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THE DEVELOPMENT OF A WEBSITE-BASED INDUSTRIAL PRACTICE ASSESSMENT (PI) MODEL AT THE FACULTY OF ENGINEERING, UNM

[1]SYAHRUL, [2]ALIFYA NFH, [3]SHABRINA SYNTHA DEWI, [4]RIANA T. MANGESA and [5*]MITHEN LULLULANGI

[1, 2, 3, 4, 5] Lecturer of the Faculty of Engineering Universitas Negeri Makassar.
Email: [1]syahrul@unm.ac.id, [2]alifya.nfh@unm.ac.id, [3]shabrinasd@unm.ac.id, [4]rianamangesa@yahoo.com, [*]Corresponding Authors: [5]mithen@unm.ac.id

ABSTRACT

The Industrial Practice (PI) assessment model at the Faculty of Engineering, UNM is still conventional. The PI assessment model only available in a paper-based document. The conventional system allows data to be lost, damaged, and makes it difficult to search for data when it is needed, given a large number of students who practice Industry in one semester. Furthermore, the conventional assessment model also has other drawbacks, namely the difficulty in recapitulating the scores of all students. Based on these problems, it is necessary to develop a website-based student PI assessment model that can facilitate the management of student PI scores. This is Research and Development (R&D) research. The stages in developing a website-based Industrial Practice assessment model at the Faculty of Engineering UNM is a modification of the waterfall development model, which consists of four stages, namely: (1) needs analysis; (2) design; (3) coding; (4) implementation. The results of the research are as follows: 1) The results of expert validation with three aspects of assessment that include aspects of the system obtained analysis results with an average of 3.88 and a percentage of 96.88% in the very valid category; (2) aspects of the function (Black Box) note that 22 functions in the information system have a success rate of 100% and a failure rate of 0% of the two validators; (3) The results of the analysis in the field trial by looking at the respondents' assessment of the ease of use of the application with an average of 3.70 with a percentage of 92.55% are in the very practical category. Based on the field trials results, the Website-Based Industrial Practice (PI) Assessment Model developed is very practical, therefore it is feasible to use.

Keyword: Development, Website, Industrial Practice, Assessment Model

1. INTRODUCTION

Undergraduate (S1) and Diploma (D3) study programs at the Faculty of Engineering, UNM are carried out by always striving to ensure that each stage in the education process is guaranteed with the quality of both the implementation process and its output. Quality control of the education process is directed at ensuring that every graduate and intermediate expert has the standard competence proclaimed by the program administering and is able to meet the standards required by the working world.

One of the processes to prepare the graduate candidates from S1 and D3 programs is through the application of Industrial Practice Courses (PI) which weigh 2 credits. PI is a practical work/skills course as a vehicle for students at their final stage to prepare the knowledge and technology obtained in college with real conditions in the working world. In the curriculum design at The Faculty of Engineering UNM, PI is a compulsory subject that must be completed

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by students and passed before the student takes the final program exam (thesis examination) and is declared to have passed as a complete bachelor.

PI is implemented for 2 months carried out in government or private agencies related to the field of expertise of each study program. PI is used to show performance, creative abilities, and as an opportunity to access job information after completing the study. Thus, there will be mutually beneficial cooperation between the components of the Faculty of Engineering UNM, students participating in PI, and institutions where PI is implemented as the Tri Dharma of Higher Education and the philosophy of link and match between universities/schools and the working world (Djojonegoro, 1998). Through PI, students gain working experience in actual industry, as well as preparing and fostering a workforce, both structural and functional, who have well-disciplined abilities (Hamalik, 2007).

PI activities are designed for students to practice and explore every activity in business units in partner institutions. With the PI model, students can measure or equalize the knowledge and skills acquired during college with the world of work. PI will accustom students to work in teams, both among participants and with staff at partner institutions with different scientific backgrounds. Through this pattern, it is hoped that students will get used to accepting differences of opinion, being able to adapt to new environments. Thus, PI activities will have an impact on improving aspects related to attitude development.

The objectives of the PI FT UNM students 'activities include: (1) Increasing the students' psychomotor skills by practicing in the real world; (2) Improving student soft skills through professional independent and group work; and (3) Identifying business/entrepreneurship opportunities according to the field of study. The objectives of the PI include: (1) Students are ready to face the world of work; (2) Students have a comprehensive understanding of engineering; (3) Students are able to work independently, in groups and have work professionalism; (4) Students are motivated to work and/or create jobs in agriculture; (5) The establishment of sustainable cooperation between the Faculty of Engineering UNM and the business world.

The implementation of PI ends with an assessment or evaluation by mentors from the business world and supervisors from the study program. The criteria for assessment by the mentor include; (1) Discipline; (2) Attitude; (3) Cooperation with other people; and (4) Active Participation. Furthermore, the evaluation criteria by the supervisor includes: (1) method of implementation; (2) achievement of PI targets; (3) suitability of implementation; (4) cooperation; and (5) Student creativity in the location of PI.

The PI assessment model at the Faculty of Engineering, UNM is still conventional. The student PI assessment model is still in a paper-based document. The conventional system allows data to be lost, damaged, and makes it difficult to search for data when it is needed due to the large number of students who practice Industry in one semester. Furthermore, the conventional assessment model also has other drawbacks, namely the difficulty in recapitulating the scores of all students. Based on these problems, it is necessary to develop a website-based student PI assessment model that can facilitate the management of student PI scores.

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Hidayat (2010) website or site can be interpreted as a collection of pages used to display text information, still or motion images, animation, sound, and / or a combination of all of them, both static and dynamic which create a series of interconnected buildings, each of which is linked by a network of pages. The connection between one web page and another web page is called a hyperlink, while the text that is used as a link is called Hypertext. Marisa (2017) Web can be defined as a collection of pages that are used to publish information in the form of text, images, and other multimedia programs in the form of animation (motion pictures, motion writing), sound, and / or a combination of these, both static and dynamic. Which forms a series of interconnected buildings from one page to another which is often referred to as a hyperlink. Rerung (2018) suggests that the web is a computer network with a collection of internet sites that offer text and graphics and sound and animation resources through a hypertext transfer protocol. Information on the web is generally written in HTML format.

In the implementation of the student learning process in the industry, an assessment system is needed that can monitor the entire process and aspects of learning related to the formation of student competencies. The assessment practice system needed is one that is meaningful, involving students, in addition to assessments carried out by industry instructors and supervisors. Therefore, it is time for the management of industrial practice assessment to take advantage of the development of internet technology. Therefore, this study intends to develop a website-based industrial practice assessment model. This website-based assessment model is expected to be an assessment model for all areas of expertise at technical and vocational colleges and vocational high schools.

In determining the Final Score (NA student competence is weighted on the results of the instructor's assessment, the assessment of student colleagues and the assessment by the lecturer on the results of student practical work activities can be determined using a formula (Syahrul, 2010):

$$NA = [0.80 \text{ (AI Value)} + 0.10 \text{ (ATS Value)} + 0.10 \text{ (AD Value)}] \times 100$$

Information:

AI scores: Assessment score by an instructor
ATS Score: Student Peer Assessment Score
AD score: Assessment score by the lecturer

The integration of the assessment methods described above will be able to guarantee the objectivity of the results of the student performance assessment while participating in industrial practice.

2. RESEARCH METHOD

2.1 Type of Research

This type of research is Research and Development (R&D). The stages in developing a website-based Industrial Practice assessment model at the Faculty of Engineering UNM are a modification of the waterfall development model, which consists of four stages, namely: (1)

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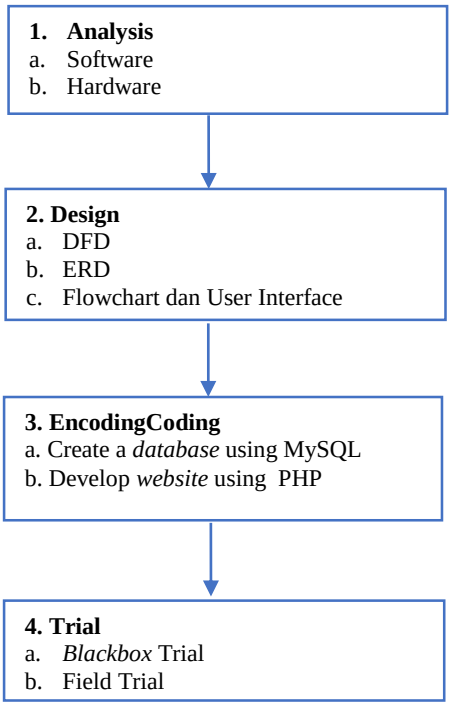
needs analysis; (2) design; (3) coding; (4) implementation. The place for conducting this research is at the Faculty of Engineering, UNM. The time used in conducting this research was 8 (eight) months. The stages of developing a website-based student PI assessment model at the Faculty of Engineering UNM are presented in the following.

Figure 1: The stages of developing the student PI assessment model



2.2 Data collection technique

Questionnaires and semi-structured interviews technique were used to obtain the data for this study. The questionnaire in this study was used to collect data related to web-based software quality testing. The research questionnaire was given to 3 categories of respondents, namely supervisors, industry advisors, and students. Interviews were conducted with the internship coordinator and the internship supervisor. This technique is used to determine user needs regarding the information system to be built.

2.3 Data analysis technique

The data obtained will be analyzed to determine the quality of the model / system produced in a valid, practical, and effective qualification. The data obtained in the study were analyzed using percentage descriptive techniques.

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3. RESULTS AND DISCUSSION

3.1. Results

The stages of developing a website-based PI assessment model.

3.1.1 Stage of Analysis

Based on observations and literature studies, information was obtained about students' needs for PI information once they were already in an industrial location, the need for supervisory monitoring of student activities written in daily journals and data management regarding student placement in the industry. The minimal functions required in this system are: students can access PI information, students can change their data, students can assess their peers, supervisors can view profiles, supervisors can see list of their guidance students, supervisors can assess their guidance students, admin can add, change, delete, view, search data.

3.1.2 Design

The design stage displays the process of system design which is carried out in several stages, including:

a) Data Flow Diagram (DFD) Context: The context diagram can be seen in Figure 2. Design of DFD

b) Flowchart: Flowcharts are used to describe in detail the steps of the program process in the form of a program flowchart. The flowchart design can be seen in Figure 3.

c) ERD: The ERD design can be seen in Figure 4.

d) User interface: The design of the login page user interface can be seen in Figure 5.

Figure 2: DFD Design.

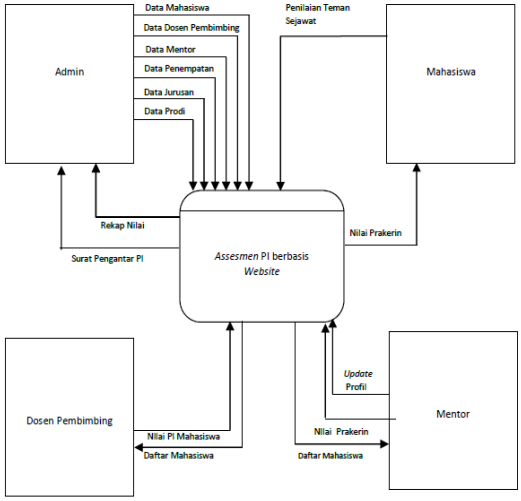

Figure 3: Main Flowchart Design

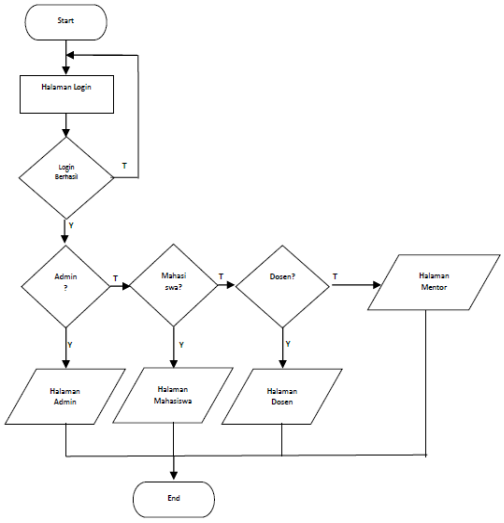

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Figure 4: Admin Page

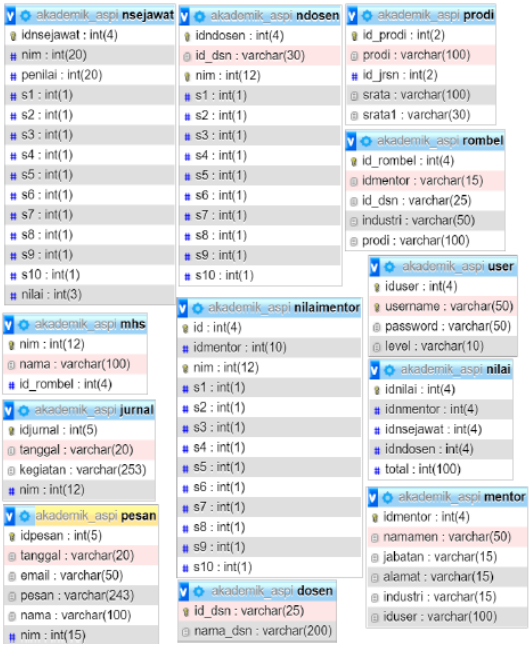

Figure 5: Login Page

3.1.3 Encoding / Coding

The coding stage generated a website-based PI assessment model for the Faculty of Engineering as follows.

a) Main page

The homepage that appears after opening the industry practice assessment website is the main page. Figure 6 is an image of the home page.

b) Student guidance list page

The student guidance page contains a list of the names of the students guidance and their status, whether they have been given a grade or not. Figure 7 is a list of students guidance that can be seen by lecturers and industrial guidance.

c) Assessment Page by Supervisors

This page is used by supervisors to assess student performance during PI. The appearance of the assessment by the supervisor can be seen in Figure 8.

d) Assessment Page by Instructor

This page is used by Instructors to assess student performance during PI. The appearance of the assessment by the instructors can be seen in Figure 9.

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Figure 6: Main Page.

Figure 7: Students Guidance List Page

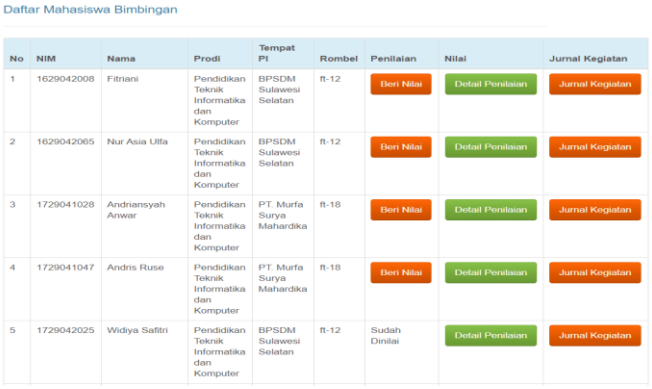

Figure 8: Assessment Page by Supervisor

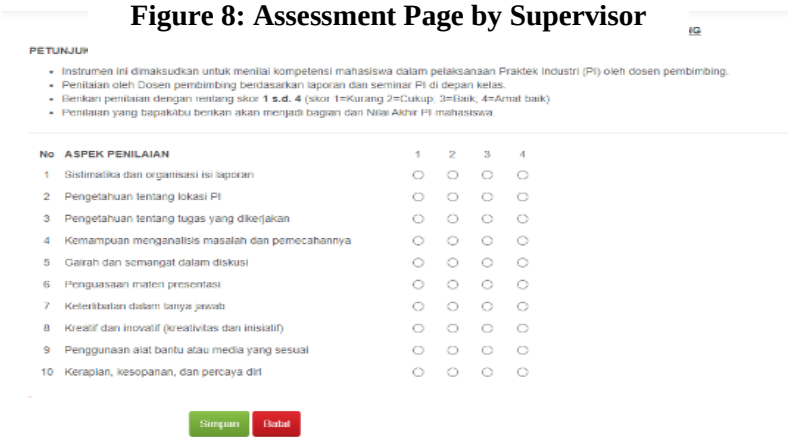

Figure 9: Assessment Page by Instructors

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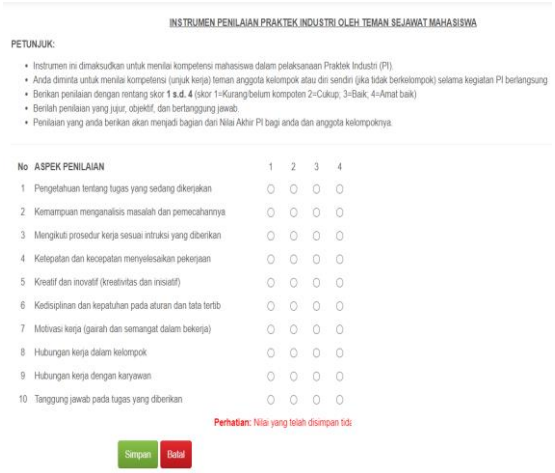
e.) Assessment Page by Peers

This page is used to rate friends in a PI group. Students are asked to rate the performance of their group mates during PI objectively. The appearance of the assessment by peer themes can be seen in Figure 10.

f.) Detailed student grade page

This page is used to see the details of PI student scores. The detailed display of the assessment can be seen in Figure 11

Figure 10: Assessment Page by Peers



INSTRUMEN PENILAIAN PRAKTEK INDUSTRI OLEH TEMAN SEJAWAT MAHASISWA

PETUNJUK:

- Instrumen ini dimaksudkan untuk menilai kompetensi mahasiswa dalam pelaksanaan Praktek Industri (PI).
- Anda diminta untuk menilai kompetensi (unjuk kerja) teman anggota kelompok atau diri sendiri (jika tidak berkelompok) selama kegiatan PI berlangsung.
- Berikan penilaian dengan rentang skor **1 s.d. 4** (skor 1=Kurang/belum kompoten 2=Cukup, 3=Baik, 4=Amat baik)
- Berilah penilaian yang jujur, objektif, dan bertanggung jawab.
- Penilaian yang anda berikan akan menjadi bagian dari Nilai Akhir PI bagi anda dan anggota kelompoknya.

No	ASPEK PENILAIAN	1	2	3	4
1	Pengetahuan tentang tugas yang sedang dikerjakan	○	○	○	○
2	Kemampuan menganalisis masalah dan pemecahannya	○	○	○	○
3	Mengikuti prosedur kerja sesuai intruksi yang diberikan	○	○	○	○
4	Ketepatan dan kecepatan menyelesaikan pekerjaan	○	○	○	○
5	Kreatif dan inovatif (kreativitas dan inisiatif)	○	○	○	○
6	Kedisiplinan dan kepatuhan pada aturan dan tata tertib	○	○	○	○
7	Motivasi kerja (gairah dan semangat dalam bekerja)	○	○	○	○
8	Hubungan kerja dalam kelompok	○	○	○	○
9	Hubungan kerja dengan karyawan	○	○	○	○
10	Tanggung jawab pada tugas yang diberikan	○	○	○	○

Perhatian: Nilai yang telah disimpan tid

Simpan Batal

Gambar 11: Detailed students grade page

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
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Alamat : Jl. Daeng Tata Raya Parangtambung Makassar
Telp. (0411) 864935 - Fax. (0411) 865307
Laman: www.unm.ac.id.

Daftar Nilai Praktek Industri

Nim : 1729042025
Nama : Widiya Safitri
Prodi : Pendidikan Teknik Informatika dan Komputer
Tempat PI : BPSDM Sulawesi
Dosen Pembimbing : Dyah Vitalocca, S.T., M.Pd.
Instruktur/Mentor : Agung

Nilai Pembimbing	Nilai Instruktur	Nilai Teman Sejawat	Nilai Akhir
100	87.5	97.5	90.375

Makassar, 04 Januari 2021
Dosen Pembimbing,

Dyah Vitalocca, S.T., M.Pd.
NIDN. 0412048405

3.1.4. Trial

a. System validation results

The system aspects evaluated in the Website-Based Industrial Practice Assessment Model (PI) consist of 4 indicators divided into several points to measure the system that has been created. The four indicators are: (1) benefit, (2) design, (3) operation, (4) user book. The assessment is carried out on the overall system and features in the content. The summary of the results of the system expert's assessment of this indicator can be seen in Table 1.

Table 1: Results of System Aspect Assessment

No	Indicator	Average	Percentage	Conclusion
1	Benefit	4.00	100.00%	Very Valid
2	Design	3.50	85.50%	Very Valid
3	Operation	4.00	100.00%	Very Valid
4	Guidebook	4.00	100.00%	Very Valid
	The average indicator	3.88	96.88%	Very Valid

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Based on the summary of Table 1, it can be concluded that all indicators from the system aspect have a very valid category with a mean value of 3.88 and a percentage of 96.88%, the above system aspect indicators are declared very valid and feasible for field trials with a little revision. The results of the revised system aspect validation are in the form of suggestions used to improve information systems. Furthermore, based on the results of testing the functionality aspect, it was revealed that the 22 functions in the Website-Based Industrial Practice Assessment Model (PI) had a success rate of 100% and a failure rate of 0% by two validators. The scale used to retrieve data is the Guttman scale with the category "yes or success" with a value of 1 and "no or failure" with a value of 0.

b. Field Test

Field trials are the main trials to measure the feasibility of the Website-Based Industrial Practice Assessment Model (PI) used and applied. The field trial involved 5 PI group groups in the Informatics and Computer Engineering Education program, FT UNM, consisting of 15 students, 3 lecturers, and 3 instructors. Field trials discuss the aspects of user assessment by respondents which consist of 5 indicators, namely: (1) ease of learning features, (2) error prevention, (3) speed, (4) ease of memorizing functions A summary of the results of the respondents' assessment of these indicators can be seen in Table 2.

Table 2 Aspects of Respondents' Assessment of the website-based PI assessment model

No	Indicator	Average	Percentage	Conclusion
1	Ease of Learning Features	4	100,00%	Very Practical
2	Ease of Memorizing Functions	3,56	88,89%	Very Practical
3	Error Prevention	3,55	88,75%	Very Practical
Average Indicator		3,70	92,55%	Very Practical

Based on the description of Table 2, the overall indicators for the assessment aspects of the respondents in the practicality category obtained a mean of 3.70 and a percentage of 92.55% was included in the very good category. This shows that the information system that has been tested on respondents is very easy to understand and use by users.

3.2 Discussion

Industrial Practice is one of the compulsory subjects in the curriculum structure at the Faculty of Engineering, UNM. The PI assessment model at the Faculty of Engineering UNM is still conventional in the form of printed documents. The conventional system allows data to be lost, damaged, and difficult to search for data when it is needed, given the large number of students who do an internship in one semester. Furthermore, the conventional assessment model also has other drawbacks, namely the difficulty in recapitulating the scores of all students. The solution to overcome this problem is to develop a website-based PI assessment model. In line with this, Kurniawan (2015) states that web-based information systems can provide fast, accurate communication and enable communication anywhere and anytime, and can increase effectiveness and efficiency. So that the management of apprenticeship using a web-based information system becomes more effective and efficient. This is in line with the results of

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research by Ningsih (2012) which states that the use of a web-based apprenticeship information system is the right thing because the system can provide information about internship programs online. This system has an advantage in terms of the speed presentation of the information results, in addition to being web-based, this system can be accessed at an unspecified time and place. In addition, this website produces information on the value of student internship which is used by the school in monitoring the achievement of the internship program objectives.

The Website-Based Industrial Practice Assessment (PI) Model can assist the recording of apprenticeship data which will be carried out by the internship administration which will then be sent and stored on the web. This is supported by Gani's research (2018) which states that a web-based apprenticeship information system will make it easier to provide internship information online for students who are internship and supervisory lecturers and other users who want to know about this website, starting the process of applying for internships, where students must go through several stages. After the student completes the registration stages the next is processed by the admin.

The Website-Based Industrial Practice Assessment (PI) Model also makes it easier for supervisory lecturers to monitor activities carried out by students at the internship through journal activities filled out by students online so that it makes it easier to give final grades for PI courses. This is in accordance with the opinion of Boiko & Shendryk (2017) which states that information system users allow active monitoring by gathering information about all events that are happening. The validation of the PI assessment instrument by peers obtained a percentage value by the first validator of 96% with very valid criteria. The percentage of validation by the second validator is 96% with very valid criteria. The validation of the PI assessment instrument by the supervisor gets a percentage value by the first validator of 90% with very valid criteria. The percentage of validation by the second validator is 100% with very valid criteria. The validation of the PI assessment instrument by the instructor obtained a percentage value by the first validator of 96% with very valid criteria. The percentage of validation by the second validator is 90% with very valid criteria. Information system testing is done by testing, expert validation and field testing. The results of expert validation with three aspects of assessment that include aspects of the system obtain analysis results with an average of 3.88 and a percentage of 96.88% are in the very valid category, the functional aspect (black box) is known that 22 functions in the information system have a success rate 100% and 0% failure rate of two validators. The results of the analysis on field trials by looking at the respondents' assessment of the ease of use of the application with an average of 3.70 with a percentage of 92.55% are in the very practical category. Based on the results of field trials, the developed Website-Based Industrial Practice Assessment Model (PI) is very practical so it is feasible to use, where the assessment model developed involves students, lecturers and instructors. This is in line with the results of Syahrul's (2010) research that the learning assessment model in an industry that involves participants (peers) and educators provides more objective and accurate assessment results, and provides a sense of justice for students compared to assessment results that are only carried out by instructors in the industry. The application of the assessment model can increase the validity, consistency and consistency of didactic decisions and the determination of the final score of students in learning activities in the

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industry, thereby ensuring the accuracy of information about the real level of student competence.

4. CONCLUSION

Based on the results of the research and development that has been done, it can be concluded as follows.

The Website-Based PI Assessment Model at the Faculty of Engineering UNM was developed using the Waterfall software development model which consists of (1) needs analysis, (2) planning, (3) system coding / development, and (4) system implementation / testing. This system has four users, namely admin / internship coordinator, supervisors, students, and industry advisors with features according to their access rights. This system provides information about online apprenticeships for internship students, supervisors, industrial supervisors and admins. Furthermore, in this PI assessment model, students conduct peer assessments, as one aspect of the PI score. The resulting Website-Based PI Assessment Model at the Faculty of Engineering UNM is in a very valid category, so it is feasible to be used for the field trial phase by users. Ease of the Website-Based Industrial Practice Assessment (PI) Model at the field trial stage is in the very practical category, indicating that the information system is very easy to understand and use by users. The application of the assessment model can increase the validity, and consistency of didactic decisions and the determination of the final score of students in learning activities in the industry, thereby ensuring the accuracy of information about the real level of student competence.

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