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Development of a Management Information System to Increase Customer Satisfaction and Loyalty in the Optimization of Income Generating at the Faculty of Vocational Sports Facilities UNY

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ABSTRACT: This study focuses on designing, assessing, and evaluating a management information system aimed at enhancing customer satisfaction and loyalty while optimizing income-generating sports facilities at the Vocational Faculty of Yogyakarta State University. To achieve this, the research follows a Research and Development (R&D) approach utilizing the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. In the development process, the system was designed with two main interfaces: a public website for general users and an admin backend for management purposes. The feasibility of the system was evaluated by five sports management experts and four information system experts. Small-scale trials were conducted with 19 prospective tenants and facility managers, while large-scale trials involved 54 participants. Data collection was carried out through interviews and questionnaires, employing a purposive sampling method. To assess effectiveness, linear regression analysis was used, and the collected data were analyzed both qualitatively and quantitatively. The study's findings indicate that the system meets the necessary feasibility standards. Sports management experts rated the system highly, with scores of 93% for the Software Aspect, 94% for the Language Aspect, and 91% for the Visual Communication Aspect, all categorized as feasible. Information system experts also provided positive evaluations, with the Software Aspect scoring 88% and the Visual Communication Aspect 73%, both meeting feasibility criteria. Furthermore, the effectiveness assessment demonstrated that the system effectively explains the variability in Usability based on Satisfaction and Loyalty. The R-squared value of 0.8672 suggests that 86.72% of Usability variations can be attributed to these two factors. Overall, this study highlights the successful development and validation of a management information system that significantly contributes to improving customer satisfaction and loyalty while optimizing the utilization of sports facilities.

KEYWORDS: management information system, loyalty, satisfaction, income, faculty.

I. INTRODUCTION

Community participation in sport and recreation activities has a positive impact on a healthy life balance and on a broad scale can encourage economic development (Goslin et al., 2015). In the New Public Management paradigm, sports facilities and infrastructure are a service product and the community, while athletes are customers who must get service satisfaction according to standards. Furthermore, sports facilities and infrastructure are one of the most vital sports industry capital and have enormous economic potential.

Customer satisfaction is an asset to increase the number of consumers and get consumers who are loyal or have loyalty to products or services in sports infrastructure facilities. Loyal consumers will reuse the same sports infrastructure if they need it again. In fact, it has been known that loyal consumers will invite others around them to use the same sports infrastructure facilities (Hill & Christine Green, 2012). The result is the acquisition of benefits, both in the form of money (profit) and not in the form of money, namely satisfaction (satisfaction). Tjiptono (2022) suggests six indicators that can be used to measure patient loyalty, namely repeat purchases, the habit of consuming the brand, always liking the brand, still choosing the brand, believing the quality of the brand is the best, and recommending the brand to others. To determine the value of customer loyalty to a product, it is necessary to assess these indicators.

Based on Government Regulation of the Republic of Indonesia Number 35 of 2022, Yogyakarta State University is designated as a Legal Entity State University (PTN BH). PTN BH is a state-owned university that is given broad autonomy through a legal entity and

receives a government mandate to organize quality higher education for all with financing from the government together with the community and efforts to raise financial resources by PTN BH. The autonomy possessed is in the form of academic and non-academic autonomy. One form of non-academic autonomy is resources. It is related to generating funding sources that will be used in the management of higher education.

One of the requirements to become a PTNBH is the fulfillment of the minimum standard of financial viability. Therefore, UNY must prepare itself to be financially independent. Financial independence cannot be achieved easily and instantly (Hodge & Piccolo, 2005). Financial management is an important key to the financial independence of higher education. Financial independence is the goal of higher education development in Indonesia. This means that the source of funds for organizing the tri dharma of higher education is not only sourced from the income of student tuition fees and participation funds from the state budget (Permenristekdikti No. 50 of 2017 concerning the Strategic Plan of Kemenristekdikti), but can also come from various innovative services and products that are able to provide added value in university non-tax revenues.

Along with the changing status of Yogyakarta State University (UNY) into a State University with Legal Status (PTN BH), improper management of sports facilities management can affect the target of obtaining funding from sports facilities and infrastructure. Seriousness in carrying out management functions must be owned by managers. Management functions are basic elements that will always exist and are inherent in the management process which will be used as a reference by managers in carrying out activities to achieve goals.

The development of the environment brings a new nuance in various sectors, including in the sports education sector. This development is suspected to be an intersection of the growth and development of information technology through the offer of convenience and innovation provided (Drnevich & Croson, 2013). Value creation from convenience and innovation provides a significant transformation in the use of information for better decision making (Ali et al., 2020). This is realized through the internet as information technology to transform communication patterns in a revolutionary way. The event marked the design of innovations developed through the catalyst of information technology in various sectors (Gregory & Jackson, 1992; Strader & Shaw, 1997). This study underlines that information technology in the creation of innovation design can be realized through management information systems.

In Indonesia, business development through information technology catalysts has mushroomed. The development is felt through the way of advertising, the way of buying and selling, the way of interacting between people, and the role of social networks (Mildawati, 2000). This is a revolutionary form of the growing pattern of digital business (electronic business) (Gregory & Jackson, 1992; Strader & Shaw, 1997). Therefore, managers at sports facilities are expected to emphasize the use of technology in conducting sports facility management management. With the latest sports facilities and high usefulness, it will certainly result in a good assessment from the community and can attract a lot of public interest in using these facilities. The utilization of this technology can be created through the design of innovations in the form of management information systems in the management of sports facilities (Ali et al., 2020).

The Faculty of Vocational Studies, Yogyakarta State University (FV UNY) really needs a medium to market its sports facilities to the public. So far, the media for sharing information about available facilities, rates, and schedules are still in the form of flyers made for each field. To find out information about sports infrastructure facilities, prospective tenants can come directly to the Public Relations Section of FV UNY. After obtaining information, the Public Relations Section will direct prospective tenants to contact the manager of the sports facility to be rented to discuss the schedule and rates to be paid.

Based on the above problems, the objectives of this research are as follows. 1. Designing a management information system to increase customer satisfaction and loyalty in optimizing income generating sports facilities of the Faculty of Vocational Studies UNY, 2. Testing the feasibility of management information system innovation to increase customer satisfaction and loyalty in optimizing income generating sports facilities of the Faculty of Vocational Studies UNY. 3. Testing the effectiveness of management information systems to increase customer satisfaction and loyalty in optimizing income generating sports facilities of the Faculty of Vocational Studies UNY.

II. METHOD

Research and Development

This research was conducted using the research and development (R&D) method. Development research is a process for developing new products or improving existing products by researching, designing, producing, and testing the validity of the products that have been produced (Hair Jr et al., 2019). The choice of using the R&D method in this study is based on the researcher's aim to develop a facility management information system. The method used by researchers in designing and developing management information systems is the Analysis Design Development Implementation and Evaluation (ADDIE)

method. ADDIE is adopted due to its conciseness in the systematics of information system development (Allen, 2006; Rohaeni, 2020). Based on development research procedures, ADDIE reveals that the R&D cycle is composed of several research steps, namely 1. Analysis, 2. Design, 3. Development, 4. Implementation, and 5. Evaluation. According to the product development steps, this research and development model is more rational and more complete (Allen, 2006; Ma & Zhang, 2021).

Place and time of research

This research was conducted at the Faculty of Vocational Studies, Yogyakarta State University, both at the Wates Campus and Gunung Kidul Campus. This research begins with the stage of analyzing the needs of information systems. Furthermore, the design of the system design was carried out together with the development team. After the system design was agreed upon, its development was carried out by the development team. Furthermore, feasibility testing was carried out to obtain the best results in the development of information systems. If there are improvements during the feasibility testing, the process is carried out by the development team. After the results of the improvements are declared feasible, the implementation of the information system is carried out. After 3 months of the system being implemented, testing the effectiveness of the information system was carried out by the researcher. In the end, the research results are written in the form of this research report.

Research Population and Sample

The population in this study were tenants and managers of sports facilities at the Faculty of Vocational Studies UNY. This study adopted a purposive sampling approach. Purposive sampling is one of the sampling methodologies used in research through certain conditions and requirements (Etikan et al., 2016; Hair Jr et al., 2019; Sekaran & Bougie, 2016). This study applies the following conditions in purposive sampling. First, customers are individuals or organizations who have rented and managed sports facilities at the Faculty of Vocational Studies UNY. Second, using the information system that has been developed by the researcher.

Instrument Validity and Reliability

The validity test is used to measure whether a questionnaire is valid or not. A questionnaire is said to be valid if the questions on the questionnaire can reveal something that will be measured by the questionnaire (Hair Jr et al., 2019). This study conducted a separate test in ensuring the quality of the research instrument. Validity and reliability tests were carried out using 35 preliminary samples. Validity is measured using the correlation of each question item. According to Sekaran and Bougie (2016), the correlation calculation is carried out using the product moment correlation technique formula. As for the reliability test using Cronbach alpha. If the Cronbach Alpha value is> 0.60, the questions used are reliable.

Data analysis technique

Data analysis techniques in this study are divided into two groups. First, the prerequisite test, used to determine whether the data used is in accordance with the minimum prerequisites or not. The prerequisite test used in this study is the classic assumption test in the form of normality test, multicollinearity test, and heteroscedasticity (Hair Jr et al., 2019). Second, hypothesis testing is carried out using a simple regression data analysis method. This is to test the effect that the independent variable has on the dependent variable (Hair Jr et al., 2019).

III. RESULT AND DISCUSSION

This research aims to develop a website-based management information system to increase customer satisfaction and loyalty in optimizing income generation at the Faculty of Vocational Studies UNY sports facilities. Furthermore, researchers hope that the resulting product can increase customer satisfaction and loyalty in optimizing income generation. In this context, the ADDIE method is used through 5 main stages, namely: Analysis, Design, Development, Implementation, and Evaluation. The following is an explanation of each stage of the ADDIE method used in the research.

1. Analysis

This study begins with the analysis stage by conducting user needs analysis and system analysis to be developed. The needs analysis in this study was conducted by collecting data from observations conducted by the researcher. This is the documentation that will be used as a background in the development of a management information system to increase satisfaction and loyalty in optimizing income generating at the UNY Faculty of Vocational sports facilities.

a. User Needs Analysis

The analysis stage begins with conducting observations on the needs of business process transformation and information system management through printed media, such as books, or online media, such as e-books and journals to find relevant research and find out various problems in the field. To evaluate the old system, the PIECES analysis method is used to create an analysis as a basis for developing a new system.

Table 1. Analysis PIECES

Analisis	Sistem yang Sedang Berjalan	Usulan Sistem Baru
Performance	Currently, orders are made by customers coming directly to FV UNY. In addition, reservations can be made over the phone, but customers still have to come to make payments.	The proposed system is in the form of an application that is accessed online through the website, so that customers can directly place orders and make payments by transferring to UNY's account.
Information	Bookers/customers only get information related to the availability of schedules and rates if they come directly to the sports facility manager at UNY.	The delivery of information about available schedules and rates to potential users of sports facilities at UNY will be faster because it can be accessed at any time.
Economy	The costs required for the short term are relatively small. However, for the long term, it requires a lot of money for the customer engagement process.	The initial costs incurred to create the system are relatively expensive, but this system can be used in the long term and can save costs to provide service satisfaction to customers and make it easier for customers to rent.
Control	The security of transaction data and tenant data is not guaranteed because it is not stored regularly. In fact, the risk of data loss is huge.	Everyone who enters the system must use a username and password for system security. In addition, when the manager needs data, it will be quick and easy to find.
Efeciency	To get information about schedules and fares, customers must come to the FV, which requires more time and money if the distance to the FV is far.	The system can speed up the time in presenting schedule and fare information because the system uses an online network so that parties who want to know information directly open the system, order, and the payment process can be done online without having to come directly to the FV.
Service	Service to the presentation of information is still in a face to face manner, namely customers must come directly to FV UNY.	Presentation of information is done online and the system can connect between customers and managers of sports infrastructure facilities FV UNY. Reservations can also be made quickly and easily without having to come directly to FV UNY.

a. Information System Requirements Analysis

Analysis of information system needs to identify the need to transform manual processes into digitized processes. In this context, researchers divide two parts in analyzing information system needs, namely functional and non-functional needs. In the analysis of the needs of sports facility management information systems, the functional needs required can be summarized as follows.

1) The function of viewing sports facilities available at the Faculty of Vocational Studies UNY.
2) The function of booking to rent the desired sports facilities.
3) The function to add and subtract data on the products offered.
4) Function to create invoice as a proof of financial transaction.
5) Function to make rental approval.
6) Function to create a rental summary report.

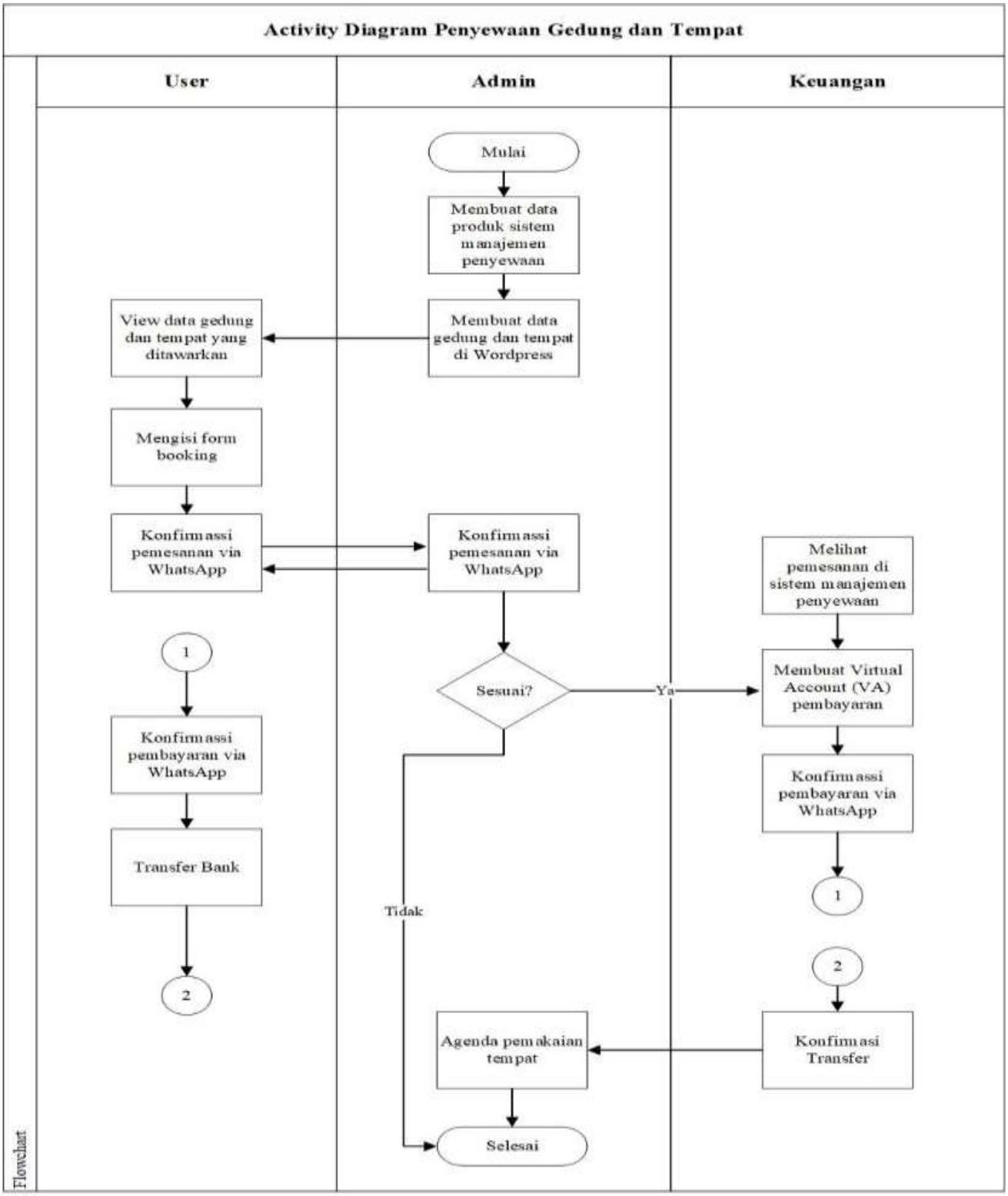
The software above is a device used in making sports facility management information systems. Operating systems that can be used to run sports facility management information systems, namely the Windows operating system at least version 7 32-bit, Linux operating system, and other operating systems. The main device for running a sports facility management information system, namely a web browser. The web browser that can be used besides Google Chrome, namely Mozilla Firefox, Internet Explorer, and others.

2. Design

The design stage or also called the planning stage includes planning various kinds of displays on the system and preparing the flow of material delivered in the form of flowcharts. The stages of making a flowchart of the management information system development model to increase customer satisfaction and loyalty in increasing income generation at the Faculty of Vocational Studies UNY are as follows:

Picture 1 *Flowchart* Creation of Management Information System

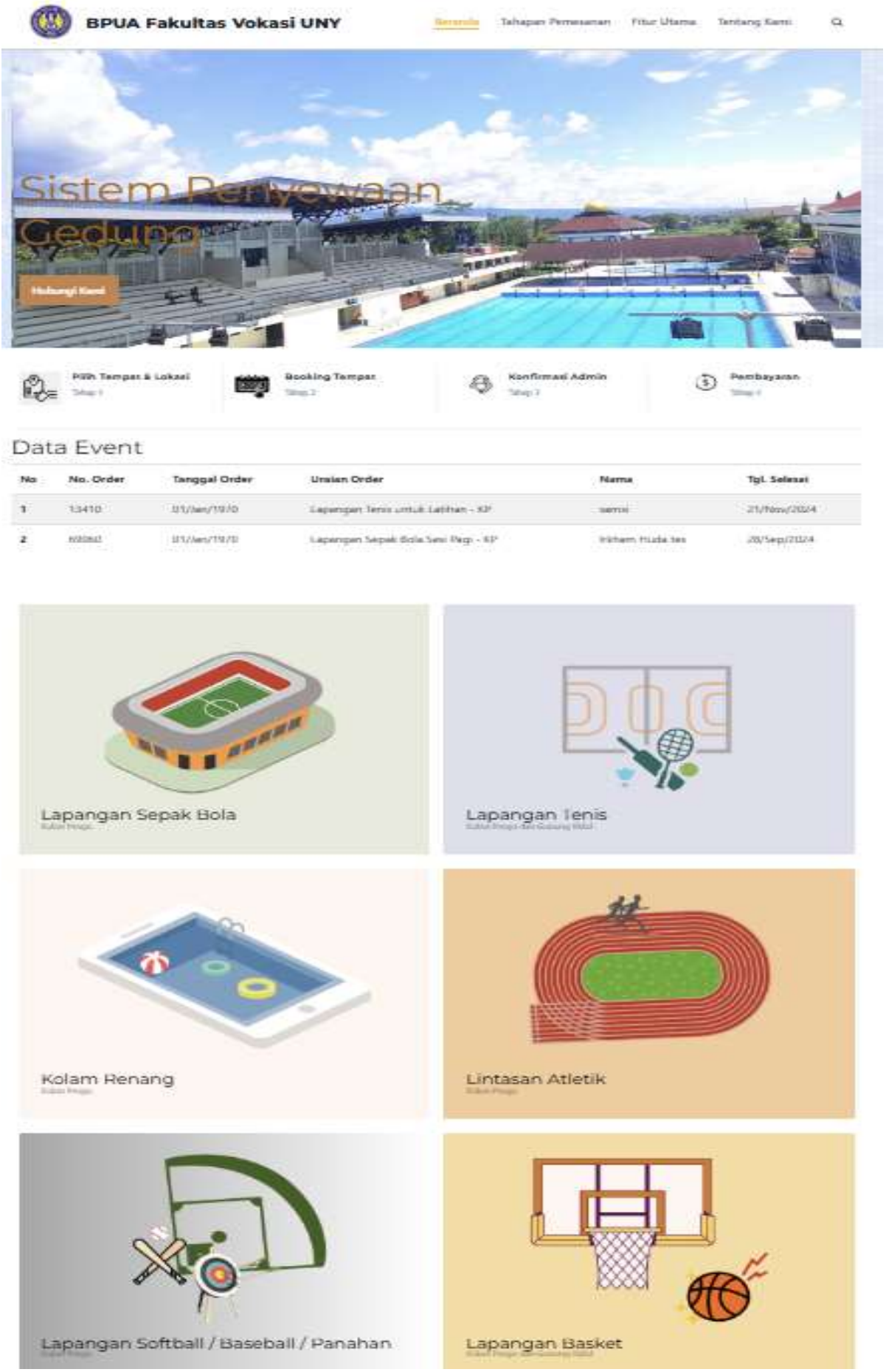
The results of the analysis obtained can be used as a reference to determine the product design.



Gambar 2 *Activity* Diagram Sistem Informasi Manajemen Fasilitas Olahraga

a. Public Web Design

The public web is a web that will be used by prospective tenants to carry out activities, whether it is just browsing or for transactions. The public web is a web that will be used by prospective tenants to carry out activities, whether it is just browsing or for transactions.

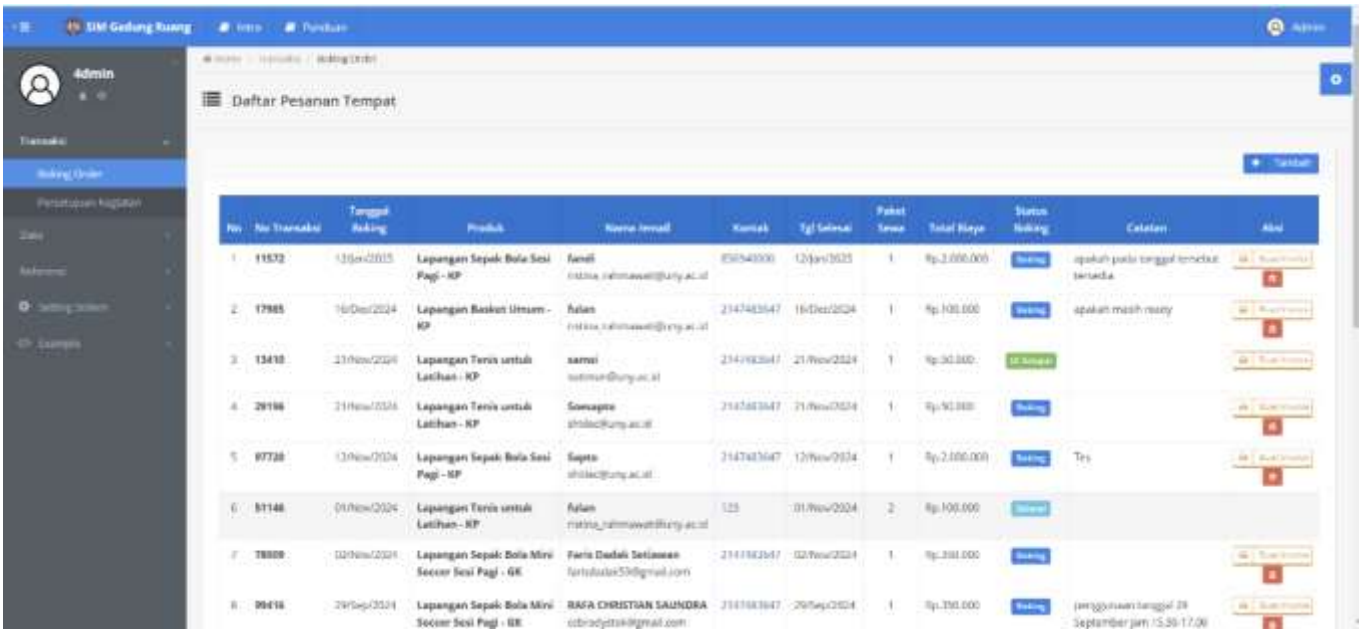


Gambar 3 Tampilan Muka Web Publik

In this view, the public can see the flow/stage of booking, the main features contained in the system, the profile of BPUA FV UNY, and the contacts of BPUA FV UNY. In the middle, there is information about the schedule for using the facilities that have been ordered. In this section, if the use has been completed, the order data will automatically disappear in the event data table. At the end of the initial display there are various sports facilities offered by FV UNY. The available facilities include soccer fields, tennis courts, swimming pools, athletic tracks, softball fields, baseball, archery, basketball courts, mini soccer fields, volleyball courts, sepak takraw courts, and auditoriums..

Figure 4 Public Web Interface for Rented Product Details

On the admin web there are several menu views: (1) Transaction Menu; (2) Data Menu; (3) Reference Menu; and (4) Transaction Menu. On this menu there are two submenus, namely the booking order submenu and the activity approval submenu.



Gambar 5 Halaman Menu Daftar Pesan Tempat–Proses Verifikasi

This submenu will display orders that must be processed by the admin. Based on the booking order, the admin verifies and will send a message via the WhatsApp (WA) application or email to confirm the correctness of the order. After that, based on the booking order, the admin makes a request for an invoice and virtual account (VA) to the Revenue Treasurer through the Business Cooperation System (SIKU) application. The invoice and VA from the Revenue Treasurer are then sent to the prospective tenant via WA or email. After the tenant makes a payment, proof of payment is sent to the admin via WA or email. From the transactions that have been carried out, the admin enters the data into SIGERU as shown below.

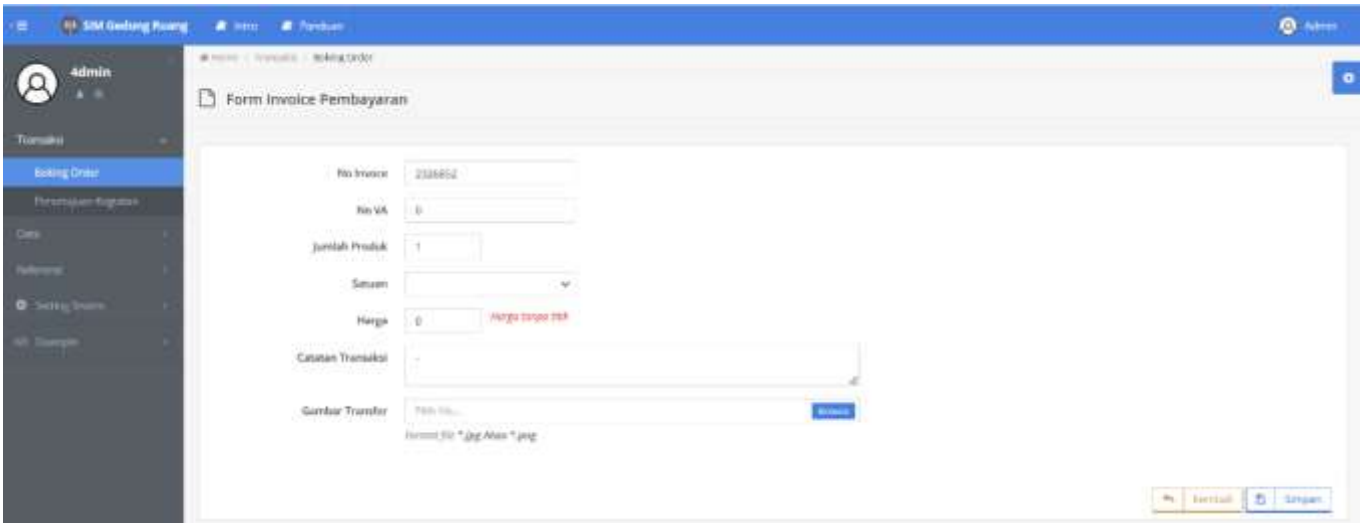


Figure 6 Invoice Payment Menu Page

The invoice number and VA number entered are the invoice number and VA from the Revenue Treasurer. The number of products, units, and prices are filled in according to the booking order. The transfer image is the payment document from the tenant. Finally, choose the 'save' menu. If the transaction has been saved, the booking order status will change to approved as shown in the picture below.

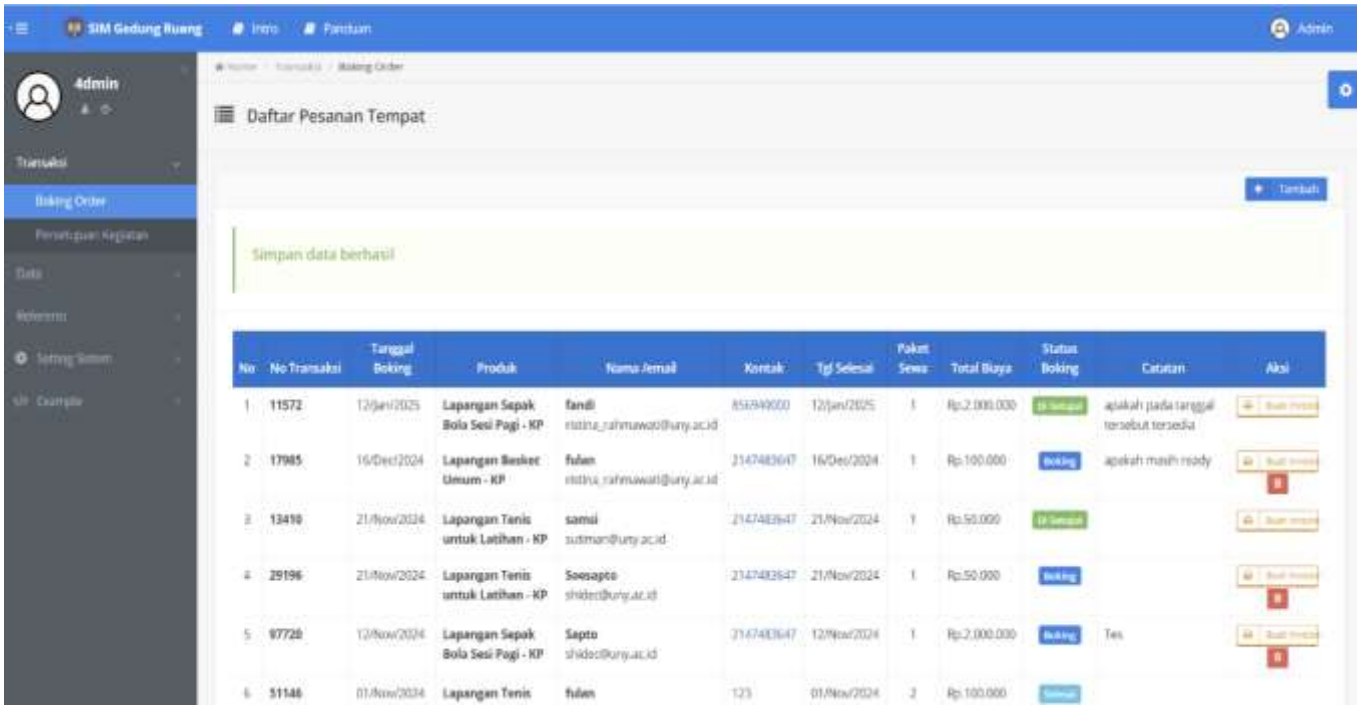


Figure 7 Venue Booking List Menu Page-Approval Process

The activity approval menu contains a list of booking orders that have been approved. In addition, the approved booking order will appear on the public web home page..

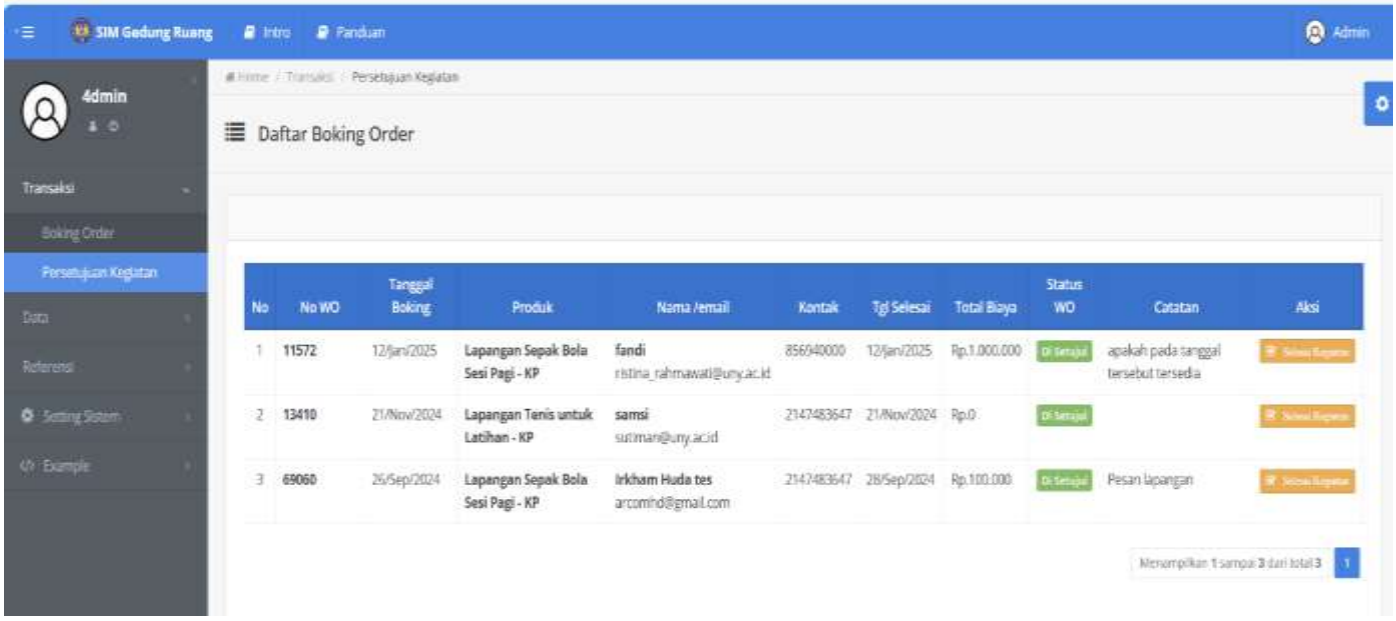


Figure 8 Place Bookings Menu Page-Processing Settlement

In addition to processing transactions, the admin can manage information/data about facilities that can be rented out on the reference and data menu. In this menu, the admin can add information that will be displayed on the public web, for example images or photos of sports facilities along with their supporting facilities available for rent and rental rates.

A. Product Trial Results

To ensure that the designed product has met the needs of users, this research conducted trials with the following stages.

1. Development

The sports facility management information system product that has been designed then enters the development stage, where this stage is validated by sports management and information system experts. The validation stage is carried out by eight experts consisting of lecturers and practitioners who are competent in the field of sports management and information systems.

The purpose of this validation is to determine whether or not the product that has been made is feasible. In addition, it is used for system improvement if there is input from experts.

Validation was carried out by nine experts consisting of lecturers and practitioners who are competent in the field of management and information systems. The purpose of this validation is to determine whether the product that has been made is feasible or not and also as a revision of expert input. Validators in this study are considered competent in the field of management because they consist of lecturers and practitioners who have a background in sports education and information systems. The validator's assessment uses a questionnaire with a Likert scale. The results of the validation obtained are presented in the table as follows.

Table 2 Expert Assessment Results

No.	Indicator	Result Score	Maximum Value	Percentage	Category
1.	Software Aspect	201	216	93%	Feasible
2.	Language Aspect	68	72	94%	Feasible
3.	Visual Communication Aspect	197	216	91%	Feasible

The results of expert assessment of the "SIGERU" application through three aspects, namely software aspects, language aspects, and visual communication aspects are depicted in the form of a bar chart as follows.

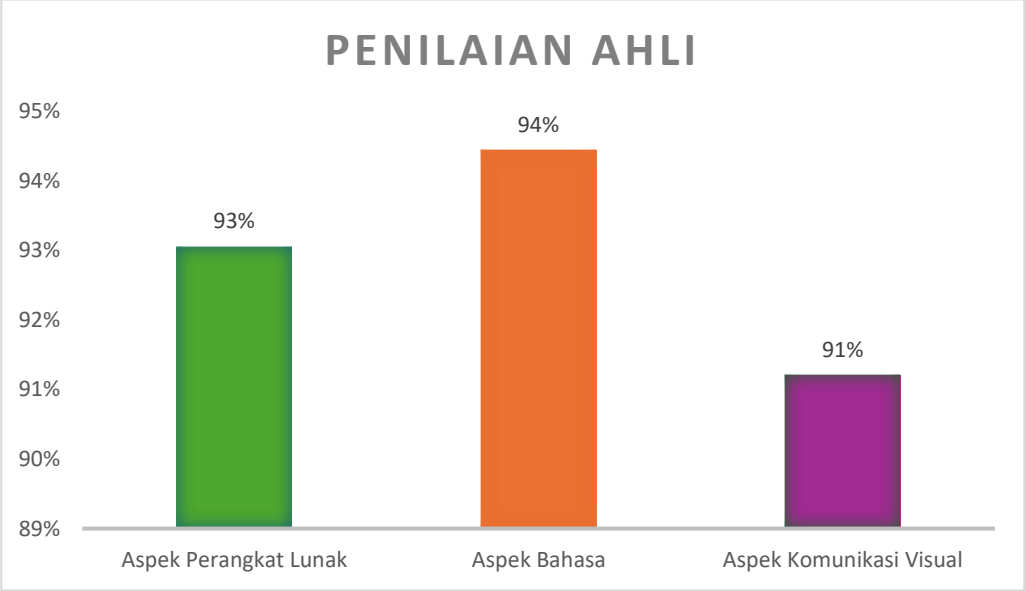


Figure 9 Bar Diagram of Expert Assessment Results

Based on Figure 13 and Table 3 above, shows the results of the expert assessment on the improvement of the "SIGERU" application characterized by the use of 93% Software Aspect indicators with decent categories, 94% Language Aspect indicators with decent categories, and 91% Visual Communication Aspect indicators with decent categories. The results of the expert assessment conducted on the "SIGERU" application using a questionnaire which aims to find the validity coefficient based on Aiken's Validity. The Aiken index is worth from 0 to 1 which is displayed in the table below.

Table 3 Expert Assessment Results

Aiken's Validity Coefficient Value (V)	Validity
$0 < V \leq 0,4$	Less Valid (Low)
$0,4 < V \leq 0,8$	Moderately Valid (Medium)
$0,8 < V \leq 1$	Very Valid (High)

Data is said to be valid if the value of V results> V table. V table with 9 raters and 4 answer choices. Then, conclusions were drawn with the following results.

Table 4 Aiken's Validation Results for each Aspect

Software Aspect Instrument Items	Appraiser									V	Description
	1	2	3	4	5	6	7	8	9		
Items 1-6	23	22	23	21	21	23	22	23	23	0,90741	High
Item 1-2	8	7	7	8	8	8	7	7	8	0,92592	High
Item 1-6	21	23	22	21	21	21	23	22	23	0,88271	High

Based on the results above, for Software, Language, and Visual Communication for improving the performance of the "SIGERU" application can be said to be in the high validity category. Then, proceed with the reliability of the "SIGERU" application using three aspects, namely the Software Aspect, Language Aspect, and Visual Communication Aspect using Cronbach's Alpha reliability with the following results.

Table 5 Results of Cronbach's Alpha Reliability of Three Aspects

Aspects	Cronbach's Alpha	N of Items
Software Aspects	0,855913978	6
Language Aspects	1,930555556	2
Visual Communication Aspect	0,96300578	6

Based on the reliability results obtained for the "SIGERU" application on the Software Aspect, a value of 0.855 was obtained; the Language Aspect obtained a value of 1.930; and the Visual Communication Aspect obtained a value of 0.963. According to Wiratna Sujarweni (2014), if the resulting reliability value is> 0.6; the data can be said to be reliable / consistent.

For information system experts, in addition to filling out questionnaires regarding management, they also fill out questionnaires related to information systems. Validation was carried out by four experts consisting of lecturers and practitioners who are competent in the field of information systems. The purpose of this validation is to determine the feasibility of the product that has been made. In addition, it is also a revision of expert input. Validators in this study are considered competent in the field of information systems because they consist of lecturers and practitioners who have an educational background in information systems technology. The validator's assessment uses a questionnaire with a Likert scale. The results of the validation obtained are presented in the table as follows.

Table 6 System Expert Validation Results

No.	Indicators	Score Result	Maximum Value	Percentage	Category
1.	Software Aspect	113	128	88%	Feasible
2.	Visual Communication Aspect	94	128	73%	Feasible

The results of the expert assessment of the "SIGERU" Application through two aspects, namely the software aspect and the visual communication aspect above are depicted in the form of a bar chart as follow.

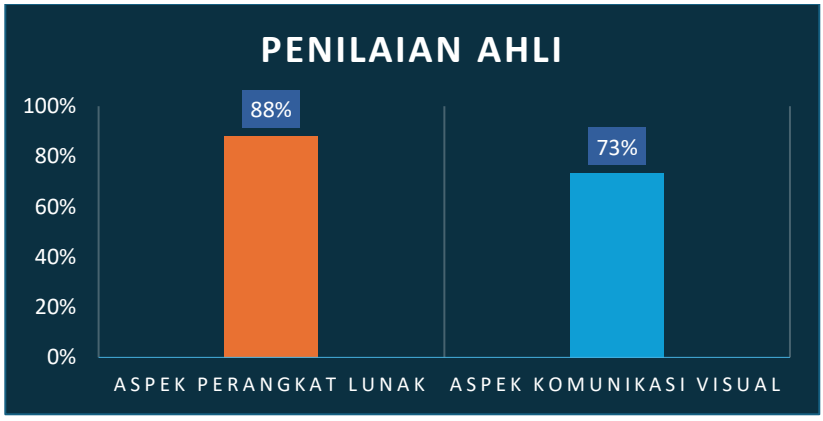


Figure 10 Bar Chart of Expert Assessment Results

Based on Figure 10, shows the results of the expert assessment on the improvement of the "SIGERU" application characterized by the use of 88% Software Aspect indicators with decent categories and 73% Visual Communication Aspect indicators with decent categories. The results of the expert assessment carried out on the "SIGERU" application using a questionnaire which aims to find the validity coefficient based on Aiken's Validity. The Aiken index is worth from 0 to 1 which is displayed in table 11 as follows.

Table 7 Aiken's Validity Coefficient

Aiken's Validity Coefficient Value (V)	Validity
0 < V ≤ 0,4	Less Valid (Low)
0,4 < V ≤ 0,8	Moderately Valid (Medium)
0,8 < V ≤ 1	Highly Valid (High)

Data is said to be valid if the value of V results> V table. V table with 4 raters and 4 answer choices. Then, conclusions were drawn with the following results.

Table 8 Aiken's Validation Results for each Aspect

Software Aspect Instrument Items	**Appraiser**				**V**	**Description**
	1	**2**	**3**	**4**		
Item 1-8	27	32	27	27	0,84375	High
Item 1-7	23	25	23	23	0,785714	Medium

Based on the above results, the performance improvement of the "SIGERU" application can be said to be in the high validity category for the Software aspect, while the Visual Communication aspect is in the medium validity category. Then, proceed with the reliability of the "SIGERU" Application using two aspects, namely the Software Aspect and the Visual Communication Aspect using Cronbach's Alpha reliability with the following results.

Table 9 Cronbach's Alpha Two Aspect Reliability Results

Aspects	**Cronbach's Alpha**	**N of Items**
Software Aspects	0,55026455	8
Visual Communication Aspect	0,65625	7

Based on the reliability results obtained for the "SIGERU" application on the Software Aspect, a value of 0.55026455 and the Visual Communication Aspect obtained a value of 0.65625. According to Dr. Wiratna Sujarweni (2014), if the resulting reliability value is> 0.6; the data can be said to be reliable / consistent.

2. Implementation

The implementation stage in this research is the stage for applying the management information system that has been made, considered valid, and reliable to users, namely prospective tenants and BPUA admins. The trials were carried out with small-scale trials and large-scale trials. The following are the results of the small-scale and large-scale trials.

a. Small Scale Implementation

Small-scale trials of this research were conducted and documented by distributing questionnaires in the form of google forms to prospective tenants and BPUA FV UNY admins. The questionnaire was attached to the manual book of the system being developed.

b. Large Scale Implementation

Large-scale trials were conducted similar to small-scale trials, but there was an increase in the number of samples from 19 respondents to 54 respondents. The flow in the large-scale trial begins with an explanation of the purpose and flow of the system to respondents through zoom media.

3. Evaluation

The evaluation stage is the final stage of this research. Evaluation is carried out at each stage of the research steps. Evaluation is carried out continuously in order to reduce errors that occur without having to wait for the product to be completed. The evaluation in this study came from the researcher's analysis, input and suggestions from experts, and field trials. The results of the assessment of the trial, both small scale and large scale, conducted on the management information system product to increase customer satisfaction and loyalty in increasing income generation at sports facilities were declared feasible. This is shown

from the results of large-scale and small-scale trials resulting in an R-squared value of 0.8672 indicating that 86.72% of the variability in usability can be explained by Satisfaction and Loyalty, while the Adjusted R-squared value of 0.8620 indicates adjustments that consider the number of variables in the model still show a very strong model..

IV. PRODUCT REVISION

The designed product underwent several revisions. Revisions were made based on input from experts who had tested the information system. Input and suggestions from experts are used to revise the product so that the product is more valid, effective, efficient, safe, and comfortable.

V. PRODUCT STUDY

1. Review of Small Scale Implementation

a. Validity Test Results

The results of the validity test of the questionnaire instrument showed that all questions had a significant positive correlation with the total score and with correlation values ranging from 0.5390 to 0.9191. Higher correlations, such as in the questions "I enjoy interacting with the Sigeru website to borrow space" (0.9191) and "The Sigeru website uses an appropriate typeface" (0.8893), indicate that the direct interaction and visual design aspects of the website have a strong influence on overall user satisfaction. Although there are questions with lower correlations, such as "Sigeru website keeps users' personal data safe" (0.5390) and "Sigeru website gives users a sense of security when downloading" (0.6386). Both remain valid and relevant although their influence is slightly smaller compared to other factors, such as ease of use and aesthetics.

Tabel 10 Hasil Uji Validitas Instrumen Kuesioner Pengguna *Website* Sigeru

Questions in the Questionnaire Instrument	Correlation with Total Score	Validity Criteria
I found it easy to learn the operation of the Sigeru website.	0.7587	Valid
The interaction between the Sigeru website and me as a user is clear and easy to understand.	0.7894	Valid
I as a user find it easy to navigate the Sigeru website.	0.8818	Valid
I feel that the Sigeru website is easy to use.	0.8326	Valid
The website has an attractive/user friendly appearance.	0.8370	Valid
The Sigeru website gives users a sense of security when downloading.	0.6386	Valid
The Sigeru website keeps users' personal data safe.	0.5390	Valid
The Sigeru website presents information in accordance with the needs of borrowing space.	0.7894	Valid
I like the look of the Sigeru website.	0.7361	Valid
I am happy to interact with the Sigeru website for space lending.	0.9191	Valid
I feel that moving from the main page of the Sigeru website to other pages is fast.	0.8476	Valid
Sigeru website can be accessed well using gadgets.	0.6848	Valid
Sigeru website can be accessed well through various browsers.	0.8326	Valid
Sigeru's website uses appropriate images.	0.8818	Valid
Sigeru's website uses the appropriate typeface (font).	0.8893	Valid
Sigeru's website has attractive colors.	0.7385	Valid
Sigeru's website has a structured and consistent layout.	0.8546	Valid

Overall, the instrument reliably measures user perceptions of the Sigeru website with a focus on ease of navigation, visual design, and functionality while ensuring that security and privacy are prioritized.

b. Reliability Test Results

The results of the reliability test using Cronbach's Alpha showed a value of 0.9604 for all items (n=17), indicating that the questionnaire instrument has a very good level of reliability. In general, Cronbach's Alpha values above 0.9 indicate that the instrument is very consistent in measuring the variable in question with a very low error rate. This means that all items in the

questionnaire consistently contribute to the measurement of the variable of interest, namely user satisfaction and experience with the Sigeru website.

Table 11 Reliability Test Results of Sigeru Website User Questionnaire Instrument (Cronbach Alpha)

Indicator	Alpha Cronbach
All Item (n=17)	0.9604

With this very high reliability, it can be concluded that the questionnaire instrument can be trusted to be used in further research and the results will provide valid and accurate information regarding users' perceptions of the features and functionality of the Sigeru website. However, even though the instrument is reliable, it is important to keep in mind the validity and other factors that may affect user responses, such as user context or technological advances that may update users' needs for the website. Overall, these results support the use of the instrument in the evaluation of the quality of the Sigeru website and provide a strong basis for further development.

c. Hasil Uji

The normality test results can be concluded that the residuals of this regression model are normally distributed. The results of the heteroscedasticity test using the Breusch-Pagan test show a chi² value of 0.29 with a p-value of 0.593. A p-value greater than the 0.05 significance level indicates that the null hypothesis (H_0), which states that there is no heteroscedasticity, cannot be rejected. Thus, it can be concluded that there is no evidence of heteroscedasticity in this regression model. The multicollinearity test results show the Variance Inflation Factor (VIF) value for the Satisfaction and Loyalty variables is 2.23 each. The 1/VIF value for these two variables is 0.4485. In general, if the VIF value is greater than 10, this indicates that there is a serious multicollinearity problem between the independent variables. However, in this case, the VIF value obtained, 2.23, is still within acceptable limits as in general VIF values below 5 or 10 are considered not to indicate significant multicollinearity.

Based on the regression results displayed, the regression model shows that the variable “Satisfaction” has a significant influence on “Usability” with a coefficient of 0.6837 and a p-value of 0.001, which means that every one unit increase in user satisfaction can increase usability by 0.6837 units. The t-test shows that this relationship is highly significant as the t-statistic value (4.35) is much larger than the critical value (usually around 2), and the very low p-value (0.001) supports the conclusion that user satisfaction is an important predictor of website usability.

In contrast, the variable “Loyalty” shows no significant effect on “Usability” with a p-value of 0.254, which is greater than the 0.05 significance level. The loyalty coefficient of 0.2285 indicates that although there is a positive relationship between loyalty and usability, the effect is not strong enough to be considered significant in this model.

Table 12 Linear Regression Results for the Effect of Satisfaction and Loyalty on Website Usability

Variable	Koefisien	Std. Err	t-Stat	P-Value
Intercept	0.3166	0.4550	0.70	0.496
Satisfaction	0.6837	0.1573	4.35	0.001
Loyalty	0.2285	0.1930	1.18	0.254
R-Squared	0.7956			
Adjusted R-Squared	0.7700			
F-Statistik	31.14 (p-value: 0.000)			
Root MSE	0.22234			
N	19			

The overall regression model is quite good with an R-squared value of 0.7956, which means that about 79.56% of the variation in “Usability” can be explained by the two independent variables, namely Satisfaction and Loyalty. The Adjusted R-squared value (0.7700) shows that this model still provides a good adjustment to the number of independent variables used. The significant F-statistic (31.14 with a p-value of 0.000) indicates that the overall regression model is significant and can be used to predict website usability.

The root MSE (0.22234) indicates a relatively low level of prediction error, indicating that the model is reasonably accurate in predicting usability values. Overall, the results of this analysis show that user satisfaction has a significant influence on website usability, while loyalty does not make a significant contribution in this model.

1. Review of Large Scale Implementation

a. Validity Test Results

The validity analysis results show that all items in the questionnaire have a significant and strong correlation to the total score with correlation values ranging from 0.7548 to 0.9099. This shows that each question in this instrument is consistently able to measure aspects of user experience of the Sigeru website. Aspects such as ease of navigation, data security, visual appearance, and functionality were rated very positively by users, which is reflected in the high validity of the related items. Questions with the highest correlation, such as "The website has an attractive/user-friendly appearance" (0.9099), indicate that visual aspects have a significant influence on user experience. Meanwhile, although the lowest correlation value was found for the question "I feel that moving from the main page of the Sigeru website to other pages is fast" (0.7548), this question is still valid and indicates a potential area for improvement in terms of technical performance. Overall, the questionnaire instrument proved effective for evaluating the user experience of the Sigeru website, while identifying key strengths such as user-friendliness and security, as well as opportunities for improvement in accessibility and navigation speed. This analysis can serve as a strategic basis for further development to better meet user needs. Overall, this instrument is reliable for measuring user perceptions of the Sigeru website.

Table 13 Validity Test Results of Sigeru Website User Questionnaire Instrument

Questions in the Questionnaire Instrument	Correlation with Total Score	Validity Criteria
I found it easy to learn the operation of the Sigeru website.	0.8670	Valid
The interaction between the Sigeru website and me as a user is clear and easy to understand.	0.8791	Valid
I as a user find it easy to navigate the Sigeru website.	0.8762	Valid
I feel that the Sigeru website is easy to use.	0.8464	Valid
The website has an attractive/user friendly appearance.	0.9099	Valid
The Sigeru website gives users a sense of security when downloading.	0.8393	Valid
The Sigeru website keeps users' personal data safe.	0.8543	Valid
The Sigeru website presents information in accordance with the needs of borrowing space.	0.7793	Valid
I like the look of the Sigeru website.	0.8086	Valid
I enjoyed interacting with the Sigeru website for space lending.	0.8992	Valid
I feel that moving from the main page of the Sigeru website to other pages is fast.	0.7548	Valid
Sigeru website can be accessed well using gadgets.	0.7806	Valid
Sigeru website can be accessed well through various browsers.	0.7967	Valid
Sigeru's website uses appropriate images.	0.8229	Valid
Sigeru's website uses the appropriate typeface (font).	0.8856	Valid
Sigeru's website has attractive colors.	0.8856	Valid
Sigeru's website has a structured and consistent layout.	0.8416	Valid

b. Hasil Uji Reliabilitas

The results of the reliability analysis show that the questionnaire instrument has a very high level of reliability with a Cronbach's Alpha value of 0.9740. This indicates that the items in the questionnaire have excellent internal consistency, where each item in the scale supports each other in measuring the same concept. The mean inter-item covariance value of 0.3421456 indicates a positive and strong relationship between the items. With a total of 17 items in the scale, these results ensure that the questionnaire instrument can be relied upon to measure the variables in question.

This high level of reliability provides confidence that the data obtained from this instrument is accurate and stable so that it can be used for further decision making regarding the evaluation of the Sigeru website. With near-perfect reliability, this instrument can be a powerful tool for understanding user perceptions consistently over time.

Tabel 14 Hasil Uji Reliabilitas Instrumen Kuesioner Pengguna Website Sigeru (Alpha Cronbach)

Indikator	Alpha Cronbach
Average interitem covariance	0.3421456
Number of items in the scale	17
Scale reliability coefficient	0.9740

With this very high reliability, it can be concluded that the questionnaire instrument can be trusted to be used in further research. The results will provide valid and accurate information about user perceptions of the features and functionality of the Sigeru website.

c. Test Result

The multicollinearity test results show the Variance Inflation Factor (VIF) value for the Satisfaction and Loyalty variables is 4.31 each. The 1/VIF value for both variables is 0.231825. In general, if the VIF value is greater than 10, it indicates that there is a serious multicollinearity problem between the independent variables. However, in this case, the VIF value obtained, which is 4.31, is still within acceptable limits because in general, VIF values below 5 or 10 are considered not to indicate significant multicollinearity.
This model shows that both Satisfaction and Loyalty have a positive and significant effect on Usability. Loyalty has a slightly greater influence than Satisfaction in increasing Usability. These results can be used to suggest a strategic focus on improving user Loyalty and Satisfaction to increase the perceived Usability of the Sigeru website. Strategies geared towards improving both factors are likely to have a significant impact on improving user experience.

Table 15 Linear Regression Results for the Effect of Satisfaction and Loyalty on Website Usability

Variable	Coefficient	Std. Err	t-Stat	P-Value
Intersep	0. 0667823	0. 2078448	-0.32	0.000
Kepuasan	0. 4909434	0. 1233346	3.98	0.000
Loyalitas	0. 5413555	0. 1064143	5.09	0.749
R-Squared	0.8672			
Adjusted R-Squared	0.8620			
F-Statistik	166.55 (p-value: 0.000)			
Root MSE	0.2465			
N	54			

Satisfaction has a coefficient of 0.4909 ($p < 0.001$), which indicates that every one unit increase in Satisfaction will increase Usability by 0.4909 units assuming the Loyalty variable is constant. This relationship is significant at the 95% confidence level. Loyalty has a coefficient of 0.5414 ($p < 0.001$), which indicates that each one unit increase in Loyalty will increase Usability by 0.5414 units assuming the Satisfaction variable is constant. This relationship is also significant at the 95% confidence level. The intercept (cons) is not significant ($p = 0.749$), indicating that the baseline value of the Usability variable without contributions from Satisfaction and Loyalty is not statistically different from zero.

The linear regression results show that this model has a very good ability to explain the variability of the Usability variable based on the Satisfaction and Loyalty variables. The R-squared value of 0.8672 indicates that 86.72% of the variability in Usability can be explained by Satisfaction and Loyalty. Meanwhile, the Adjusted R-squared value of 0.8620 indicates that adjustments that consider the number of variables in the model still show a very strong model. The F-statistic value of 166.55 (p-value = 0.000) indicates that the overall model is significant so that the independent variables in this model together have a significant influence on the dependent variable. The Root Mean Square Error (MSE) of 0.2465 indicates how much deviation the model predicts from the actual value.

VI. CONCLUSION

Based on the research findings, it can be concluded that the development of a management information system to enhance customer satisfaction and loyalty in optimizing the revenue of sports facilities at the Vocational Faculty of Yogyakarta State University was carried out through two main interfaces: a public website and an admin backend. The system was developed following the ADDIE model stages to provide faster and more efficient services while also aiming to increase revenue from sports

facilities. The feasibility test results indicate that the "SIGERU" application was deemed feasible by sports management experts, scoring 93% for the Software Aspect, 94% for the Language Aspect, and 91% for the Visual Communication Aspect. Similarly, information system experts rated the application with 88% for the Software Aspect and 73% for the Visual Communication Aspect. Overall, the application has been tested and proven feasible for implementation within the Vocational Faculty of Yogyakarta State University. In terms of effectiveness, the management information system demonstrates a strong ability to explain the variability of the Usability variable based on Satisfaction and Loyalty variables, with an R-squared value of 0.8672 (86.72%) and an Adjusted R-squared value of 0.8620. The F-statistic value of 166.55 with a p-value of 0.000 indicates that the model is statistically significant, confirming that the independent variables collectively have a strong influence on the dependent variable. Future research could focus on further developing this system by integrating it across all faculties within Yogyakarta State University and enhancing it with additional features. Moreover, the effectiveness of the application could be further analyzed by incorporating additional independent variables, such as the duration of customer engagement and prior experience in utilizing similar services in other institutions.

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