

# Designing a Web-based Career Assessment Test

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**Abstract**—Employees are one of the most important assets of a company. Therefore, it needs to be maintained both in number and quality. However, this is not easy to do by HRD (Human Resources Development), especially in recruiting employees. In the process of recruiting, employees must be aligned with the needs of the company. Therefore, an assessment test is needed to facilitate recruiting appropriate employees. Various types of tests are carried out using company recruitment standards. It makes HRD difficult because the need for a recurring summons process on the candidate takes days until the process is complete. This system is designed as a web-based application using a Laravel framework to carry out an assessment process on prospective employees which includes the assessment test scale based on MBTI (Indicator Type of Myers-Briggs), SDS (Independent Search), and Disk (Domination, Influence, Stability, Stability, awareness). Researchers collected data to get the UAT (User Acceptance Test) and produced twenty-one representatives from the Human Resource Development (HRD) division; it was concluded that 97.1% agreed to use a web-based career assessment test for the recruitment process.

**Keywords**—web-based application, laravel framework, career assessment test, MBTI, SDS, DiSC.

## I. INTRODUCTION

Everyone needs income to continue living, and revenue is obtained from working. Work is generally considered to have the same meaning as a career, but the two have differences. Work is just one way to make money, while a career is self-identity; a career defines half of one's life, gives direction and purpose, and is also a tool to change a life, even the world.

Seeing how important the role of a career is in human life, we cannot underestimate it. A person with a wrong career, not following his life vision, only works to survive but needs more enthusiasm to continue to improve and contribute to the world's development. Often the wrong career can break the spirit of life to the point that it has a bad influence on other important

aspects of life, such as finances, relationships, and health. But the right decision in choosing a career can improve the quality of life [1].

Employees need the right career, just as companies need the right employees. The Human Resource Development (HRD) section carries out human resource management. One of the HRD tasks is to carry out the employee recruitment process. However, selecting prospective employees who match the vision and mission of the company takes work. This is due to the many potential employee candidates that take time to see quickly and the competition between companies to get the best candidates. Therefore, it is necessary to have a good assessment test. The assessment test conducted will assess aspects of hard skills and soft skills. These two aspects are equally important. However, it is common for companies to place too much emphasis on hard skills compared to soft skills, so sometimes companies recruit employees who are not following the company's culture and, in the end, result in huge losses for many parties. In selecting competent and skilled employees with good personalities to contribute to developing the company in a more positive direction [2].

ABC company is the largest bread maker at the national level. This company is well known enough that it is in great demand for job applicants because of its adequate suitability and growing rapidly in various regions nationwide. The many needs for job positions within the company make the HRD division try as much as possible to recruit new employees to fill vacant positions in the company. Many applicants at the company make the HRD division quite overwhelmed in handling each process because applicants need to go through several functions before being accepted as an employee. The current process is still manual and requires a lot of technical activities, such as printing documents and evaluating and contacting candidates, which can be done repeatedly.

This research will create a web-based application as a place for psychological tests that can be done online. With the Career Assessment Test application, the recruitment process will

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become much easier and more efficient. A survey conducted on representatives from the HRD department at the head office and all company branches shows several problems in the offline assessment test system, such as limited space and time, psychological test results that take a lot of time, and inaccurate results due to human error also lack objectivity from the examiner. Therefore, a new, more adequate assessment test system is needed.

## II. LITERATURE REVIEW

### A. Career Assessment

Career assessment is used to predict five important factors needed to determine whether the candidate in question is an individual that fits the company's needs at the time the assessment is carried out. The first factor is personality; these factors help recruiters to understand the most consistent patterns of applicant behavior. This assessment provides a clear picture of what fits the applicant's style and attributes. The second factor is the Orientation style; This factor identifies the factors that can encourage someone to decide or act. You will see the applicant's dominant interaction style with the surrounding environment. The third factor is Interest. This factor tries to understand the field of work and the attributes that arouse the interest of the applicant and that will keep him enthusiastic about being involved, making the career choice in question worthwhile for his life. The fourth factor, Talent, requires an understanding of the applicant's innate strengths because everyone has expertise and inclinations in areas that need improvement for himself. The last factor is emotional intelligence; these factors are necessary to help recruiters understand applicants' emotional intelligence and their ability to handle social situations. With this assessment, both recruiters and applicants will gain a good understanding of the applicant's dynamic patterns and ability to handle interpersonal relationships[3].

### B. Related Research

In this research, the following journals are used as references. The first journal, "Design and Development of Alumni Career Information System using PHP MySQL" [4], the application was also web-based. It was built using a CodeIgniter framework, while in this study, the researchers used the Laravel framework instead. Second with the title "An Android based Mobile Application for Career Guidance" [5], the journal only discussed the selection based on aptitude. The third reference is "Myers-Briggs type indicator (MBTI) personality and career indecision among Malaysian undergraduate students of different academic majors" [6]. In that journal, they only discussed the study of the distribution of 16 MBTI types among UTM students and their effect on the inability to make the right decision related to college majors following the right career. The last journal is "Industrial human resource management optimization based on skills and characteristics, Computers and Industrial Engineering" [7]. In that journal, the researchers only discussed an employee selection test based on MBTI. The researchers added two

more instruments to increase accuracy and validity in the current study: SDS and DiSC tests.

Our research is to develop web-based Career Assessment uses three proven psychological instruments as the fundamental, which are the MBTI (Myers-Briggs Type Indicator) [6], SDS (Self-Directed Search) [8], and DiSC [9]. Researchers use these three types of instruments because they can have a mutually sustainable impact, where the MBTI can provide a clear cognitive picture, then followed by SDS which provides an overview of related personal work preferences, and then reinforced with DiSC which determines the tendency of the type of career that best suited the candidate based on their interests and talents. The web-based application in this research is limited to psychological tests within three instruments, which are MBTI, SDS, and DiSC.

## III. RESEARCH DESIGN

The methodology used in making this Career Assessment Test is the Waterfall model [10], and the study was carried out in a branch factory of a company. The factory branch is in Bali, Indonesia. The study involved thirty-seven respondents who work in the company's HR department. The data was collected using questionnaires given to the HR department, an in-depth interview with the HR national supervisor in the company, and observations of the whole company, including other branches. Below is the study flowchart. Here are the steps in designing the Career Assessment Test application:

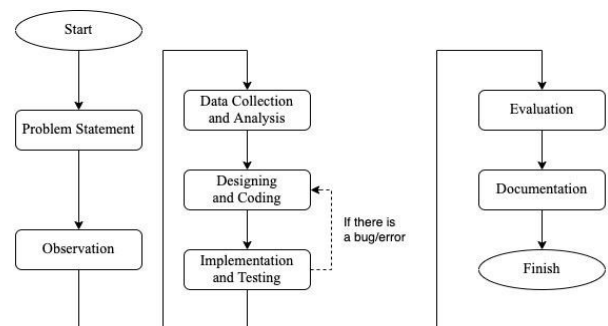


Fig. 1. Research Process

## IV. RESULT

### A. Problem Identification

Digging data from a survey of 37 HRD people and interviewing the head of the company's national division, several problems were found during the recruitment process, such as Prospective employees taking a long time to take manual career assessment tests, HRD taking a long time to check test results that job applicants had carried out, Time is limited for the manual career assessment test, and the results of the manual assessment test are less objective due to human error. Researchers also made observations on the career assessment process conducted at this company. The following is the flow of the assessment pattern carried out; see Figure 2.

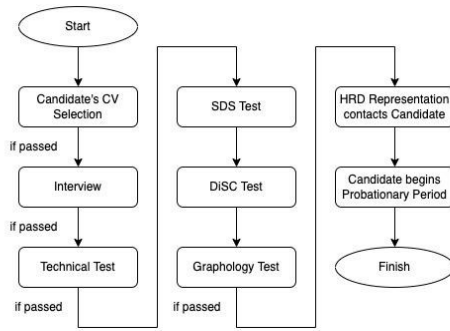


Fig. 2. Recruitment Flow

The first step taken by HRD is to select candidates from company applicants. After being selected, information is sent to the candidate for the interview process. Candidates who pass the interview process will follow the process of several technical tests such as SDS (Self Directed Search), DISC and How to Analyze Handwriting (Graphology). If the candidate has passed the technical test, HRD will contact the candidate and proceed with a contract binding for a trial period.

### B. Design

After analyzing the problem and finding a solution, the next step is for the researcher to make a UML diagram [11] as a guide for the application development process. The use case diagrams for this system can be seen in Figure 3, 4, and 5. This application involves three actors: Admin, HRD, and the Candidate.

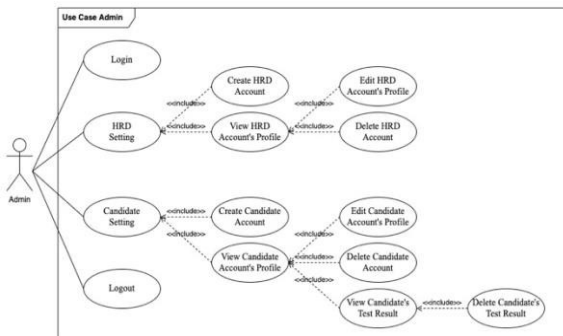


Fig. 3. Use Case Diagram for Admin

The Admin role will be filled by the team in the IT department, and they will manage the HRD and the Candidate's accounts. They are authorized to create and delete HRD and Candidate's accounts (see figure 3).

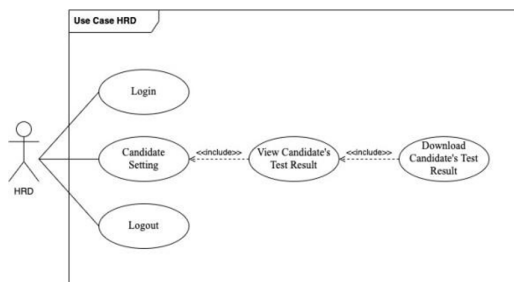


Fig. 4. Use Case Diagram for HRD

The HRD can manage the Candidate's accounts including their test results (see figure 4).

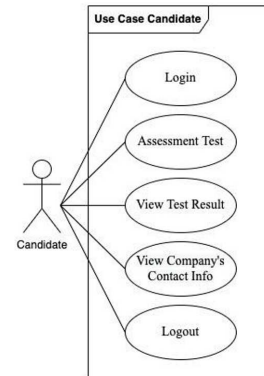


Fig. 5. Use Case Diagram for Candidate

The Candidates can do the test, view the test result, and view the company contacts (see figure 5). The class diagram is shown in Figure 6. Class diagram contains users who are using the system. Candidate is an object that contains the candidate's data. HRD is an object that contains HRD's data. Admin is an object that contains admin's data. Test is an object which contains the test questions. Test result is an object that contains candidate's test result data.

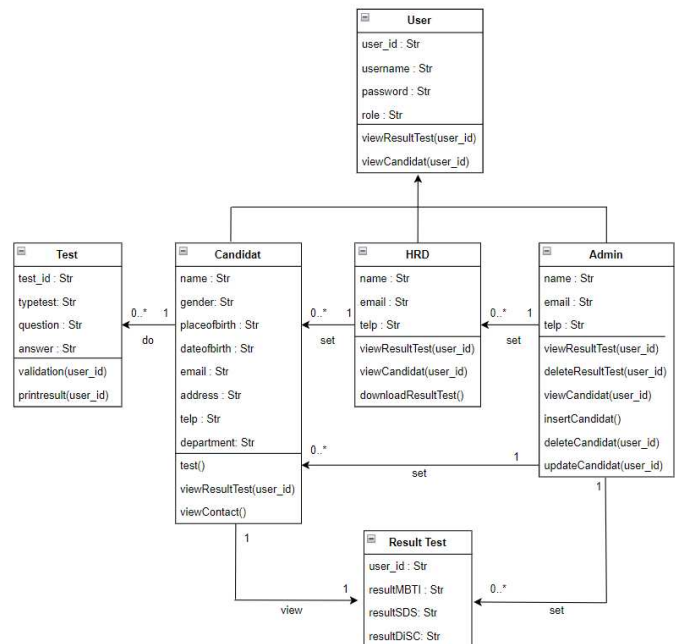


Fig. 6. Class Diagram

### C. Implementation

The web-based career assessment test program uses PHP programming language [12] and Laravel framework [13]. Other programming languages, such as HTML, CSS, JavaScript, and SQL, are also utilized to support the system's functionalities. Since the users will vary widely, the program will be designed to suit every possible user [14].

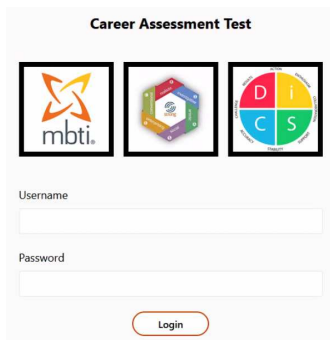


Fig. 7. Login Page

Figure 7 shows that the login page is the first page accessed on the Career Assessment Test website. This page only contains a login form which will direct the user to the next page according to permission.

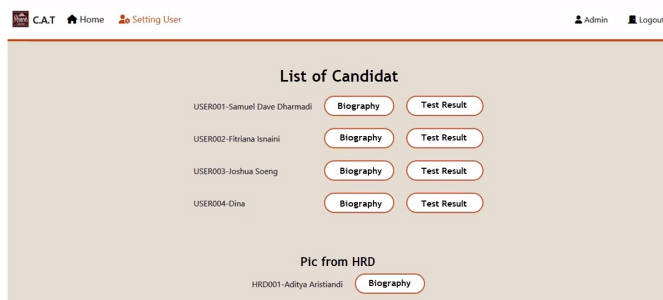


Fig. 8. Candidate Setting for Admin

Based on Figure 8, this is the candidate setting page for the admin. The admin can view, edit, and delete the candidate's profile and test result.

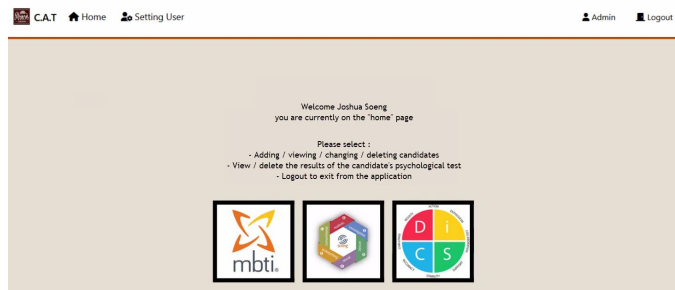


Fig. 9. Home Page - Candidates

Figure 9 shows the MBTI, SDS and DiSC test pages. The MBTI Test Page is the first test section of the online Career Assessment Test, this test contains 28 multiple choice questions. the second test is the SDS Test and the last test is the DiSC Test page which is the last test part of the online Career Assessment Test. Candidate must answer all questions in the test. if all tests have been completed, the candidate can press the Done button to end the test and see the results immediately.

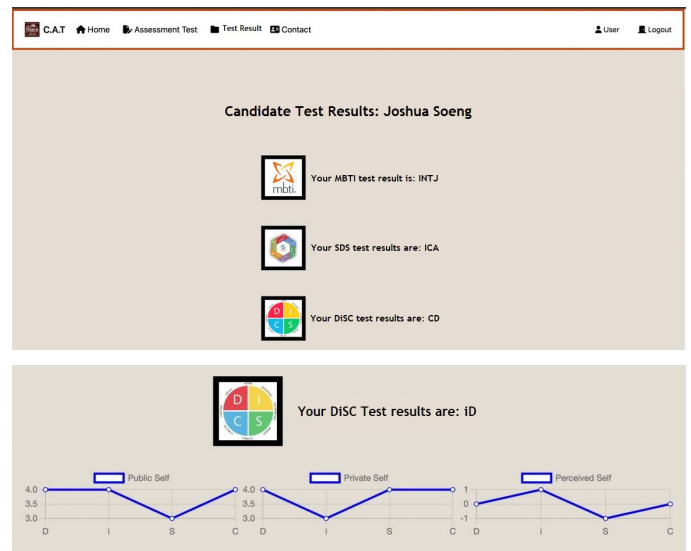


Fig. 10. Test result example

Figure 10 shows the test result pages for each instrument (MBTI, SDS, DiSC) along with a detailed description of the relevant personality types. In the DiSC test results, there are 3 graphs representing public self, private self, and perceived self. The vertical axis on this graph shows the number of user choices from each category. There are 4 categories visible on the horizontal axis, namely D, i, S, and C.

#### D. Evaluation

The development of this application the process of accepting new employees in the company has changed, while the comparison flow of changes is (see table).

TABLE I. COMPARISON OF THE EMPLOYEE HIRING FLOW BEFORE AND AFTER THE CHANGE


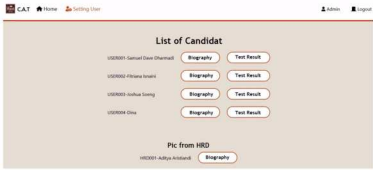
| No | Before                 | After Change  | Description of Change  |
|----|------------------------|---|--|
| 1  | candidate cv selection | candidate cv selection  | -  |
| 2  | Interview              | HRD provides login info to candidates   | HRD provides a username and password to log into the career assessment test application.   |
| 3  | Technical test         | candidate's login to the website application  | candidate's login to the website using the login info provided by HRD and there is no technical test, the test starts from the application.  |
| 4  | Test SDS               | candidate completes the psychological test  | the three psychological test instruments are carried out simultaneously in the career assessment test application, while the graphology test is only carried out as needed if an anomaly is found in the candidate (according to the main function of the graphology test function). |
| 5  | Test DiSC              | HRD checks the results of the psychological test and then proceeds to the DiSC test |  |
| 6  | Test Graphology        | Interview   |  |


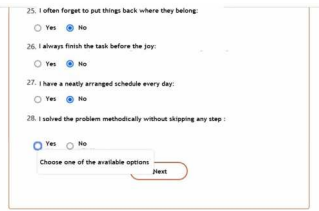
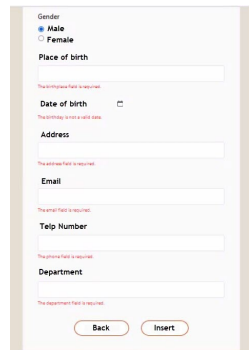


| No | Before                                     | After Change                               | Description of Change   |
|----|--|--|---|
|    | HRD contact candidate                      | Technical Test                             | on the same day after the interview is complete and the candidate is deemed suitable, HRD will immediately provide a technical test                       |
| 7  | The candidate begins a probationary period | The candidate begins a probationary period | assessment of test results can be done quickly, so that candidates can immediately get a decision whether to be accepted for work or not on the same day. |

Under the company's core values which emphasize the character of the company's members, the psychological test is carried out before the technical difficulty. With a flow like this, it is hoped that it can increase efficiency because candidates only need to attend face-to-face once, and on the same day, the candidate can immediately receive a decision on whether the candidate can be accepted at the company or not.

The Career Assessment Test application was evaluated using the Eight Golden Rules and User Acceptance Test surveys. It was distributed to the company's HRD team; after they tried and tested the application. Twenty HRD representatives provided feedback on the two surveys. The following are the evaluation results using the Eight Golden Rules survey and the UAT survey that has been conducted:

TABLE II. EVALUATION RESULTS

| No | Golden Rules   | Screen Capture  |
|----|--|---|
| A  | Strive for consistency   | There is consistency between all pages. The layout, color, size of buttons and size of similar types of text are consistent |
| 1  | Website layout is consistent. Consistent placement such as the navbar remains there from the home page to the test results page. |    |
| 2  | Color combination is consistent. The colors used on the website is consistent between one page and the other.                    |   |
| 3  | Font type and size are consistent in every page. Titles are using bigger size with bold style.                                   |   |
| 4  | Button shape and size are consistent in every page.  |    |
| B  | Offer informative feedback   | Informative feedback is sufficient  |

| No | Golden Rules   | Screen Capture  |
|----|--|---|
| 5  | Page navigation on the website is unambiguous and clear. It is easy for users to find what they need.  |    |
| C  | Offer simple error handling  | Error handling provided on the website is sufficient  |
| 6  | There is a warning if there was an unanswered question in the test   |    |
| 7  | There is a warning if there was an empty text box when adding or editing a user profile  |   |
| D  | Reduce short-term memory load  | The website only contains essential features and crucial information. There is no unnecessary features or information that could disrupt the user's attention |
| 8  | The website is simple, and user friendly, so even new users don't get confused.  |    |
| 9  | In the home page, information and instructions are clear and not overwhelming  |   |
| 10 | There are only essential and useful features. On the website there are no insignificant features. All features on this website are functional and practical. |    |

The results of the Eight Golden Rules survey show that all participants agree with the 10 statements above, except for 1 participant who disagrees with the 3rd statement, and 1 participant who disagrees with the 4th statement.

The ten statements above are contained in the UAT survey [15]. A total of 21 participants were asked to provide a "Agree" or "Disagree" response. It was found that one participant



disagreed with the 3rd statement, three participants disagreed with the 4th statement, and two participants disagreed with the 5th statement. Meanwhile, all other participants agreed with all the statements in the UAT survey. From the results of this survey, it can be concluded that users are satisfied using the Career Assessment Test application.

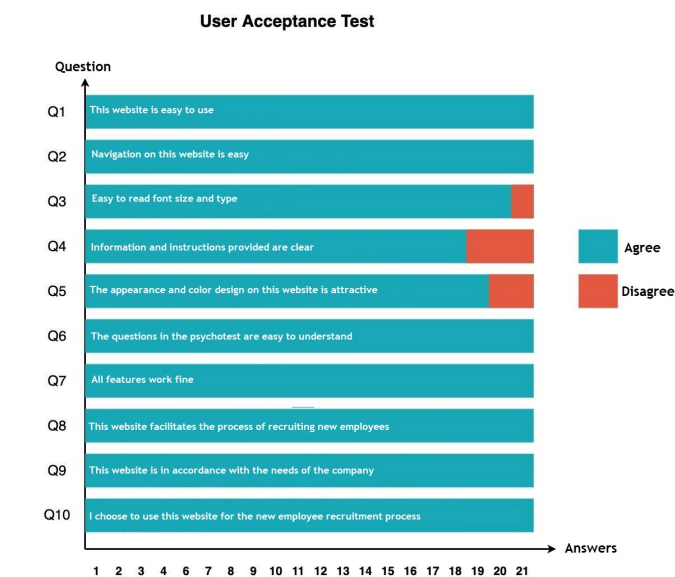


Fig. 11. UAT Bar Graph

## V. CONCLUSIONS

The result and discussion show that the application has changed the recruitment flow more efficiently. The application uses PHP programming language with Laravel framework for simplicity and practicality. Twenty-one representatives from the HRD department in the company took the survey. Each representative had to answer ten questions for the survey, and every representative gave overall positive feedback. Therefore, this Career Assessment Test application has achieved the goal of making a good assessment test for the company. This Career Assessment Test application is expected to accommodate the HR department of the company data collection related directly to the recruitment process in a more computerized and effective manner. This application is also likely to assess prospective candidates' character and traits; therefore, the candidates will be more likely to suit the company's needs.

This application provides career-related information for the candidates that could be used as their reference later. This application is expected to be used by the public in the future. However, it would require much more optimization beforehand, especially regarding the eight golden rules, web security, and ease of maintenance.

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