

# **Development of Online Training Application Using a Learning Management System (Case Study: PT. Delta Sinergi Prima)**

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## **Abstract**

Human resources in a company are the most important assets of the company. Because it is so important, many companies need the training to improve the quality of human resources in these companies. PT. Delta Sinergi Prima (PT. DSP) is a company engaged in Management Consulting and Training. PT DSP still uses conventional services to conduct training. Therefore, it is necessary to use the LMS (Learning Management System) method. Due to the Covid-19 pandemic, many companies have suddenly stopped their business or have had to run slowly and inefficiently. Due to social distancing and the prohibition of large gatherings, many companies are switching and running their business online in the digital reforming business. The methodology used in this research begins with a literature study to see how the training process at PT DSP is carried out, followed by an interview as an analysis of system requirements by collecting information and a preliminary investigation as a formulation of the problem. Furthermore,

the results of the study of system requirements that have been carried out, collecting data from PT DSP, by including several research inputs in determining the training/training web design that will be implemented in this research. After that, the system design was continued, and the implementation of development websites training system and the results of the UI/UX design continued with the system testing phase through questionnaires and interviews to get conclusions and suggestions. Therefore, as a solution to the problems that exist in PT. Delta Sinergi Prima, an online training application, was made to simplify the training process at PT. Delta Synergy Prima. This training web application is expected to be helpful and can facilitate the online training process at PT. Delta Sinergi Prima.

## **Keywords**

Learning Management System, Development Website, Online Training, Web Training System

## **1. Introduction**

In the face of global competition in the world of digitalization, the use of technological developments is very much needed, especially in improving the quality of providing training activities facilities in honing skills in the development of electronic learning in the form of a Learning Management System (LMS) application. So many, training provider companies have to work hard during the COVID-19 pandemic in order to provide services in the form of providing training that can be accessed in various locations. this is to meet the demands of companies that require increased training services in the form of digitization so as to improve the quality of human resources in the company. According to Mathis (2002), training is a process by which people achieve certain abilities to help achieve organizational goals (Sendow and Mekel, 2015). Therefore, this process is tied to various organizational goals, training can be viewed narrowly or broadly. On a limited basis, training provides employees with specific and identifiable knowledge and skills used in their current job (Rudhaliawan and Very, 2013).

PT. Delta Sinergi Prima (PT. DSP) is a company engaged in Management Consulting and Training. In 2014 PT. DSP has started software development in a simple way. However, with the increasing demand for software development, in 2016 an independent software development business unit was added and a business unit for assessment was added. In 2019 PT. DSP already has 4 independent business units, namely consultants, training, assessment and information technology. Each business unit has several experienced and focused experts in their fields to guarantee the best results (PT Delta Sinergi Prima, 2020). Currently the implementation of training at PT. DSP is still conventional, using paper assistance, and is carried out offline, customers need to come to a place that has been provided or the company comes to a place that has been mutually agreed upon, then the training begins. Implementation of training organized by PT. DSP is still conventional, so it requires online services based on e-learning.

PT. DSP still uses conventional services to conduct training. Therefore, it is necessary to use the LMS (Learning Management System) method. LMS is a software application for online activities, electronic learning programs (e-learning programs) and training content (Wibowo et al., 2015). LMS runs in accordance with the demands and needs of the company in carrying out learning and training activities for its employees. LMS makes it easier to manage master data and lab scheduling data so that company performance is more effective and efficient in carrying out learning activities (Denita Putri, D. 2020).

Due to 2020, there is a pandemic like Covid-19. Many companies have stopped their business or business suddenly because of this pandemic. There is an appeal from the government to stay at home, wear masks to social distancing and the prohibition of gathering in large numbers has made many companies switch and run their business online in digital form (Nurhalimah, 2020).

Therefore, in solving the digitalization problem, an application was made that focuses on the process of providing an online training website so as to facilitate the training process at PT. DSP. The web training application that was built can provide all the needs of the online training process at PT. DSP and make it easier for registered participants to access training materials at PT. DSP.

### **1.1 Objectives**

The purpose of this study was to development e-learning applications using learning management system and investigate the effectiveness of using e-learning among students or employees that through delta training's website.

## 2. Literature Review

### 2.1. Development of Information Technology

Development of Information technology usually includes all forms of technology described in applications or platforms whose designation is to handle information on companies, institutions or other organizations. (Grauer, 2001). Majchrzak and Malhotra (2013) states that in the context of modern organizations, the use of information and communication technology (ICT) has a very important role in the development, maintenance, and use of innovation capabilities. (Majchrzak & Malhotra, 2013) states that in the context of modern organizations, the use of information and communication technology (ICT) has a very important role in the development, maintenance, and use of innovation capabilities. B. Means, J. Roschelle in his book *An Overview of Technology and Learning*, describes that the use of ICT is more focused on teaching, learning, and assessment. Current technological trends with the potential to transform learning practices virtually by influencing the increasing availability of opensource course content on the Internet, supported by collaborative, user-generated content and even immersive multi-user games with highly realistic dynamic graphics. This trend tends to make ICT an increasingly important factor in learning in any sector.

### 2.2. E-Learning

In the previous research, according to Soekartawi, et al. (2002), e-learning is defined as a technical term used to support learning through telephone, audio and video, teleconference, satellite transmission, and web-based training or computer instruction assistance. According to Sylviana, F, et al. (2015) in their research entitled *Website Design And Build E-Learning Elementary School Of Tahawa 1 Using php And Mysql*, where the research method focuses on the development and survey analysis using observations and interviews, which results in that student and teachers can develop the e-learning application by producing new learning media at the Elementary School Of Tahawa 1 that makes it easier for students to access subjects and obtain learning outcomes.

As for the research on the analysis and design of the e-learning system at SMA Negeri 8 Bogor conducted by Saputra (2019), using the SDLC model research method, the results obtained are that the e-learning system can help teachers in the learning and teaching process without being limited by space and space. It makes it easier for students to learn. While in Wibowo et.al (2015)'s research related to *Development of Web-Based LMS (Learning Management System) to Measure Concept Understanding and Student Character*, where the research method is carried out using questionnaires, interviews, and observations where the results obtained focus on the development of existing features that have gone well and are easily used, so that the user is accessible in the operation process, facilitates interaction and communication students, especially in teaching and learning activities. Given how vital the LMS is in the learning process, no exception in schools but also companies, especially in use in the current pandemic era, e-learning is needed. It can even make it a basic need for companies that use it, especially companies engaged in providing training services or companies that want to deliver training like giving training on improving employee skills through digitalization transformation.

### 2.3. Benefits of E-Learning

Research related to the use of e-learning conducted by Anuragini Shirish, et al. (2021) said that the support of an online learning environment that enhances student learning by offering IT tools can increase student productivity and creativity in learning. The results show that IT Attention has a significant positive relationship with productivity and creativity in learning. In addition, this relationship is mediated by the perception of techno eustress in online learning participants (students). In terms of the use of ICT in e-learning, research by Zeying Wan, et al. (2008) describes that ICT and virtual competence are two factors that play a role in influencing e-learning and have a positive influence on the impact of e-learning. In this study, a sample of 383 Chinese students participated in an online course. The results obtained can confirm the effect of virtual competence and reveal the atmosphere in which experience with ICT affects e-learning outcomes. Another positive impact of the use of this learning management system, can increase student motivation in learning. (Safiyeh RajaeHarandi, 2015).

### 3. Methods

To do this research, we used the following research methods. (Figure 1)

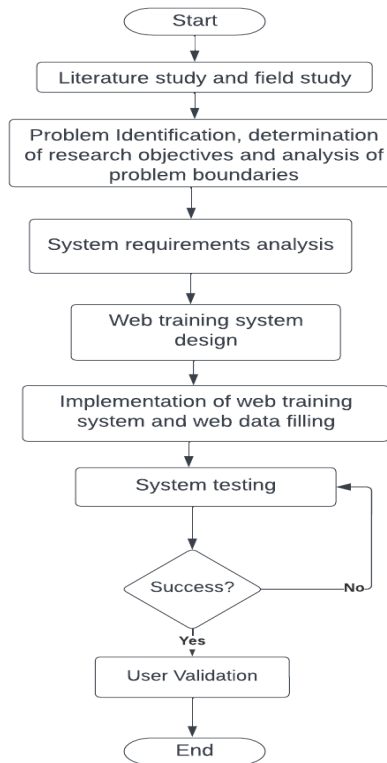


Figure 1. Research Methodology

#### 3.1 Literature Study and Field Study

Data and information collection was carried out by reading various books, papers and other reading materials as a reference that can be used as a reference in the process of discussing the problem. . In addition, the data and information needed are also obtained by visiting various related websites that provide various information relevant to the research discussion. Information - information obtained for the discussion of theoretical foundations, research methodology and used in application development.

#### 3.2 Problem Identification, determination of research objectives and analysis of problem boundaries

After all the data needed by the researcher has been collected, the researcher proceeds to identify what problems exist in PT. Delta Sinergi Prima, determines the research objectives and final results, so that researchers can determine the final results of what has been researched, and determine the problem boundaries of what has been researched.

#### 3.3 System requirements analysis

Stages of System Requirements analysis in carrying out this stage, there are four final goals as follows:

1. Knowing the current business process in completely.
2. Describe the ideal Information System for PT DSP.
3. Bringing the ideal Information System to the current condition by taking into account the existing resource constraints.
4. Provide encouragement to user confidence in the system development team.

#### 3.4 Web training system design

After processing the data, the next step is to design an information system based on the needs that have been obtained.

- a. Physical Design

The purpose of this stage is to transform business requirements which are represented as logical designs into physical designs which will later be used as a reference in making the system to be developed. If the logical design depends on various technical solutions, then the physical design represents a more specific technical solution. The physical design of the web training system describes the design of the database.

#### b. Logical Design

Is the definition of the system object from the analysis. The results of this stage are a functional description of the data and processes that exist in the new system and a detailed description of the system specifications such as input, process, and output. At this stage, there are several main activities carried out, namely as follows:

- Designing system requirements
- Designing user interfaces
- Designing system interfaces
- Designing and integrating databases
- Creating prototypes for details from the design
- Designing and integrating system designs

### **3.5 Implementation of web training system and web data filling (Online Training)**

Implementation Stage of Web Training System / Online Training. For developing the system, researchers will do the algorithm in webcode or commonly called coding implement the results of the designs that have been determined and made by the researchers. This stage is carried out so that the application can be used by users and achieve the final goal of the results of this study. At this stage, the researcher will create a website-based online training system using a framework from PHP, namely CodeIgniter and for the interface, the researcher uses bootstrap which has been explained in the theoretical basis. In the development work, they also use apache for the web server so that researchers can also run the application when making an online training system for PT Delta Sinergi Prima. At this stage, data is also filled in on the training system website, which contains the needs for training materials, and questions used in the training exam.

### **3.6 System Testing**

At this stage a trial is carried out on the coding that has been made. Where the equipment needed in this test is a laptop that has a browser installed, and the author's Virtual Host application uses WAMP, and of course the online training application itself. The testing method used is the Blackbox testing method. Blackbox testing is checked by making a test scenario to see if it fits the functional flow of the application whether it is in accordance with what is needed by the main user, namely PT DSP. The Blackbox testing is checking for errors in functionality, interface error, data structure, while writing database and the distribution of access rights and also checking error in application performance. The instrument used in obtaining survey results in the assessment of the web testing system in order to obtain information was carried out through observation, interviews and questionnaires.

### **3.7 User Validation**

The user validation process is carried out by involving several people who are asked to use the application, starting from the data input process, data recording, to the features in the application by answering a questionnaire to see the level of acceptance from users of the delta training system application.

## **4. Results and Discussion**

### **4.1 Data Collections**

The data collection process is carried out by studying literature studies, identifying problems and identifying user and system needs using analysis requirement system, where the data collection process is carried out using observation and interview the respondent.

#### **4.1.1 Observations**

Observations are made to observe activities at the client's place during training activities. At this stage, observations were made by way of researchers going directly to PT DSP to find out how the flow of business processes at PT DSP. After the researchers conducted interviews and observations at PT DSP where researchers found several problems, including:

1. Training and learning of training participants is usually done manually and comes directly to PT DSP.
2. The existence of the COVID-19 pandemic has hampered the learning and training process because the company is more concerned with health factors so that a quick adaptation is needed to changes in the situation and the company's business processes.

#### 4.1.2 Interviews

The interview procedures that the researchers did are as follows:

1. Interview questions based on the questions asked in terms of design, convenience (ease of use) and efficiency.
2. The employees interviewed were the main director of PT DSP, and the leader of the IT team.
3. Conducting interviews with 40 participants on online training applications.

### 4.2 Design System of Web training

#### 4.2.1 Use Case Diagram

Analysis of the current system is carried out with the aim of knowing the ongoing business processes. In this online training application of delta training website using the learning management system method, it needs to be developed considering that the old system that is running still has many shortcomings and has not been computerized and the implementation of the training is still offline, so it requires a lot of money, time and energy. The following is a depiction of a use case diagram that covers all online training activities at PT DSP where there are three actors who carry out activities, including: Admin, Participants, Presenters. (Figure 2)

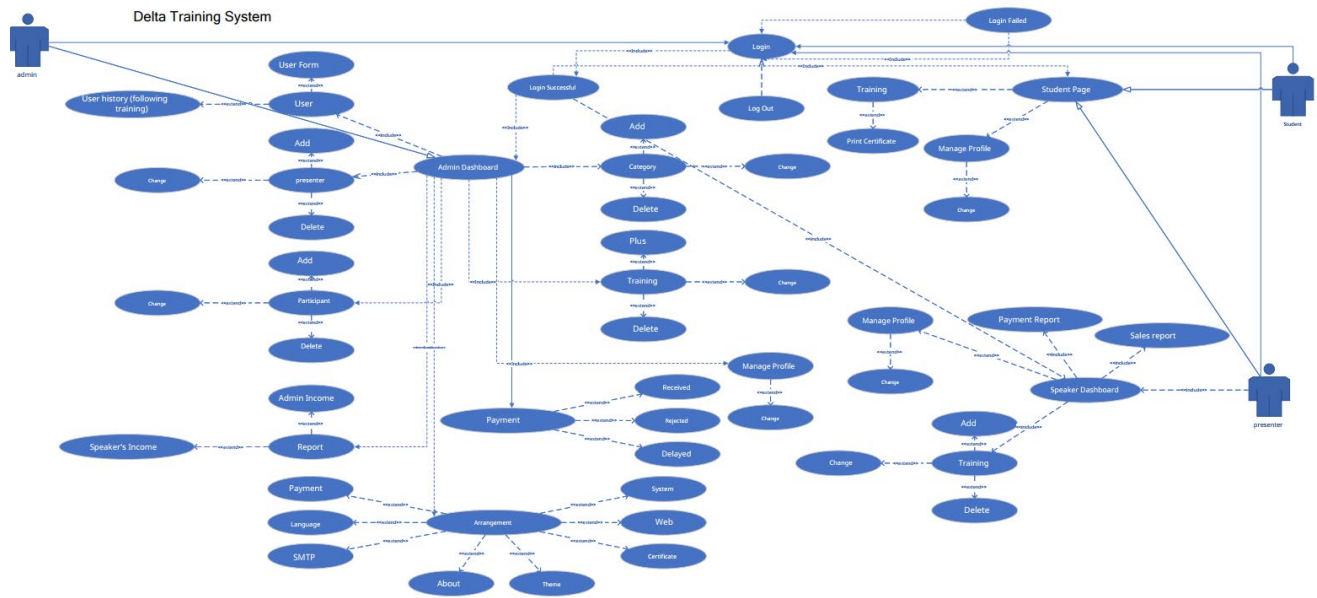


Figure 2. Use Case Diagram of Delta Training System

#### 4.2.2 Class Diagram

Class diagram describes a static structure diagram that is included in the UML (unified modeling language) which describes the structure of the system by showing the system class, its attributes, methods, and relationships between objects. This is intended in analyzing the business to create a system model in terms of a business perspective and identify the requirements for the required system database files. (Figure 3)

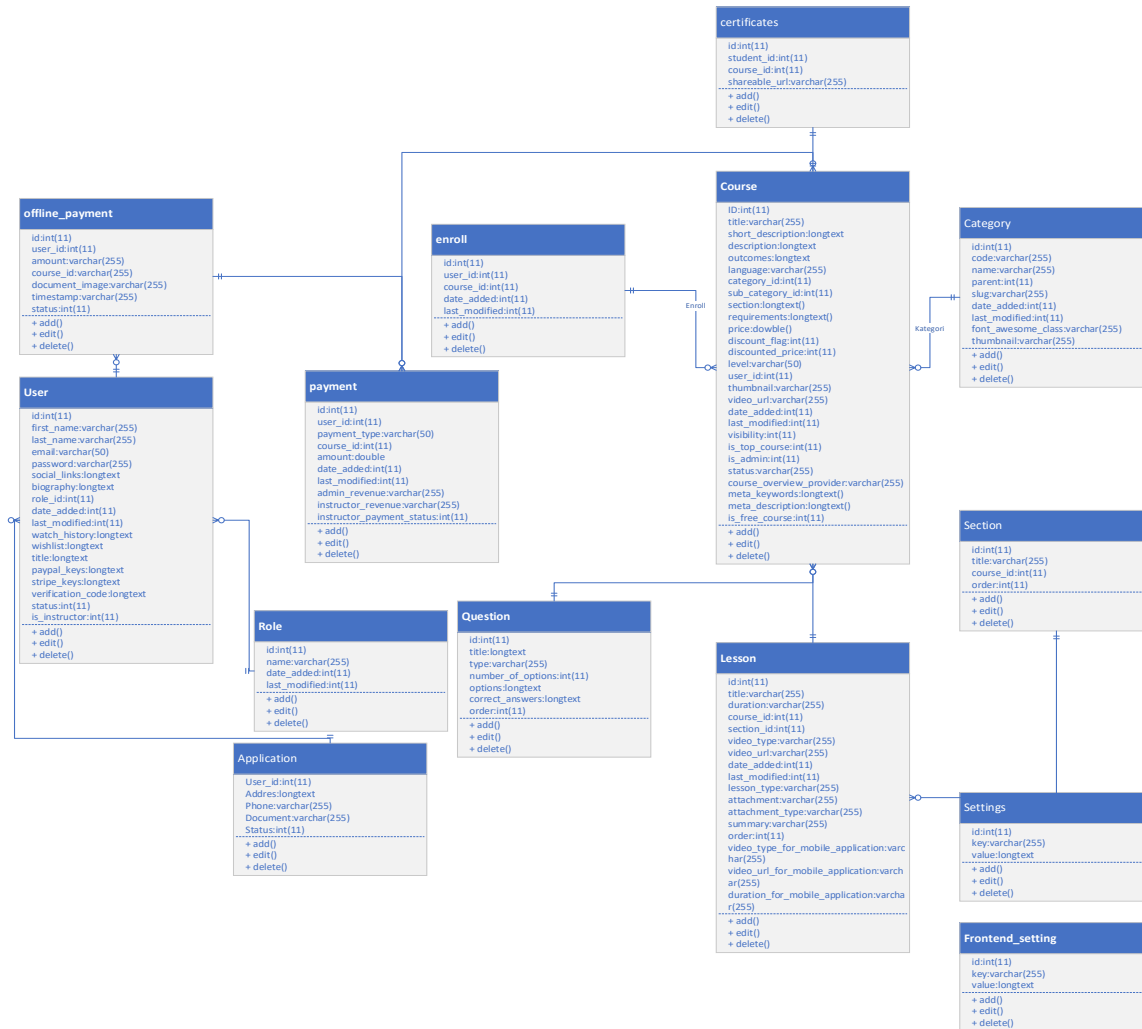


Figure 3. Class Diagram of Delta Training System

### 4.3 Implementation System of Delta Training

At the implementation stage of making a delta training website system here, where the interface created at the design stage is implemented in the form of a web page applications <http://kelasku.co.id>. The form of the web page as a result of the implementation can be presented as follows: (Figures 5, 6, 7, 8 9, 10 & 11)

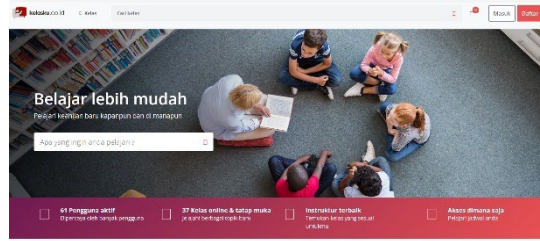


Figure 5. Main Page

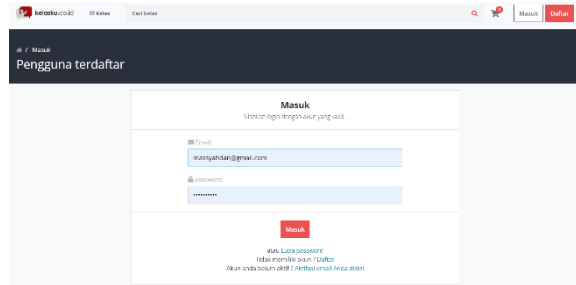


Figure 6. Login Page

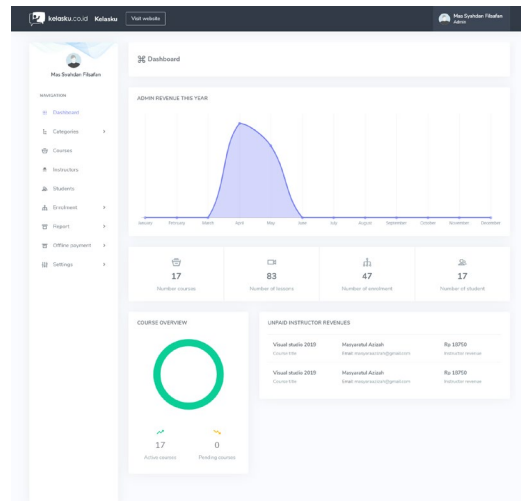


Figure 7. Dashboard Admin

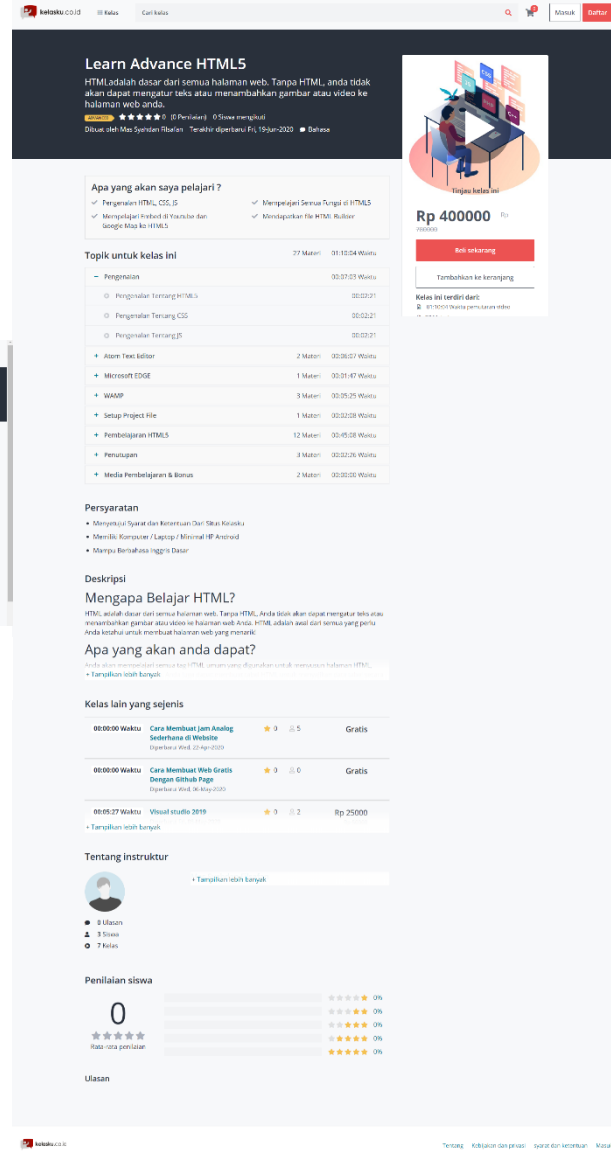


Figure 4. Menu page in one of the training classes

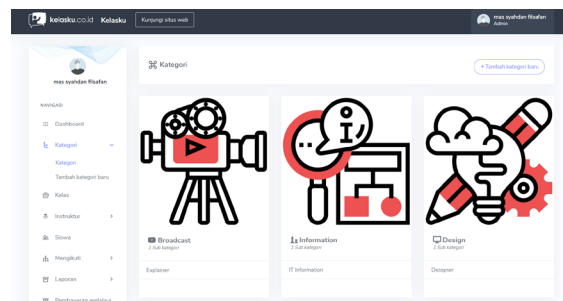


Figure 8. Category Page

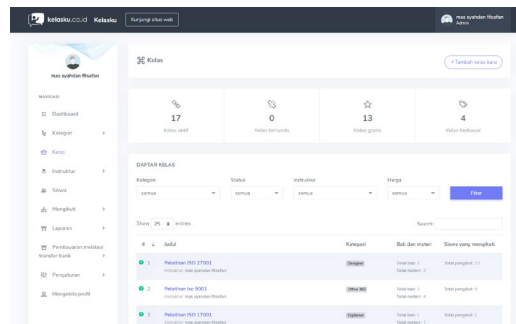


Figure 9. Training Menu Page



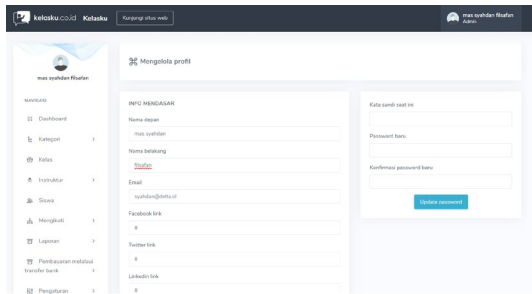


Figure 10. Profile Menu Page

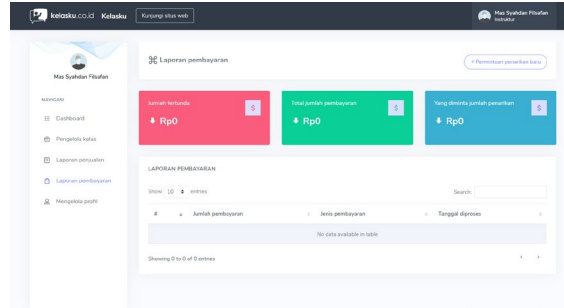


Figure 11. Payment Page

#### 4.4 System Testing

System testing is a stage that will be carried out to determine whether the system can be used. In this test using Blackbox testing. The selection of blackbox testing is used to determine whether the system that has been made is appropriate. System suitability includes how the functional requirements, inputs and outputs of the system run properly and can be used.

No	Tested features	Scenario	Expected results	Test results
1	Login	Input username and admin password (correct)	The user successfully logged in and logged in on the dashboard admin page	Successful
		Input username and admin password (incorrect)	Back to login page	Successful
2	Category data menu	Fill out the add category data form	Category data increases as entered	Successful
		Edit category data	Category data changes as per input	Successful
		Click clear category data	The selected category data is deleted	Successful
3	Training data menu	Fill out the add training data form	Training data increases as entered	Successful
		Edit training data	Training data changes as per input	Successful
		Click clear training data	The selected training data is deleted	Successful
4	Speaker data menu	Fill out the form to add speaker data	Speaker data increases as entered	Successful
		Edit speaker data	Speaker data changes according to input	Successful
		Click clear speaker data	The selected user data is deleted	Successful
5	Participant data menu	Fill out the form to add participant data	Participant data increases as entered	Successful
		Edit participant data	Participant data changes according to input	Successful
		Click clear participant data	The selected user data is deleted	Successful
6	Follower data menu	remove participants from training that has already been attended	Participant data from the training that has been participated in is deleted	Successful
		Adding participants to the training	Adding participants to take part in the training changes as entered	Successful
7	Report data menu	Filter report that appears	The filtered data appears according to the data entered	Successful

		Search for report data	The report data in search appears as entered	Successful
8	Payment data menu	Approve payment	Admin successfully approved payment	Successful
		Refuse payment	admin successfully declined payment	Successful
		Remove a payment	admin successfully deleted payment	Successful
9	Settings data menu	Change web settings, system, certificates, payments, language, smtp, theme.	data settings web, system, certificate, payment, language, smtp, theme successfully saved	Successful
10	User profile data menu	Change a user's profile	user profile data successfully inserted	Successful

#### 4.5 User Validation

User validation is carried out by distributing questionnaires to DSP employees as admins, and presenters, and the general public as participants. The questionnaire contains 10 questions that already represent the three aspects of usability namely design, convenience, and efficiency. Users fill out questionnaires that have been shared based on their experience in using online training applications. From the questionnaire data obtained, the data is then calculated as the percentage of eligibility. (Table 1)

Table 1. Variable Questionnaire of usability aspects

No	Variable	Questionnaire	Result
1	Design (appearance)	Is the appearance of this online training application learning media attractive?	Based on the test results, it can be seen that from 40 respondents stated that the appearance of the e-learning application is very attractive
		Are the menus or features of the learning media in this online training application easy to understand?	Based on the test results, it can be seen that from 40 respondents stated that the web feature menu is easy to understand
		Is the use of color in the letters with the background appropriate?	Based on the test results, it can be seen that from 40 respondents stated that the use of color is very appropriate
2	Convenience (Ease of use)	Do you think that the delivery of material using media in this online training application is easy to understand?	Based on the test results for ease of use in the first question, 40 respondents strongly agree that the media used is easy to understand
		Do you think that the learning media in this online training application can be used as a supporting tool during training?	Based on the test results for ease of use in the second question that of 40 respondents strongly agree that the learning media used strongly supports online training activities.
		Do you think that using this online training application can reduce learning difficulties during your training?	Based on the test results for ease of use in the third question that of 40 respondents strongly agree that the learning media used can reduce difficulties in learning the training material.
		Do you think that the existence of this online training application can help participants and admins, especially the ease of accessing online training materials?	Based on the test results for ease of use in the fourth question that of 40 respondents strongly agree that the learning media used is very helpful in the learning interaction process, especially in accessing material.

3	Efficient	Do you think that understanding the material is faster and more efficient by learning through online training applications (e-learning)?	Based on the test results for Completeness and Efficient that 40 respondents strongly agree that online learning media (e-learning) is more efficient.
		Do you think this online training application can increase user income?	Based on the test results for Completeness and Efficient that 40 respondents agree that online learning media (e-learning) is efficient in terms of facilitating user trainers to increase user income.
		Do you think the material provided in this e-learning is efficient in giving informative material?	Based on the test results for Completeness and Efficient that 40 respondents strongly agree that online learning media (e-learning) is efficient in providing information

User validation used as an evaluation of the online delta training system that involved 40 respondents consisting of DSP and general employees. Researchers involve the general public as respondents because they also use this application either as a speaker or as a participant. As for the user validation results of this online training system, show below: (Table 2)

Table 2. Result of User Validation

R	Question										Total Score
	1	2	3	4	5	6	7	8	9	10	
R1	4	4	4	4	4	3	3	3	3	3	35
R2	4	4	3	5	4	4	5	4	3	4	40
R3	3	4	4	4	4	4	3	3	4	5	38
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
R39	4	4	3	4	4	5	5	4	5	5	43
R40	4	4	5	5	4	4	5	5	4	5	45
Total											1732
Average											43.30
Prosentage											86%

Based on the results of the evaluation, the Online Training Application got an overall score of 1732 with an overall average of 43.30 and an overall percentage of 86% so that the online training application in all aspects of variables can be said to be very feasible for an online training application at PT. DSP

## 6. Conclusion

The results of the implementation of the online training system that have been carried out, show that the application built has met the main requirements, namely functional ease of use, usefulness, and an attractive and easy-to-understand interface. The acceptance of the system is taken from three aspects of assessment, namely design (appearance), convenience and efficiency. The test results use Black box testing, where the overall system features are in accordance with the expected results. This is because no errors were found in the system test results. Meanwhile, at the user validation stage, the user strongly agrees that the system developed is easy to use when trying and according to user needs and the application can run smoothly. This online training application is still asynchronous, so this application can only run in one direction, where the training participants cannot express their opinion if they want to ask something, they need to contact the speaker number. Recommendations that can be made in the future are that the implementation of this website is carried out by adding several complementary features such as being synchronous, so that it can be discuss problem directly with the presenters.

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## Biography

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