

# A Holistic Approach to Net Benefit Through User Satisfaction: The Interplay of Quality System, Quality Information and Service Quality

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**Abstract**— This study aims to present empirical data that shows how user satisfaction plays a role as a mediator in the relationship between system quality, information quality, and service quality to the net benefit of the academic information system (SIKAD) of the Merdeka University of Malang. This type of research is in the form of explanatory research with the population of Master of Management students at the Merdeka University of Malang, Indonesia. The research sample totaled 87 which was taken through the simple random sampling method. The primary data from the questionnaire results given to the respondents directly is the data used. Data analysis in the form of path analysis, results shows that user satisfaction is positively influenced by system quality, information quality, and service quality and that net benefit is positively influenced by these factors. The study's results also show that user satisfaction can act as a mediator between system quality, information quality and service quality in net benefit.

**Keywords**— System Quality, Information Quality, Service Quality, User Satisfaction and Net Benefit.

## I. INTRODUCTION

Today, almost all businesses depend on information technology, where technology is integrated with people and processes, so many advances are happening very quickly (Samukri et al, 2022). Information technology has ushered in several jobs that are technical to shift to electronic-based management which can also be called automation. The development of the current era will allow all to switch to autonomy because it can process technical work quickly, accurately, and easily (Saputra & Ilhami, 2024).

The development of information technology makes people think about how to make the right and fast decisions effectively and efficiently in all activities carried out (Hidayatullah et al, 2020). The application of information technology systems is highly expected to be useful to help activities because information systems supported by information technology can support decision-making and can bring success in the activities carried out, such as in the fields of business, economics, socio-politics, and education (James A. O'Brien & Marakas, 2017). Similarly, Szymkowiak et al (2021) mentioned that information systems increase efficiency and save time, become an important tool for business management, decision-making, competition, and development, and especially stand out in new methods for learning and education.

The use of information and communication technology in educational aspects can improve the quality and efficiency of

education (Abdullajonov, 2023). Information technology in the field of education can not only be used as a means of broadcasting learning programs in one direction or interactively but can also be used in the context of equitable distribution of education and improving the quality of education. Information technology support is very important in the learning and management process in the world of education because it can accelerate and simplify the governance of education services (Subadre, 2023).

Information and communication technology has had an extraordinary influence on aspects of life both professionally and personally which is shown through the increase in various knowledge and flow of information and communication. The continuous development of information and communication technology has posed diverse challenges for individuals. It can also change the work process in organizations, cause a paradigm shift in the education sector, and change student learning methods, in other words, information and communication technology becomes the main driving force behind education reform (Al-Rahmi et al, 2020; Haleem et al, 2022).

The intense use of information technology will have an impact on the perceived benefits that reflect the positive utility perceived by individuals (Wang et al, 2020). The impact of using information systems can be shown through net benefit, which is a balance between positive and negative impacts from system users (Jayanti et al, 2023). Reflecting on the success model of information systems from DeLone and McLean, the net benefit is determined by several factors, including system quality, information quality, service quality, user interest, and user satisfaction (Alfiandika & Utomo, 2022; Mazadu et al, 2022).

The use of information systems has been established as one of the most frequently used dimensions to test the success of information systems (Basyir & Safitri, 2022). As mentioned by Mazadu et al (2022) user satisfaction is used as one of the main variables to measure the success of adopting new systems. User satisfaction is the user's response or behavior when interacting with the system so that the output of the system can be optimized (Sary et al, 2021). Setiawan (2022) empirically tested the DeLone and McLean Model, the results proved that user satisfaction is influenced by the quality of the system, the quality of information generated from the system in question, and the quality of service.

System quality is a regulation in an organization to be regulated, controlled, and evaluated in every operational activity to produce quality products (Sopalatu et al, 2021). The quality of the system will generate query results faster. In addition, the quality of the system will increase the interest of the end user. On the other hand, user-friendly interfaces and modern graphical interfaces increase user satisfaction levels (Shahzad et al, 2021).

Another factor that can have an impact on user satisfaction is the quality of information (Sundjaja & Wangsa, 2023). Information quality is a measurement that focuses on the output produced by the system, as well as the output value for users, measuring information quality can be done in three ways, namely: Information must have a certain accuracy, information must not arrive late and information must have appropriate benefits (Jazil et al, 2022).

Service quality is a service excellence that can only be judged by customers. Delone & McLean (2003) explained that service quality refers to the overall support provided by the service provider, which applies regardless of whether the support is provided by the information systems department or a new organization or outsourced to another service provider (Lau, 2020).

The use of information technology for universities is designed to manage data related to academics by applying computer technology, both hardware and software, or in general can be referred to as academic information systems. Academic information systems (SIKAD) are one of the most widely used information systems by universities. Academic information systems are designed to meet the needs of universities in providing computerized educational services to improve the performance, quality of services, competitiveness, and quality of human resources created (Kartini et al, 2024). This system aims to support the implementation of education and also provides information services to students. Because the needs in the field of education and regulations are increasingly complex, making academic management at a university drains time, energy, and mind (Pusparini & Sani, 2020).

One of the private campuses in Indonesia that uses SIKAD to provide information services in the form of data related to academic needs is the Merdeka University of Malang. The types of services include new student data storage, determination of lecture schedules, creation of teaching schedules, study result cards, and details of tuition fees. SIKAD at Merdeka University Malang was built to provide convenience to lecturers and students in academic administration at the university. This system is very beneficial for the university because all the data is integrated. The data will always be updated and ready to use. This system will also reduce the possibility of data duplication because the database is centralized.

This study aims to provide a better understanding of how system quality, information quality, and service quality are related to user satisfaction with academic information systems at Merdeka University Malang. The results of this research are expected to provide input for universities in improving the quality of their academic information systems and increasing user satisfaction. This research is expected to be empirical

evidence in future research, especially regarding the relationship between system quality, information quality, and service quality on user satisfaction and net benefits in the Academic Information System (SIKAD) of the Merdeka University of Malang.

## II. LITERATURE REVIEW

The net benefit is defined as the effect caused by the use of information systems on individuals, groups, organizations, industries, communities, and others. This includes individual impacts, and benefits from customers and the community as well as organizations (Hidayatullah et al, 2020). The net benefit is the result or usefulness felt by individuals and organizations after implementing an information system (Wagiman et al, 2023). Net benefits are essential for determining the performance of information systems because they represent the balance of the system as a whole. Therefore, it plays the most significant function and is inseparable from the measurement of system and information quality. Indicators to measure net benefit include Speed of accomplishing tasks, Job Performance, and Effectiveness (Azizah et al, 2021; Walean & Supit, 2023)

User satisfaction is operationalized as the perception of information system users regarding satisfaction with the quality of service felt after using the information system (Puspitasari et al, 2020). User satisfaction is considered an important way because it can measure an opinion of the user experience about the system used (Pusparini & Sani, 2020). User satisfaction can be measured using indicators, namely effectiveness, efficiency, and satisfaction (Arijaya et al, 2020; Alamsyah & Parama, 2023)

Information quality refers to the ability of a system to provide accurate, timely, complete, and relevant information for users to reach the right decision. It is an important measurement of the quality of the output produced by information technology (Alzoubi & Snider, 2020; Lutfi et al, 2022). Information quality is the level at which characteristics provide value to the user. The proportion of user fulfillment in the information system can be seen from the quality of information obtained through a system where the fulfillment of user satisfaction with the information system is a technique for users to see the information system in its way, not like the information system technically (Gustyari et al, 2022). Information quality can be measured using indicators such as accuracy, timeliness, and completeness (Wilson et al, 2021).

System quality is a combination of hardware and software in an information system (Sopalatu et al, 2021). Technical system quality is related to issues such as system reliability, availability, ease of use of system features, etc. On the other hand, the quality of the education system revolves around the existence of features such as interactivity and communication components, assessment materials, and diversity of learning styles (Al-Fraihat, 2020). Indicators used to measure system quality include ease of use, response time, and security (Riandi et al, 2021; Lutfi et al, 2022).

Service quality is used to measure the quality of a variety of different management practices and cultures for the benefit of an organization's customers (Naveed et al, 2021). Quality is also defined as the customer's perception of the overall quality or

excellence of a product or service concerning the intended intent. Service quality is measured as the quality of convenient service and the quality of accessible service (Kim et al, 2021). Indicators that can be used to measure service quality are *empathy*, *assurance*, and *responsiveness* (Shiwakoti et al, 2022).

Several previous studies have examined the relationship between the variables of net benefit, user satisfaction, system quality, information quality, and service quality To test the quality of the system on its effect on net benefit, its influence has been proven significantly by Salam & Farooq (2020); Pramadya et al (2023) who stated that there is a significant influence between system quality and net benefit. Research by Bradford et al (2020) and Sudarto & Legowo (2021) proves that information quality has an impact on net benefit. In the research, Satriya et al (2023) stated that service quality has an impact on net benefit. Regarding the influence of user satisfaction on net benefit, Shahzad et al (2021) and Kaniawulan et al (2022) also researched which stated that user satisfaction has an impact on net benefit. In this study, user satisfaction is raised as an intervening variable, where the influence of system quality, information quality, and service quality on user satisfaction was researched by the previous researcher, Pramadya et al (2023) who stated that there was a significant influence on each of these variables on user satisfaction.

Based on the literature review and the results of the latest research that have been explained, the conceptual model and research hypothesis are formulated as follows:

- H1: System Quality has a significant influence on User Satisfaction.
- H2: Information Quality has a significant influence on user satisfaction.
- H3: Service Quality has a significant influence on User Satisfaction.
- H4: System Quality has a significant influence on Net Benefits
- H5: Quality of Information has a significant influence on Net Worth.
- H6: Quality of Service has a significant influence on Net Worth.
- H7: User Satisfaction has a significant influence on Net Benefit.
- H8: System Quality has a significant influence on Net Benefit through User Satisfaction
- H9: Quality of Information has a significant influence on Net Benefits through Satisfaction
- H10: Quality of Service has a significant influence on Net Benefits through User Satisfaction

The conceptual framework of this research can be presented in the following Figure 1.

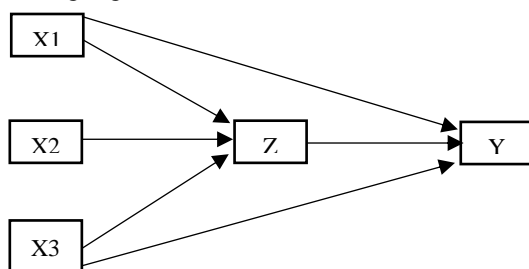


Figure 1. Research concept framework

Note: Y2= Net Benefit; Y1= User Satisfaction; X1= System Quality; X2= Quality of Information; X3: Quality of Service.

### III. RESEARCH METHODS

This study uses a quantitative approach with an explanatory method. The research environment includes management information systems with a focus on studies related to net benefit, user satisfaction, system quality, information quality, and service quality. This research is located at Merdeka University Malang, East Java, Indonesia. The variables studied are classified into three, namely system quality, information quality, and service quality as exogenous variables. The second intervening variable is customer satisfaction and the third endogenous variable is net benefit. The type of research data is quantitative data with the data source used, namely primary data in the form of a questionnaire measured by a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The research population is all Master of Management students of the Merdeka University of Malang Indonesia as many as 305 students. The sample was included in simple random sampling whose number was determined by the Slovin formula obtained a sample size of 87 respondents. Data analysis techniques are in the form of path analysis to test structural equations and test hypotheses.

### IV. RESEARCH RESULTS

The researcher distributed the questionnaire to 87 students of the Master of Management at the Merdeka University of Malang. The respondents' answers were tabulated to then be analyzed for validity, reliability, and descriptive and linear regression tests. The following data describing the characteristics of the respondents in this study consists of gender and semester level, shown in Table 1 below:

TABLE 1 Respondent Profile

Gender	%	Semester Level	%
Male	42	2	20
Female	45	4	24
		6	22
		8	21

The majority of respondents were women, most in the 4th-semester range. The respondent's profile illustrates that the use of the Academic Information System (SIKAD) of the University of Merdeka Malang is dominated by women compared to men and the majority of its users in semester 4.

Data processing analysis uses the SPSS (Statistical Package for Social Science) program. There are 5 research variables, 15 indicators, and 30 instrument items as a whole. The results of the validity and reliability tests of 30 items are proven to be valid, as evidenced by the probability that each instrument does not exceed the error rate of 5%, where the instrument can measure variables. The results of the reliability test of the research instrument show a good level of reliability as evidenced by the Chronbach alpha value exceeding 0.7 (Ghozali, 2019), Presented in the following Table 2:

TABLE 2. Statistical test results of research variables

Research variables	Instruments	Product Moment (r)	Cronbach Alpha	Mean	Total Mean
System Quality	SQ1	0.930	0.930	4,22	4.16
	SQ2	0.907		4,17	
	SQ3	0.844		4,30	
	SQ4	0.866		4,33	
	SQ5	0.897		4,11	
	SQ6	0.907		3,83	
Quality of Information	IQ1	0.870	0.947	4,07	4.06
	IQ2	0.881		4,22	
	IQ3	0.857		4,03	
	IQ4	0.890		3,89	
	IQ5	0.874		4,02	
	IQ6	0.794		4,13	
Quality of Service	QS1	0.906	0.947	4,18	4.03
	QS2	0.853		3,86	
	QS3	0.912		4,09	
	QS4	0.913		3,99	
	QS5	0.871		3,90	
	QS6	0.886		4,14	
User Satisfaction	US1	0.923	0.964	4,15	4.14
	US2	0.929		4,17	
	US3	0.913		4,15	
	US4	0.922		4,23	
	US5	0.935		4,08	
	US6	0.903		4,07	
Net Benefit	NB1	0.935	0.965	4,11	4.14
	NB2	0.917		4,25	
	NB3	0.936		4,18	
	NB4	0.901		4,05	
	NB5	0.936		4,10	
	NB6	0.912		4,16	

CA is Chronbach's Alpha value  
\* is level sig. lowest than 0,05

accessed at any time, has stored data information security features, can provide services without errors. The information quality variable has a total average of 4.06 which illustrates that users agree that the quality of information on the Academic Information System (SIKAD) of the University of Merdeka Malang can provide accurate information, provide reliable information, provide information whenever I need it, provide up-to-date information, provide complete data information, The information presented by SIAKAD is relevant to the needs of students. The service quality variable has a total average of 4.03, this shows that SIAKAD users tend to agree on the quality of service presented at SIAKAD, understand the academic needs of students, respond well to student input, ensure data security, have reliable security, pay special attention to students, and provide fast service. The customer satisfaction variable has a total average of 4.14, this shows that SIAKAD users tend to agree that user satisfaction presented in SIAKAD can provide satisfaction to students with the services provided, provide information on academic assignments effectively, students can be faster in doing tugas from lecturers, simpler to use, students are satisfied with the information provided, Students are satisfied with the features in SIAKAD. Furthermore, the net benefit variable has a total average of 4.14, this shows that SIAKAD users tend to agree that the net benefits presented in SIAKAD can improve student services in completing assignments, make it easier for students to collect assignments, make an important contribution to my performance as a student, be used in decision-making related to learning information, can increase effectiveness in doing assignments, can save time searching for learning information.

The results of the descriptive analysis based on the respondents' responses showed that the System Quality variable had a total average of 4.16 which illustrated that users agreed that the System Quality in the Academic Information System (SIKAD) of the University of Merdeka Malang is easy to understand, easy for users, can be accessed easily, can be

To build a structural equation model, two regressions were performed. The results of the regression model equation are as follows:

First multiple linear regression model:  $Z = 0.283X1 + 0.017X2 + 0.649X3 + e1$

Second double linear regression model:  $Y = 0.160X1 + 0.100X2 + 0.697X3 + 0.942Z + e2$

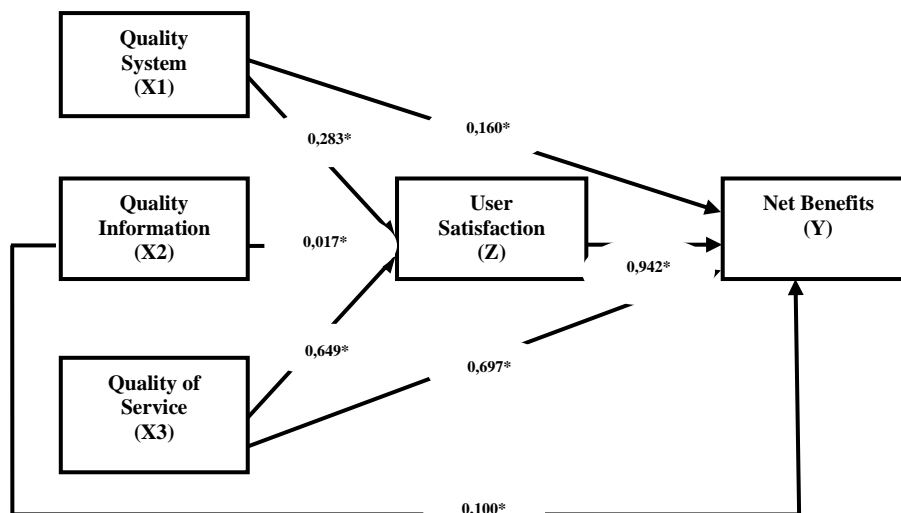


Figure 2. Results of the structural equation model

Note: \* is level sig. lowest than 0,05



TABLE 3. The results of the path analysis evaluation.

Variables			Direct Effect	Indirect Effect	Total effect	Result
Independent	Mediation	Dependent				
SQ	US	-	0.283*	-		H1 is accepted
IQ	US	-	0.017*			H2 is accepted
QS	US	-	0.649*			H3 is accepted
SQ	-	NB	0.160*			H4 is accepted
IQ	-	NB	0.100*			H5 is accepted
QS	-	NB	0.697*			H6 is accepted
US	-	NB	0.942*			H7 is accepted
SQ	US	NB		0.283 x 0.942 = 0.267	0.160 + 0.267 = 0.427	H8 is accepted
IQ	US	NB		0.017 x 0.942 = 0.016	0.100 + 0.016 = 0.116	H9 is accepted
QS	US	NB		0.649 x 0.942 = 0.611	0.649 + 0.611 = 1.308	H10 is accepted

\* is level sig. lowest than 0,05

Figure 2 and Table 3 explain that System Quality (SQ) has a significant influence on User Satisfaction (US) and ultimately has a direct effect on Net Benefit (NB), the indirect influence is 0.267. Information Quality (IQ) has a significant influence on User Satisfaction (US) and ultimately has a direct effect on Net Benefit (NB), the indirect effect is 0.016. Furthermore, Service Quality (QS) has a significant influence on User Satisfaction (US) and ultimately has a direct effect on Net Benefit (NB), the indirect influence is 0.611. The comparison of indirect influence of 0.611 is higher than 0.267 and 0.016 which means that service quality (SQ) has a stronger influence on User Satisfaction (US) which ultimately has an impact on Net Benefit (NB).

V. DISCUSSION

System quality has a significant effect on user satisfaction, empirically proven. The improvement of the quality of the system in the academic information system (SIKAD) of the Merdeka University of Malang will also increase user satisfaction. The quality of the academic information system (SIKAD) of the University of Merdeka Malang is how much information system technology is available that can be easily used, the speed of access, and the existence of security guarantees in meeting the needs and desires of users. In other words, if users trust SIKAD and run without problems, it can be concluded that user satisfaction will be higher. The greater the degree of user satisfaction with the information system, the better the performance. The quality of a reliable information system reflects the ability of an information system that can produce accurate information and meet user expectations (Layongan et al, 2022).

The quality of information indicates the quality of the products produced by the information system. The better the quality of the information will affect the decisions made by users. Information quality is used to measure information produced from an information system with quality that can provide value to users of a certain system with information characteristics that are to user needs (Nitami et al, 2021). Information Quality is an inherent characteristic of the Information itself. This shows that if the user of the information system feels that using the information is complete, then it does not require much effort to use it. Information quality refers to the quality of the output of an information system that can be measured in terms of accuracy, timeliness, and completeness of information.

According to (DeLone & McLean, 2003) the quality of service has become more important than other implementations because the users of the system are now more users rather than employees or internal users of the organization. Service quality is a must that companies must do to be able to survive and continue to gain the trust of users, service quality means the quality of support that system users receive from the organization. Good Service Quality will increase the use of the system.

System quality includes accuracy in presenting information systems used in decision-making. Research results in Salam & Farooq (2020) and Pramadya et al. (2023) stated that System quality positively influences net benefits. Good system quality indicators, such as ease of use, access speed, and system security, will provide an easy system for decision-making.

In the metrics of effective information quality, which encompass accuracy, timeliness, and completeness of information. The results of research conducted by Bradford et al (2020) and Sudarto & Legowo (2021) prove that information quality affects net benefits, frequently used information systems, in general, it can increase the knowledge obtained by users. Delone & McLean stated that the intensity of information system development can affect individual impacts (DeLone & McLean, 2003).

The service quality indicators include empathy, guarantee, and grasp in presenting information for decision-making. His research (by Pattipeilohy et al., 2021) said that net benefits are influenced by Service Quality. The quality of service focuses on users' needs and desires. A system that looks easy to understand and can be accessed using various devices makes it easier for users to access the system. Speed, accuracy, and service can affect the user's decision to continue using the information system.

Research conducted by Shahzad et al (2021) and Kaniawulan et al (2022) stated that user satisfaction greatly affects net benefits. User Satisfaction Indicators include information satisfaction, and system satisfaction, where the more satisfied the system user is, the more the Net Benefits will also increase. SIKAD users who are satisfied with the service and feel the ease of accessing the system until the desired goals are achieved will support the smooth performance of their academic performance both personally and the smooth academic activities of the university.

A quality system can represent the meaning so that users can easily understand the information. If the user feels satisfied, it

can be predicted that the degree of satisfaction of the user will increase, which will also have an impact on increasing the Net Benefit. This shows that the quality of information can increase net benefits if it is supported by users who feel satisfied with the information conveyed by users. The information available in an up-to-date, complete, and accurate manner that can be relied on is a commitment from government agencies to provide satisfaction to users.

To create business value for organizations through Information Systems, it must ensure that the Information Systems are efficient through system attributes such as reliability, complete information, speed of access, efficiency, and ease of use. As well as software that must be efficient and have qualified system features to give the company a competitive advantage. Previous research (Pertiwi et al, 2020; Mayseptyana et al, 2024) stated that Information Quality affects Net Benefits through User Satisfaction. Satisfaction is a factor that can strengthen the success of the use of SIAKAD. The quality of information has an indirect effect on net benefit through the mediation of user satisfaction, which is mostly characterized by the ease of use of SIAKAD.

The results of the research by Satriya et al (2023) said that the Service Quality of an Information System can affect the Net Benefits when users are satisfied. Service Quality focuses on the needs and desires of users. Systems that can be accessed with a wide variety of smart devices today provide User Satisfaction. The speed of response from the system provider can also meet the needs of users and affect User Satisfaction. So, when users are satisfied with the quality of service of the information system, they will work more effectively and efficiently.

## V. CONCLUSION

Service quality is made a top priority to form customer satisfaction which has an impact on the benefits obtained from the use of the academic information system (SIAKAD) Merdeka University of Malang is considered to have provided an academic information system (SIAKAD) with a quality information system that can be understood by users to answer the needs and desires of users. The results of the study showed that out of ten hypotheses as a whole, they were accepted. There is a positive and significant influence of system quality, information quality, and service quality on user satisfaction; There is a positive and significant influence of system quality, information quality, and service quality on net benefit. User satisfaction can mediate system quality, information quality and service quality to net benefit.

It is hoped that this research can encourage the academic information system work unit (SIAKAD) to improve its performance so that users get net benefits from the purpose of SIAKAD being made. For further research, it is suggested that it can be carried out using a larger sample for other public sector agencies. Meanwhile, for the next researcher, the research methods and data analysis techniques to be used are developed more deeply so that a more comprehensive follow-up research can be produced. Similarly, the results of the research can provide insights and discourse to support other systems that can contribute to the world of information technology.

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