Evaluation of Human Resource Information System by Using HOT-Fit Model

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***Abstract*— Today's competitive business environment, many organization give more attention to enhance effectiveness and efficiency of employee. PT Pembangkitan Jawa Bali as a subsidiary of PT PLN (Persero) also continues to improve business processes of Human Resource Management through the application of Human Resource Information System (HRIS). This application has been developed since 2016 and is still implemented 67% of the HRIS PJB model design. This certainly raises questions about the development of HRIS PJB implementation, which is need for an evaluation of the implementation of HRIS PJB applications. HRIS Manager has never conducted an evaluation of HRIS PJB that can strengthen the benefits of its use for employees. Therefore, this study was conducted to evaluate the use of HRIS PJB applications in this case the focus on the Personal Management module in order to assess its usefulness to the needs of users and organizations by using Human Organization Technology (HOT) Fit Model. Primary data were obtained through a survey method by distributing questionnaires to PT PJB employees as application users. Data analysis method used is Partial Least Square using SmartPLS. The results of this study shows the suitability of this application benefits. If there is a gap, alternative solutions are needed to improve and develop applications in the future. Decision making through Borda Count Method is used to get the right solution with the current conditions and can be used as improvements priority and development of HRIS PJB applications for both application managers and management of PT PJB.**

***Keywords*— HRIS, HOT Fit Model, Partial Least Square, Borda Count Method.**

I. INTRODUCTION

NOWADAYS it is undeniable that information technology is one of the main resources in an organization to improve competitiveness and optimal service. Therefore, every organization tries to apply information technology in order to increase effectiveness and efficiency in business processes, it aims to be able to provide added value in the form of competitive advantage. No exception the function of Human Resources (HR) in organizations that have been affected by the paradigm shift where human resource management is now moving from a silo approach to an integrated approach [1]. Integrating the HR function in planning a company's business strategy is needed so that the process of managing resources can be done effectively and efficiently.

While all current HR practices are influenced by information technology, the term Human Resource Information System (HRIS) appears. According to Hendrickson [2], HRIS is defined as an integrated system used to collect, store and analyze information about an organization's human resources consisting of databases, computer applications, hardware and software needed to collect, record, store, manage send, present and manipulate data for human resource functions. HRIS consists of several modules, one of which is Personal Management. This module is related to the personnel administration process in an organization.

This study evaluates the application of the Human Resource Information System (HRIS) system by focusing on the Personal Management Application (PMAN) at PT Pembangkitan Jawa Bali by using the Human Organization Technology (HOT) Fit model. This model was chosen because it was considered capable of explaining a comprehensive evaluation approach to the core components of the information system, which are Human, Organization, Technology and the suitability of the three components affecting net benefits on implementation of the information system.

Based on the background of the problem, problem formulation of this study is evaluating the success of the application of the PMAN application at PT Pembangkitan Jawa Bali by referring to the HOT-Fit model by looking at three factors, which are human, technology, and organization.

The objectives of this reasearch are to evaluate the success of the application of PMAN at PT Pembangkitan Jawa Bali and get empirical evidence regarding the successful application of the PMAN by using HOT-Fit model. By knowing the empirical evidence resulted of this study, recommendations for developing PMAN and HRIS PJB can be carried out appropriately by management in managing HRIS PJB, so that it can make the optimal utilization of PJB HRIS.

II. METHOD

This study uses a quantitative descriptive study method by conducting surveys and collecting primary data through interviews with guidance on distributing questionnaires to PMAN application users as respondents. In this study the object and material are the users of the PMAN application at PT Pembangkitan Jawa Bali.

The types of questions used in the questionnaire are closed questions. The sampling technique used in this study was to use the Slovin formula ($\alpha = 5\%$) which was measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) [13].This study uses the HOT-Fit model developed by Yusof [3], with several modifications to assess

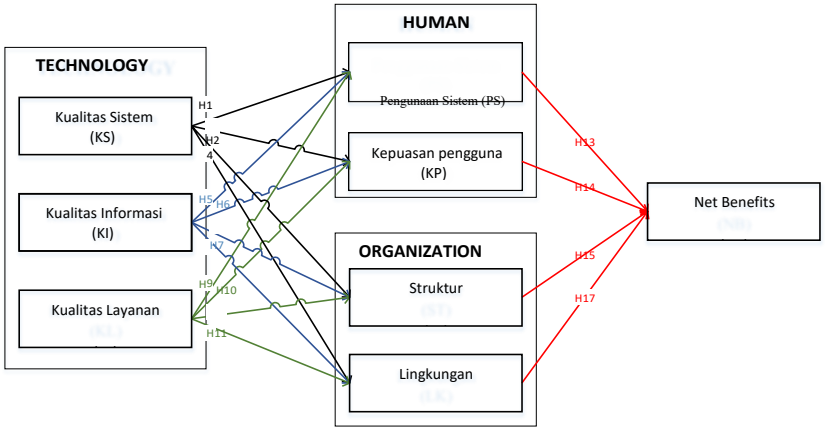

Figure 1. HOT-Fit Model of The Study.

Table 1.
Rule of Thumb of PLS

Measurement	Parameter	Rule of Thumb	Description
		Outer Model	
Discriminant validity	Loading Factor	> 0.7 / min. 0.4	for Confirmatory Research
	Average Variance Extracted (AVE)	> 0.5	for Confirmatory Research and Exploratory Research
Convergent validity	Cross Loading	> 0.7	For each variable
	Square Root of AVE	Square Root of AVE > correlation between latent variable (min 0.7)	
Construct Reliability	Cronbach Alpha	> 0.7	for Confirmatory Research
	Composite Reliability	> 0.7	for Confirmatory Research
		nner Model	
R-Square	-	> 0.67	Good
		> 0.33	Moderate
		> 0.25	Weak

the successful application of the Personal Management Administration (PMAN) application [4][5][6][7][14]. The definition and concept of HOT-Fit variables used in this study can be explained as follows:

A. Human

The Human Aspect in HOT-Fit Model uses two dimensions to assess the success of information technology application , which are the system use and user satisfaction. System use focuses on the frequency and breadth of functions and investigations of information systems. Besides system use can be measured through: 1) people who use, 2) the level of use, 3) training , 4) knowledge, 5) beliefs, 6) expectations, and 7) acceptance or rejection of the system. The frequency of system use is usually measured by how often or long a user uses the system which will result in the user's dependence on the system.User Satisfaction focuses on measuring system success. User satisfaction is subjective because it depends on whose satisfaction is measured. User satisfaction is defined as an overall evaluation of user experience in using the system and the potential impact of the system. User satisfaction can be associated with perceptions of usability and user attitude towards the system that is influenced by personal characteristics. User satisfaction can be measured through 1) experience using the system, 2) the potential impact of the system, 3) perceived usefulness, 4) attitudes which are influenced by his / her personal characteristics [3]

B. Organization

Organizational aspects assess information systems in terms of organizational structure and organizational environment. Organizational structure can be analyzed from 1) type and size of organization, 2) culture, 3) politics, 4) hierarchy, 5) autonomy, 6) planning and control systems, 7) strategy, 8) management, and 9) communication. Whereas organizational environment can be analyzed from 1) sources of funding, 2) government, 3) politics, 4) location, 5) types of population served, 6) competition, 7) relationships between organizations, 8) populations served, and 9) communication [3].

C. Technology

The technology aspect evaluates the system in terms of the quality of the information system that is related to the system quality, information quality and service quality. System quality in question is the quality or performance of the system itself. Both in terms of hardware and software that provides information for users. System quality can be measured through 1) ease of use, 2) ease of learning, 3) response time, 4) usefulness, 5) availability, 6) reliability, 7) completeness, 8) system flexibility, and 9) security. Even the existing system is often not used because it is not as expected. Therefore, it is important to determine whether the system (1) meets the needs of the projected user, (2) is comfortable and easy to use, and (3) matches the user's work pattern. Information quality is the quality of information output provided by the information system. Information quality can be measured through 1) completeness, 2) accuracy, 3) legibility, 4) timeliness, 5) availability, 6) relevance, 7) consistency, and 8) reliability. Service quality is related to the overall quality support provided by external providers to internal departments. Service quality can be assessed through

Table 2.
Outer Loading and Average Variance Extracted (AVE) Value

Variable	Indicator	Outer Loading	Average Variance Extracted
System Quality (SQ)	SQ1	0.795	0.567
	SQ2	0.817	
	SQ3	0.751	
	SQ4	0.753	
	SQ5	0.713	
	SQ6	0.749	
	SQ7	0.75	
	SQ8	0.757	
	SQ9	0.683	
Information Quality (IQ)	IQ1	0.762	0.662
	IQ2	0.773	
	IQ3	0.817	
	IQ4	0.789	
	IQ5	0.826	
	IQ6	0.878	
	IQ7	0.854	
	IQ8	0.803	
Service Quality (SL)	SL1	0.874	0.781
	SL2	0.886	
	SL3	0.873	
	SL4	0.884	
	SL5	0.9	
System Usage (SU)	SU1	0.726	0.557
	SU2	0.716	
	SU3	0.7	
	SU4	0.722	
	SU5	0.762	
	SU6	0.798	
	SU7	0.795	
User Satisfaction (US)	US1	0.834	0.686
	US2	0.797	
	US3	0.839	
	US4	0.842	
Structure (ST)	ST1	0.751	0.623
	ST2	0.82	
	ST3	0.814	
	ST4	0.797	
	ST5	0.808	
	ST6	0.762	
	ST7	0.793	
	ST8	0.795	
	ST9	0.762	
Environment (EV)	EV1	0.793	0.728
	EV2	0.881	
	EV3	0.882	
Net Benefit (NB)	NB1	0.868	0.743
	NB2	0.869	
	NB3	0.89	
	NB4	0.841	
	NB5	0.839	

1) technical support, 2) quick responsiveness, 3) assurance, 4) empathy, and 5) follow-up service [3].

D. Net benefits

A system can benefit a user, a group of users, an organization or a company as a whole. Net Benefit captures the balance of positive and negative impacts for its users, which includes managers and IT, staff, system developers, departments, work units or all sectors in the organization. From the human aspect, the impact of user behavior is influenced by the information it receives through the system. Changes can be in the form of influences on performance, changes in work activities, and increased productivity. Thus, an individual's Net Benefit can be evaluated using impact on work, efficiency, effectiveness, decision quality, and error reduction. From the Organizational aspect, the influence of information impacts the perceived performance of the organization. Just like individual Net Benefit, the organization's Net Benefit can also be evaluated using 1) job effects, 2) efficiency, 3) effectiveness, 4) decision quality, and 5) error reduction.

Fit can be measured and analyzed using the number of definitions given by these three factors related to the relationship dimensions and information system success, which are System Quality, Information Quality, Service Quality, System Use, User Satisfaction, Structure, Environment, and Net Benefit [8][9].

Figure 1 shows the model and variables that will be used in this study based on the HOT-Fit Model. There are three main aspects with different variables and one complementary variable. The first aspect is Technology with dimensions of system quality, information quality, and service quality. The second aspect is Human with the dimensions of system use and user satisfaction. The third aspect is the Organization

Table 3.
Discriminant Validity

Variable	Root AVE	AVE
System Quality	0.566	0.752
Information Quality	0.661	0.813
Service Quality	0.780	0.883
System Usage	0.557	0.746
User Satisfaction	0.685	0.828
Structure	0.623	0.789
Environment	0.727	0.852
Net Benefit	0.742	0.861

Table 4.
Composite Reliability

Variable	Composite Reliability	Cronbach Alpha
System Quality	0.922	0.904
Information Quality	0.94	0.927
Service Quality	0.947	0.93
System Usage	0.898	0.869
User Satisfaction	0.897	0.848
Structure	0.937	0.925
Environment	0.889	0.813
Net Benefit	0.935	0.913

Table 5.
R-Square Value

Endogen Variable	R-Square	Description
System Usage	0.324	System usage shows a weak model for SQ, IQ, SL
User Satisfaction	0.321	User satisfaction shows a weak model for SQ, IQ, SL
Structure	0.338	Structure shows a moderate model for SQ, IQ, SL
Environment	0.342	Environment shows a moderate model for SQ, IQ, SL
Net Benefit	0.624	Net Benefit shows a moderate model for SQ, IQ, SL

with structural and environmental dimensions, and complementary dimensions, which is net benefits.

Compared with the HOT-Fit Model framework created by Yusof in 2006 [10]and 2008 [3], there were no changes in all aspects and dimensions used in this study. However, in this study a slight change was made to match the problem conditions at PT Pembangkitan Jawa Bali, which is the change in relationships between variables in each aspect in one direction. From the aspect of technology, each dimension is connected one way to each dimension on the aspects of human and organization. Likewise in each dimension on the aspects of human and organization that are connected in one direction on the net benefit dimension. This one-way relationship was chosen because of the evaluation adjustments made to find out whether the use of PJB HRIS affects the user (human) and PT Pembangkitan Jawa Bali (organization) in obtaining the overall benefit (net benefit).

Furthermore, the formulation of hypotheses based on the HOT-Fit model used includes:
H1: System Quality influences System Usage H2: System Quality affects User Satisfaction H3: System Quality influences Structure
H4: System Quality influences the Environment H5: Information Quality affects System Use
H6: Information Quality affects User Satisfaction H7: Information quality influences structure
H8: Information quality affects the environment
H9: Service Quality influences System Usage H10: Service Quality affects User Satisfaction H11: Service Quality influences Structure H12: Service Quality affects the Environment H13: System usage affects Net Benefit
H14: User Satisfaction influences Net Benefit H15: Structure influences Net Benefit
H16: Environment influences Net Benefit

This study uses population as samples. Users are employees of PT Pembangkit Jawa Bali with a total number as of April 2020 of 2,984 employees. The number of samples was calculated using the Slovin formula (α = 5%) with a result of 353 employees. The questionnaire was designed according to the HOT-Fit model. The choice of answers is mapped in the form of a Likert scale with a range of 1 (strongly disagree) to 5 (strongly agree).

Data will be procesed by using SmartPLS software to test the outer and inner model,. The first thing to do is determine the parameters according to the Rule of Thumb for the Outer and the Inner Model according to the PLS rules shown Table 1 [11].

III. RESULT AND DISCUSSION

From the average respondent's survey, overall data shows that many respondents gave four (4) assessments, which means System Quality, Information Quality, and Service Quality of HRIS application as a whole is Good. Even if examined and calculated more deeply there are several factors that need to be improved. Table 2 shows the outer loading value of all indicator items on each variable has a value greater than 0.7 so that it can be concluded that the indicators used in this study have met the convergent validity.

The square root of AVE for each variable already has a greater value than the value of the Average Variance Extracted variable itself as in Table 3, hence the evaluation of discriminant validity has been fulfilled.

Table 4 shows that the composite reliability and Cronbach Alpha of each variable already has a value greater than 0.7. Thus research model compiled by the researcher has met the construct reliability.

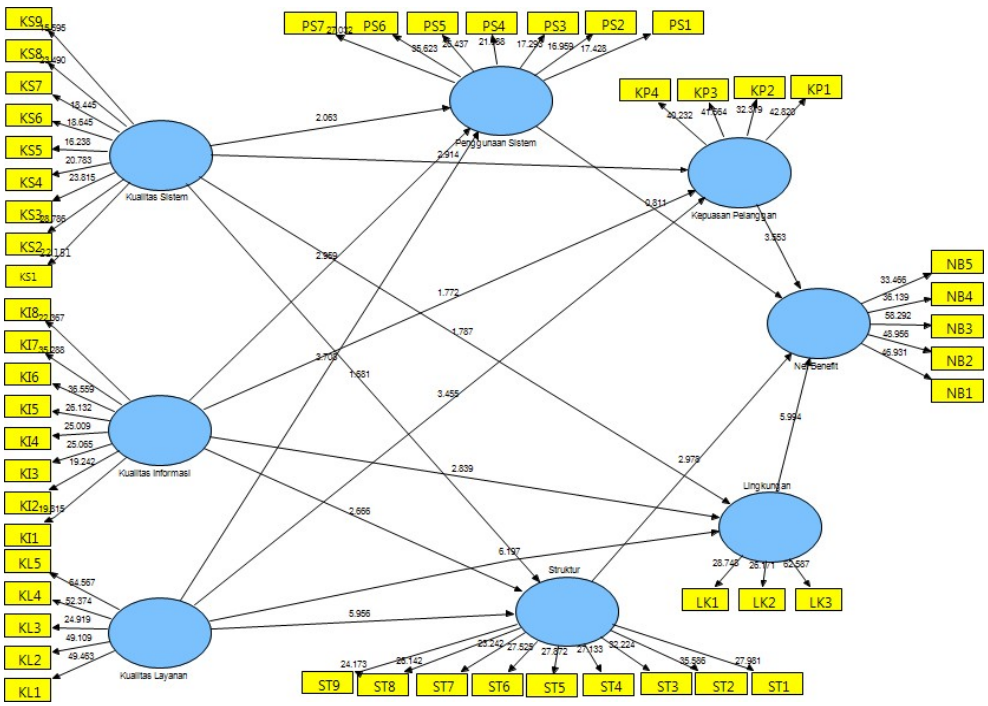

Figure 2. Bootstrapping Estimation

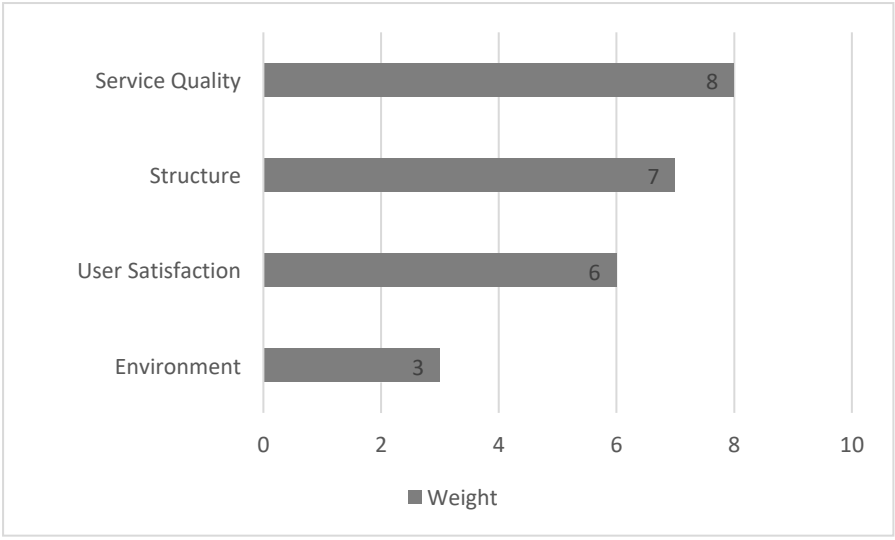

Figure 3. Priority Solution Variables by Using Borda Count Method (BCM)

Then, testing of the inner model will be explained by using R-Square and Bootstrapping. The result of R-Square values are as follows.

R-Square values of each latent variable are greater than 0.1 or 10% (see Table 5). The latent variables of System Use and User Satisfaction indicate weak model values. While the latent variables of Structure, Environment, and Net Benefit (NB) indicate moderate or moderate model values. Thus, all latent variables can be said to be adequate or good. Rank of the most decisive factors in the application of System Quality, Information Quality, and Service Quality of the HRIS PJB at PT Pembangkitan Jawa Bali is the Environment (EV), Structure (ST), System Usage (SU), and User Satisfaction (US).

Hypothesis testing is done by looking at the effect coefficient value and the T-Value value generated in the inner PLS model. The significance level used in hypothesis testing was 95% ($\alpha = 0.05$). The t-table value with a significance level of 95% is 1.96. The research hypothesis will be accepted if the T-Statistic > 1.96 and P-Value <0.05. Testing the research hypothesis is based on the results of the bootstrap estimation in Figure 2. From Table 6, we can find out the hypothesis rejected or accepted by looking at the value of T-statistic and p-value.

Hypothesis Testing (Bootstrapping) resulted in only four of the sixteen hypotheses rejected, which are H3 (System Quality and Structure), H4 (System Quality and Environment), H6 (Information Quality and User Satisfaction), and H13 (System Usage and Net Benefit). Based on the hypothesis test (bootstrapping), it is r that the factors that influence the use of HRIS application in PT PJB from the most influential to the least influential, are Service Quality (SL) > Environment (EV) > User Satisfaction (US) > Structure (ST) > Information Quality (IQ) > System Quality

Table 6.
Hypothesis Test

	Hypothesis	Original Sample	T Stat	p -Values
H1	System Quality → System Usage	0,170	2,063	0,040
H2	System Quality → User Satisfaction	0,271	2,914	0,004
H3	System Quality → Structure	0,132	1,681	0,094
H4	System Quality → Environment	0,129	1,787	0,075
H5	Information Quality → System Usage	0,247	2,959	0,003
H6	Information Quality → User Satisfaction	0,139	1,772	0,077
H7	Information Quality → Structure	0,205	2,666	0,008
H8	Information Quality → Environment	0,183	2,839	0,005
H9	Service Quality → System Usage	0,267	3,708	0,000
H10	Service Quality → User Satisfaction	0,269	3,455	0,000
H11	Service Quality → Structure	0,359	5,956	0,000
H12	Service Quality →à Environment	0,378	6,197	0,000
H13	System Usage → Net Benefit	0,029	0,811	0,418
H14	User Satisfaction → Net Benefit	0,230	3,553	0,000
H15	Structure → Net Benefit	0,198	2,978	0,003
H16	Environment → Net Benefit	0,451	5,994	0,000

Table 7.
Alternative Solutions

No.	Solution Variables	Alternative Solutions
1	Service Quality (SQ)	Development towards user friendly mobile application
2		Add FAQ feature from problems or obstacles that often appear in the application
3		Evaluate and upgrade the system regularly to maintain stable loading of applications
4		The addition of HR service features that are currently still manual or face to face
5		Provides internet access for all features so that they can be opened anytime and anywhere
6	Structure (ST)	Developing integrated HRIS PJB application
7		Update rules on HR Regulations application
8		Giving access of employee's data recap for all HR Admin
9		Use reminder notification in HRIS application to remind employees of the important schedules of PJB HR activities
10		Develop dashboard features of HR for decision making
11	User Satisfaction (US)	Make evaluations and update the needs of users regularly
12		Added data update features and certificate documents of training / certification
13		Utilizing HRIS application as a feedback media evaluation periodically
14		Socializing the use of HRIS application to the admin (HR Admin) and users (all employees) periodically
15		Update user manual of HRIS application regularly
16	Environment (EV)	Digital mindset socialization for all employees to increase the effectiveness of the company's business processes
17		Hold regular meetings with related divisions who have responsible for the evaluation and development of the HRIS application
18		Rearrange the completeness and updating of employee dossier files
19		Utilizing the PMAN application for career information or job posting at the company

(SQ) > System Use (SU). So that the four most influential variables then tested using the Borda Count Method (BCM) to determine priority solution variables that need to be improved to strengthen the benefits received by users [12].

Solution variable is constructed by distributing questionnaires involving seven respondents directly responsible for HRIS application. The selection of respondent considers role map of the process owner of HRIS Application, which are 4 experts in subdivision of Human Capital Information System. Based on questionnaire result, a calculation is constructed ranking solution variable by using ranking weight. Borda Count Method shows that service quality variable gets the highest score. Therefore, the priority focus of the solution to the improve and develop HRIS application is on service quality, structure, user satisfaction, and the environment (see Figure 3). Alternative solutions of this study then constructed in Table 7 to get successfull of net benefit by considering the suggestions of questionnaire recap.

IV. CONCLUSION

A. Based on the results of statistical data analysis and discussion regarding the evaluation of the application of HRIS at PT Pembangkitan Jawa Bali, the following conclusions can be drawn:
B. Success of PJB HRIS application is influenced by system quality factors, information quality, service quality, usage system, system satisfaction, environment and the role of organizational structure.
C. System quality affects the system usage and user satisfaction. This means getting higher the system quality on HRIS PJB, then also increasingly the system usage and user satisfaction against HRIS PJB. Conversely, the system quality has no influence on structure organization and environment.
D. Quality information has an influence on system usage, organizational structure, and environment. Conversely, the quality information has no influence on user satisfaction.

E. Quality service affects system usage, user satisfaction, organizational structure, and environment. This means the higher quality service at HRIS PJB, also increases the system usage, user satisfaction, organizational structure, and environment of HRIS PJB.
F. System usage has no effect on the netbenefit. This means the system usage does not have influence on net benefit.
G. User satisfaction, organizational structure, and environment affect the net benefit. This means they will increase net benefit obtained from HRIS PJB apllication.
H. From the average respondent's survey, overall data shows that many respondents gave four (4) assessments, which means System Quality, Information Quality, and Service Quality of HRIS application as a whole is Good. Even if examined and calculated more deeply there are several factors that need to be improved. Based on the results of the PLS analysis, four variables were found to have a strong enough influence on the success of the HRIS application application of PT Pembangkitan Jawa Bali, which are Service Quality, Environment, User Satisfaction, and Structure. Furthermore, the determination of solution variables performed using the Bourda Count Method (BCM) results in the priority of the solution variables for the improvement and development of PT PJB HRIS applications starting from service quality, structure, user satisfaction, to the environment. At the end alternative solutiona are made from the user's suggestion on the questionnaire that has been prioritized according to the priority results of the solution variable.

From the results of evaluations carried out on the PMAN application, several alternative solutions were developed for future development with a focus on the first priority, which is service quality variables. In addition, further evaluation can also be tested using the same method for other HRIS PJB applications. From the suggestions and priorities for alternative solutions recommended above, PT Pembangkitan Jawa Bali is expected to implement these recommendations in stages for future improvement. Furthermore, periodic evaluations are carried out to measure the extent to which the advice can provide improvements to the use of HRIS application, so it can increase the benefits of the Human Resource Information System (HRIS) at PT Pembangkitan Jawa Bali. For the next study, an evaluation of the information system design process can be carried out in collaboration with the Performance Management and Human Capital Information Systems Division as the busineess owner of HRIS PJB. A framework that can be used to evaluate the system design process is Capability Maturity Model Integration (CMMI) for Development. It is used to harmonize the evaluation process that is useful in making a better development strategy for HRIS PJB in the future.

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