Preliminary Review of Desktop-to-Web System Transformation of Data Input Process in Accounting Information System

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Abstract. The accounting information system is an important key to financial management, the information influences the company’s decisionmaking in determining its future strategy. However, before the development of web technology, current systems were usually implemented on desktop platforms. Over time, many obstacles were found during its implementation, which had an impact on time efficiency on staff performance. Therefore, in this study, a preliminary review assessment is made to find out whether the current desktop information system is still good for use or a web-based system is able to provide more performance, especially in terms of time efficiency. According to the results of this study, web information systems have better performance than desktops. With the transformation of the platform in the system, there was an increase in the use of time in carrying out input process activities of 35%.

Keywords: accounting information system, web, performance, efficiency

1. Introduction (12 pt)

Since the 21st century, the development of web technology has become increasingly advanced, bring the web system the one of the most popular platforms [1], [2]. The advantages that can be used on various devices (cross-platform) and the ease of access are the main attractions for users [3]. Followed by the development of increasingly qualified network speeds, and in Indonesia, it has now entered 5G, which offers internet speeds of 1 Gbps up to a maximum of 20 Gbps [4]. This further encourages web technology to become more stable and advance to be applied in various fields. One of them is in the field of business, where companies are currently competing to implement information technology systems for storing and managing data to become useful information in company decisions, for example, the Accounting Information System (AIS). The AIS is not only used by large companies but also by many medium to small-sized businesses that need it to facilitate financial management.

Due to the rapid progress of information technology, the AIS has developed from a relatively independent and restricted type to an open type that operates in the internet environment [5]. AIS plays an important role in improving the quality of information with the aim of providing correct information to decisionmakers. Effective information processing makes it easier for information to reach decisions, with faster performance and greater knowledge giving companies a significant competitive advantage [6], [7]. Data received from the internal and external
environment by AIS is formed and modeled to reduce uncertainty and is given to decision makers to suit the company’s circumstances [8].

The success of implementing AIS is not only seen in how much data can be obtained but also in how well the data is conveyed [8]. Data that can be submitted is data that has been successfully processed into useful information. From this information, it can be seen how it affects the company and whether this information can help the company carry out its activities and improve its performance or not. Therefore, the main focus of this research is on how efficient or effective an AIS is for a company. In improving system performance, it will be closely related to the performance of employees who interact directly with the system [9]. By making it easier for users to use the system, it will speed up processes and increase work efficiency [10]. The main focus of this research is on how efficient AIS is for the performance of company employees.

Previously, AIS was widely used on desktop platforms and is still being used today [11]. Desktops have systems with stable performance and are in accordance with the specified hardware specifications [3]. Along with business and technology developments, various limitations on platforms and new requirements for systems, such as longer data processing times, arise due to the increasing volume of data every year and every day. Then, the appearance of errors in the system that worsen the performance of the computer, and limited monitoring control because the system is difficult to access remotely. This becomes an obstacle to the company’s business activities and prevents user performance.

According to these problems, it is necessary to reassess whether the current system with a desktop platform is still feasible to maintain and whether changing the platform to the web has an impact on better performance. Performance refers to time efficiency, where users can maximize the use of their time to complete work with information systems. So, this study aims to answer and find out the comparison of platform differences on time efficiency to increase employee performance. For analysis using paired t tests and quantitative experiments as a method of data collection. To further guide this research, the following research questions were addressed:

- Is implementing the web-based accounting information system affecting user performance in terms of time efficiency?
- Is the desktop-based information system still recommended for future information system implementation?

With this research, it is hoped that it can provide a basic knowledge and insight for companies in implementing better information technology and encouraging the development of information systems. From the literature that has been found, research related to this is very limited and has not been carried out in a long time [3], [12]. This research will be very helpful in updating and improving research designs to find new insights that are in accordance with current technological developments.

2. Literature Review

Accounting is the process of recording transactions used to measure and evaluate a company’s financial performance by grouping them into several types, such as sales, purchases, assets, and liabilities, in a standardized format [13]. Accounting helps companies evaluate their past, present, and future performance [11]. An AIS is a tool used to assist in facilitating accounting activities that arise thanks to
developments in technology and information systems [14].

AIS plays the role of operating data collection, processing, categorizing, and financial reporting functions for the purpose of storing information, recording inventories, providing financial information, and making decisions [7]. AIS plays a proactive role in strategic management for companies and is closely related to employee performance. Its implementation will help reduce the risk of errors and data repetition, allowing the system to provide businesses with accurate information that can support fast and accurate decision-making. By implementing an integrated information system, employees can complete their work effectively, get information at the right time, share information, and not need to retrieve data manually.

Various accounting literatures show that the strategic success of a business is considered as a result of the suitability of the AIS design with tasks and technology [15], [6]. The suitability between the needs of the company and the system will have a direct impact on the effective and efficient performance of employees. One of the characteristics that shows that AIS is effective and efficient is time, how the system is able to do its job accurately and on time and is able to optimize the use of time. However, the tasks and needs will continue to grow in accordance with business and technological developments that occur. Especially the emergence of various platforms that follow global trends adds to the dilemma for companies in implementing good information systems.

In information systems, the application of the concept of efficiency has many views and various methods and benchmarks. According to Sala Elvira Esperanza, efficiency is defined as the right way of doing things without wasting time, effort, or money [16]. The effectiveness of a system that is not good can be determined by comparing performance with the goals and achievements obtained in terms of how well it has been standardized [17]. Efficiency refers to doing the right thing in the most appropriate way given the availability of resources. A quality system for achieving goals using appropriate resources. Unnecessary resource restrictions are also one of the survival factors for the company in the long term [16].

There have been several previous studies related to the accounting information systems of the two platforms, but most of them have only investigated system performance in terms of user satisfaction and empirical studies [18], [12], [19], [3]. Noordiansyah [19] is one of the similar studies that compared desktop-based AIS with the web; this comparison was measured by user satisfaction with the system, and the results of the survey support the implementation of web-based information systems. There is no research that directly investigates the effect of different platforms on user performance in terms of time efficiency. Then, until now, there hasn’t been much further research regarding the comparison of the two platforms because previous research was on average very long [3], [12]. Therefore, this research wants to update and improve research designs and methods so as to find new discoveries that can be useful and more in line with current technological developments.

3. Methodology

3.1 Context and Participants

The research aims to observe performance changes in accounting information systems on different platforms. The performance to be measured is in terms of time efficiency, which is how long it takes to complete one activity or business process. Therefore, a parametric approach will be used with the Paired Sample T Test methods to carry out comparisons on the two platforms. The paired sample t-test method is
typically used to compare two groups of data that have the same subject [20].

Participants in the experiment were employees of CV. Tekad Jaya Motor, which is a motor spare parts distributor company located in Surabaya, Indonesia. Participants who took part in the experiment totaled seven people with different positions, but their work was directly related to the system (end user). Then, participants must have positions and jobs that are familiar and understand the basic use of AIS. This avoids data outliers or data deviations, differences in abilities between participants also affect the performance and results of the data recorded [15]. It will impact on the calculation of system efficiency, and data can be inconsistent. Then, even though it only uses a small number of participants, it will not affect performance as long as these participants have equal abilities and have insight and experience in information systems [9], [21].

3.2 Instrument
For data collection, this research used quantitative experiments as a research instrument because the data obtained is in units of time and can only be obtained by testing under certain conditions (second). The desktop-based system will utilize an existing system within the research object, while the web-based system will be built according to the task scenario to be tested. In this case, the web system was developed with the PHP language and CodeIgniter 4 framework.

The development of a web-based system must be able to adapt to the business processes of the existing features on desktop information systems and at least have the same basic features as the task to be tested. This is because both platforms have measurable and valid control variables and independent variables. The system that becomes the measuring device in the experiment will run on a computer with the following specifications: an Intel Core i5 desktop processor, 500 GB of storage, 4 GB of memory, and a 16" display.

3.3 Experiment Design
The flow of the experiment is shown in Fig. 1. This experiment will require an accounting information system with two different platforms, i.e., desktop and web. The preparation stage of the experiment involves setting up both platform systems as tools for data collection.

Before conducting the experiment, respondents will be given time for training to familiarize themselves with the system and understand the tasks they will be doing for 10 to 15 minutes. That’s to reduce the impact of the learning effect on the experimental results. The data to be retrieved is the length of time the user gets to complete one task in a unit of time. Each task will be repeated five times for each respondent, and the timer will start at the time the user is ready to do the task.

3.4 Experimental Task
Task is a condition, activity, or business process that will be given to participants in the system. This study will focus on the data input tasks of an accounting system using both desktop and web-based accounting information systems, as follows:

- T1: Create a new transaction item
- T2: Create an invoice of a transaction
These tasks were selected according to interviews with users related to the activities most frequently used by users in recording transactions and inputting data. According to the results of the interviews, there were 9 activities mentioned, with each position suggesting 3 activities. As this study conducted a preliminary evaluation, only 2 activities, T1 and T2, were taken from these results, which are the basis for recording data.

Each task is prepared 5 related case studies for participants. Then each participant will work on 5 case studies to get 5 data for each task. In T1, participants will be given a case study related to storing new item data in the database. Each case study has specified the item name, item code, quantity, price, and other detailed information on the item. So that participants simply input data from the information that has been received in accordance with the system’s business processes. Participants will be given 10 to 15 minutes to familiarize themselves with the system and understand the task to be carried out. If the participant is ready, then the stopwatch to calculate the time will start from the time the participant carries out the activity in the case study. Then, the stopwatch will stop once the activity is complete and the data is successfully saved.

Likewise, for T2, the mechanism will be the same, but the case studies given will relate to creating invoice transactions. Each case study has determined what items will be inputted, the intended customer, price, quantity, and other detailed information that is important.
4. Result and Analysis

4.1 Experimental Result

Paired data obtained from 2 groups amounted to 35 for each task. Descriptive statistics of experimental data are shown in Table 1. The data shows that there are significant differences between the two platforms. On tasks T1 and T2, the web data group consistently produces a faster time to complete tasks compared to the desktop data group. This can be seen from the resulting average on the T1 desktop, which is an average of 50.43 seconds, while the web can complete an average task in only 28.31 seconds. Likewise, on the desktop of T2, you get an average of 64.79 seconds, while on the web it is 48.05 seconds.

<table>
<thead>
<tr>
<th>Task</th>
<th>Min(s)</th>
<th>Max(s)</th>
<th>Mean(s)</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desktop</td>
<td>40.33</td>
<td>59.01</td>
<td>50.43</td>
<td>5.26</td>
</tr>
<tr>
<td>T2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desktop</td>
<td>49.79</td>
<td>78.45</td>
<td>64.79</td>
<td>7.90</td>
</tr>
<tr>
<td>Web</td>
<td>38.54</td>
<td>55.69</td>
<td>48.05</td>
<td>4.28</td>
</tr>
</tbody>
</table>

The comparison between the two data is shown in the graphs in Fig. 2. There is a clear difference in time performance between the two systems, whereby the web-based system has a lower completion time than the desktop on data input tasks. On average, the difference in time between the two platforms reaches 22 seconds on T1 and 16 seconds on T2, as shown in Table 2. The difference between the two platforms shows an increase, system performance becomes faster, and if the percentage shows an average performance increase, it reaches 34.85%. The activity of input data items on T1 and the activity of creating invoice transactions on T2 are not difficult activities, especially for participants who are used to doing them. Although the two platforms have the same business processes, the results are significantly different. In T1 the difference is caused by a simpler interface display from a web-based system than a desktop-based system. The interface on the desktop is quite complex, with several menus that are rarely used because they are not in accordance with company needs. So, on the web system, participants can more easily and quickly interact with the system.

The difference that occurs in T2 is no longer about the interface but in terms of the process of loading data onto the system. On a desktop-based system, for every process that requires a lot of data, the system will take time to load. This is because every process performed on the system will use computer resources, especially hardware. This is different from web-based information systems, where the system processes activities faster just by utilizing the speed of the internet network, although it still requires performance from computer hardware but is not too burdensome.

4.2 Analysis

Parametric analysis approach needed both data groups’ to be normally distributed, which can be determined by the normality test. In this case, the normality test was performed with the Kolmogorov-Smirnov method, and the results are shown in Tables 3. These results show that Sig value of the data is 0.200, which is greater than 0.05, indicating the obtained data is normally distributed.
In the paired t test, the data will be tested to determine whether there is a significant difference between the two systems shown in Table 4. The test results show that both T1 and T2 produce the same significant value of 0.00, which is smaller than 0.5. This proves that between desktop-based systems and web-based systems, there is a significant difference in performance. Therefore, according to the results of

Table 2. Process Time Difference of The Two Group

<table>
<thead>
<tr>
<th>Task</th>
<th>Mean Desktop (s)</th>
<th>Mean Web (s)</th>
<th>Difference (s)</th>
<th>Improvement (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>50.43</td>
<td>28.31</td>
<td>22.12</td>
<td>43.86</td>
</tr>
<tr>
<td>T2</td>
<td>64.79</td>
<td>48.05</td>
<td>16.74</td>
<td>25.84</td>
</tr>
</tbody>
</table>

Table 3. Normal Distribution Test

<table>
<thead>
<tr>
<th>Task</th>
<th>n</th>
<th>Mean Desktop</th>
<th>sd</th>
<th>Sig.</th>
<th>Mean Web</th>
<th>sd</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>35</td>
<td>50.43</td>
<td>5.26</td>
<td>.200</td>
<td>28.31</td>
<td>4.12</td>
<td>.200</td>
</tr>
<tr>
<td>T2</td>
<td>35</td>
<td>64.79</td>
<td>7.90</td>
<td>.200</td>
<td>48.05</td>
<td>4.28</td>
<td>.200</td>
</tr>
</tbody>
</table>

Table 4. Paired Sample T-Test

<table>
<thead>
<tr>
<th>Task</th>
<th>Mean</th>
<th>sd</th>
<th>Paired Sample T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>22.16</td>
<td>6.49</td>
<td>T = 20.21, df = 34, Sig. = 0.00</td>
</tr>
<tr>
<td>T2</td>
<td>16.78</td>
<td>6.27</td>
<td>T = 15.83, df = 34, Sig. = 0.00</td>
</tr>
</tbody>
</table>
the analysis, it can be concluded that web-based information systems have better performance than desktop-based information systems. The increase in time efficiency that occurs from platform changes is almost 35%. This increase in time efficiency also increases the company’s performance significantly. On the other hand, development of growing business causes changes or additions to the company’s requirements. Therefore, it’s recommended that companies or business entities that wish to implement

5. Limitation

This study uses a small number of participants and is limited to the selected research object. So that if there are changes or additions to the object of research, and the greater the number of participants, it can affect the results obtained. This causes the data obtained to be insignificant and inconsistent. Then, this research is also difficult to interpret because many factors can affect experimental results, especially the system built and data collection errors during experiments. The system must really have business processes that are compatible with each other between platforms, so that research can be measured. In experiments, data collection must be consistent between tasks, participants, and the amount of data taken.

In the future, this research will be better if it has several objects that can be studied and a larger number of participants to produce more reliable data. Analysis of system performance on platforms is also one of the challenges in research, judging from the many platforms that have now developed and competed with each other for the better.

6. Conclusion

This study compares the implementation of desktop and web-based systems to determine the effect of different platforms on time efficiency of user performance. Based on the results of the analysis, the web-based system obtains results in a shorter time, and the efficiency increase greatly affects the company’s productivity. This is prioritized for companies working on specific targets that require fast performance and have a wider coverage area. Monitoring situations and transactions will be much easier and will not be limited by distance or time. If there are changes in conditions or needs, system updates can also be carried out. Even though the results of this research analysis show that web-based systems are better, systems with desktop platforms are still good to use, but with a smaller business scope and minimal changes.

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