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BIT304 FINAL YEAR PROJECT I

LITERATURE REVIEW

Ayo Magang: Web Application for Internship in Denpasar

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1. **Introduction**

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According to Law Number No. 13 Year 2003 about Manpower, Internship is part of a work training system that is organized in an integrated manner between training in training institutions by working directly under the guidance and supervision of instructors or workers who are more experienced, in the process of producing goods and / or services in the company, in order to master skills or certain expertise.

In this particular case, we are taking a different perspective of internship, where we are focusing on vocational high school and college. These educational institutes are applying “academic” internship that has been known to complete their curriculum for the balance of theory and practice by going down directly to the field of their work. This is done so students will get real work experience in real situation with real companies, real workers, and real clients. Internship is available in some of major course, such as Medical School, Engineering, Hospitality, Technology and many others.

Analyzing from many existing application about internship (work) and dedicated academic internship, we choose to build a dedicated academic internship website search for students so they can find workplaces to conduct internship at ease. The current application (web & mobile platform) sometimes cannot differentiate between internship-for work and academic internship. Moreover, companies that offer training or academic internship sometimes do not advertise well not having enough exposure for students to find out. This creates opportunity for student to find better companies to “practice” with, while companies can also add more exposure of advertisement of their company by opening a vacancy (not an official for occupation) for academic internship, increasing branding awareness.

2. Benefit of Technology in Internship

2.1 Benefits of Internship

Quoting from the report of “Benefits of Internships for Interns and Host Organizations” by Zenobia Ismail, with implementing real practice of theory into the fields, we can get some benefits from internship:

- Internships are useful for developing soft skills such as interpersonal skills, professionalism, confidence and self-efficacy. (Ismail, 2018)
- Employers’ value interpersonal skills and interns are perceived to require less need for socialization or training to help them adjust to the work environment (Holyoak, 2013).
- Internships increase the probability of finding employment, but decrease the likelihood of postgraduate studies (Saniter & Siedler, 2014).
- Internships have a positive impact on earnings (Gault, Leach, & Duey, 2010).
- Internships provide useful labor at low cost to employers (Maertz et al., 2014).
- Recruitment and training costs can be reduced by employing interns (Dobratz, Singh, & Abbey, 2014).
- Knowledge sharing is more likely to occur if interns who join professional communities are assisted by well-connected mentors who can help them integrate into the community (Holyoak, 2013).

Diving more in to the focus of academic internship, we can conclude from the explanation above that academic internship will be focused on how students will get the real education from real practice on the fields. This can be as a step to develop soft skill or hard skill (Ismail, 2018), depending the individual. Knowledge sharing will be more possible since student will get hand-to-hand work with seniors or supervisor on fields.

Not only student, but academic institutions and companies also get the good deeds here. This can lead to networking, skill development, collaboration, cost-savings (Ismail, 2018), and even exposure to company or institution branding. Student and regarding parties (Schools and Companies) will save times and money, because they indirectly train students for the work, which makes students as perspective employees,

depending on the company requirements and the ability of the student. In addition, relationships between parties can result in better business agreement, such as endorsement, brand exposure, or even collaboration project between school / university and companies. This will give positive effect to student, as there will be wider chance for them to apply academic internships to many companies.

2.2 Implementing Technology in Helping Academic Internship Recruitment

With the existing conventional system that need students to find companies for their internship, it will be very hard for certain student that having low soft-skill or no networks to work with. This is where our idea comes in. We want to provide easier way for student to find companies to “practice” with, while we also want to ease company to recruit interns from a dedicated platform that will be very easy to notice. The problem with conventional system is that while students are having hard time to search for companies, companies also having hard time to recruit proper interns, due to not enough exposure of brand, not enough promotion, etc. With the dedicated platform our project is proposing, students and companies can meet each other to fulfill each parties’ need.

3. Proposed System: Responsive Web Design vs Mobile Apps

Nowadays technology improvement is very advanced and fast that people can access anything easily. People can access information from any type of device, and most general device that we can use to access information is mobile devices, such as laptops, smartphones, tablets, and many others. Nevertheless, mostly people brings smartphone all the time with them.

With this, the mobile platform is getting bigger as many people is getting their hands on smartphones, from low-end, to flagship-class smartphone. It is no doubt that mobile operating system such as Android and iPhone has massive user base in the market. Many website has starting to develop mobile application in those platform, such as Facebook, Twitter, Instagram, and many others. Even so, their website is also developed with responsive design, so either you choose to have the native mobile application installed on the machine, or you just have to access the website with responsive design, which allows website to adjust the size of theirs to the user's smartphone resolution.

COMPARISON	Native Apps	Mobile web apps
Create vs. consume content	Native apps are more suitable for content creation due to performance and hardware access.	Mobile web apps are less suited for content creation, but equally suited for content consumption
User experience	Seamless integration with native operating system	Limited integration, requires external frameworks
Update frequency	Updates are formal through app stores	Updates are more informal and equivalent to website updates
Performance	Maximum performance and access to device hardware	Performance is dependent on JavaScript rendering and mobile web browsers, limited access to device hardware
Functionality	All functionality in the mobile operating system is available	Most of the functionality of the mobile operating system is available
Development	Requires specific development for each mobile operating system	Open web languages and browsers make "Write once, run anywhere" development possible
Profitability	Framework for monetizing apps is available via app stores	No clear, unified strategy for monetization.

Source: (Jobe, 2013)

As you can see from the table before, the comparison between mobile platform and responsive design website is can be concluded as a fair one. The answer for which better will always relies to the word “depends”. Although it seems that native mobile application has all the advantage due to be integrated to the operating system directly, it can be a waste of energy. Such complex programming skills and code structure will be needed in building the native mobile application, which is why we will choose the responsive-design website.

The purpose of our application is to help student to apply academic internship in companies, while we also help companies to recruit internship for the interest of training or even business (but for now, we are focusing on academic internship. We do this so we can help students that are having trouble to find companies because of lack of soft-skills and networking. This also help other student in other condition such as for finding certain companies because the nature of their project (or research). On the other side, we can also help companies to have better exposure of brand, resulting in more networking, more recruits means more perspective employees, cost-savings (since the recruits is also doing some of the job as the part of the exercise), brand awareness, or even engaged in business agreement between parties.

From our analysis, with such objectives, we know that we do not have to build such complicated native mobile apps to support this idea, as the advantage of website is you do not have to own the application to access the information. You can easily open the browser, visit the website, login, and you can start to dig information about internships. These simple objectives leads to simpler and lower requirements, which makes responsive-design website will be fit for our project.

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4. Methodology and technique

4.1 Methodology

For the methodology, we choose Agile because for its known framework called Scrum. Agile has been a very big change for business & project progress. The flexibility of Agile and the terrific delivery point of Scrum makes developer starting to use them for project and schedule plan.

With Agile, developers can have more flexible time in development due to nature of development that will always encounter unexpected errors or even failures at a point. Instead of having drawbacks of development and long-way circling test due to errors and failures from previous Waterfall methodology, Agile offers short sprint release of the product (as prototype or the real application in alpha or beta release). It allows customers and stakeholders to engage more in the development, giving feedbacks that will be very helpful in the process. Therefore, developers will have better picture of how the application should be, because customers and stakeholders are the end-user that will use the application (Charles Edeki, 2015).

In addition Agile can handles life cycle of software, meaning there is room for continuous improvement. Whether the developer wants to upgrade the system, or redesign the system from very beginning. In addition, Agile methodology does encourage teamwork. Therefore, allows developers from any division to communicate and work together in developing the software.

4.2 Technique

For our project, we consider to implement black box and white box testing:

- ✓ White Box Testing Technique: It is the detailed investigation of internal logic and structure of the code. It is necessary for a tester to have full knowledge of source code. (Khan & Khan, 2012)
- ✓ Black Box Testing Technique: It is a technique of testing without having any knowledge of the internal working of the application. It only examines the fundamental aspects of the system and has no or little relevance with the internal logical structure of the system. (Khan & Khan, 2012)

White box (also known as Structural testing) in reality will be performed by us the developer that will be testing the system, as we will run through a sequence of testing. This is a technical testing, as we will test each branch of use case available, focusing on code structure and software entity. The expected results are evaluated on a set of coverage criteria. Examples of coverage criteria include path coverage, branch coverage, and data-flow coverage (Nidhra & Dondeti, 2012)

Black box testing in the other hand, will be tested by some users that have less or no knowledge about coding, but will be examining the application by the looks, fluidity, and other basic user-friendly value. Black box testing is also known as Functional Testing, means the application will be tested based on the requirement or design specification of the software entity under test. Examples of expected results sometimes are called *test oracles*, include requirement/design specifications, hand calculated values, and simulated results. (Nidhra & Dondeti, 2012)

6. Platform Used

Operating System

1. Windows 10

Windows 10 is an operating system developed by Microsoft. It is the newest and latest (and last) operating system developed by Microsoft, as Windows 10 will be developed and treated as “service” rather than usual major development of operating system. We used Windows 10 for the reason of universality, as many software is compatible with Windows.

Application Building

1. XAMPP

XAMPP is a freeware that supporting many operating system, that is a compilation of few programs. The function is to be as a standalone-server (localhost) consists of Apache HTTP Server, MySQL database, and language translator written in PHP and Perl (Palit, Rindengan, & Lumenta, 2015).

2. MySQL

MySQL is an open source and multithreaded Relational Database Management System developed by Michael “Monty” Widenius in 1995. Rich feature and decent performance make MySQL one of the best RDBMS to depend on (Wahyudi & Sialahi, 2018). We will integrate MySQL to the system as our RDBMS; provide CRUD and other operations on the database.

3. PHP

PHP (Hypertext Processor) is a web programming language that is commonly used with HTML. PHP works on server-side or so-called “Server-side programming”, means any syntax or command will be fully executed in the server with HTML, so the real will be exposed to clients (Palit, Rindengan, & Lumenta, 2015). PHP functions as the logical programming of the website, so any operation performed in the web (including SQL syntax, CRUD) will be handled by PHP. The purpose of this language is to build an application that will commonly display the result on the clients’ web browser, but the whole operations will be executed in the server (Palit, Rindengan, & Lumenta, 2015).

4. Bootstrap

In essence, Bootstrap is a collection of CSS created by Mark Otto and Jacob Thornton. Bootstrap is used as a way to design the web by calling certain class (or id) available inside the CSS collection. The property of Bootstrap enable better and vivid experience in terms of UI and UX. In addition, Bootstrap is compatible with mobile devices, meaning the design that we will built is already responsive design. This can ease our development as we can use any property of Bootstrap manual HTML and CSS, to create a good design for the project.

5. Brackets

Brackets is an open-source text editor developed by Adobe. It is written in JavaScript, HTML and CSS. Its simple and useful features, supports for various programming language, plugins, and support across Windows, Linux and MacOS, and the lightweight makes the text editor is feasible to use.

6. Browser

For our preview and testing, we picked some famous browser such as Google Chrome, Mozilla Firefox, and Microsoft Edge. In addition, with our objectives to make the web to be responsive, we can also simulate mobile devices through the browser. Browser needed to develop our website application system. We will test our website in browser. We use several browsers to test our system, such as Google Chrome and Mozilla Firefox.

7. GitHub (Desktop and Web Version)

Github is a code-hosting platform for version control. Thanks to its version control system, Github lets developer to work each other by working in a branch, where we can compare or merge our work, that can ease the workflow of developers.

8. UML

UML refers to a graphical language for specifying, visualizing, constructing, and documenting the artefacts of a software-intensive system. UML offers a standard way to write a system's blueprint, including conceptual components such as actors, business process, system's components and activities.

9. Adobe Photoshop CC 2015

Adobe Photoshop is an application for raster graphics editing developed by Adobe System. It is available on MacOS & Windows. We use Photoshop to design banners & logos for our project.

10. Adobe XD

Adobe XD is a vector-based UX design tool for web application and mobile applications developed by Adobe. It is available on MacOS & Windows. We will use Adobe XD to develop our prototype and the workflow of our prototype.

Creating Project Document

1. Microsoft Word

Microsoft Word is a graphical word processing application developed by Microsoft. With its rich feature, friendly UI, and easy to use, we decide to use Microsoft Word so we can produce documents or deliverables related to the project.

2. Microsoft Power Point

Microsoft Power Point a graphical application for presentation developed by Microsoft. With its rich feature, fast-to-set templates, friendly UI, and easy to use, we decide to use Microsoft PowerPoint so we can present our project to you.

3. Microsoft Visio

Microsoft Visio a graphical application for making diagram and vector graphic developed by Microsoft. With its rich feature, fast-to-set templates, many diagram standards, friendly UI, and easy to use, we decide to use Microsoft Visio so we can make diagrams related to the project.

4. Gantt Project

Gantt Project is an open source tool for project scheduling and management. We decide to use Gantt Project because for its open source, the feature are simple but useful, helping our team to create schedules and milestones, targets to work on. The task duration can only be inputted in days, not months that probably will make a confusing start for beginners to deal with.

7. Conclusion

With the rapid development technology, people can access information anytime anywhere. You can get any information you want with only a phone. Many developers start to develop many mobile apps into the platform. You can find anything regarding to your needs, and depending on your platform. However, the problem is not every information you want can be fulfilled by the present of native mobile application, as there are still many opportunity for developers to develop application of any information they want to provide with. We realized that this also happened in academic internship. Vocational high school and college student are still having trouble to search companies that can be reached for opportunity of internship. This can be happened because lack of networking, or low soft-skill that finally put a hold for their effort. On the other side, there are still companies that open opportunities for any training or practice for student for the purpose of academic internship. As we know that Internship can help student to get real experience of their dream work in the field, balancing between the theories they have learned in school, and the practice they have to exercise in the field.

With our project and all the consideration with it, we decide to build a dedicated responsive design website application. With this way, we can help student to find companies for their academic internship, while we also help companies to get more exposure. More exposure means more opportunities. We analyzed and realized there have been existing job vacancies application that similarly offering this service. But the turning point that we have, is that we build this especially for only vocational high school (or equivalent) and college student for helping their way internship.

The reason we choose to go with responsive design website rather than native mobile application is that also the information itself. The importance of information we are offering is high, but the complexity of it is not that high. With all the luxury of native mobile programming, the consequence will be also a lot more than what we can give; Time, cost and waste of memory. We decided that so the user could access the application and information from all platform with medium or low-end hardware that they have in hand. Besides the feature is not that far away from native mobile programming, because the importance here is the information.

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