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# Design and implementation of web-based internship information system at vocational school

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**Abstract.** Information technology has been used as a means of communication in vocational schools but its optimal utilization in internship programs is still low. This study aims to design web-based internship information system. The method used to collect quantitative data in this study is the Design Science Research Methods (DSRM), namely research that produces products and services information systems. The research flow starts from requirement analysis, design, implementation and system testing. The system is built using interactive website technology based on four major components namely students, supervisors, industry and coordinators. The web-based internship system contains information features, schedules, signups, daily journals, portfolio reports, final reports, database backup and guidance systems. PHP, Bootstrap, CSS, HTML, JavaScript, MySQL database and Apache web server is a technology used to develop web-based internship information system. The results show that the resulting system can be used as support for the internship program for all parties involved. This system can facilitate students, supervisors and coordinators in the implementation of internship programs.

## 1. Introduction

The difference between competence and education is available in vocational schools and industry requirements during the learning period. One reference is the industry-processed school standard. Differences in school and industry environments as facilitators of learning activities at work are highlighted to be more empowered and supportive of students during internship activities [1]. Environmental equations are indispensable for students to improve their ability to work in industry. The internship program not only enhances the relationship between school and workplace, but also enhances the skills of working together in the workplace environment [2].

The most common problems are work and placement lessons during internships, difficult to find workplaces, no information and adequate consultation, as well as students who work outside the job field [3]. Some students choose where internship programs are less appropriate to their field. Students often find it difficult to find and determine practices related to internship behavior. The problem of place of internship can be bad for students when in internship program.

In the era of the use of global networks such as the use of information systems, binary arithmetic, computer programs, programming languages, text and table processing, database, visualization software, image processing, audio, video, e-mail services, web communications worldwide specific and



very commonly used [4]. The ease of disseminating information through information systems and the internet has resulted in new experiences in education [5]. The development of education through information systems enables the transition of educational data processing into a better model.

Web-based internship information system can produce information as school evaluation data in monitoring student progress. Students also agree on the use of online-based journals as a review of their learning during the internship.

The presence and dependability of web applications usage is essential to ensure the quality, security, and accuracy of web applications. Testing is a widely used technique for validating web applications [7]. Web applications refer to applications that are accessed through a web browser on a computer network and are developed using a programming language (such as: HTML, JavaScript, PHP) [8].

## 2. Experimental Method

### 2.1. Research Method

The method to be used in this research is Design Science Research Method (DSRM), DSRM is a research method that produces information system products and services [9]. Based on the steps of DSRM method, this research is made in the stages as can be seen in the following diagram:



**Figure 1.** Research Stages

The first stage is the requirements analysis that is problem identification, software function analysis, software interface design, software and hardware requirements to be able to develop and run the information system to form the website. At this stage requirements analysis is expected all the needs of the software development process can be planned. Methods of data collection in this research by conducting literature studies and questionnaires.

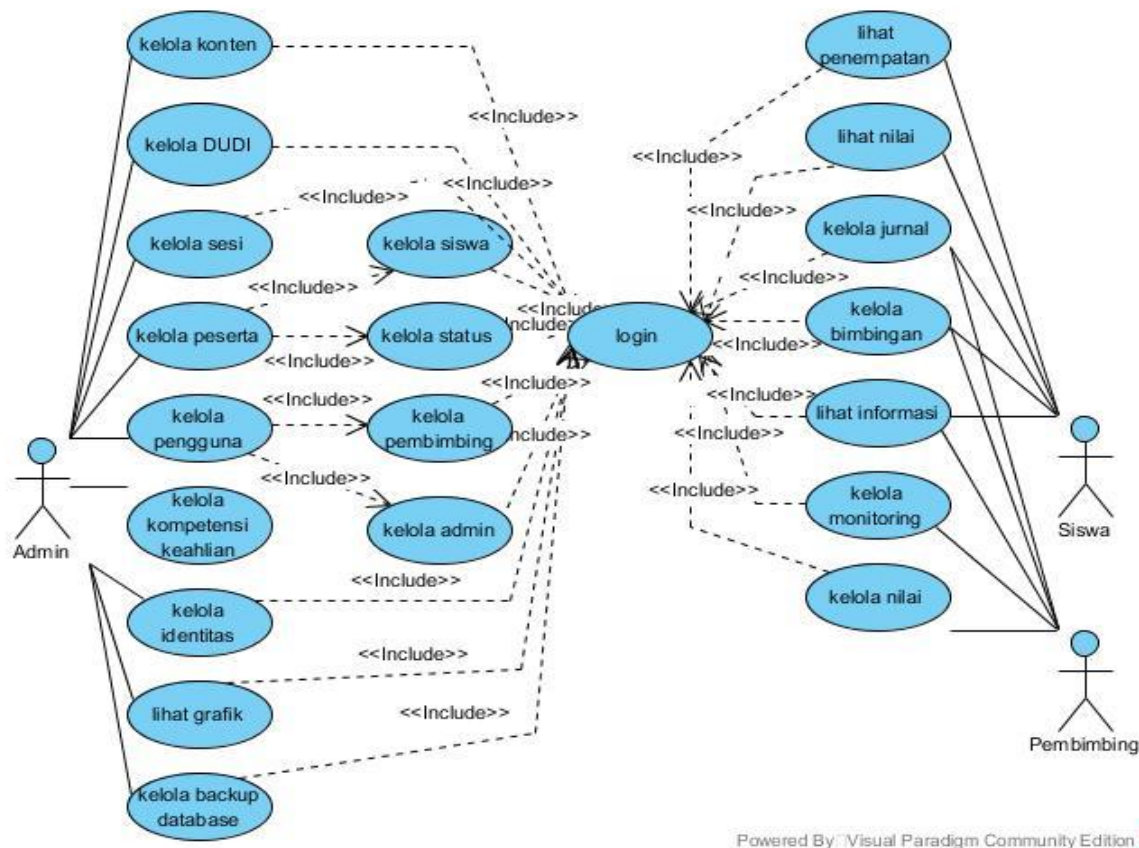
The second stage is the design of the system includes the design of UML (Unified Modeling Language) is to describe the work process of software consisting of four diagrams, namely Use Case Diagram (UCD), Class Diagrams, Activity Diagrams and Sequence Diagrams. Database design provides an overview of the data dictionary used, as well as user interface design to provide system display patterns to be developed.

The third stage is the implementation begins with the translation of the design using programming language code and system configuration for the program to run properly. The system created is a website-based system. The system is implemented using PHP Native programming language. The interface uses Bootstrap and CSS templates.

The fourth stage is testing to minimize errors that occur and test the quality of information systems that have been made. System testing consists of testing system functions. System function testing is done using Blackbox method.

### 2.2. System Design

UCD is a pattern of interaction between users (actors) or more actors with created systems. UCD is used to find out what functions can be performed by actors in information systems. In Figure 2 it can be seen that the system has three users (actors), namely: coordinator (admin), supervisor (pembimbing), and student / participant (siswa).

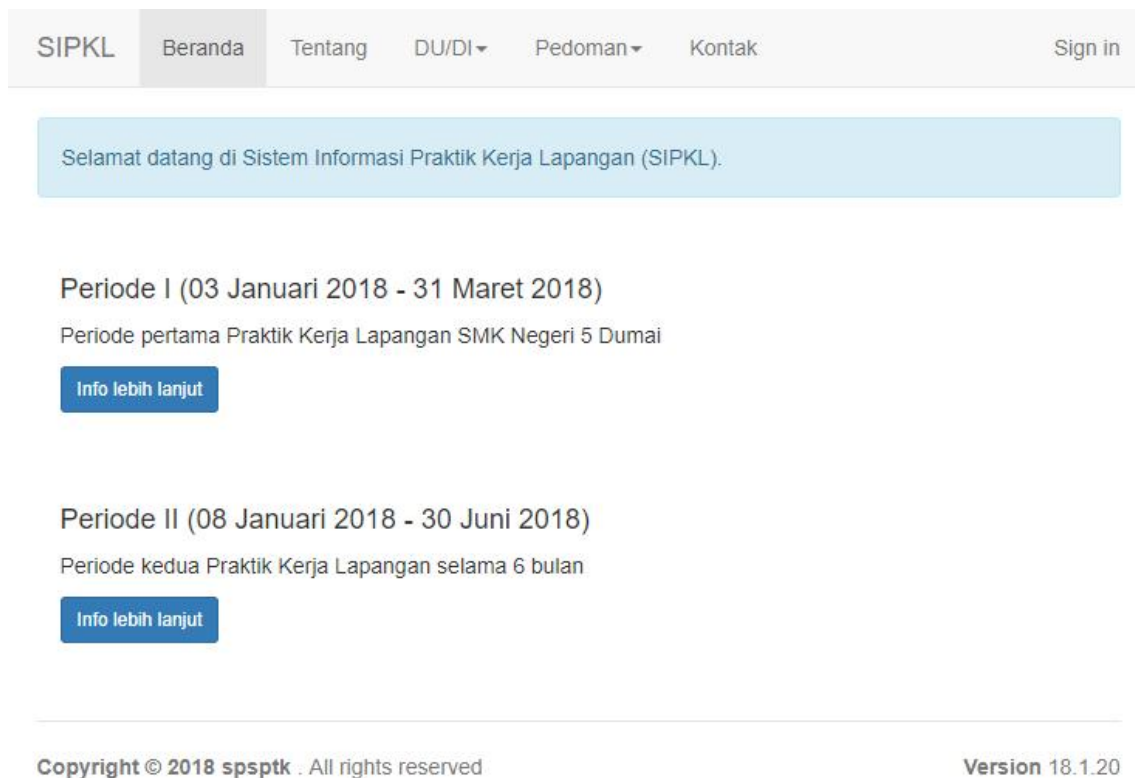


**Figure 2.** Use Case Diagram

The functions that administrators can manage are website content, industry data, session data, participant data, user data (supervisors and administrators), managing competencies, managing identities, viewing charts, and managing database backup by logging in first. Teachers in systems called supervisors have functions that can manage journals, manage guidance, manage monitoring, manage values and view information about internships by logging in first. Students or participants who perform internships have functions that fill daily journals, view guides, view placement status, view information and see internship assessment by logging in first.

### 2.3. System Implementation

Implementation of web-based internship information system function consists of interface implementation using bootstrap template that is Jumbotron-narrow for student page. For admin and supervisor pages use AdminLTE templates. Implementation of web-based internship information system can be seen at <http://www.smkn5dumai.sch.id/sipkl>. Figure 3 below is the result of a system interface implementation:



**Figure 3.** Home Page Interface

In the login page view consists of username, password, sign in button and forgot password. The login page is accessible to the user by selecting the sign in menu at the top right corner of the system main page. Users must enter their login account by pressing the login button. The system user will be redirected to the main page (dashboard) if the account is valid. Login will be redirected according to permission of each account. Figure 4 below shows the results of the login page implementation:



**Figure 4.** Login Interface

The participants menu consists of several sub menus including status menu, confirmation, journal, guidance, assessment and change the student profile. In the status menu containing the status of the participants is a new registrar, waiting, valid and cancel. Registered participants can confirm placements and supervisors. Figure 5 below shows the results of the student page implementation:

SIPKL
Beranda
Menu Peserta ▾
Tentang
DU/DI ▾
Pedoman ▾
Kontak
Sign out

Status peserta dapat dilihat pada kolom status yang terdiri atas **Baru**, **Menunggu**, **Valid** dan **Dibatalkan**. Kartu peserta PKL dapat dicetak setelah status keikutsertaan dinyatakan **Valid**. Hubungi pengelola PKL jika status Anda dinyatakan **Dibatalkan**.

### Status Peserta

No. #	No. Registrasi	Tgl Registrasi	Sesi PKL	Nama Peserta	Nama DU/DI	Pembimbing	Status
1	2018040016	12 April 2018	Periode I	Syahdan	PT. Pekan Perkasa Berlian Motor	Anggun Saputra, S.Pd	<div style="background-color: #007bff; color: white; padding: 5px 10px; border-radius: 3px;">Cetak Kartu</div>

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Version 18.1.20

**Figure 5.** Student Interface

The admin page serves as the page that manages all the information available on the internship information system. The admin page displays a menu in the form of a dashboard so that the admin can manage information quickly such as the participant registration status, ongoing sessions, number of supervisors and the number of active industries. The administrator menu consists of nine menus located on the left side of the menu, company content, internship sessions, participants, monitoring, settings (users, expertise competencies, and identity cards). The implementation of the administrator page or the internship information system coordinator page is shown in Figure 6 below:

Sistem Informasi PKL
Humas SMK

Humas SMK Admin

NAVIGASI UTAMA

- Dashboard
- Konten
- Perusahaan/Industri
- Sesi PKL
- Peserta
- Monitoring
- Pengaturan
- Gratifikasi
- Utilities

### Dashboard Control panel

**Perhatian!**

Selamat datang di halaman Control Panel. Mohon gunakan fitur yang terdapat di halaman ini dengan sebaik baiknya.

0

Jumlah Status Pendaftaran (Baru)

0

Jumlah Status Pendaftaran (Menunggu)

37

Jumlah Status Peserta PKL (Valid)

0

Jumlah Status Pendaftaran (Batal)

37

Total Registrasi Peserta

2

Jumlah Sesi (Aktif)

9

Jumlah Pembimbing (Aktif)

35

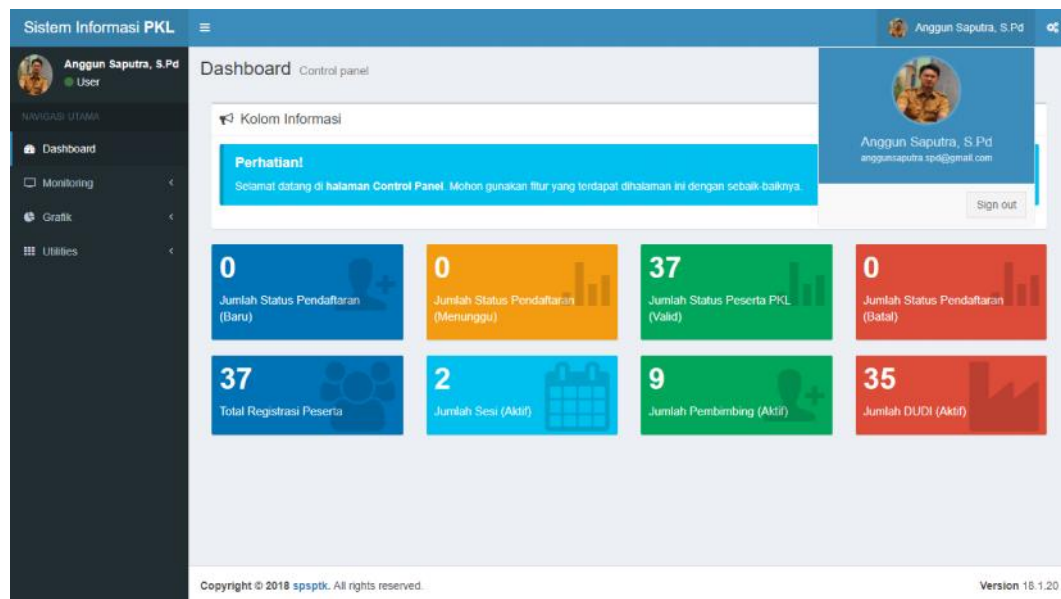
Jumlah DU/DI (Aktif)

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Version 18.1.20

**Figure 6.** Administrator Interface

Teachers who have an account as a supervisor may enter the monitoring page according to their rights access. The main function on the supervisory page is that teachers can monitor student guidance through information systems. Implementation of the internship information system monitoring page is shown in Figure 7 below:



**Figure 7.** Supervisor Interface

### 3. Results and Discussion

Blackbox testing method is used to check and evaluate the function of the system that has been created. Blackbox testing is done by information system practitioners. Information system practitioners consist of 2 operators and 1 teacher. Table 1 below shows test results by blackbox test methods on internship information systems in vocational schools.

**Table 1.** System Functionality Testing Results

No.	Function	Result	
		Success	Fail
1.	Navigation without any broken link	3	0
2.	View internship information	3	0
3.	View industry	3	0
4.	View internship guidelines	3	0
5.	Logging into system	3	0
6.	Logout from system	3	0
7.	View list of internship information	3	0
8.	Add internship information	3	0
9.	Edit internship information	3	0
10.	Delete internship information	3	0
11.	View list of participants	3	0
12.	Add participant data	3	0
13.	Edit participant data	3	0
14.	Delete participant data	3	0
15.	View list of supervisors	3	0
16.	Add supervisors data	3	0
17.	Edit supervisors data	3	0
18.	Delete supervisors data	3	0
19.	Edit Administrator data	3	0
20.	View list of industry	3	0
21.	Add industry data	3	0
22.	Edit industry data	3	0

Table 1. Cont.

23.	Delete industry data	3	0
24.	View list of placement participants	3	0
25.	Accept data of placement participants	3	0
26.	Reject data of placement participants	3	0
27.	Add data of placement participants	3	0
28.	Edit data of placement participants	3	0
29.	Delete data of placement participants	3	0
30.	View list of participants assessment	3	0
31.	Add data of participants assessment	3	0
32.	Edit data of participants assessment	3	0
33.	Delete data of participants assessment	3	0
34.	View monitoring data	3	0
35.	View supervisors data	3	0
36.	View the list of guidance and journal participants	3	0
37.	View guidance and journal lists	3	0
38.	Add guidance and journal data	3	0
39.	Add journal comments and approvals	3	0
40.	Delete guidance and journal data	3	0
41.	View the list of student grades	3	0
42.	Edit student grades data	3	0
43.	View participants profile	3	0
44.	Edit participant profile	3	0
45.	Sign up for new internship place	3	0
46.	View internship participants place	3	0
47.	Print internship ID card	3	0
48.	View list of guidance	3	0
49.	Add guidance data	3	0
50.	Add guidance comment	3	0
51.	View list of journal	3	0
52.	Add journal	3	0
53.	View students mark	3	0
54.	Print student grade data	3	0
55.	View internship guidelines	3	0
<b>TOTAL</b>		<b>165</b>	<b>0</b>

The test results using a questionnaire in the form of a checklist that contains the functions created. Based on the test results in Table 1 it can be seen that the percentage for each assessment is as follows:

$$\begin{array}{lll}
 \text{Success} & = (165/165) \times 100\% & = 100\% \\
 \text{Fail} & = (0/165) \times 100\% & = 0\%
 \end{array}$$

Based on the results of testing on the aspects of functionality in Table 1 can be seen that 55 functions that exist on web-based internship information system has a success rate of 100% and 0% failure rate. The test scale used for data retrieval is Guttman scale with "yes or success" answer by getting 1 point and answer "no or fail" by getting 0 points. Table 2 below is a summary of the functional aspects test results.



**Table 2.** Functionality Aspect Testing Results

Tester	Occupation	Gender	Ages	Function Total	Success	Fail
Tester 1	Operator	Male	39	55	55	0
Tester 2	Operator	Male	36	55	55	0
Tester 3	Teacher	Female	36	55	55	0
<b>Total</b>				<b>165</b>	<b>165</b>	<b>0</b>

Based on the results in Table 2 shows a web-based internship information system in a vocational school suitable for managing internship programs.

#### 4. Conclusions

Based on the results of testing this system can run as planned and meet the procedure as an information system that can be used to facilitate the process of guidance apprenticeship programs between students, teachers and coordinators. This system can solve some of the problems that typically occur in internal data management such as: industry management, apprenticeship sessions, expertise competencies, users, students, supervisors, registration, placement, guidance, daily journals, assessments, information graphs and damage or loss of reports.

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