



Industrial Field Work Practice (IFWP) Website Design Towards Integrated System Management in The Department of Mechanical Engineering Education Universitas Negeri Medan

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Abstract. Research on the design of the Industrial Field Work Practice (IFWP) Website in the Mechanical Engineering education department, FT UNIMED, began with identifying the problems that occurred, namely the difficulty of creating a Website that met student needs, such as lack of readiness of participants to carry out actual work practice, lack of coordination between educational institutions and companies, lack of supervision or guidance from academic institutions. This research aims to determine the stages of the Website design process in implementing IFWP in the Department of Mechanical Engineering Education, FT UNIMED. The method developed to access and analyze a list of web page design features, as a step in this research, is the process of creating input/output data flow designs such as context diagrams - level 0, diagrams 0 - level 1, detailed diagrams - level 2, and designing Website templates such as the IFWP main page, company profile, implementation registration form, exam registration form, score submission form. From the results of this research, it can be concluded that (1) DFD is a diagram that explains the entry and exit (flow) of data through an information system, ERD is a diagram that explains the relationship between entities (tables) in a database (2) This Website design can make it easier for students to get information and implementing IFWP in a structured manner (3) With the results of this Website Design, it can make it easier for researchers in the process of creating a Website, where there are complete templates for every need in the IFWP implementation process.

Keywords: Website, Website Design, DFD, ERD, Industrial Field Work Practice

1 Introduction

The apprenticeship program in the form of IFWP is a form of providing professional skills education that systematically and synchronously combines educational programs on campus with skills mastery programs through practical activities in the real world of work. To implement this program, the world of education and the world of business/industry have almost the same responsibilities.

Identification of problems that occur is the difficulty of creating a website that meets students' needs. This website, which serves as a platform for information dissemination, coordination, and feedback, is crucial for the success of the program. Some of the identified challenges include the lack of preparation of participants to carry out illegal work practices, lack of coordination between educational institutions and companies, and lack of supervision or guidance from academic institutions. These issues have led to companies (industry) being reluctant to give jobs to students. This encourages the need to make efforts that can improve the implementation of IFWP so that it can achieve the expected goals with the help of a system, namely website information.

The impact of Website features on users' information processing and output can contribute to developing theory and understanding of media according to user needs for Website design [1]. With the development of technology and information, every system requires technology to simplify the work process; one is using information systems in the Website sector. Based on Minister of Education and Culture Regulation Number 50 of 2020 [2], Field Work Practices (FWP) are learning for students that is carried out through work practices in the world of work within a certain period by the curriculum and needs of the world of work. This research aims to determine the stages of the Website design process in implementing IFWP in the Department of Mechanical Engineering Education, FT UNIMED.

This article is an idea that can be used as a guideline in designing the IFWP Website, thereby making it easier for students to implement IFWP. This Website design process will later make it easier for researchers to create websites that are more efficient in their use so that students can more easily obtain information in implementing IFWP.

2. Literature Review

2.1. Industrial Field Work Practice (IFWP)

Industrial Field Work Practice (IFWP) is a separate course that discusses the application and acceptance (adoption) of developments in science and technology from the industrial world. In Industrial Field Work Practice activities, students carry out practical work in companies/industries by applying the knowledge they have acquired in college. Through practical activities on real work, students are expected to gain knowledge in managing industrial field work practices, besides the opportunity to apply knowledge to helpful work-valuable expertise and experience in actual work situations. With practical experience in the real world of work, students will experience work situations and technological developments that occur in the field, which are very likely not available in educational institutions [3].

2.2. Website

A Website is a collection of interconnected web pages generally located on the same server and containing information provided by individuals, groups, or organizations.

A Website is usually placed on at least a web server that can be accessed over a network such as the Internet. The Internet has made information more accessible, significantly impacting how people learn and practice programming [4]. The combination of all publicly accessible sites on the Internet is also known as the World Wide Web, better known by the abbreviation WWW.

2.3. Website Design

Web design is a general term used to cover how web content is displayed (usually in hypertext or hypermedia) and delivered to end users via the World Wide Web, using a web browser or web-based software. Website design is a constant challenge for product manufacturers, especially web admins, because, through a unique Website, they have to satisfy search engine algorithms to increase its visibility and integrate related information so visitors can transform into potential customers [5][6].

2.3.1.Content

Elements such as text, forms, images (GIF, JPEG, Portable Network Graphics), and videos can be placed on pages using HTML/XHTML/XML tags. Browsers sometimes also require plugins such as Adobe Flash, Quick Time, Java, and so on to display some media placed on web pages using HTML/XHTML.

2.3.2.Web Designer

A web designer or web designer is a person who has the expertise to create presentation content (usually hypertext or hypermedia) that is delivered to end-users via the World Wide Web, using a Web browser or other Web-enabled software such as internet television, microblogging, RSS, and so on. Website designers should focus more on web design Attributes (especially Web layout and structure) [7]. Users gain many benefits from a well-designed Website. But which elements of Website design quality matter, and how do these elements influence usage behavior [8].

2.3.3.Types of Website Layouts

A layout is needed to organize the Website content. Types of Website layouts include; fixed layout, liquid layout, responsive layout.

2.4. DFD and ERD

2.4.1. Data Flow Diagram (DFD)

Data Flow Diagram (DFD) is a diagram that describes the input/output data flow process of an information system being built. (DFD) is a modeling notation focusing on the essential and functional aspects of initial software design [9]; it is a graphical modeling tool that breaks down complex systems into functional process networks [10]. In structural modeling, data flow diagrams (DFD) are used in the central diagram [11].

2.4.2. Entity Relationship Diagram (ERD)

Entity Relationship Diagram (ERD) or entity relationship diagram designs databases and details the relations or connections between objects or entities and their attributes [12]. In forming an ERD, 3 components will be formed, namely; (1) An entity is an object that can be distinguished from others and realized in a database, (2) A relationship is a relationship between two types of entities, represented as a straight line connecting two entities, (3) Attributes provide more detailed information about the entity type. Attributes have an internal structure in the form of data types.

3. Methods

Developed procedures for accessing and analyzing a list of web page design features. The implementation is based on web page design elements, where the word “design” refers to all visual and nonvisual elements (e.g., links or hidden text) on a web page and its associated features. Researchers assume (and evaluate) that these design features can serve as valuable identifiers to improve the accuracy of identifying types or categories of websites [13].

The first step in this research is to prepare the necessary tools and materials and search for literature related to this research topic.

3.1. The process of creating input/output data flow designs

- Context Diagram – Level 0
- Diagram 0 – Level 1
- Detailed Diagram – Level 2

3.2. Web Template Sketch Design:

- The main page consists of IFWP
- About IFWP
- IFWP Implementation Registration Form
- IFWP Exam Registration Form
- IFWP Value Submission Form
- News
- Letter Format
- Company Information and IFWP Needs

The process of creating an input/output data flow design can be seen in Fig.1, Fig.2 and Fig. 3, Fig. 4, Fig. 5, and Fig. 6.

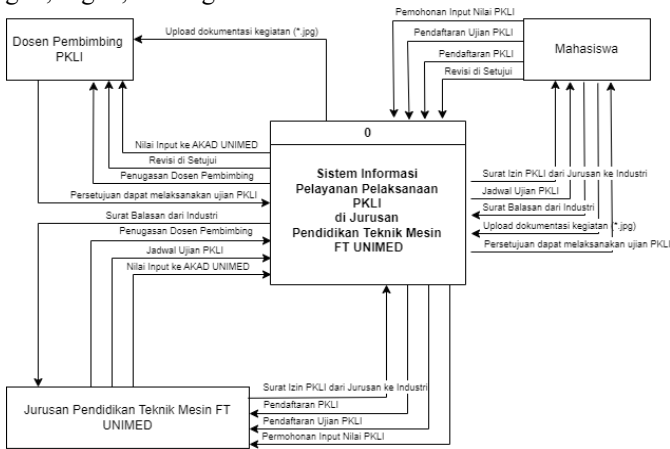


Fig. 1. Context Diagram – Level 0 (Website IFWP)

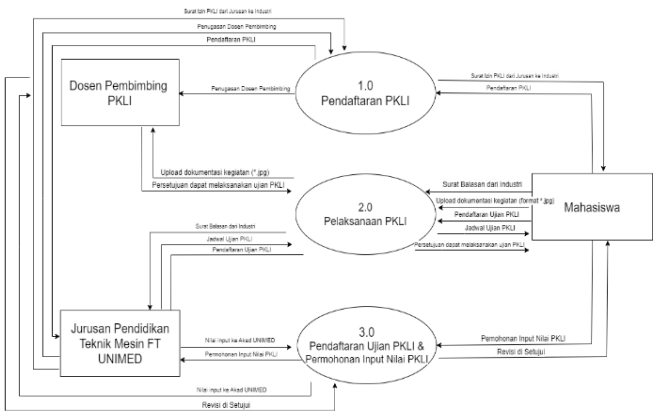


Fig. 2. Diagram 0 – Level 1 (Website IFWP)

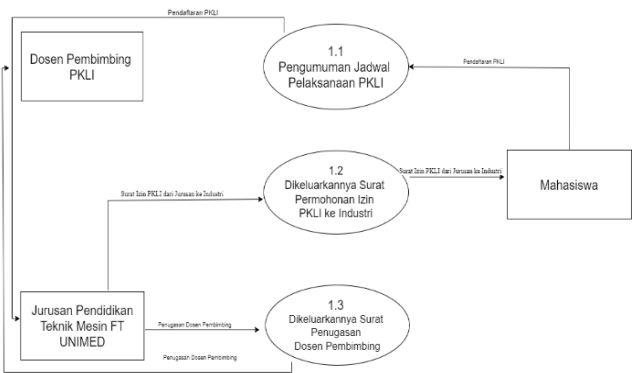


Fig. 3. Diagram Rinci 1.0

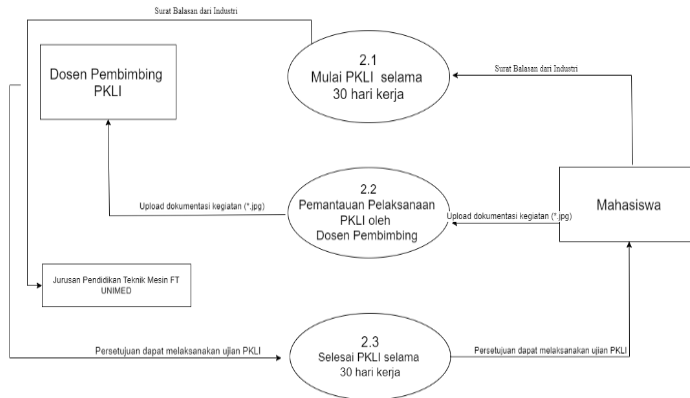


Fig. 4. Diagram Rinci 2.0

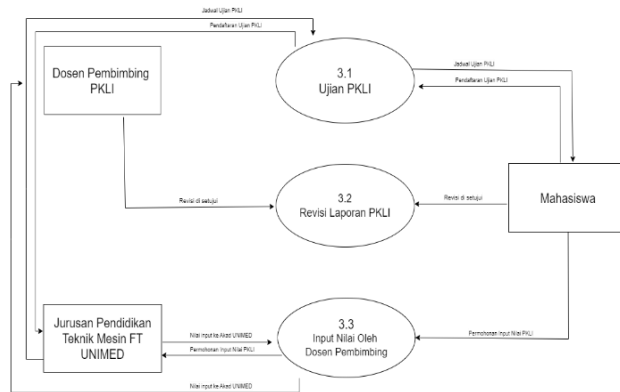


Fig. 5. Detailed Diagram 3.0

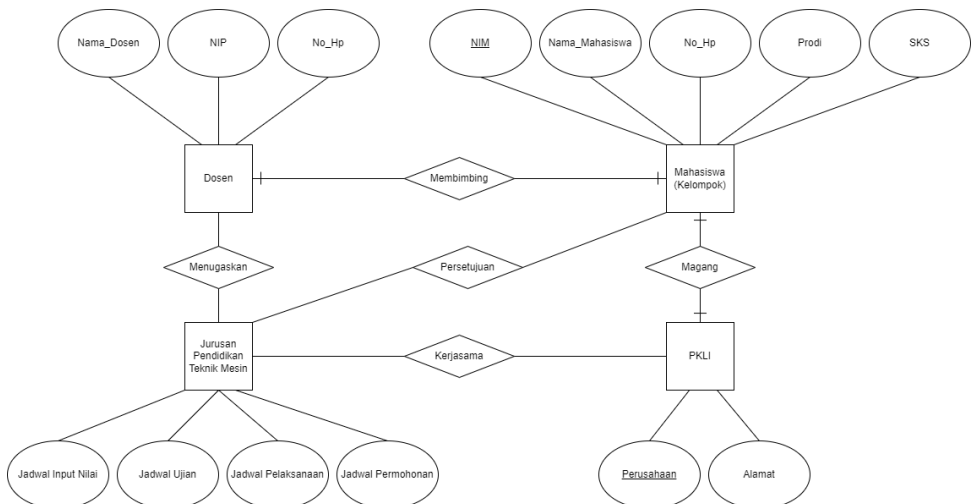


Fig. 6. ERD

4. Result And Discussion

From the results of the designs that were built, several page designs were produced, which will be developed in the process of creating the IFWP Website; from the results, several Website pages were obtained, including.

4.1. IFWP Website Main Page

The main page displays information on the IFWP implementation schedule starting from the date of registration of the IFWP application, implementation of the IFWP, IFWP exam, and input of IFWP scores. This main page also displays companies and company addresses (see Fig.7).

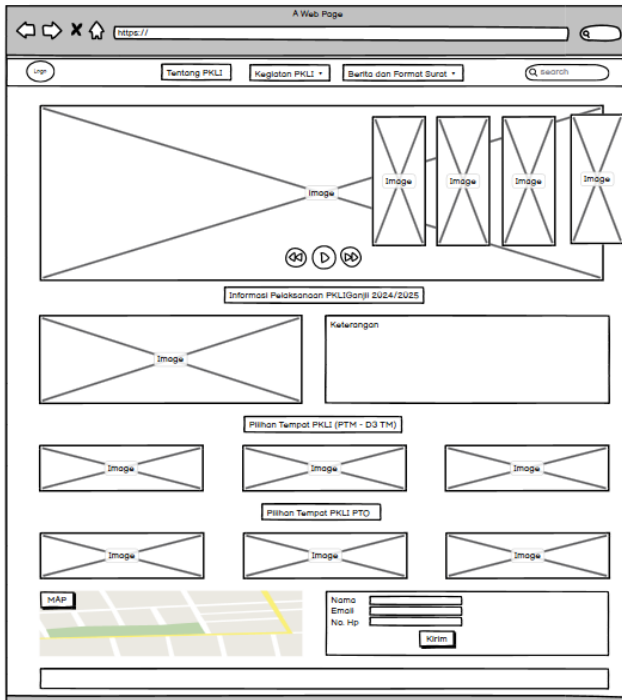


Fig. 7. IFWP Website Design Home Page

4.2. IFWP Implementation Registration Form Page

After understanding the explanation of several Website page designs above, students can fill in the registration form for implementing IFWP with a minimum graduation requirement of 85 credits for Mechanical Engineering and Automotive Engineering Education students; for D3-Mechanical Engineering students, the minimum graduation requirement is 65 credits. The maximum number of students for each company selected is four students; information can be seen in Fig. 8.

The screenshot shows a web browser window titled "A Web Page" with a URL bar containing "https://". Below the browser window is a "Home" button. The main content area features a "Form Pendaftaran PKLI" (PKLI Registration Form). The form includes a "Tempat PKLI" (PKLI Location) field, followed by a "Prodi" (Program) field, and then a "Mahasiswa" (Student) section. This section contains four identical sets of fields for "Nama" (Name), "Nim" (NIM), "Hp" (Phone), and "Total SKS" (Total SKS). To the right of the "Total SKS" fields, there is a note: "(Syarat Minimal Kelulusan: D3-TM = 65 SKS, PTM/PTO = 85 SKS)". Below the student fields, there is a checkbox labeled "I Accept The Terms and Conditions" and a "Submit" button.

Fig. 8. IFWP Implementation Registration Form

4.3. IFWP Exam Registration Form Page

After completing the IFWP to the company and completing guidance with the supervisor to be approved for carrying out the IFWP exam, students can fill out the exam registration form provided they upload an endorsement sheet that the supervisor has signed (see Fig. 9).

The screenshot shows a web browser window titled "A Web Page" with a URL bar containing "https://". Below the browser window is a "Home" button. The main content area features a "Form Pendaftaran Ujian PKLI" (PKLI Exam Registration Form). The form includes a "Tempat PKLI" (PKLI Location) field, followed by a "Prodi" (Program) field, and then a "Mahasiswa" (Student) section. This section contains fields for "Nama" (Name), "Nim" (NIM), "Hp" (Phone), and "Judul PKLI" (PKLI Title). Below the student fields, there is a checkbox labeled "I Accept The Terms and Conditions" and a "Submit" button.

Fig. 9. IFWP Exam Registration Form

4.4. IFWP Value Submission Form Page

After completing the revised revision of the IFWP report, students can fill out the IFWP score submission form with the condition of sending the entire IFWP report file (Format: *.pdf and *.docx). It can be seen in Fig. 10.

Fig. 10. IFWP Value Submission Form

5. Conclusion

Based on the research results and discussion referring to the objectives of this research, it can be concluded that 1) DFD and ERD are two different diagrams; DFD is a diagram that explains the entry and exit (flow) of data through an information system, ERD is a diagram that explains the relationship between entities (tables) in a database 2) This Website design can make it easier for students to get information on IFWP registration schedules, IFWP implementation schedules, IFWP exam schedules, IFWP score input schedules, company profiles, company production process flowcharts, courses available must be mastered in the selected industry, alternative topic titles are also attached to the Website page. 3) The results of this Website Design can make it easier for researchers in the process of creating a Website, where there are complete templates for every need in the IFWP implementation process.

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