

Feasibility Study of Web-Based Internship's Information System Based on ISO 1926 Standard

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Abstract:

At this globalization era, unlimited accessible information across the overseas, increasing competition for getting a job. This condition affected a university student to enhance their skills to keep competitive. One method to improve is conducting an internship program (PI) at industrial companies. Thus, to implement and monitor the program, Informatics and Computer Engineering for Education Department (PTIK) at Universitas Sebelas Maret was used a web-based information system. This research aims to conduct and analyze a feasibility study of PI information system built for PTIK based on ISO 9126 standard. The research has two phases, the first is developing the system using waterfall method, and the second is feasibility study based on five characteristics of ISO 9126 standard which is: (1) functionality, (2) reliability, (3) usability, (4) maintainability, and (5) portability. Eighteen PI information system examiners are involved. Those reviewers divided into three categories: system's expert, substance's expert, and the end user of the PI information system. Examining result shows that the average number of all categories is 85.5%. It means that PI information system considered as very feasible to implement and use.

Keywords: feasibility study, information system, web-based, internship, iso 1926.

Introduction

In the academic's environment, a student is encouraged to obtain knowledge both theory and practice capability or skill. Thus, to facilitate and improve student's practice ability, it is necessary to hold an Internship's Program (PI) as organizing education expertise and vocational intention. PI is conducted with creating a cooperation relationship with an industrial performer. PTIK will facilitate and communicate between the company and the student. In order to monitor and help all the stakeholder during the PI process then PTIK develop a new information system, PI Information System (PIIS).

Based on the result of requirement gathering to all the PIIS stakeholder, we design and built PIIS with several main features. The main features of PIIS are: Internship's submission, internship's report title submission, seminar schedule submission. Those three features require verification process from the PI coordinator. This verification process required for the monitoring function of PI.

Along with PI progress, PIIS needs some process-business such as PI report upload feature and testimony feature. PI report feature is necessary to archive and study resources for PTIK. Meanwhile, testimony feature is necessary to organizing internship's practice testimony from students recommendation. So that student problem when during the internship's could be handled and recorded for future. Testimony also useful for a recommendation for a new student who wants take PI.

This research is a feasibility study of PIIS with all its features before implemented at PTIK, Teacher Training and Education Faculty of Universitas Sebelas Maret, based on five characteristics of ISO 9126 standard.

This article divided into six sections which are: 1) introduction. 2) literature review that contains about a large of research related. 3) methodology explain the methodology of internship's information system development. worthiness testing, participant test, and instrument test. 4) results and discussion contain research results and testing results that 3 participant test category did. 5) conclusion showing the conclusion of this research. 6) future works contain a recommendation for potential further study.

Review on Related Study

There is some research that focuses on developing internship's information system. Table 1 shows the research which relevant with this study.

Table 1. Some research related

Author	Field of Study	Study Result
Puji Wahyu Ningsih, et al. (2012)	The Design of Web- Based Internship's Practice at Industrial Companies Information System (Case Study: Menganti Gresik Al-Azhar Vocational High School)	The system built can process and provide information about Field Industrial Practice to students, the school and companies that work together. Also, this system can display assessment of field industrial practice results for the school in monitoring the development of learners during the implementation of field industrial practice program.
Siwi Dwi Martanti, et al. (2012)	The Design of Internship's Practice and Thesis Information System (Case Study: STMIK of Semarang province)	The Information System ease academic administration division to handling data searching that related with internship's practice, proposal test and final test schedule arrangement process easier and faster. Because the process can be handled anywhere and anytime as long as internet connection is available, also ease archives documentation related to the final

paper, proposal test enrollment and trial session.

Methodology

Research Method

To build the PIIS, we use waterfall method. This method suggests a systematic and sequential approach to software development, begin with requirements process and continue with design, coding process, testing and the last is integrating with the existing system (Pressman, 2010). We can see the process at Fig. 1.

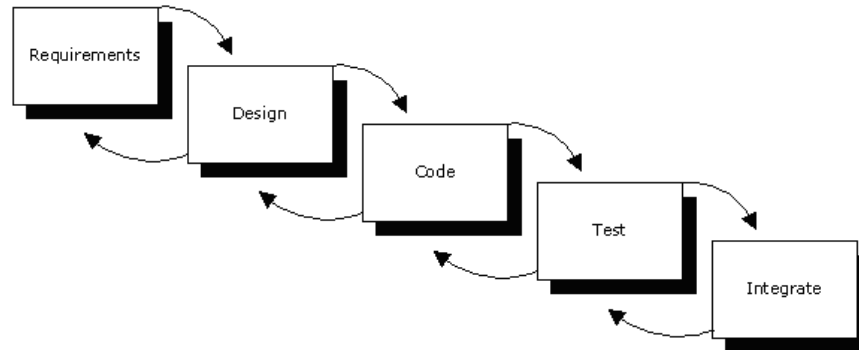


Figure 1. Waterfall Model Research and Development

Table 2. Waterfall Model’s phases and results

Phase	Result
Requirements	Internship’s files, functional requirement, hardware and software requirement
Design	use case diagram design, activity diagram design, sequence diagram design, class diagram design, table and its relation and user interface design.
Code	Codeigniter framework modul description and user interface description
Test	Qualification testing results, participant test and instrument
Integrate	Recovering failure

Qualification Testing

Qualification testing of internship’s information system using system quality testing refers to ISO 9126 standard that is functionality, reliability, usability, maintainability, and portability. The characteristics of ISO 9126 defined to apply to every kind of software, including computer programs and data contained in firmware and provided a consistent terminology for software product quality (Behkamal, Kahani & Akbari, 2009).

Participant Testing

This research did in 2 phases of testing. The first phase did by system and substance expert. The second phase did by the system user, which is an administrator and 15 students that have been done with PI.

Testing Instrument

The testing instrument used for observing the PIIS system encompasses five from six of ISO 9126 standard characteristics. The fifth characteristics are: functionality, reliability, usability, maintainability, and portability. Tables 3.4 and 5 show the selected ISO characteristics and indicators for each of the characteristics and questions that represent each indicator.

Table 3. Test instrument for system expert

ISO 9126 Characteristics	Indicators	Questions
Functionality	A. The accuracy of selection app/software/tool types for development	<ol style="list-style-type: none"> 1. The use of web-based internship's information system is appropriate for internship's information system. 2. Web-based internship's information system fulfill the requirement based on Information Technology and Computer Education standard. 3. Codeigniter Framework usage as a programming language is appropriate for system development. 4. Etc.
Realibility, Usability	B. Ease of Access	<ol style="list-style-type: none"> 1. No error occurred on internship's information system operation. 2. Internship's information system be able to operate well while accessed on certain time. 3. Internship's information system features easy to operate and can be controlled. 4. Etc
Functionality	C. Process and Data Flow	<ol style="list-style-type: none"> 1. The presentation of data is appropriate for real data on database. 2. Navigation grouping based on standard is appropriate. 3. Verification feature on Internship's submission, internship's report title submission and internship's seminar schedule submission required for monitoring. 4. Etc.
Portability	D. Program View	<ol style="list-style-type: none"> 1. The design of internship's information system is simple. 2. Interface design is interactive. 3. The use of color is not mess up the views of internship's information system. 4. Etc.
Portability	E. Program Compatibilitiy	<ol style="list-style-type: none"> 1. Internship's information system can provide good views of various browsers. 2. Internship's information system can be accessed from various screen resolution.
Maintainability	F. Program Sustainability	<ol style="list-style-type: none"> 1. Internship's information system can be further modified by the user's requirement. 2. Internship's information system can be developed.

Table 4. Test instrument for substantive expert

ISO 9126 Characteristics	Indicators	Questions
Functionality	A. System sustainability	<ol style="list-style-type: none"> 1. The modification of system plot does not mess up the system functionally. 2. The requirement of old system already fulfilled by the new system. 3. The plot of new system simplifies internship's process.
Realibility	B. Completeness of data	<ol style="list-style-type: none"> 1. The presentation of data is appropriate with the specified information system operation. 2. The resulting data is precise and accurate. 3. The result of data has fulfilled user requirements on internship process. 4. Etc.
Usability	C. Ease of data collection	<ol style="list-style-type: none"> 1. Input feature on Konfigurasi Aplikasi menu is easy to use. 2. Industryverification feature facilitates the monitoring process. 3. The Output from Verifikasi Industri sub menu is easy to use.

Table 5. Test instrument for Administrator

ISO 9126 Characteristics	Indicators	Questions
Functionality	A. System sustainability	<ol style="list-style-type: none"> 1. The presentation of data already appropriate with internship's procedure. 2. The plot of internship's report title submission on new system already appropriate with internship's procedure. 3. The plot of internship's seminar schedule submission on new system already appropriate with internship's procedure.
Usability	B. Ease of Access	<ol style="list-style-type: none"> 1. Internship's information system features easy to operate and can be controlled. 2. Left sidebar menu placement is right. 3. Navigation button is easy to use. 4. Etc.
Realibility, Usability	C. Ease of data collection	<ol style="list-style-type: none"> 1. Input feature on Pengumuman sub menu is easy to use. 2. Edit feature on Pengumuman sub menu is easy to use. 3. Delete feature on Pengumuman sub menu is easy to use. 4. Etc.
Portability	D. Program View	<ol style="list-style-type: none"> 1. Interface design is interactive. 2. The design of internship's information system is simple. 3. The use of color is not mess up the views of internship's information system.

Table 6. Test instrument for student

ISO 9126 Characteristics	Indicators	Questions
Functionality	A. System sustainability	<ol style="list-style-type: none"> 1. The plot of Internship's submission on new system already appropriate with internship's procedure. 2. The plot of internship's report title submission on new system already appropriate with internship's procedure. 3. The plot of internship's seminar schedule submission on new system already appropriate with internship's procedure.
Usability	B. Ease of Access	<ol style="list-style-type: none"> 1. Internship's information system features easy to operate and can be controlled. 2. Left sidebar menu placement is right. 3. Navigation button is easy to use.
Realibility, Usability	C. Ease of data collection	<ol style="list-style-type: none"> 1. Input feature on Biodata menu is easy to use. 2. Output from Biodata menu is easy to use. 3. Input feature on Daftar Anggota menu is easy to use. 4. Etc.
Portability	D. Program View	<ol style="list-style-type: none"> 1. Interface design is interactive. 2. The design of internship's information system is simple. 3. The use of color is not mess up the views of internship's information system.

Score determination on this instrument using a Likert scale. Likert scale is necessary to measure of attitude, opinion, and perception of someone or a group of people about the social phenomenon (Sugiyono, 2014: 93). Likert scale answer on this instrument can be described as follow: 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree and 1 for strongly disagree. The formula for score counting is:

$$Percentage (\%) = \frac{F}{B} \times 100$$

where,

F = Result of assessment

B = Total number of assessments

Table 7. shows the criteria of worthiness assessment that has been changed from the result of the assessment.

Table 7. Percentage of information system worthiness criteria (Source: Riduwan, 2013)

Criteria of Worthiness	Percentage
Very Feasible	81 – 100
Feasible	61 – 80
Less Feasible	41 – 60
Unfeasible	21 – 40
Very Unfeasible	0 – 20

Result and Discussion

Research Result

PIIS that has been developed with the stages of the Waterfall model and tested by system experts, substance experts and users using test instruments. The test was carried out to ensure that the developed PIIS has the result that appropriate to the requirements and the feasibility of the developed PIIS.

Table 8 shows the assessment results from system experts with 85% as a result.

Table 8. Test assessment result from system expert

Participant	Indicators	Score (%)
Information system expert	1. The accuracy of selection app/software/tool types for development	80%
	2. Ease of Use	89%
	3. Process and data flow	77%
	4. Program View	90%
	5. Program Compatibility	100%
	6. Program Sustainability	80%
Final Score (%)		85%

The result from the test by the substance's expert is shown in Table 9. The table shows that the final score is 96%.

Table 9. Test assessment result from substantive experts

Participant	Indicators	Score (%)
Substantive Experts	1. System Suitability	93%
	2. Completeness of data	92%
	3. Ease of data collection	98%
Final Score (%)		96%

Table 10 and Table 11 shows the assessment results of users, as administrators and college students. The result of the test by the user as administrator is 85%, while the result of test by the user as a student is 88%.

Table 10. Test assessment result from administrator

Participant	Indicators	Score (%)
Administrator	1. System suitability	90%
	2. Ease of use	84%
	3. Ease of data collection	80%
	4. Program view	87%
Final Score (%)		85%

Table 11. Test assessment result from college student

Participant	Indicators	Score (%)
College Student	1. System suitability	90%
	2. Ease of use	83%
	3. Ease of data collection	90%
	4. Program view	89%
Final Score (%)		88%

Discussion

PIIS is used as an information system that managing data of internship's program. From Table 8,9,10 and 11 user assessments results show, most of the result is higher than 80%. It can be concluded that PIIS is "very feasible" to use or implement. As we can see in Table 8, there is one parameter with the result below 80% which is "Process and data flow". This result will be good feedback for PIIS developer to improve the data flow.

The final test results from information system experts, substance experts and users can also be seen in Figure2.

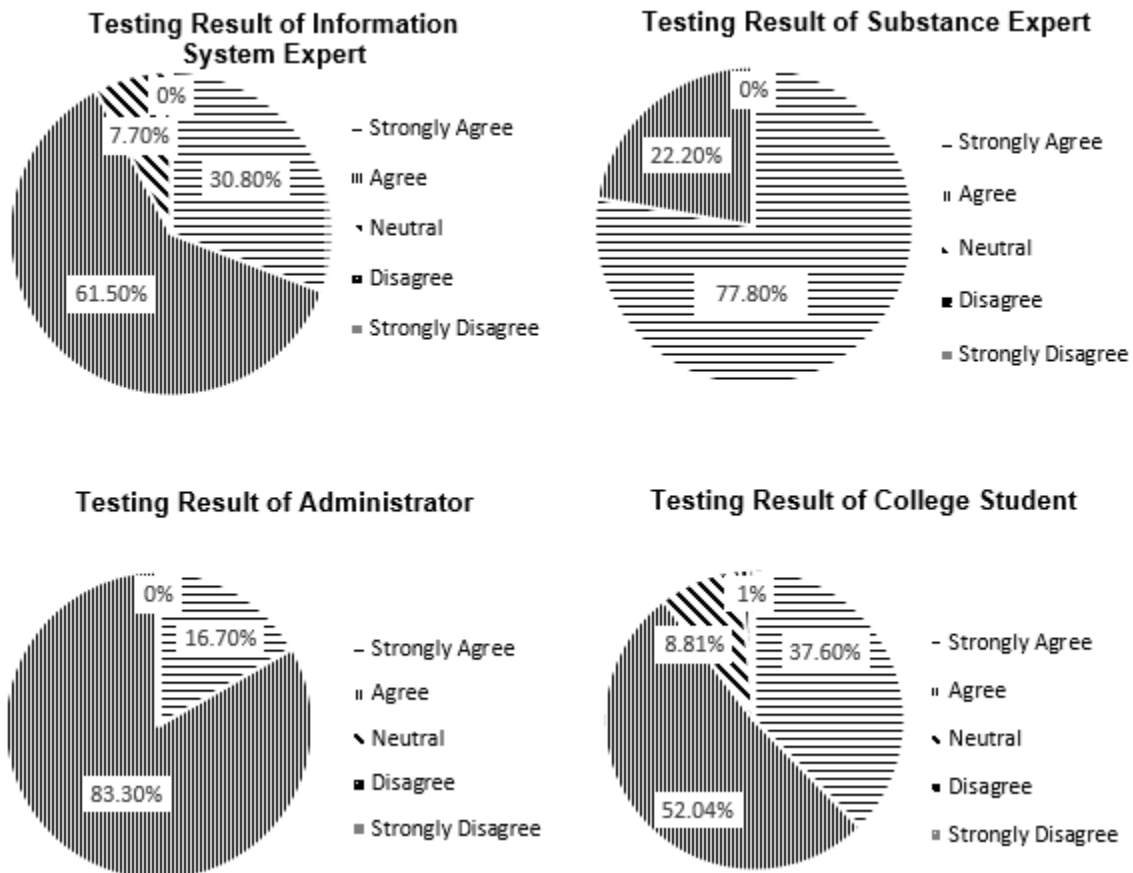


Figure 2. Pie chart of test result

Conclusion

Based on the results of research and discussion on the development of internship's information system on Education Studies Program Informatics and Computer FKIP UNS can be concluded as follows:

1. The information system of this internship can provide information both about the industry and the implementation of the internship.
2. The development of Internship's Information System at Informatics Technology and Computer Education FKIP UNS uses Codeigniter framework by applying Waterfall development model developed by (Pressman, 2010). The development phase consists of a) Analysis, b) Design, c) Coding, d) Testing and e) Maintenance. This information system has three types of users with access rights by those owned by students, PI coordinator, and admin.
3. The results of the internship information system test get the percentage of 85% from information system experts, 96% of the substance experts, and 85% of users as administrators as well as 88% of users as

students who have implemented PI. From the test results can be concluded that industrial practice information systems that have been developed into the category of "Very Eligible to Use".

Recommendation

Recommendation for further internship's information system research and development as follows:

1. The developed internship's information system can be integrated with Google maps for knowing the location details of the industry.
2. The addition of users permissions as internship's lecturer, so that lecturer can also monitor the students.

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