the framework of the Bootstrap Framework but with some advantages and flexibility compared to CSS in general, so developers can easily access information, color, variable, and operation functions its use.

In the Research of Mochamad A.R and Ribangun B. J, [7] said that by applying the Twitter Bootstrap Framework, the process of designing the New Student Admission Application becomes faster, because the syntax of CSS has been provided. The look of each page becomes uniform following the Bootstrap style. In addition, the resulting display looks simple, lightweight, and responsive to the device used by the user. The New Student Admissions Application can show the same look at desktop and mobile, this is because of the responsive nature of the Twitter Bootstrap Framework.

Viknes Balasubramanee, et.al [8] explains in his research that using Twitter Bootstrap and the AngularJS Framework can overcome the balance between design and implementation where Twitter Bootstrap provides users the same view on all devices without loss of user functionality and AngularJS provides both date and side filter features elegant in its development. Both frameworks empower developers to produce more stylish and easy websites in their maintenance process, as

developers do not have to work with CSS to make the website look attractive or support responsive design principles, unless required.

According to Widiastuti and Akhmad Faisal [9], the benefits of a web-based cooperative information system are to reduce errors in data processing (input or search); Make it easy to generate reports; Monitoring transactions can be done better; Facilitate the dissemination of information about the existence of cooperatives to the people more quickly.

The Credit Union Cloud Model is such a cloud provision model that aims at tapping into the overabundant idle/underutilized computers for cloud service provisioning, while the standard practice is based on dedicated data centers. CU clouds run on existing infrastructures with excessive capacities, which are not specifically setup for supporting Cloud Computing. These PCs are not dedicated resources for the cloud infrastructure, instead they are still used by their intended users as usual, e.g., running a word processor or web browsing (referred to as local/native applications). Credit Union Cloud Model, which aims at tapping into the underutilized computing resources available within an organization/community rather than dedicated servers, provides a promising alternative Cloud Computing solution for organizations and communities. Our work demonstrates that the “no data center” solution indeed works. Besides proving the concept, model, and philosophy of CUCM, our experimental study turned out to be highly encouraging – the “no data center” solution can gain highly competitive performance compared to its counterpart that depends on dedicated cloud servers [10].

The appropriate selection of design elements is important to avoid annoyance toward websites. Thus, diversification in the website designs makes it difficult to classify them for target population. The cultural variations and preferences also underscore the need for a tailored design. In this study, the researchers attempted to examine user preferences for web design attributes to determine trust, satisfaction, and ultimately loyalty. Thus, the prime motivation for this investigation is to identify the role of web design attributes in building trust and satisfaction for UA (Uncertainty Avoidance) culture. Furthermore, both content quality and navigation were observed to be strong factors in building user trust with a website. In contrast, interactivity, color, and typography were observed as strong determinants of user satisfaction. Finally, the effect of trust is more significant than the effect of satisfaction on loyalty for risk/high-UA cultures [11].

The adoption of online banking systems and presenting detailed information about the deposit offer on the bank’s website boost deposit mobility. The availability of an online banking system can be thus treated as an additional tool with which depositors can effectively discipline a bank. The results are useful for future research on cooperative banking and their internet activity, as well as on market discipline mechanisms. The findings demonstrate that despite cooperative banks adopt relational banking model and usually serve small local communities, the internet can be a significant factor contributing to their success or failure [12].

Credit Union (CU) cooperative in West Kalimantan continues to experience significant growth as one of the democracy strength. As a financial institution in the form of cooperative, the credit union had owned and controlled by the members who use its services. Professional management had made CU stronger with regard to solidarity aspect of the stakeholders in it. The use of information technology for service activity in order to keep the solidarity, members also had participated in the growth of the Credit Union, but there are some values of contribution that still unknown, such as the contribution of information technology and the participation of members. The research problem formulated to produce new research on the influence of IT innovation, IT resource, IT service and the involvement of consumer in enhancing business growth; Create a hypothetical test design in order to know the influence of each variable in this research. This research aims to produce model and hypothetical test design to recognize the influence of IT innovation, IT resource, IT service and consumer involvement in enhancing business growth. This research was designed with unit explanatory survey that analyzed by organization. Furthermore, this research applied mixed methods (quantitative and qualitative) and triangulation strategy. The sample included 58 Credit Union is measured by using the formula Slovin. Credit Union (CU) determined by simple random sampling technique because it is based on the contribution of information technology and consumer

involvement in business growth. This study only produces a research proposal model without providing results that illustrate the role of information technology and empirical consumer involvement [13].

The financial and economic crisis as well as increasing awareness about cooperatives on the European and global level awoke interest in cooperatives and similar business models in Slovenia. Several initiatives for establishing new cooperatives have emerged in recent years. The paper analyses the recent developments of cooperatives in traditional (e.g. farmers' cooperatives) and new sectors (e.g. media, worker, local food supply, energy and housing cooperatives) through the use of a short historical survey, available statistical data and relevant changes in public policy towards cooperatives in Slovenia. As cooperatives typically grow organically, through admission of new members and reinvesting their surplus, their development will probably require time, perseverance and patience. Like investor-owned firms, cooperatives may merge but may not be taken over. The organic growth, including intergenerational funds of cooperatives, may be more sustainable and resilient against threats from the environment [14].

3. Methods

3.1. Data collection method

In this research used qualitative methods in data collection. The procedures are:

3.1.1. Observation. Observations were made in the office of Serviam Credit Union, by looking at the problem of access limitations, administrative procedures that are time-consuming, or wasteful use of paper in the administrative process. Anticipation is also done by looking at other alternatives in the process.

3.1.2. Interview. Interview process involves Serviam Credit Union employees, leaders, and the people as members of the Serviam Credit Union. Topic interview is related to the use of media website as a means to provide smooth and easy not only in the process of registration and transactions but also development of information and technology in Serviam Credit Union.

3.1.3. Literature review. Literature references used are scientific articles from reputable international journals relating to research.

3.2. System development method

Here are some steps of system development in accordance with the prototype method,

- **System Requirement Identification and System Design**
This stage will be done identification problems and solutions offered, then defining the software format that will be developed, which includes the system requirement planning and system design outline to be made. If system design is deemed to be appropriate then it can be continued to the next stage.
- **Creation, Testing and Evaluation of Prototype;**
At this stage, the coding process of the system begins to generate the website system. Then the resulting website will go through a final testing and evaluation process regarding the website's eligibility to use. If not feasible then the system will be re-coded (recode) and tested again until it is really worth using. Once the website passes the testing and evaluation stage then the system can be used.
- **Using Prototype**
The system used has been thoroughly tested on the real environment and the website is ready to be used repeatedly in the registration process and transaction process.
- **Development of Prototype.**

System development can be done in the next stage, for example the connectivity built between website and banking system so that transaction process can involve Automatic Transaction Machine (ATM) or mobile banking transaction.

4. Results and discussions

4.1. System designs

As we can see in figure 1, prospective members to fill out the registration form, after filling out the form prospective members will receive the registration proof code. Prospective members shall attach additional terms and sign the registration form at the office in order to become legally members.

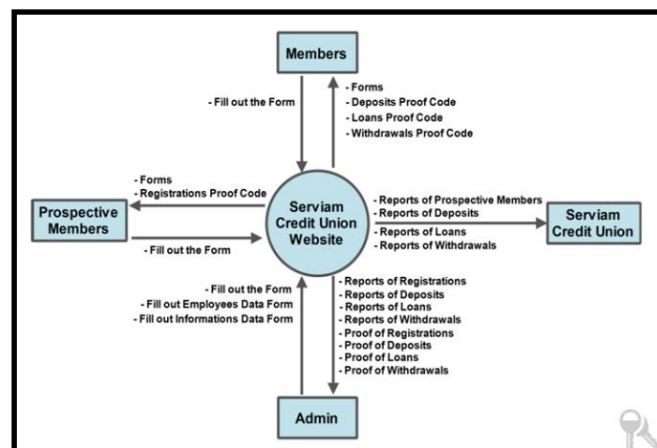


Figure 1. Context diagram of serviam credit union system.

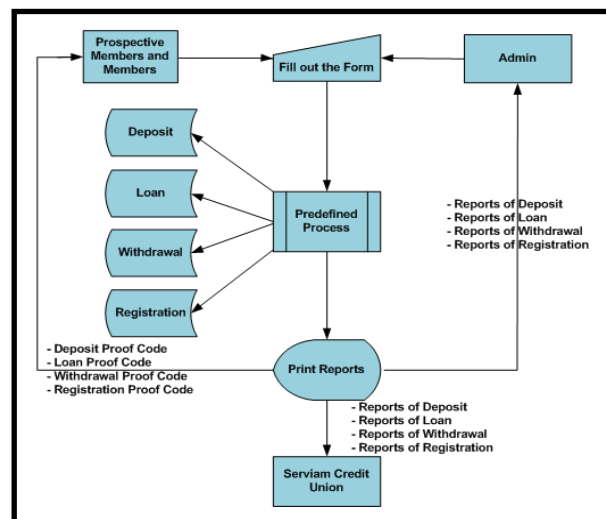


Figure 2. Data Flow Diagram (DFD) of serviam credit union system.

Figure 2 are described how members can fill in deposit forms, withdrawal forms, and loan forms. After filling out the form, the member will receive the deposit proof code, the loan proof code, the withdrawal proof code and registration proof code. Administrator can fill out the form, enter employee data and enter data information and receive reports member candidates, registration reports, loan reports, deposit reports, withdrawal reports, proof of registration, proof of withdrawal, proof of

deposit, and proof of loan. The cooperative receives the Report of the member candidate, loan report, deposit report and withdrawal report.

4.2. Registration form

Registration form runs file registration-form.php. After filling out the registration form, the user will receive the Registration Code. All forms marked with Stars must be filled out, otherwise an error message will appear. Below is part program code of registration-form.php.

```
<?php
$myQry = mysql_query("SELECT * FROM `registration` WHERE `registration_id` ORDER
BY `registration_id` ASC");
$nomor=1;
while ($myData = mysql_fetch_array($myQry)) { ?>
    <tr>
        <th><?php echo $nomor++; ?> </th>
        <th>SRVM/<?php echo $myData ['registration_id']?>/DAFTAR</th>
        <th><?php echo $myData ['name'];?></th>
        <th><?php echo $myData ['birth_place']; ?>,<?php echo $myData ['birth_date'];
        ?></th>
        <th><?php echo $myData ['reference_id_member'];?></th>
        <th><?php echo $myData ['employee_name'];?></th>
        <th><?php echo $myData ['registration_date']; ?></th>
    </tr>
<?php } ?>
```

4.3. Deposit form

This page is the result of the execution of webformat.php for deposit_form.php, which will enter the deposit data after being filled into the database. After filling the deposit form, the user will receive the Deposit Code. Below is part program code of deposit_form.php.

```
<?php
$sql = mysql_query("SELECT * FROM deposit WHERE deposit_code = '$_GET[id]'");

$i=0;
while($r=mysql_fetch_array($sql)){
    .....
    $pdf=new FPDF('P','mm','A5');
    $pdf->AddPage();
    $pdf->SetFont('Arial','',9);
    $pdf->Image("../images/deposit.png", 10, 3, '130', 'left');
    $pdf->SetFont('Arial','B','11');
    $pdf->Cell(130,20,'DEPOSIT CODE OF SERVIA CREDIT UNION',0,0,'C');
    $pdf->Ln(9);
    $pdf->Text(10,200,'The Date of Printed : ' . date( 'd-m-Y'),1,0,'L');
}
$pdf->Output("deposit_membr_serv.pdf","I");
?>
```

4.4. Withdrawal form

This page is the result of the execution of webformat.php for withdrawal_form.php, which will enter the deposit data after being filled into the database. After filling the deposit form, the user will receive the Withdrawal Code. Below is part program code of withdrawal_form.php.

```
<?php
define('FPDF_FONTPATH', 'fpdf/font/');
require('fpdf/fpdf.php');

include "../config/connection.php";
include "../config/library.php";
$pdf=new FPDF('L','mm','A4');
$pdf->AddPage();
$pdf->SetFont('Arial','',12);
$pdf->SetFont('Arial','B','18');
```



```

$pdf->Cell(280,20,'Withdrawal List of Serviam Credit Union',0,0,'C');
$pdf->Ln(20);
$pdf->SetFont('Arial','B','8');
.....
$sql = mysql_query("SELECT * FROM withdrawal ORDER BY withdrawal_code");
$no = 1;
while($r=mysql_fetch_array($sql)){
    $cell[0]=$r['id_member'];
    $cell[1]=$r['account_number'];
    $cell[2]=$r['name'];
    $cell[3]=$r['amount'];
    $cell[4]=$r['calculated'];
    $cell[5]=$r['total'];
    $no++;
    $pdf->Ln();
}
$pdf->Output("rep_withdr_serv.pdf","I");
?>

```

The “coding system” enforced in the registration and transaction process is intended to keep face-to-face process and validation directly on prospective members and members performed in Serviam Credit Union Office. This is intended to reduce the process of queuing that often occurs due to the length of time used to fill out the form or transactions made. Code number obtained by prospective members or members as evidence has occurred registration process or transactions made online through the website.

Registration and transactions made through the online website is intended for prospective members and members can better prepare for information or completeness needed to register or transactions. In addition, with the registration process is done online then there will be a decrease in the amount of paper used for registration and transaction purposes. In fact, from a printed registration forms, then that used for registration and returned to the office is as much as 1/3 of the total printed. But with this website, there is a decrease in the amount of paper use is quite significant in each month.

4.5. Analysis results

Overall, the use of paper in the whole process of registration and transactions decreased for each month. The impact of the decrease in the use of paper is the activity of the registration process. This is understandable because of the amount of the registration form provided to prospective members, not much to restore the use of the form. The details are as follows, the fact that the Serviam Credit Union in month, can spend as much as 250 sheets of paper to print a registration form of membership. But of that number were used and returned to Serviam Credit Union as a petition candidate member, on average, only about 1/3 of the total number of papers were taken. This can happen due to many enthusiasts who take the form prospective members but few are filled and approved as a candidate member of the Serviam Credit Union. With a system of the website is used, a decline in the use of paper as much as 211 sheets of paper, or about 84.4% and this was due to filling of the form is done online. Now with the website system, the paper used in the registration process is only for the purposes of signature and validation by the prospective member. The same thing happened in the transaction process where a decline in the use of paper in the process of depositing an ownership of 81.5%, in the process of withdrawal of 73.3% and in the process of borrowing amounted to 42.8%. It can be concluded that the entire process of registration and transactions that occur in Serviam Credit Union system uses the website is able to lower the amount of paper in each month by average of 70.5%. Explanation of the analysis data can be seen in figure 3 below.

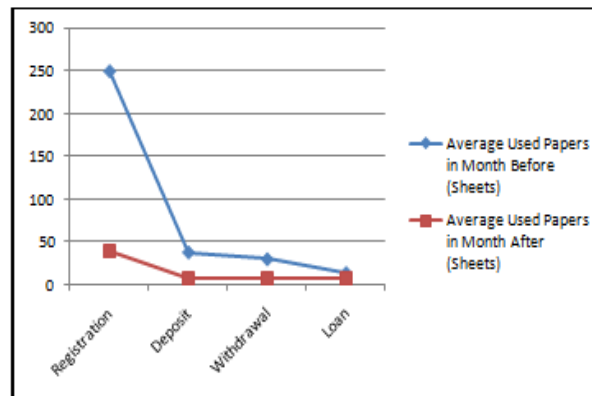


Figure 3. Average used sheets of papers in month.

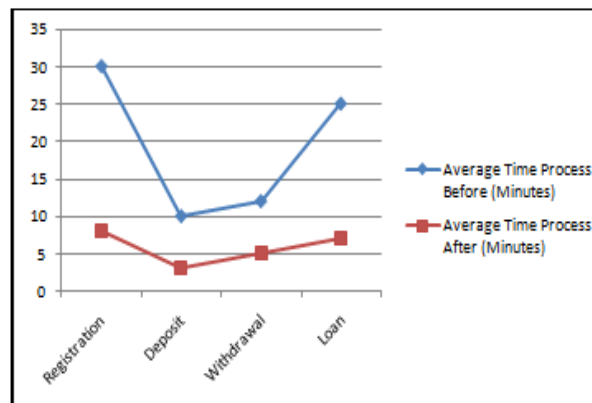


Figure 4. Average time of service process.

In addition to the registration process, the use of the website system also provides a significant impact on the estimated processing time of services performed in Serviam Credit Union. In Figure 4, it appears that the process of prospective members registration, before using the website system takes time to serve one person is of approximately 30 minutes. But after using the website system, a decrease in the estimated time to just 8 minutes of the services performed on each person or a decline in the estimated time required for 73.3%. While in the process of depositing a decline in service time by 70%, and for the process of withdrawal as well as the lending process, each experienced a decline estimated time required to perform services amounted to 58% and 72%. After using the website system, Serviam Credit Union has succeeded in reducing the estimated working time required to perform a service at each person who registers as well as the cooperative transaction amounted to 68.4%. This means that the increase or speed up service time for each person so that the extra time available can be used for other activities to further enhance labor productivity in serviam credit union. In addition, so also encouraged the reduction of electricity usage load of the electronic devices that is used when the service is performed.

5. Conclusion

Through the use of Serviam Credit Union Website, we can shorten the time in registering and transactions, because both prospective members and members, no need to take the form or slip. We can fill the form from home or anywhere before validation to Serviam credit union office, and when we are doing data validation in serviam office, the data that we fill out in the online form previously, it been stored in Serviam Credit Union database. Serviam credit union website can be a solution for the people not only in finding information about Serviam Credit Union, but also in registration, deposit, withdrawal or borrowing for all members of Serviam credit union. Serviam credit union website can

minimize the queue that occurs in the cooperative when registering or transactions and also supports green computing technology by making paper savings in registrations and transactions.

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