

Enterprise Resource Planning Implementation: User Satisfaction on Service Information System Quality

I Made Yukodharma Putra¹⁾; Dewi Nusraningrum^{2*)}

¹⁾ yukodharma@gmail.com, Universitas Mercu Buana, Indonesia

²⁾ dewinusraningrum@mercubuana.ac.id, Universitas Mercu Buana, Indonesia

*) Corresponding Author

ABSTRACT

Objectives: This study was conducted to analyze the success of ERP implementation and user satisfaction after using the ERP system at flexible packaging manufacturing companies.

Methodology: This study uses a quantitative method with causal analysis using tools from Smart PLS. The population of this study are ERP system users with a sample of 300 respondents using a random sampling technique. The population of this study includes all employees of flexible packaging manufacturing companies. The respondents in this study are employees who use ERP systems.

Finding: The results found that the greater the quality of the system provided, the better will the user satisfaction. Increased user satisfaction can be achieved by producing good quality information, and good service quality of a system will also increase user satisfaction. Satisfied users will increase the benefits received by the company in its business processes.

Conclusion: Greater benefits can be received by improving information quality, service quality, and system quality, and. User satisfaction can be used as a mediation of information quality, service quality, and system quality towards the successful implementation of ERP.

Keywords: ERP-implementation; information-quality; system-quality; service-quality; user-satisfaction.

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INTRODUCTION

The growth of the business world and the complexity of the business area pose challenges for the industry to improve its business processes (Nusraningrum, Pangestu, et al., 2021), especially the food and beverage industry which affects the supply chain from raw materials to finished products. According to data compiled from websites, the investment value of the food and beverage industry in the first quarter of 2022 reached Rp 19.17 trillion (Anonim, 2017). This will have a positive impact on the food and beverage industry. The packaging industry is one part of the supply chain for the food and beverage industry. The increase in the investment value of the food and beverage industry, in turn, will make packaging companies continue to innovate their business processes so that they are able to stay ahead in their sector.

ERP implementation is one example of solving problems using the Industrial Technology 4.0 approach, and one of the potential benefits for organizations implementing Industry 4.0 (Nusraningrum, Mulia, et al., 2021). Efficient means organizations which can make “real-time” decisions faster and still maintain high quality in their products or services (Roosmariharso et al., 2021). Based on this opinion, it is hoped that the implementation of ERP will increase the efficiency of achieving targets for the company.

A successful ERP can provide long-term benefits for companies such as lower operating costs, speeding up the production process, and improving customer service, and become one of the solutions to solve internal problems in the company (Alhazami, 2021; Gumanti & Utami, 2019). An ERP system is an industrial software system package that enables industries to manage resources (materials, human resources, finance, etc.) by providing integrated solutions for operational data processing or information technology management efficiently and effectively (Nusraningrum et al., 2020). The main requirement of an ERP system is the integration of good system quality, reliable information quality, and good service quality (Syahdindo et al., 2019).

In addition, user involvement in the ERP system is inseparable. This is because the system will be run by its users in the company. Therefore, user satisfaction is something that cannot be missed. User satisfaction was found to be related to user experience and user expectations (Emilda & Nusraningrum, 2020). So, user satisfaction will increase user interest to continue using the system (Hermawan, 2019).

Implementation of an ERP system that involves several related departments is not easy. According to (Agustina, 2018), the more departments that have a relationship with one another will lead to the ineffectiveness of an information system. Furthermore, according to (Agustina, 2018), an effective system will make users satisfied and improve their performance. Therefore, the satisfaction of the ERP system users in the company needs to be evaluated.

Based on this, this study was conducted to evaluate the implementation of ERP systems in companies using the DeLone & McLean method (DeLone & McLean, 2016). The DeLone & McLean method is used to measure information quality, service quality, system quality, and their impact on user satisfaction. In addition, the purpose of this study is to analyze the impact of system user satisfaction on the successful implementation of an ERP system that benefits the organization. This study is expected to provide suggestions to companies to improve system user satisfaction so that they can contribute to them.

LITERATURE REVIEW

System Quality

System quality is related to meeting the needs of system users so that it can be used to process data into useful information (Nusraningrum et al., 2020; Tulodo & Solichin, 2019). System quality has characteristics such as device availability, device reliability, ease of use, and response time to determine the quality of an information system (Pawirosumarto, 2016). The quality of the system directly impacts the relationship between the information system and the user. Therefore, satisfied system users come from good system quality (Dreheeb et al., 2016; Nuryanti et al., 2021; Widiastuti et al., 2019).

Information Quality

Good quality information will result in the right decisions from users (Nuryanti et al., 2021; Widiastuti et al., 2019). The results of a good information system generally consist of the level of accuracy, timeliness, relevance, informativeness, and completeness of the information provided (Anjarwati & Apollo, 2018; Nusraningrum et al., 2020; Widiastuti et al., 2019). Users who are facilitated by the existence of good information are inherently satisfied (Putra et al., 2020).

Service Quality

Service quality is a must in order to survive and retain trust (Hidayatullah et al., 2020). This trust is the decision of the user to determine whether the service has met his expectations (Irfan et al., 2019). Based on this, good service quality will increase the satisfaction of information system users (Pawirosumarto, 2016; Rohani & Hati, 2018; Siti, 2017).

User Satisfaction

User satisfaction is the user's level of perception as a result of comparing user expectations with the actual results achieved by users of the product (Kotler & Keller, 2016). Satisfaction will arise because user demands can be met by service providers (Devi & Untoro, 2019). End-user satisfaction with an information system can be used as a measurement of the success of implementing a system (Machmud, 2018). Measuring the success of a system within the organization is a very important thing for the organization to know the actual conditions of the application of the system (Sari, 2019).

ERP Implementation Success

A successful ERP project will provide long-term benefits to the company (Gumanti & Utami, 2019). The success of the ERP system is dependent on how the ERP meets the needs that exist within the company and whether the system is able to solve problems and become the solution for the business (Alhazami, 2021). The success in question is the amount of satisfied users, with greater benefits obtained by users from the system (Chaveesuk & Hongsuwan, 2017).

The previous study and literature review becomes a basis to develop this framework below:

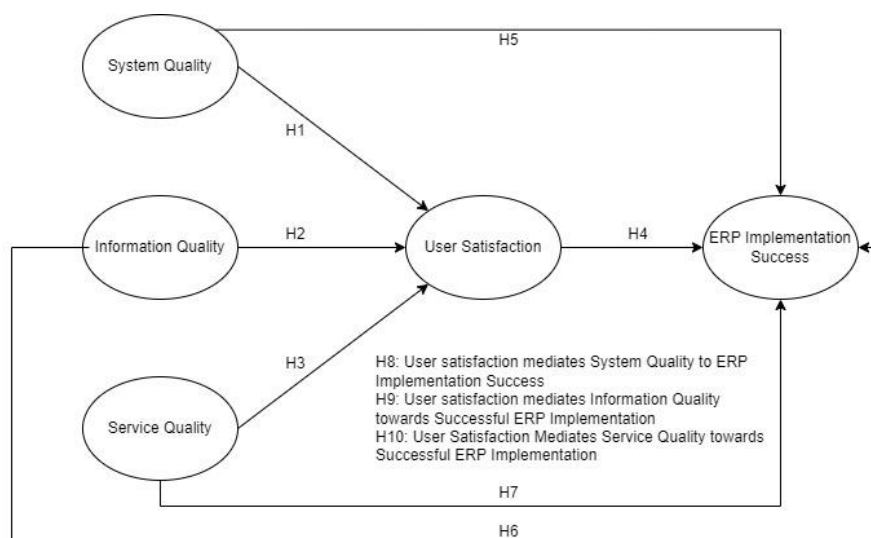


Figure 1. Research Framework

Therefore, several hypotheses can be formulated as follows:

- H1: There is a positive influence in system quality towards user satisfaction
- H2: There is a positive influence in information quality towards user satisfaction
- H3: There is a positive influence in service quality towards user satisfaction
- H4: There is a positive influence in user satisfaction towards ERP implementation success
- H5: There is a direct impact in system quality towards ERP implementation success
- H6: There is a direct impact in information quality towards ERP implementation success
- H7: There is a direct impact in service quality towards ERP implementation success
- H8: User satisfaction can mediate system quality and ERP implementation success
- H9: User satisfaction can mediate information quality and ERP implementation success
- H10: User satisfaction can mediate service quality and ERP implementation success

METHOD

This research was conducted using a quantitative method. The data collection for this survey is collected through Google Forms. Each question on the questionnaire received a Likert scale (range 1-5). The population in this survey is PT XYZ ERP system users which total a of 2000 employees with a total sample of 300 respondents. Data was analyzed using the Smart PLS programs.

RESULTS AND DISCUSSION

Results

Table 1. Characteristic Respondent

		Frequency	Percentage
Gender	Male	282	94.00%
	Female	18	6.00%
Qualification	Senior High School	265	88.33%

Position	Diploma III	20	6.67%
	Bachelor	14	4.67%
	Magister	1	0.33%
	Staff	280	93.33%
	Managerial Staff	2	0.67%
	Section Chief	14	4.67%
	Department Manager	4	1.33%
Years of Service	< 5 years	8	2.67%
	5 - 10 years	5	1.67%
	10 - 20 years	162	54.00%
	> 20 years	125	41.67%

Based on the observations made, it was found that the characteristics of the respondents are as in table 1. This study was dominated by males (94%) who had a long working period of more than 10 years (54%). Then the last education of the respondents is dominated by high school graduates who have positions as staff in the company.

Table 2. Result Validating Indicators Using Smart PLS

Variable	Indicators	Outers Model				Inner Model
		Outers Loading	AVE	Cronbach's Alpha	Composite Reliability	R-Square
Information Quality	KI1	.99	.979	.996	.997	
	KI2	.994				
	KI3	.994				
	KI4	.988				
	KI5	.99				
	KI6	.989				
	KI7	.982				
ERP Implementation Success	KIE2	.957	.888	.968	.975	.883
	KIE3	.927				
	KIE4	.905				
	KIE5	.963				
	KIE6	.96				
Service Quality	KL1	.888	.791	.736	.883	
	KL2	.89				
User Satisfaction	KP1	.946	.885	.87	.939	.753
	KP2	.936				
System Quality	KS3	.832	.716	.869	.91	
	KS7	.861				
	KS8	.862				
	KS1	.828				

Table 2 shows that the outer loading value calculated using Smart PLS is between 0.828 – 0.99. A valid indicator is if it has a value above 0.50 (Palupi, 2021). The resulting AVE score for each variable is between 0.716 – 0.979. Table 3 shows that the score from the cross-loading has fulfilled that there is no score greater than the indicator with the variable itself. The Cronbach

Alpha score obtained is between 0.736 – 0.996 and the Composite Reliability score is between 0.883 – 0.997. These results have met the standard value set according to (Ghozali, 2016). In addition, based on the obtained R-square value, ERP implementation success can be explained with 88.3% within the scope of this study and the remaining 11.7% is outside of this study. Then, user satisfaction can be explained with 75.3% within the scope of this study and the remaining 24.7% outside of this study.

Table 3. Cross Loading Result

	ERP implementation success	Information quality	Service quality	System quality	User satisfaction
KI1	.693	.99	.537	.578	.708
KI2	.715	.994	.547	.604	.731
KI3	.705	.994	.538	.591	.721
KI4	.694	.988	.528	.588	.712
KI5	.718	.99	.542	.592	.739
KI6	.709	.989	.542	.588	.722
KI7	.713	.982	.541	.584	.732
KIE2	.957	.658	.659	.828	.867
KIE3	.927	.663	.665	.688	.88
KIE4	.905	.721	.672	.752	.867
KIE5	.963	.639	.672	.773	.84
KIE6	.96	.684	.723	.788	.901
KL1	.643	.488	.888	.612	.62
KL2	.638	.482	.89	.535	.636
KP1	.931	.662	.657	.775	.946
KP2	.805	.716	.674	.689	.936
KS3	.577	.455	.496	.832	.533
KS7	.648	.415	.531	.861	.57
KS8	.748	.559	.531	.862	.778
KS1	.745	.558	.612	.828	.708

Table 4. Hypothesis test result

Direct Effect	Original Sample (O)	T Statistics	P Values	Note
Information quality -> ERP implementation success	0.065	2.085	0.037	Sig.
Information quality -> User satisfaction	0.35	9.967	0.000	Sig.
Service quality -> ERP implementation success	0.09	2.534	0.011	Sig.
Service quality -> User satisfaction	0.252	7.011	0.000	Sig.
System quality -> ERP implementation success	0.209	3.146	0.002	Sig.
System quality -> User satisfaction	0.409	10.619	0.000	Sig.
User satisfaction -> ERP implementation success	0.651	9.543	0.000	Sig.

Information quality has a positive influence on ERP implementation success. This can be seen in the original sample score of 0.065, while for t-stat it is 2.085 using a significance of more than t-table 1.96 and p-value 0.037. The result is that the 6th hypothesis (H6) is accepted.

Information quality has a positive reaction to user satisfaction. It can be seen in the original sample score of 0.35. In addition, information quality has a significant reaction on user satisfaction, this can be seen from the t-stat score of 9.967 and with a significance of more than t-table 1.96 and a p-value of 0.000. So, the 2nd hypothesis (H2) is accepted.

Furthermore, service quality has a positive reaction toward ERP implementation success according to the original sample score of 0.09. The reaction of Service Quality on ERP implementation success is significant, it can be seen from the resulting t-stat value of 2.534 more than 1.96, and p-value of 0.011. So, the 7th hypothesis (H7) is acceptable.

Service quality has a positive reaction to user satisfaction. This is obtained based on the original sample score of 0.252. Service quality has a significant reaction to user satisfaction. This is obtained from the t-stat score of 7.011 more than 1.96 and a p-value of 0.000 thus stating that the 3rd hypothesis (H3) is acceptable.

System quality has a positive reaction toward ERP implementation success. These results were obtained based on the original sample score of 0.209. The reaction of system quality towards ERP implementation success is significantly based on the results of the t-stat score of 3.146 more than 1.96 and p-value of 0.002 less than 0.05. These results state that the 5th hypothesis (H5) is acceptable.

System quality has a positive reaction to user satisfaction. These results were obtained based on the score of the original sample of 0.409. The reaction given by system quality towards user satisfaction is significantly based on the results of the t-stat score of 10.619 more than 1.96 and p-values of 0.000 less than 0.05. These results state that the 1st hypothesis (H1) is acceptable.

User satisfaction has a positive reaction toward ERP implementation success. These results were obtained based on the score of the original sample of 0.651. The reaction of user satisfaction toward ERP implementation success is significant. These results were obtained based on the t-stat score of 9.543 more than 1.96 and p-values of 0.000 less than 0.05. These results state that the 4th hypothesis (H4) is acceptable.

Table 5. Indirect effect result

Indirect Effect	Original			Note
	Sample (O)	T Statistics	P Values	
Information quality -> User satisfaction -> ERP implementation success	.228	7.262	.0000	Pos & Sig.
Service quality -> User satisfaction -> ERP implementation success	.164	5.669	.0000	Pos & Sig.
System quality -> User satisfaction -> ERP implementation success	.266	6.441	.0000	Pos & Sig.

The indirect effect of the “System quality” variable on “ERP implementation success” through “User satisfaction” is influential and significant where the value of t-stat is 6.441 more than 1.96 and the resulting p-value is 0.000 less than 0.05. Therefore, the 8th hypothesis (H8) can be accepted.

The indirect effect of the "Information quality" variable on "ERP implementation success" is influential and significant where the resulting t-stat value is equal to 7.262 more than 1.96 and the p-value of 0.000 less than 0.05. Therefore, the 9th hypothesis (H9) can be accepted.

The indirect effect of the "Service quality" variable on "ERP implementation success" is influential and significant where the t-stat value is 5.669 more than 1.96 and the p-value of 0.000 less than 0.05. Therefore, the 10th hypothesis (H10) can be accepted.

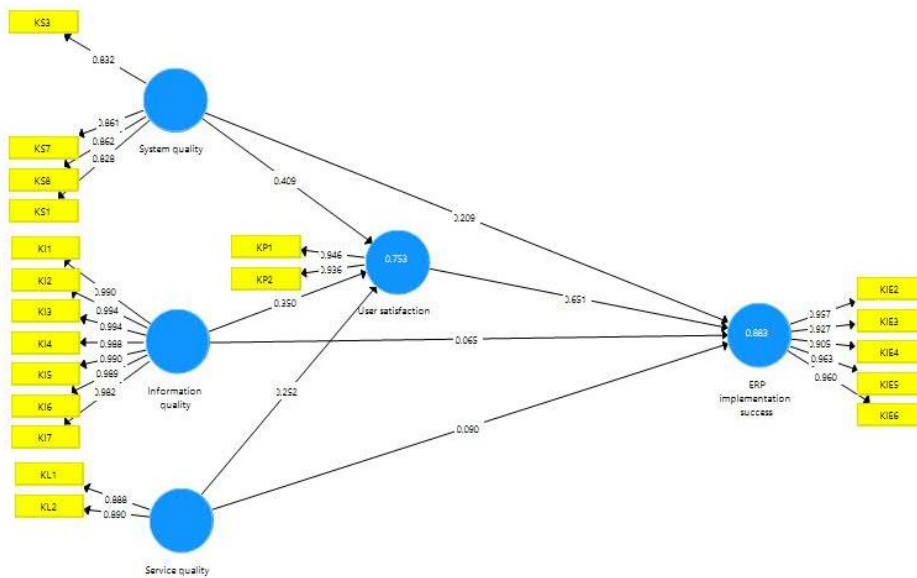


Figure 1. Final Result Smart PLS

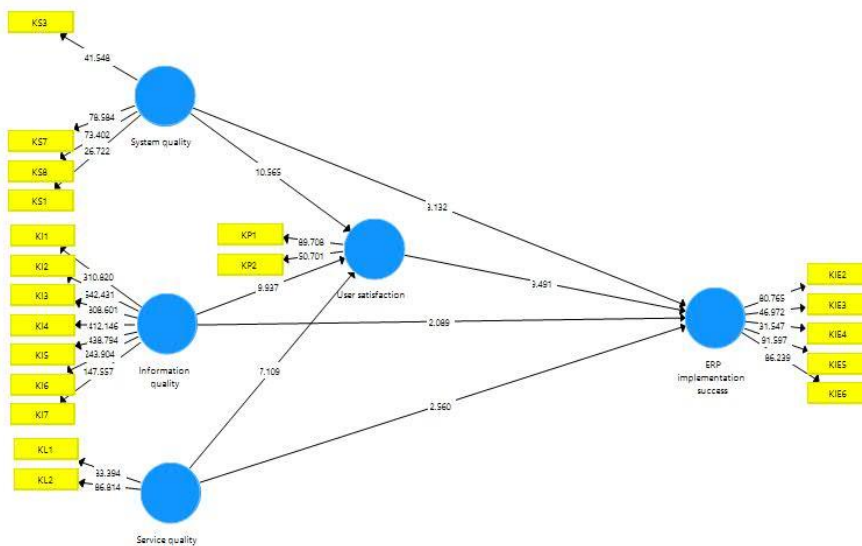


Figure 2. Result Bootstrapping Test Smart PLS

Discussion

System quality has a positive impact on user satisfaction. This result is in line with previous research by (Antong & Usman, 2017; Irawan & Syah, 2017; Sinaga, 2019; Suhendro, 2017). The good quality of the system used by the user equals to the user using the system more often,

and ultimately satisfies the user with the system (Nusraningrum et al., 2020; Putra et al., 2020). The better the quality of a particular system, the happier users are with that system (Nusraningrum, Pangestu, et al., 2021). In addition, a system that is easy to understand by users has a good impact on the company (Imaroh & Soleh, 2020).

Information quality has a positive reaction to user satisfaction. These results are in line with the findings (Antong & Usman, 2017; Irawan & Syah, 2017; Sinaga, 2019; Suhendro, 2017). Based on the discussion above, it is determined that the quality of information is the output of the system. The results of a good system generally have characteristics such as being relevant, timely, accurate, complete, and concise (Putra et al., 2020). The results of this study found that the quality of information produced by the ERP system provides a good output and allows system users to make decisions from the results of the information. Therefore, the quality of information generated by a company's ERP system can affect its users (Nusraningrum et al., 2020).

Service quality has a positive reaction to user satisfaction. This result is in accordance with the findings (Hidayat & Akhmad, 2017; Irawan & Syah, 2017; Rohani & Hati, 2018; Suhendro, 2017). Service quality is the expectation of system users for the services provided by the information system. According to (Hidayatullah et al., 2020), high-quality system services are needed to gain the trust of system users. So, this study reveals that the service quality of the ERP system implemented in the company can meet the expectations of system users.

User satisfaction has a positive reaction to the success of ERP implementation. These results are consistent with the surveys conducted (Chaveesuk & Hongsuwan, 2017; Hamid & Ikbal, 2017; Sarkoro & Dewanta, 2018; Wirawan & Napitupulu, 2018; Yassien et al., 2017). According to (Chaveesuk & Hongsuwan, 2017), "successful ERP implementation" is an advantage for ERP system users. Based on these results, according to (Yassien et al., 2017), one of the factors that determine the successful implementation of information systems is the impact on the individual and the impact on the organization. This explains that the benefits of implementing an ERP system affect system users. Therefore, the ERP system implemented at a company will affect individual system users. This is in accordance with the results of this study that "user satisfaction" has a positive and significant effect on "ERP implementation success". In addition, respondents who answered the given questionnaire indicated that the average system user (4.4015) agreed or was satisfied with the ERP system implemented. The more satisfied the users are, the more likely it is for employees to innovate so that they can have a good impact on the company (Yasa et al., 2021).

The direct effect of System quality on ERP implementation success is positive. These results are in accordance with research conducted by (Hamid & Ikbal, 2017; Hardianti et al., 2021; Hibatullah, 2019; Iskandar & Amriani, 2021; Mahmoodi et al., 2017). Therefore, the better the "System quality" of a system, the greater the "ERP implementation success" is obtained by the users. System quality is related to the hardware and software of a system (Pawirosumarto, 2016). Good software will make the user's work more efficient (Hardianti et al., 2021; Hibatullah, 2019). Therefore, a good system quality will provide great benefits to the organization.

Information quality has a positive influence on ERP implementation success. These results are in line with research from (Hamid & Ikbal, 2017; Hardianti et al., 2021; Hibatullah, 2019; Iskandar & Amriani, 2021; Martins et al., 2019; Wulandari et al., 2021) which state that the better the result outputs of the information system, the greater the benefits received by system

users. Information quality is related to the results provided to system users. These results can be used as the basis for making decisions in organizations (Nuryanti et al., 2021; Widiastuti et al., 2019). Therefore, the results of a good information system will provide benefits to the organization and customers (Nurjannah et al., 2022).

Service quality has a positive influence on ERP implementation success. These results are in accordance with research from (Hamid & Ikbal, 2017; Hardianti et al., 2021; Hibatullah, 2019; Iskandar & Amriani, 2021; Martins et al., 2019; Wulandari et al., 2021) which states that the better the service quality provided, the better the benefits received by system users. Service quality is related to the service procedures of an information system. A good procedure will give a good picture of the company to run its business processes (Emilda & Nusraningrum, 2020; Martins et al., 2019; Wulandari et al., 2021). Therefore, good service quality will provide great benefits to the organization.

User satisfaction can mediate System quality and ERP implementation success. These results are in line with research from (Hamid & Ikbal, 2017; Iskandar & Amriani, 2021; Pertiwi et al., 2020; Sappri & Baharudin, 2016; Serumaga-zake, 2017) which states that user satisfaction can mediate system quality and ERP implementation success. A good system quality will provide benefits to organizations that use the system (Hamid & Ikbal, 2017; Hardianti et al., 2021; Hibatullah, 2019; Iskandar & Amriani, 2021; Mahmoodi et al., 2017; Nusraningrum et al., 2020). The system used will involve users in the process. Therefore, users who are satisfied with the quality of a good system will provide benefits to the organization.

User satisfaction can mediate Information quality and ERP implementation success. These results are in line with research from (Hamid & Ikbal, 2017; Iskandar & Amriani, 2021; Pertiwi et al., 2020; Sappri & Baharudin, 2016; Serumaga-zake, 2017) which states that user satisfaction can mediate information quality and ERP implementation success. Information quality is the result of data processing obtained from the system. The results obtained from the information system will provide convenience to users in making decisions (Nuryanti et al., 2021; Nusraningrum et al., 2020; Widiastuti et al., 2019). The correct decisions of system users can provide great benefits to the organization (Pertiwi et al., 2020; Sappri & Baharudin, 2016; Serumaga-zake, 2017). Therefore, users will be more satisfied with the results of a system that can provide consideration in decision-making and can provide great benefits to the company.

User satisfaction can mediate Service quality and ERP implementation success. This research is appropriate with research from (Hardianti et al., 2021; Iskandar & Amriani, 2021; Panjaitan et al., 2019; Sarkoro & Dewanta, 2018; Yatin et al., 2017) which states that user satisfaction can mediate service quality and ERP implementation success. Service quality is a service provided to users. Good service quality will produce satisfied users so that the benefits obtained are greater (Panjaitan et al., 2019; Sarkoro & Dewanta, 2018; Yatin et al., 2017).

CONCLUSION

Information quality, service quality, and system quality have a positive reaction toward user satisfaction. It means, the better the quality of information, system, and service from an information system, the higher the satisfaction of its users. In addition, more satisfied users will provide benefits to companies that implement the system. More satisfied users will influence the success of the application of the information system. Companies that implement ERP systems can improve the quality of their systems by scheduling periodic repairs to their

hardware and software. In addition, increasing user satisfaction can be done by translating the language on the system into a language that users can understand. A guide on how to handle when problems occur can be used as assistance to users. Thus, users can find out solutions to problems encountered.

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