Web-based Computerized Land Activities Analysis

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Abstract

Information technology (IT) development in internet and web technologies have grown a variety of web-based services. Public services no longer require face-to-face activity, but can already be done virtually through web media. This research will evaluate land services at the ATR/BPN office in Ogan Ilir South Sumatra. The evaluation method used is the PIECES framework which consists of performance, information, economy, control, efficiency, and service. The questionnaire consists of 23 items and distributed using Google Forms. After analyzing the results of the questionnaire, five (5) variables are included in the "Excellent" category (Performance, Information, Control & Security, Efficiency, and Service), and only 1 (one) variable is included in the "Good" category (Economy).

Keywords: ATR/BPN, e-Government, Internet, PIECES, Web evaluation.

1. INTRODUCTION

The development of information technology (IT) greatly influences civilization which enables the work within an organization to be completed quickly, accurately and efficiently. In the beginning, people needed information and communication technology (ICT) to be able to exchange information. In its development, information and communication technology spread through network technology that enables the exchange of data quickly and efficiently. One example of technological development is the internet and website. Indonesia ranked number 4 (four) in the world for internet users [1]. With a large number of internet users, more and more internet-based services are needed by the community. In this study will discuss internet services in government related to land administration services.

The web is a source of data and information that can be accessed by everyone via the internet. Internet technology makes an important replacement in government service and communication actions [2]. Countries that have successfully implemented e-Government have the following features [3]: 1) Comprehensive, 2) Integrated, 3) Ubiquitous, 4) Transparent/Easy to Use, 5) Accessible, and 6) Secure, 7) Private, 8) Re-engineered, 9) Interoperable, and 10) Be Developed to E-governance Systems. The application of electronic services

can change the pattern of distribution of human resources and improve the performance of an agency [4].

However, a website that can be said to be successful must be in accordance with the targets or targets that have been determined in the initial planning. Therefore to find out the level of success in implementing a website-based application must be evaluated or analyzed. By conducting an evaluation or analysis of an ongoing system, it is expected that the company being evaluated will better understand and understand the obstacles and benefits of using the system that has been running in the institution.
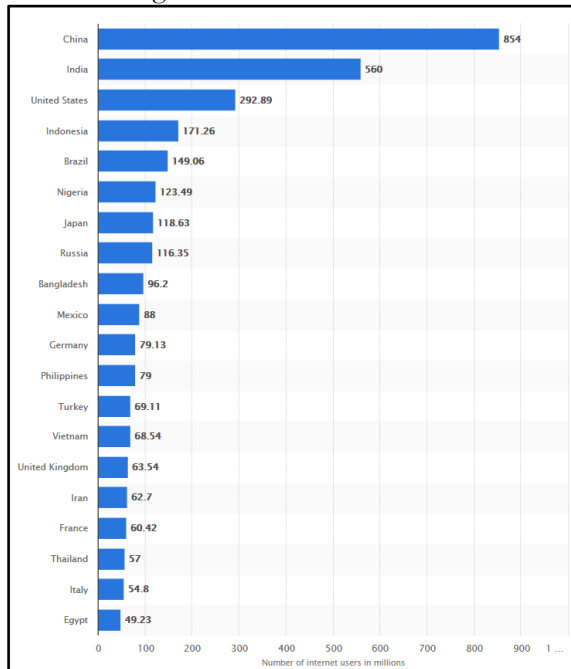

Figure 1. Countries with the highest number of internet users as of June 2019

In analyzing or evaluating a system, it can be done with several methods of analysis such as 1) Value Chain Analysis (VCA), 2) Strengths, Weaknesses, Threats, and Opportunity (SWOT), 2) Performance, Information, Economy, Control, Efficiency, and Service (PIECES), 3) Politic, Economy, Social, Technology (PEST), etc. In this study will use the PIECES analysis method, because the PIECES analysis is very suitable for analyzing the level of user satisfaction and to find out the strengths and weaknesses of the system.

PIECES is a framework of analysis as a basis for obtaining more specific issues. In the PIECES analysis several other stages will be carried out, namely performance, information, economy, security, efficiency and service. By using PIECES analysis a detailed and comprehensive system will receive special

attention, so that the strengths and weaknesses of the system can be known to later be used as a reference for the progress of the institution.

The aims of this practical work are as follows: 1) Analyze the computerized land activities website (KKP) using the PIECES method, and 2) Based on the PIECES analysis, what are the strengths and weaknesses in the implementation of a computerized land activity system Web-based?

The rest of this article will cover method, then followed by results and discussion, and closed with conclusions. The references are list at the end of article.

2. RESEARCH METHODS

This research was conducted with a quantitative approach that involved a number of activities, in the form of: observation, interviews, and questionnaires distribution.

2.1. Research Location and Duration

The research was carried out at the "Agraria dan Tata Ruang (ATR)" or "Badan Pertanahan Nasional (BPN)" office located on Jln. Lintas Tengah Palembang – Prabumulih KM 34. ATR or BPN is a non-ministerial government institution in Indonesia that has duties and functions in the national, regional and sectoral of land services. National land agency has an important role in land allotment, management of land rights both government and individual. Control of the documents concerned with land ownership which is the key link between the people and the government and government services to the people.

The duration of the study was carried out for a period of around 4 (four) months. These activities began from the interview stage, observation, until the distribution of questionnaires.

2.2. Respondents

Respondents involved in this study were employees who worked at the ATR or BPN office. Total respondents involved in this study amounted to 26 people.

2.3. PIECES Framework

The analysis was carried out using the PIECES framework (developed by James Wetherbe in 1994) [5]. PIECES consisted 6 (six) points or aspects of analysis: 1) Performance, 2) Information, 3) Economy, and 4) Controlling, 5) Efficiency, and 6) Service (Table 1).

The PIECES framework can be used to analyze both manual and computer-based systems [6], identifying operational problems to be solved [7], analyzing the level of user satisfaction with the information system used [8], can providing a thorough assessment of the application of the system used [9]. Through this PIECES-based analysis, it is expected to answer the need to utilize existing information systems [10].

Table 1. PIECES Variable and Checklist

No	Variable	Checklist
1	Performance	a) Throughput, b) Response times
2	Information	a) Outputs, b) Inputs, c) Stored data
3	Economy	a) Costs, b) Profits
4	Control & Security	a) Too little security or control, b) Too much control or security
5	Efficiency	a) People, machines, or computer waste time, b) People, machines, or computer waste materials and supplies, c) Effort required for tasks is excessive, d) Material required do tasks is excessive
6	Service	a) The systems produces inaccurate results, b) The systems produces inconsistent results, c) The systems produces unreliable results, d) The systems is not easy to learn, e) The systems is not easy to use, f) The systems is awkward to use, g) The systems is inflexible to new or exceptional situations, h) The systems is inflexible to change, i) The systems is incompatible with other systems

2.4. Questionnaire Distribution

Distribution of the PIECES questionnaire was carried out using Google Forms. Google Forms is an online facility form from Google that can be used in building online questionnaires. Google Forms has very rich and flexible features that are arranged according to the needs of the questionnaire as well as to facilitate interaction with respondents [11]. In addition to being easy to use, Google Forms can also automatically save the results of questionnaire entries in the form of files that are compatible with Microsoft Excel. When the data is in Excel format it will be very easy to be processed, both processed directly in Microsoft Excel or through statistical software.

2.5. Data Analysis

The scale used in this study is a Likert scale [12] with 4 (four) kinds of options, 1) "Sangat Setuju" (Strongly Agree = 4), 2) "Setuju" (Agree =3), 3) "Tidak Setuju" (Disagree = 2), and 4) "Sangat Tidak Setuju" (Strongly Disagree = 1).

Table 2. Likert Scale

No	Note	Score
1	Sangat Tidak Setuju (Strongly Disagree)	1
2	Tidak Setuju (Disagree)	2
3	Setuju (Agree)	3
4	Sangat Setuju (Strongly Agree)	4

The average value of the respondents' answers is obtained by dividing the total score of the questionnaire by the number of respondents.

$$Av = \frac{\sum d}{n} \tag{1}$$

Av = average value
$\sum d$ = total questionnaire data
n   = number of respondents/questionnaires

Next is to calculate the class interval by dividing the range of class values divided by the number of classes.

$$i = \frac{r}{c} \tag{2}$$

i = interval
r = range (highest scale - lowest scale)
c = number of classes

$$i = \frac{(4-1)}{4} = \frac{3}{4} = 0.75$$

In addition to using the questionnaire, this study also used a number of tools as follows:

Table 3. Interval Score

No	Score Range	Criteria
1	1.00 – 1.75	Very Poor
2	1.76 – 2.50	Poor
3	2.51 – 3.25	Good
4	3.26 – 4.00	Excellent

3. RESULTS AND DISCUSSION

In the results and discussion section will show the characteristics of respondents, then followed by the results of the analysis of each variable measured, then an overall analysis of the six variables involved. The discussion follows the results of each variable analyzed.
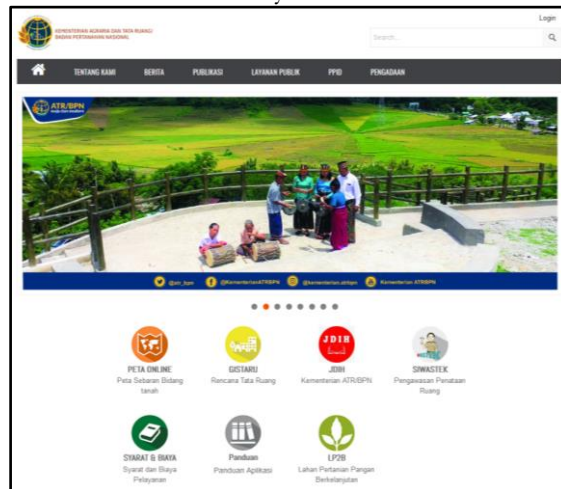

Figure 2. KKP Website

3.1 Respondent Characteristics

The respondents involved in this study were dominated by male respondents who reached 65.38%. While female respondents numbered 34.62%. The characteristic chart of respondents by gender is shown in figure 2.
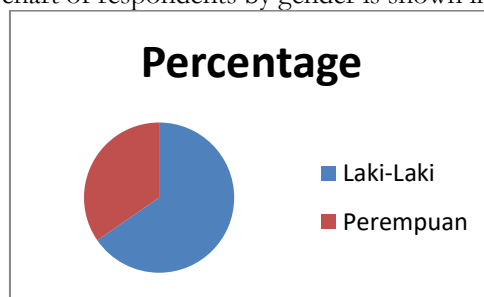

Figure 3. Respondents' Gender

The largest number or half of the respondents (50%) have been educated at the undergraduate level then followed by respondents who have graduated from the diploma level (38.46%), and the least are respondents who have high school education or the equivalent (11.54%).
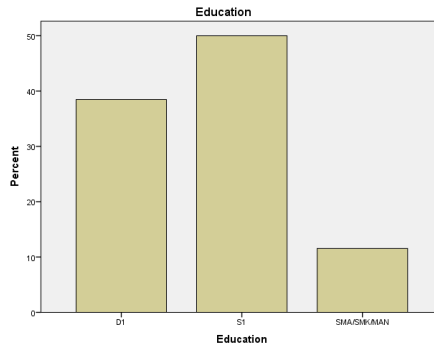
Figure 4. Respondents' Education

A summary of respondents' characteristics from the aspects of gender and education can be seen in Table 4.

Table 4. Respondents' Characteristics

Characteristics		Total	Percentage
Gender	Male	17	65.38
	Female	9	34.62
Education	SMA/SMK/MAN	3	11.54
	D1	10	38.46
	S1	13	50.00

3.2 Performance Variable Analysis

Performance variable has 4 (four) indicators: 1) Menu and navigation options available make it easy to use the KKP website, 2) The loading page of the KKP website is very fast, 3) Instructions for canceling orders are available when needed, and 4) Menus and navigation provided can be run easily and interactively.
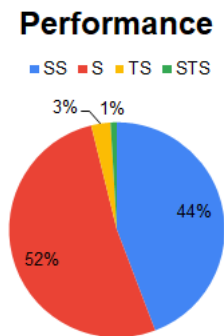

Figure 5. Performance Variable Percentage Responds

The statistical mapping of the results of the questionnaire for the "Performance" variable was dominated by "Agree" by 52% and "Strongly Agree" by 44%. This means that the KKP website in terms of performance is very good or satisfying.

Table 5. Variable Performance Score

Indicators	N	Mean	Category
Performance 1	26	3.19	Good
Performance 2	26	3.46	Excellent
Performance 3	26	3.50	Excellent
Performance 4	26	3.42	Excellent
Average	26	3.39	Excellent

Based on the results of the calculation, 3 (three) indicators include the "Excellent" category, and there are 1 (one) indicators that fall into the "Good" category. The average score for all indicators on the "Performance" variable is 3.39 which include into the "Excellent" category.

3.3 Information Variable Analysis

Information variable has 4 (four) indicators: 1) The Land Complementation Website (KKP) does not require a complicated input process, 2) Information generated as needed, 3) The KKP website has up-to-date news, and 4) The desired information is easy to find.

The statistical mapping of the results of the questionnaire for the "Information" variable was dominated by "Agree" by 47% and "Strongly Agree" by 42%. This means that the KKP website in terms of performance is very good or satisfying.
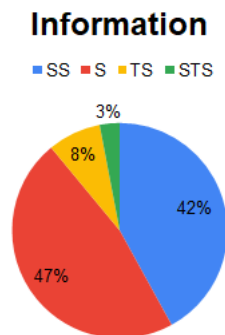

Figure 6. Information Variable Percentage Responds

Based on the results of the calculation, 2 (two) indicators include the "Excellent" category, and there are 2 (two) indicators that fall into the "Good"

category. The average score for all indicators on the information variable is 3.28 which belongs to the excellent category.

Table 6. Variable Information Score

Indicators	N	Mean	Category
Information 1	26	3.50	Excellent
Information 2	26	3.27	Excellent
Information 3	26	3.19	Good
Information 4	26	3.15	Good
Average	26	3.28	Excellent

3.4 Economy Variable Analysis

Economy variable has 4 (four) indicators: 1) The KKP website saves operational costs, 2) The KKP website provides various benefits for organizations and users, 3) Website of Computerized Land Activities (KKP) as needed, and 4) In maintaining the system, there are no difficulties in terms of both costs and implementation.
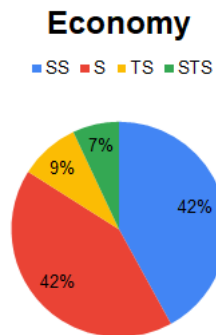

Figure 7. Economy Variable Percentage Responds

The statistical mapping of the results of the questionnaire for the "Economy" variable was dominated by "Agree" by 42% and "Strongly Agree" by 42%. This means that the KKP website in terms of performance is very good or satisfying.

Table 7. Variable Economy Score

Indicators	N	Mean	Category
Economy 1	26	3.27	Excellent
Economy 2	26	3.38	Excellent
Economy 3	26	3.27	Excellent
Economy 4	26	2.85	Good
Average	26	3.19	Good

Based on the results of the calculation, 3 (three) indicators include the "Excellent" category, and there are 1 (one) indicators that fall into the "Good" category. The average score of all indicators in the economy variable is 3.19 and it belongs to the "Good" category.

3.5 Control & Security Variable Analysis

Control & Security variable has 4 (four) indicators: 1) The KKP website is controlled by the admin/supervisor so that errors do not occur, 2) The security system on the KKP website is good, 3) There is centralized control over data usage, and 4) Existing data cannot be changed arbitrarily.

The statistical mapping of the results of the questionnaire for the "Control & Security" variable was dominated by "Agree" by 49% and "Strongly Agree" by 42%. This means that the KKP website in terms of performance is very good or satisfying.
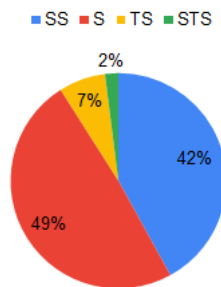

Figure 8. Control & Security Variable Percentage Responds

Based on the results of the calculation, all 4 (four) indicators include the "Excellent" category. The average score for all indicators in the "Control" variable is 3.32 which falls into the "Excellent" category.

Table 8. Variable Control & Security Score

Indicators	N	Mean	Category
Control 1	26	3.27	Excellent
Control 2	26	3.31	Excellent
Control 3	26	3.31	Excellent
Control 4	26	3.38	Excellent
Average	26	3.32	Excellent

3.6 Efficiency Variable Analysis

Efficiency variable has 3 (three) indicators: 1) The KKP website accelerates and facilitates work completion, 2) KKP's website according to need, and 3) Website CTF accelerates the search for data or documents.

The statistical mapping of the results of the questionnaire for the "Efficiency" variable was dominated by "Strongly Agree" by 56% and "Agree" by 37%. This means that the KKP website in terms of performance is very good or satisfying.
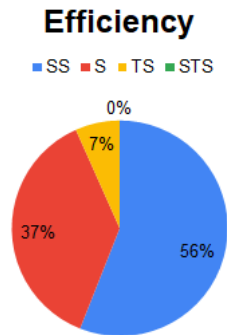

Figure 9. Efficiency Variable Percentage Responds

Based on the results of the calculation, all 3 (three) indicators include the "Excellent" category. The average score for all indicators in the "Efficiency" variable is 3.49 which falls into the "Excellent" category.

Table 9. Efficiency Variable Score

Indicators	N	Mean	Category
Control 1	26	3.58	Excellent
Control 2	26	3.62	Excellent
Control 3	26	3.27	Excellent
Average	26	3.49	Excellent

3.7 Service Variable Analysis

Service variable has 4 (four) indicators: 1) The KKP website is coordinated and integrated with other systems, 2) Information on the website can be accessed easily, 3) The CTF website can be used easily, and 4) Every menu on the KKP website can be accessed easily and quickly.

The statistical mapping of the results of the questionnaire for the "Performance" variable was dominated by "Strongly Agree" by 47% and "Agree" by 38%. This means that the KKP website in terms of performance is very good or satisfying.
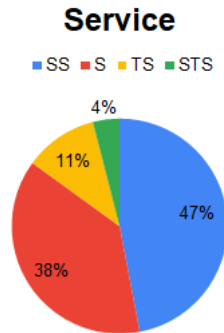
Figure 10. Service Variable Percentage Responds

Based on the results of the calculation, 2 (two) indicators include the "Excellent" category, and there are 2 (two) indicators that fall into the "Good" category. The average for all indicators included in the "Service" variable is 3.28 and belongs to the "Excellent" category.

Table 10. Variable Service

Indicators	N	Mean	Category
Service 1	26	3.50	Excellent
Service 2	26	3.08	Good
Service 3	26	3.31	Excellent
Service 4	26	3.23	Good
Average	26	3.28	Excellent

3.8 Overall PIECES Analysis

The statistical mapping results of the questionnaire for the whole PIECES' variables (Figure 11) could be described as followed:
1) The variable of "Performance", "Information", and "Control & Security" was dominated by "Agree" choice,
2) The variable of "Efficiency" and "Service" was dominated by "Strongly Agree" choice, and
3) The variable of "Economy" was dominated by "Strongly Agree" and "Agree" choice equally.

A summary of the results of calculations for all six variables of PIECES can be seen in Table 11. There are 5 (five) variables that are grouped into the "Excellent" category, and there are 1 (one) variables which scores is grouped into the "Good" category, namely the "Economy" variable.

Overall statistics show that all the PIECES' variables measured have very good scores (Figure 11).
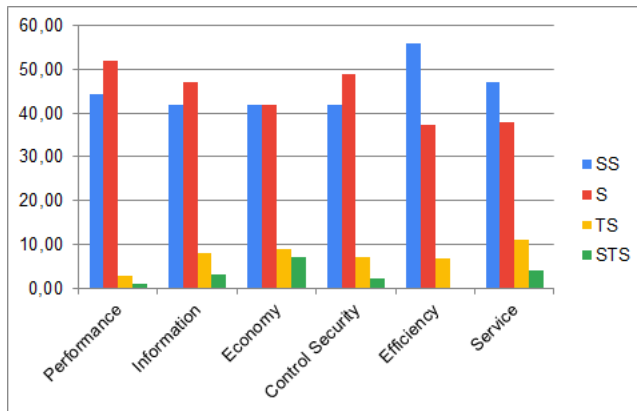
Figure 11. PIECES' Variables Percentage Responds

The rank order of the six variables is as follows: 1) Efficiency (3.49, Excellent), 2) Information (3.45, Excellent), 3) Performance (3.39, Excellent), 4) Control (3.32, Excellent), 5) Service (3.28, Excellent), and 6) Economy (3.19, Good).

Table 11. PIECES Overall Score

Variables	Questions	Mean	Predicate
Performance	4	3.39	Excellent
Information	4	3.45	Excellent
Economy	4	3.19	Good
Control & Security	4	3.32	Excellent
Efficiency	3	3.49	Excellent
Service	4	3.28	Excellent
Average		3.32	Excellent

4. CONCLUSION

Based on the analysis and description described in the previous sections, it can be concluded and given suggestions relating to the main problem. In accordance with the title of this research, the authors can conclude:

1) Judging from the six assessment reference variables, 5 (five) of them score in the excellent category, and only 1 (variable) scores in the "good" category. This shows that the KKP Kantah Ogan Ilir website is in the "Excellent" category.
2) For economic variables that are still in the "good" category, improvements can be made related to costs and profits.

3) For further research direction, analysis can be done using other methods (for variables that do not include PIECES), so that more comprehensive results are obtained.

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