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Design of Web-Based Information System for the Bung Hatta University Professional Certification Institute (LSP)

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INTISARI

Sertifikasi profesi merupakan upaya memberikan pengakuan atas kompetensi yang dikuasai seseorang sesuai dengan standar kompetensi kerja yang dipersyaratkan. Lembaga Sertifikasi Profesi (LSP) Universitas Bung Hatta merupakan lembaga pelaksana kegiatan sertifikasi kompetensi yang mendapat lisensi dari Badan Nasional Sertifikasi Profesi (BNSP) untuk mensertifikasi mahasiswa dari berbagai bidang ilmu dan profesi yang ada di Universitas Bung Hatta. LSP Universitas Bung Hatta memiliki status LSP pihak kesatu lembaga pendidikan. Saat ini, proses pendaftaran sertifikasi di LSP Universitas Bung Hatta masih dilakukan secara manual, yaitu dengan mengisi beberapa formulir berupa kertas. Hal ini dirasa kurang efektif mengingat kemajuan teknologi pada saat sekarang ini. Dengan mengembangkan sistem informasi berbasis website hal tersebut dapat diatasi. Tujuan perancangan sistem informasi berbasis website ini adalah untuk menghasilkan sistem informasi yang dapat membantu proses sertifikasi dan dapat diakses oleh setiap user terkait kapan saja dan dimana saja. Sistem informasi ini dikembangkan menggunakan metode waterfall. Metode ini memiliki beberapa tahapan, yaitu tahap analisis kebutuhan, perancangan, implementasi, dan pengujian. Perancangan sistem informasi ini menggunakan pemodelan Unified Modelling Language (UML) dan diimplementasikan menggunakan framework Yii2 sebagai framework PHP dan MySQL sebagai Database Management System (DBMS). Perancangan sistem informasi ini menghasilkan Sistem Informasi LSP Universitas Bung Hatta berbasis web, yang berfokus pada proses administrasi awal.

Kata kunci: Framework Yii2, Sertifikasi Profesi, Sistem Informasi, UML, Waterfall.

ABSTRACT

Professional certification is an effort to recognize a person's competence by the required work competency standards. Bung Hatta University Professional Certification Institute (LSP) is an agency implementing competency certification activities that have received a license from the National Professional Certification Agency (BNSP) to certify students from various fields of science and professions at Bung Hatta University. Bung Hatta University LSP has the status of the first party LSP educational institutions. The registration process for certification at the Bung Hatta University LSP is still done manually by filling in several paper forms. This is considered ineffective considering the current technological advances. By developing a website-based information system, this can be overcome. The purpose of designing a website-based information system is to produce an information system that can assist the certification process and can be accessed by any relevant user anytime and anywhere. This information system was developed using the waterfall method. This method has several stages, namely the needs analysis, design, implementation, and testing stage. The design of this information system used Unified Modeling Language (UML) and implemented using the Yii2 framework as a PHP framework and MySQL as a Database Management System (DBMS). The design of this information system resulted in a web-based Information System for Bung Hatta University LSP, which focused on the initial administrative process.

Keywords: Information System, Professional Certification, UML, Waterfall, Yii2 Framework.



INTRODUCTION

Professional certification is an effort to recognize a person's competence by the required work competency standards [1]. Article 18 of Law

Number 13, the Year 2003 concerning Manpower, mandates establishing a National Professional Certification Agency (BNSP) to carry out certification [2]. Furthermore, with Government Regulation No. 23/2004, BNSP was established [3]. In carrying out its duties, BNSP can delegate to Professional Certification Institutions (LSP). Bung Hatta University LSP is an implementing agency for competency certification activities that have received a license from BNSP to certify students from various fields of science and professions at Bung Hatta University. Bung Hatta University LSP has the status of the first party LSP educational institution [1].

The certification registration process at the Bung Hatta University LSP is still carried out manually, namely by filling in several paper forms, so that the candidates must visit the Bung Hatta University LSP to register. This is considered ineffective considering the current technological advances. By developing a website-based information system, this can be overcome. Existing forms can be replaced with digital documents. Then, the data that has been inputted will also be saved directly to the database and can be recalled at any time if needed.

The information system is a collection of computer hardware and software and human devices that will process data using the hardware and software [4]. Website-based information system design aims to simplify the information system because it can be accessed online. One of the programming languages used to build websites is the PHP programming language. PHP is a serverside programming language specifically designed for web-based application development [5]. Along with the times, various PHP frameworks were developed to make it easier for programmers in the website building process. The framework is a framework, or it can also be interpreted as a collection of scripts that can help application development in handling various programming problems such as connecting to databases, calling variables and files so that developers build applications faster [6]. So, the PHP framework is a framework that helps web developers in making webs using PHP scripts.

Many PHP frameworks have been developed, including the Laravel framework, CodeIgniter framework, and Yii2 framework. Each framework has advantages and disadvantages, but both have the goal of making it easier for programmers to build websites. One of the PHP frameworks features that makes the programmer's job easier is the code generator. The Yii2 framework includes a code generator called Gii. Gii is a module provided by the Yii2 framework for generating various coding components such as models and controllers. This greatly facilitates the work of programmers in programming that has a model, view, controller (MVC) pattern. In addition to the model and controller generator, Gii also has a CRUD (Create, Read, Update, Delete) generator that makes it easy to manage data to and from the database. [7]. Therefore, the Yii2 framework is considered very suitable for developing this information system.

In information system design, database design is important. To produce good information, an information system must have a database that can manage data properly. This requires a database management software known as a Database Management System (DBMS). DBMS is software for controlling the creation, maintenance, processing, and use of large-scale data [8]. One of the most frequently used DBMS is MySQL. MySQL is the main choice for many software developers because of its advantages, namely, an easy-to-understand syntax and support for various programming languages such as C, C ++, Java, PHP, and Python [8].

METHOD

One of the software development methods is the waterfall method. The waterfall method is a sequential software development process in which progress is seen as continuously flowing downward (like a waterfall) through the phases of planning, modeling, implementation (construction), and testing [9]. In developing this information system, the waterfall method will be used [10]. The technique in question can be explained in the following figure.



Figure 1. Waterfall Method [10]

1. Needs Analysis

This stage is carried out to produce a system by user needs. The analysis carried out on this system includes analysis of the ongoing design, analysis of problems and solutions, analysis of the user (user), and analysis of the proposed approach.

1.1. Current System Analysis

The certification process at the Bung Hatta University LSP is still carried out manually, starting from the registration process to issuing certificates by BNSP standards and regulations. The following flow map can explain this process.



Figure 2. Current System Analysis Flowmap

1.2. Problems Analysis and Solutions

Problems analysis and solutions are needed to find out the current system's problems and suitable solutions to solve them. The following are the problems found and the explanations provided.

Table	ole 1. Problems Analysis and Solutions					
No	Problems	Solutions				
1	Limited information related to the implementation of certification, such as the requirements that the assessment participants must prepare	It is creating an LSP Information System that displays information related to the implementation of certification. Such as information about the certification scheme, certification requirements, competency units, competency elements, performance criteria (KUK), certification costs, and the certification schedule				
2	The registration process is still manual, so participants must go to LSP Bung Hatta to register.	The system can be accessed online so that participants can register anywhere.				
3	The storage of files related to the access data is still manual so that when the file is needed, it will be difficult to find.	Files that have been uploaded to the system will be stored in the database and will be easily retrieved when needed again.				
4	No system facilitates assessors to obtain documents related to the implementation of certification (assessment tools).	The system provides a page for downloading the assessment tool.				

1.3. User Analysis

User analysis is used to describe who is involved in the system and the activities that users can perform. The following is an analysis of the users of the Bung Hatta University LSP information system.

Fable 2	. User	Analysis

No	User	Activity			
1	Participant	 View scheme information and 			
		requirements			
		- Register			
		 Make data corrections 			
		 Conduct self-assessment 			
		- View the assessment schedule			
2	LSP Admin	 Manage assessor data 			
		 Manage the certification 			
		scheme			
		 Manage scheme requirements 			
		 Manage competency unit data 			
		 Manage competency element 			
		data			
		- Manage performance criteria			
		data (KUK)			
		 Upload assessment tools 			
		- Checking participant			
		registration files			
		- Determine the place for the			
		competency test (TUK)			
		- Determine the schedule for the			
		competency test (real			
		assessment)			
		- Determine the assessors			
3	LSP	- Approve the delegation of			
	Management	assessors			

No	User	Activity	
		- Making assessor's assignment	
		letter	
4	Assessor	- Get a letter of assignment	
		- View the real assessment	
		schedule	
		 Download the assessment tool 	
5	TUK Admin	- Checking the TUK preparation	
		- Confirming the real assessment	
		schedule	

1.4. Proposed System Analysis

The proposed system analysis is used to get an overview of the certification process on the system to be designed. The following is a flow map of the proposed approach.



Figure 3. Proposed System Analysis Flowmap

From the flow map of the proposed system, it can be seen that the proposed approach focuses on the initial administration process consisting of initial registration and self-assessment. The initial administrative process is continued until the participants obtain a realistic assessment schedule.

2. Design

The design stage is the stage where the system is designed using certain diagrams, which will describe the system as a whole. The design of this system uses Unified Modeling Language (UML) diagrams. UML is a tool for visualizing and documenting the analysis and design results, which contains syntax in modeling systems visually [11]. UML diagrams used in the design of this information system include use case diagrams and class diagrams.

2.1. Use Case Diagram

Use case diagrams are diagrams that describe the interaction between the user and the system. The following is a use case diagram of the system being designed.



Figure 4. Use Case Diagram of Bung Hatta University LSP Information System

2.2. Class Diagram

The class diagram is a diagram that describes the classes contained in the system and their relationships. The categories related to the class diagram represent the tables in the database. The

following is a class diagram of the system being designed.



Figure 5. Class Diagram of Bung Hatta University LSP Information System

3. Implementation

At the implementation stage, what was designed in the previous step is then applied using a programming language that suits the system's needs. This information system uses the Yii2 framework as the PHP framework and MySQL as the Database Management System (DBMS).

4. Testing

At this stage, the results of the implementation phase will be tested whether they are by what has been designed. The results of the testing phase can be analyzed for system development.

RESULTS AND DISCUSSION

The system design that was carried out resulted in a web-based Bung Hatta University LSP information system. Following are the results and discussion of the Bung Hatta University LSP Information System.

1. Main Page

The main page is the page that the user first accesses when accessing the system URL. This page displays menus that the user can select to get the information needed. The following is a look at the main page.



Figure 6. Home Page

2. Registration Page

The registration page is the page that appears when a user accesses the registration menu on the main page. The registration page is divided into three registration steps. After carrying out each stage, the registrant data will be forwarded to the admin for verification. If the data entered is by the requirements, the admin will send an email containing the login username and password to the email address that has been registered.

Assessment Registration				
1 – Step 1		(2) Step 2	(3) Step 3	
Step 2: Details of the certifice Personal Data	ation opplicant's data (FR.AP)	.01) Current Job Status		
Full Name		Job Status		
Identity Number (KTP/KK/Paspor)		Work Place Name		

Figure 7. Registration Page

3. Login Page

The login page is the page that the user accesses to access the system backend page. On this page, the user is asked to enter a username and password. Each user will be connected to a different backend page according to their access rights.

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Figure 8. Login Page

4. Registration Confirmation page

This page can be accessed by selecting the registration confirmation menu on the LSP Admin page. On the registration confirmation menu, there is a detail button to view the participant data. After checking the data, the LSP admin can press the confirmation button if the data entered is by the registration requirements.

Full N	ame		Mustaqim	
Place	of Birth	Padang	Padang	
Date	of Birth		Jun 6, 1996	
Req	uirement Document			
Showin	ng 1-6 from 6 items.			
No.	Nama Doksyarat	Lampiran Dok	Status	Status
1	Foto KTP/ KK/ Paspor	f7571363b2d.jpg	Meet the requirements	O Does not m
2	Foto Kartu Mahasiswa (KTM)	4f8d4402b96.png	Meet the requirements	O Does not m
3	Pasfoto (dengan latar merah)	1a111a80689.jpg	Meet the requirements	O Does not m
4	Foto Transkrip Nilai Sementara	f633e479c98.jpg	Meet the requirements	O Does not m
5	Foto Piagam PKL/ Magang/ KKN	cecbffff438.jpg	Meet the requirements	O Does not m
6	Foto Ijazah Pendidikan Terakhir	2e7bfebab84.jpg	Meet the requirements	O Does not re

Figure 9. Registration Confirmation Page

5. Assessor Delegation Page

This page can be accessed by selecting the registration confirmation menu on the LSP Admin page. This page will appear after the LSP Admin confirms the registration of the session. On this page, the LSP Admin is asked to enter a recommendation for the assessor's name, which will be forwarded to the LSP Management for confirmation.

LSP	UBH	ASSESSOR DELECATION
Û	змон	
~	REDISTRATION CONFIRMATION	Assessor Delegation
8	USER MANAGEMENT	Assessor Pecomendation Choose
▣	CERTIFICATION SCHEME	Confirm Back
E	COMPETENCY UNIT	
	COMPETENCY ELEMENT	
	PERPORMANCE CRITERIA	
۶	ASSESSMENT DOCUMENT	
Ð	тик	
\checkmark	PRIMENT CONFIRMATION	
Ċ	REAL ASSESSMENT SCHEDULE	
匪	ASSESSMENT REPORT	

Figure 10. Assessor Delegation Page

6. Assessor Delegation Confirmation Page

This page can be accessed by selecting the assessor delegation menu on the LSP Management page. In this menu, there is a button to display the assessor delegation confirmation page. On this page, the assessor recommendations that the LSP admin has inputted will appear. If the LSP Management does not agree with the assessor recommendation given by the LSP Admin, then the LSP Management can change the assessor delegation before confirming it.

LSP UBH	ASSESSOR DELEGATION CONFIRMATION
	Assessor Delegation Confirmation
ASSESSMENT REPORT	Assessor Recomendation: Ir. Yempita Efendi, M.S. (if not approved can be changed)
	Assessor Nerre P. Vergita Elendi, M.S. v Corfern - Back

Figure 11. Assessor Delegation Confirmation Page

7. Self-assessment Page

Assessment participants can access this page after the LSP Management confirms the assessor delegation. This page can be accessed by selecting the self-assessment menu of the assessment page. In this menu, there is a button to display a form of self-assessment. In this form, assessment participants are asked to measure their abilities based on the questions given. If competent, participants can mark column K (capable). Then participants are asked to upload relevant evidence related to the statements given.

Self Assessment Form (FR.APL.02) Fishery Extension	in Super	visor Occ	cupation Certification Scheme
ell'Assesment Cuide			
 Read the questions (compatency elements) provided Mark column K if you feel you are able to fulfill the performace criteria Attach relevant evidence documents to support your statement 			
Competency Unit & Formulating the State of the Fishery Area Question (Competency Element)	ĸ	вк	Relevant Evidence
Lotlict primary and accordary data. Performance Channia Lift has data calcelation method was determined according to the rules of descriptive Lift has promary and accordary data calcelation instruments were prepared in the time of quarterizations and forms. Lift Primary and secondary data calcelation instruments were prepared in the min of description statution.	0	0	Drocer File No File chosen
2. Prevents permay and secondary data. Preformace Orbits 21. The data presentation instrument was prepared in the form of tables, pictures and neutration 22. The data presentation instrument is filled in according to secondary data and primary data.		0	Choose File No file chosen Explanation

Figure 12. Self-Assessment Page

8. Self-Assessment Evaluation Page

This page can be accessed by selecting the self-assessment menu on the assessor page. This menu displays the participant's self-assessment data. In this menu, there is a button to display the self-assessment form. The assessor can see the relevant evidence that participants have uploaded. If the participant fills in K (competent) for each question given and the evidence uploaded is appropriate, the assessor can recommend it by pressing the recommended button. If not, the assessor can select the button not yet recommended.

Self Assessment Form (FR.APL.02) Fishery Extension	n Super	visor Occup	ation Certification Scheme
Decommended Not Recommended			
Question (Competency Element)	к	BK	Relevant Evidence
1 Collect primary and secondary data. Next Immuno Chemic beams of the second second second second second second second second second second second	¥.		c477291038.pdf Explanation: Sernester 2 course
2. Presents primary and secondary data. Performance Citeria: 2.1 The data presentation instrument was prepared in the form of tables, pictures and nametion 2.2.1 The data preventation instrument is filled in according to secondary data and primary data 3.2. Data preventation in schow in the form of tables or images and namation	v		dca3o90w8pdf Explanation: Semester 2 course
 Processing primary data and secondary data. Performance Criteria: S1. Primary and secondary data in the form of tables or figures are processed 			4ba52e00fcb.pdf

Figure 13. Self-Assessment Evaluation Page

9. Assessment Fee Payment Page

This page can be accessed by selecting the assessment payment menu on the participant page. A pay button will appear on this menu if the participant is recommended competent by the assessor during the self-assessment stage. If the participant presses the pay button, the assessment fee payment page will appear. On this page, participants are asked to upload proof of assessment payment.

LSP UBH		ASSESMENT FEE PAYMENT 14
٥	HOME	Assesment Fee Payment 14
	REQUIREMENT DOCUMENT	Transfer Amount: IDB 500,000 Account Number: 0846605812 On Behalf of: LSP Universitas Bung Hatta
~	SELF ASSESSMENT	Proof of Payment Choose File No file chosen
¤3 ⇔	ASSESSMENT FEE PAINENT	Confirm Back

Figure 14. Assessment Fee Payment Page

10. Assessment Fee Payment Confirmation Page

This page can be accessed by selecting the payment confirmation menu on the LSP Admin page. On this page, the admin can see proof of payment that the participant has uploaded. After confirming the assessment payment, the admin can press the confirm button.

LSP UBH		PAYMENT CONFIRMATION	
Φ	HOME	Payment Confirmation	
~	REDISTRATION CONFIRMATION	ld Pembayaran	14
E	CERTIFICATION SCHEME	ld Asesmen	65
Ē	COMPETENCY UNIT	id Asesi Id Skema Sertifikasi	8
▣	COMPETENCY ELEMENT	Status	Menunggu Konfirmasi
	PERFORMANCE CRITERIA	Proof of Payment	59f56ab319a.jpg
۲	ASSESSMENT DOCUMENT	Confirm Reject Back	
٦	тик		
~	PROMENT CONFIRMATION		



11. Real Assessment Scheduling page

This page can be accessed by selecting the assessment payment menu on the LSP Admin page. This page will appear after the LSP Admin confirms the payment of the assessment fee. The LSP admin is asked to input the TUK and recommend a schedule.

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LSP UBH	REAL ASSESSMENT SCHEDULE
Ф номе	
REDISTRATION CONFIRMATION	Real Assessment Schedule
S USER MANAGEMENT	TUK Choose
CERTIFICATION SCHEME	Assessment Date Recommendation
COMPETENCY UNIT	mm/dd/yyyy
COMPETENCY ELEMENT	
PERFORMANCE CRITERIA	Canfern Back
ASSESSMENT DOCUMENT	
E TUK	

Figure 16. Real Assessment Scheduling Page

12. Real Assessment Schedule Confirmation Page

This page can be accessed by selecting the confirmation menu for the entire assessment schedule on the TUK Admin page. On this page, the TUK Admin is asked to confirm the schedule recommended by the LSP Admin. If the suggested plan is not according to the TUK conditions, the TUK Admin can change the plan before confirming.

LSP UBH	SCHEDULE CONFIRMATION 6
D HOME	Schodulo Confirmation L6
TUK DATA	Schedule Commation 6
	Date of Assessment
REAL ASSESSMENT SCHEDULE	02/11/2021
ASSESSMENT REPORT	09:00 AM (0):00
	Confirm Back

Figure 17. Real Assessment Schedule Confirmation Page

13. Real Assessment Schedule Page

This page can be accessed by selecting the entire assessment schedule menu on the participant page. This page displays information on the whole assessment schedule that the participants will follow.

	TUK	Assessor Name	Asesi Name	Time of Assesment	Date of Assessment	sho #
isheries and Marine Sc	Faculty of Fish	lr. Yempita Efendi, M.S.	Mustagim	09:00	Feb 11, 2021	1

Figure 18. Real Assessment Schedule Page

14. Assessment Tools Page

This page can be accessed by selecting the assessment tool menu on the assessor page. On this page, assessors can download the assessment tools they need.

SP UBH	PEGANGKAT ASESMEN			
Ф нялачса	Description			
Delle Alkin	Perangkat Asesmen			
	No. Skema Sertifikasi	Kode Perangkat Asesmen	Nama Perangkat Asesmen	Lampiran Perangkat Asesmen
	1 Skema Sertifikasi Okupasi Ahli Muda K3	FR.MAPA.01	Merencanakan Aktivitas dan Proses Asesmen	2d76c223075.doc
JADWAL REAL ADESMEN	2 Skema Sertifikasi Okupasi Ahli Muda K3	FRJA.02	Tugas Praktik Demonstrasi	o4610157723.doc
LAPORAN	3 Skema Sertifikasi Okupasi Ahli Muda K3	FRIA.06	Pertanyaan Tertulis Esai	416/0d3c2e1.doc
	4 Skema Sertifikasi Okupasi Ahli Muda K3	FRIA.06.A	Jawaban Tertulis Esai	540bacba700.doc
	5 Skema Sertifikasi Okupasi Ahli Muda K3	FRAK02	Formuliz Rekaman Asesmen Kompetensi	Of7of2f77oc.docx
	6 Skema Sertifikasi Okupasi Ahli Muda K3	FRAKOS	Laporan Asesmen	lef50fe0937/docx
	7 Skema Settifikasi Okupasi Konsultan Manajemen SDM BOM	FR.MADA.01	Merencanakan Aktivitas dan Proses Asesmen	Stalf4434a6.docx
	8 Skema Sertifikasi Okupasi Konsultan Manajemen SDM IKM	FRIA.01	Celdis Observasil Aktivitas di Tempat Kerja atau Tempat Kerja Simulasi	224/8a83cht.docx
	9 Skema Sertifikasi Okupasi Konsultan	FRIA.02	Tugas Praktik Demonstrasi	0d88cd0e6dLdocx

Figure 19. Assessment Tool Page

15. Assessment Report Page

This page can be accessed by selecting the report menu on the assessor page. On this page, assessors are asked to input assessors' recommendations, and upload completed assessment report files.

LSP	UBH	ASSES	IMENT REPORT				
17 (9)	HOME AGOS DATA	As	sessment	Report			
8	SELF ASSESSMENT	Sho #	Date of Assessment	Asesi Name	Certification Scheme	Assessor Name	Ass
8	REAL ASSESSMENT SCHEDULE	1	11-02-2021	Mustaqim	Fishery Extension Supervisor Occupation Certification Scheme	Ir. Vempita Efendi, M.S.	
۵	ASSESSMENT REPORT						

Figure 20. Assessment Report Page

16. Assessment Report Recap Page

This page can be accessed by selecting the report menu on the TUK Admin page. This page displays a recap of the report data that the assessor has inputted. Admin can filter data based on the assessment schedule.

SP UBH					
🗇 номе	A	Demont			
TUK DATA	Assessment	Report			
Schedule configmation	From mm/dd/yyyy		mm/ddl/yyyy		
REAL ASSESSMENT SCHEDULE	Fitter Print 1	heset			
ASSESSMENT REPORT	Showing 1-3 from 3 items.	_			
	# Assessment Schedule	Asesi Name	Certification Scheme	Assessor	Assessor Recomm
	1 08-02-2021	Afiful Azkia	K3 Young Expert Occupation Certification Scheme	Ir. Yempita Efendi, M.S.	Kompeten
	2 09-02-2021	Afiful Az	Fishery Extension Supervisor Occupation Certification Scheme	Ir. Yempita Efendi, M.S.	Kompeten
	3 10-02-2021	Afiful	Fishery Extension Supervisor Occupation Certification Scheme	Ir. Yempita Efendi, M.S.	Kompeten

Figure 21. Assessment Report Recap Page

CONCLUSION

The conclusions obtained from the design results of the Bung Hatta University LSP Information System are as follows.

1. The Bung Hatta University LSP Information System is implemented using the Yii2 framework.

2. The Bung Hatta University LSP Information System focuses on the initial administrative process.

3. The Bung Hatta University LSP Information System can store assessment data in a more structured manner.

4. The Bung Hatta University LSP Information System makes it easier for assessors to obtain assessment tools.

SUGGESTION

The Bung Hatta University LSP Information System, which was designed, still focuses on the initial administrative process, so many assessment processes are still being carried out manually. It is hoped that the Bung Hatta University LSP Information System can be further developed to cover the entire assessment process, from the registration process to the certificate management process.

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