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Virtual Assistant for Prediction High Education Students' Personality in Seeking Sustainable Careers

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ABSTRACT
Choosing the good career is important since early when you are still in college. The good career will help should be in accordance with the personality of each person to ensure that the career can be lived in continuous time. The purpose of this study is to predict the career of students in higher education based on their personality using a virtual assistant. The method used is the prototype method to build a virtual assistant by adopting the MBTI personality test. The results of this study indicate that virtual assistants are built very well to recommend appropriate career choices to students in higher education according to the personality possessed by each student. The virtual assistants produced successfully implemented the MBTI test model in a system that was built and had a high degree of accuracy in recommending career choices. This study concludes that predicting the right career choice will be able to help students in higher education to prepare for careers early when they are still educating and practicing it well so as to produce sustainable career choices in the future.

Keywords: prediction, higher education, personality, careers, virtual assistant

1. INTRODUCTION

Career selection becomes very important in the journey of every individual's life. A good career will guarantee sustainability and economic conditions. The sustainable career choice becomes Security for excellent health both physically and psychologically. Psychological conditions such as empathy, motivation, relationships with others, beliefs and emotions [1] are contrary to good careers. To be able to build a successful career, an individual must have successful abilities to improve well and non-employment [2]. This makes career choices complicated because they have to consider many factors. An easy way is needed to resolve this problem. Preparation for career selection from an early age, a solution for sustainable career selection.

Career preparation at an early age must start from the moment they are still studying both in vocational high school and in higher education. In current conditions in developing countries, many tertiary education graduates experience many serious problems such as limited job choices and low ability to get high careers. Also, it takes a long time to achieve the desired career because the level of achieving it becomes very long. The best plan is needed to prepare the right career with psychological conditions and mature abilities [3]. This should start from the time of study in higher education. The problem is, higher education in many developing countries, does not see career choices for graduates become an important part of the education process so it does not prepare appropriate treatment. An approach is needed to prepare a career for tertiary education graduates. The impact of this problem, many graduates of tertiary education, work not following the abilities and personality possessed, but simply take whatever job choices are available at that time. This causes them to always change jobs and not enjoy what is done. Another impact is that graduates are not able to develop psychologically and even work with low standards.

Temporary solutions that use tertiary education are still oriented towards enhancing knowledge and psychomotor abilities and not yet competency aspects of personality. Activities are undertaken as building learning facilities such as libraries, study rooms, and even providing virtual-based learning resources [4] to improve student abilities. This has not been able to solve the problem because it is still difficult to choose the right career as desired. Increasing academic ability needs to be improved through personality [5] This needs to be introduced to the personality of each student so that learning can occur by what students have.

The choice of a career model like this is very good, but higher education has limitations to present adequate psychologists to meet a large number of students in tertiary education. Therefore, it is very important to build a virtual assistant to

help students get the right accompaniment to choose a career that suits their personality. This research develops virtual assistants that can be used to predict the right careers for students in higher education by their personalities. This research is based on a personality test developed by Myers-Briggs. This personality test is expected to represent the personality test developed by psychologists. With the help of computing, this personality test was built with computer-based programming to produce virtual assistants. Virtual assistants can be used by individuals to find out career choices that can be made according to the personality of each student. The virtual assistant can be used by every student from start to finish to get a career choice to be chosen after graduating from tertiary education. This virtual assistant generates predictions based on those developed using personality indicators built by Myers-Briggs.

2. LITERATUR REVIEW

Virtual Assistant is a computer application that is used to help solve digital problems. Virtual assistants are built to solve specific problems with specific solutions too. The results of virtual assistants are expected to be more effective in the handling of good resources and expert infrastructure. The virtual assistant has flexibility in its use and is easy to use using computers and smartphones. Virtual assistants must have a more interactive component with users who can answer raised user questions [6]. Virtual assistants can have an avatar model that facilitates communication between users who use interactive and can represent interactive types that are easy and fast in providing quality information [7]. Virtual assistants can be built using web-based internet infrastructure by providing learning engines on servers on the internet [8]. Models like this can use cloud computing technology to make it more efficient in the use of processors, memory, and bandwidth [9]. Virtual assistance is built with a framework that is proven efficient in solving a problem [10]. The framework implemented on the website can produce virtual assistants that are more flexible to use and can be accessed using both mobile devices and personal computers and laptops. Virtual assistants must be built with artificial intelligence technology that has high accuracy and capability so that they have a high level of trust from users [11].

Building a virtual assistant that has a high level of power analysis requires good allocation and can be implemented in programming with easy implementation. The problem complexity requirements that will facilitate the use of compilation technology adoption in making virtual assistants very important because they have to pay attention to the variety of dialogs presented to users [6]. Virtual needs to predict with the main requirements of virtual assistants, such as the ability to predict one's personality according to ownership of social media accounts [12]. The personality test model algorithm can be used using the Myers-Briggs Type Indicator (MBTI) [13]. The algorithm that was built uses a more efficient algorithm to install an efficient and efficient work machine [9]. The choice of this algorithm is very dependent on the problem to be discussed and the scope of which will be discussed by the built virtual assistant system. MBTI personality tests can be published with student learning styles in higher education that can be adjusted to the personality of each student so that learning outcomes can be improved [14]. Thus, the MBTI method can be adopted in computing to build accurate virtual assistants to predict the right career choice for higher education development. This is between the existence of a significant relationship between student personality with the academic performance of higher education students [5]. This will help the lecturer to make appropriate learning with students in his care [15].

3. METHOD

The development method for building a virtual assistant uses a virtual assistant architecture that is built on a website. The virtual assistant architecture uses the internet with the client-side to access the virtual assistant using a website-based interface and server-side that contains applications and virtual machine assistants with algorithms that adopt MBTI personality tests such as figure 1.

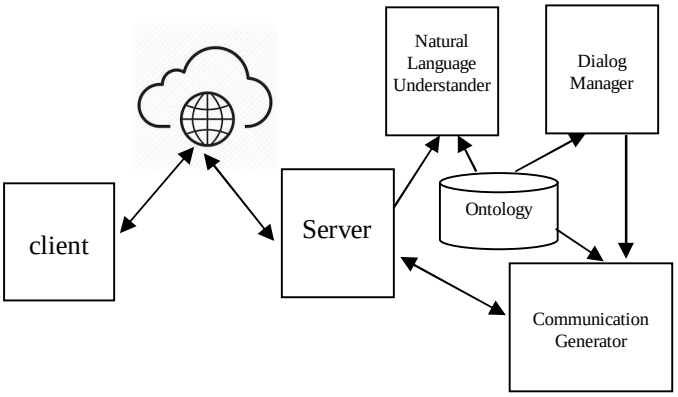

Figure 1: Architecture virtual Assistant

The ontology contains entities that are units of information and are used to describe concepts that have special meaning. This ontology is built based on knowledge representation of MBTI indicators that have been developed previously. The ontology built in this virtual assistant contains MBTI questions mapped out according to 4 main dimensions, namely Introvert (I) - Extravert (E), Sensing (S) - Intuition (N), Thinking (T) - Feeling (F), and Judging (J) - Perceiving (P). This built ontology contains 70 questions that will be answered by students who use this virtual assistant.

A natural language understander is a unit used for the introduction of references. The results of this recognition will provide directions to answer the following questions that have been arranged in such a way as to use forward chaining logic to build system conclusions. The system will use calculations based on the adoption of the MBTI model to infer the personality of a student and build a career prediction system that is right for the student.

To build conclusions, a virtual assistant uses a dialog manager. The dialog manager will issue the answers that have been analyzed with the MBTI technique based on the exact sum per column that has been categorized. The total number of columns generated is 7 columns, each containing each answer to each question that has been categorized. The summation results will be compared to 4 pre-existing MBTI categories. The Highest Yield for each column will be used to draw personality conclusions.

The communication generator is used as a part to translate and transform the results obtained previously in the dialog manager section. In this section, the results of the virtual assistant predictions are displayed in an attractive user interface so that the personality test results and career choice recommendations can be seen by students. This makes it easy for students to use virtual assistants for quick and easy career selection. It can be done at any time and also done repeatedly.

4. RESULT AND DISSCUSION

This research succeeded in building a virtual assistant using a virtual assistant according to Figure 1. In the ontology section, all questions were prepared using the MBTI personality test model of 70 questions. The pattern of arrangement of questions as shown in Figure 2.

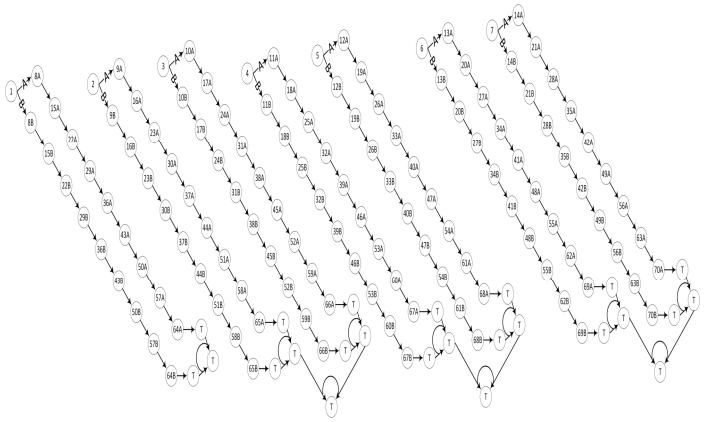

Figure 2: Arrangement on ontology

This composition is built in such a way that it produces patterns arranged in a related manner to one another. Questions are arranged randomly between the parts Introvert (I) - Extravert (E), Sensing (S) - Intuition (N), Thinking (T) - Feeling (F), and Judging (J) - Perceiving (P). The relationship between questions is built using forward chaining logic, as in Figure 2.

The forward-chaining logic is designed as follows:

1. The logic for grouping answers A from numbers 1, 8, 15, 22, 29, 36, 43, 50, 57, 64, at the end of this grouping will add up the number of answers A selected and will be adjusted to the total number of answers B from numbers 1, 8, 15, 22, 29, 36, 43, 50, 57, 64. If A is greater than B then more E is obtained, conversely if B is greater than A then the result is I. If A and B equal, then the results are E and I.
2. The logic for grouping answers A from numbers 2, 9, 16, 23, 30, 37, 44, 51, 58, 65, the number of answers will be added to the total answers A from numbers 3, 10, 17, 24, 31, 38, 45, 52, 59, 66. For answers B from numbers 2, 9, 16, 23, 30, 37, 44, 51, 58, 65, the numbers will be added to the number of answers B from numbers 3, 10, 17, 24, 31, 38, 45, 52, 59, 66. At the end of this grouping the total number of answers A will be selected and will be compared with the total number of answers B. If A is greater than B then the result is S. Conversely if B is greater than A then the result is N, if the sum of A and B has the same value then the result is S and N.
3. The logic for grouping answers A from numbers 4, 11, 18, 25, 32, 39, 46, 53, 60, 67, the number of answers will be added to the total answers A from numbers 5, 12, 19, 26, 33, 40, 47, 54, 61, 68. For answers B from numbers 4, 11, 18, 25, 32, 39, 46, 53, 60, 67, the answer will be added with the number of answers B from numbers 5, 12, 19, 26, 33, 40, 47, 54, 61, 68. At the end of this grouping, the total answers A will be added and will be compared with the total number of answers B. If A is greater than B then the result T. then the result F, agree the number of A and B has the same value, the results of T and F.
4. The logic for grouping answers A from numbers 6,13, 20, 27, 34, 41, 48, 55, 62, 69, the number of answers will be added to the total answers A from numbers 7, 14, 21, 28, 35, 42, 49, 56, 63, 70. For answers B from numbers 6,13, 20, 27, 34, 41, 48, 55, 62, 69, the answers will be added with the number of answers B from numbers 7, 14, 21, 28, 35, 42, 49, 56, 63, 70. At the end from this grouping, the total answers A will be added and will be compared with the total number of answers B. If A is greater than B, then the result is J. Request if B is greater than A then the results of P, the total sum of A and B are equal then the results are J and P.

The results of the analysis that was formed showed the pattern of personality results according to the criteria in the MBTI. the results obtained from the personality test, the system will determine the right career choice predictions according to the personality of the student. This result precisely has a high degree of accuracy as shown by the results of the MBTI test. With a high degree of accuracy, it can be seen that this virtual assistant can be used by students to find out the personality and career choices that they can pursue after graduating from higher education.

The interface that can be built on the virtual assistant is shown in figure 3.

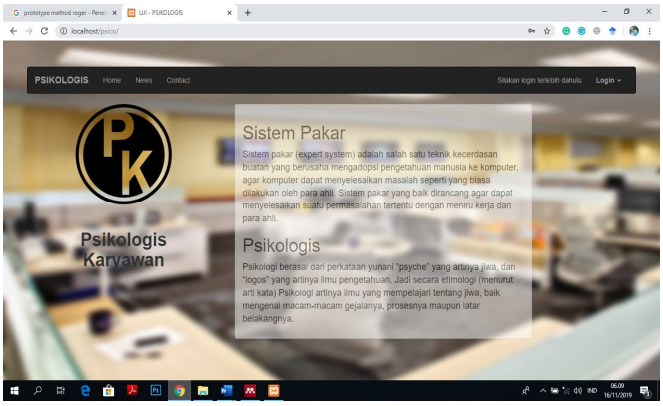

Figure 3: Interface virtual assistant

Initial access to the virtual assistant is used to start running the virtual assistant. Inside there are explanations and simple instructions for using the virtual assistant application. Users can register and login to start an interaction in this virtual assistant system.
Users can directly enter and first answer identification questions to get the results of their personality types. The interface for answering questions is very simple as shown in figure 4.

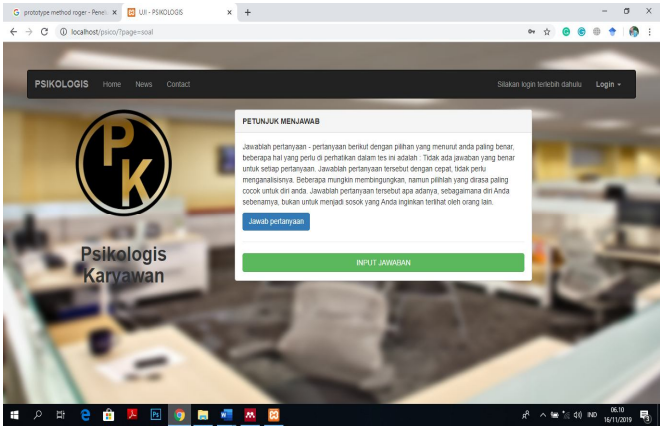

Figure 4: Interface to start identification

The interface in Figure 4, is used to start the personality identification question. Users will be asked to answer honestly 70 identification questions that are optional and the user can choose one of the 2 answer options available for each question. Examples of questions as shown in Figure 5.

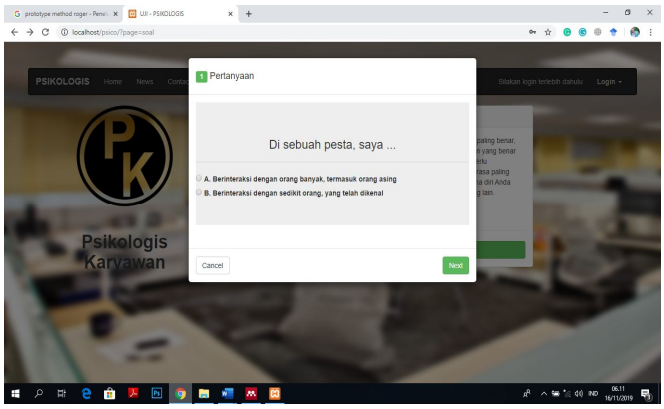

Figure 5: Interface questions

After answering by selecting the available answer option, the user must press the next button to go to the next identification question. The next question that appears after the user presses the next button like figure 6. The number of questions that appear as many as 70 questions that have been arranged following the MBTI personality test pattern so that it can obtain accurate results and have high precision.

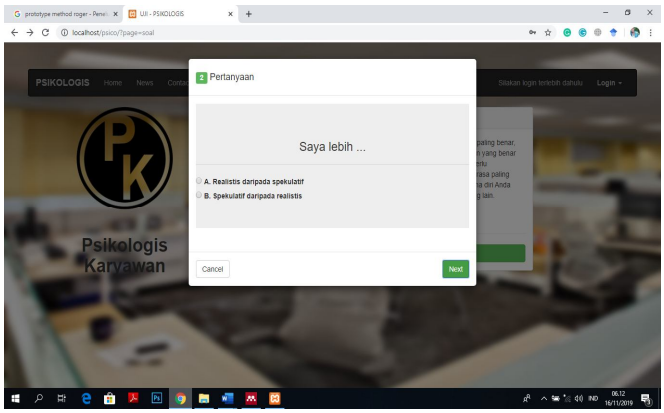

Figure 6: Interface advanced questions

To get results that have high precision and accurately record a person's personality, the user is expected to answer truthfully according to the facts that occur and by what is in him. The accuracy of the results depends on how the user answers each question raised by the virtual assistant system. The right response will get accurate results with high precision.
To be able to see the results of personality tests, users will be asked to log in first. Login interface as shown in figure 7.

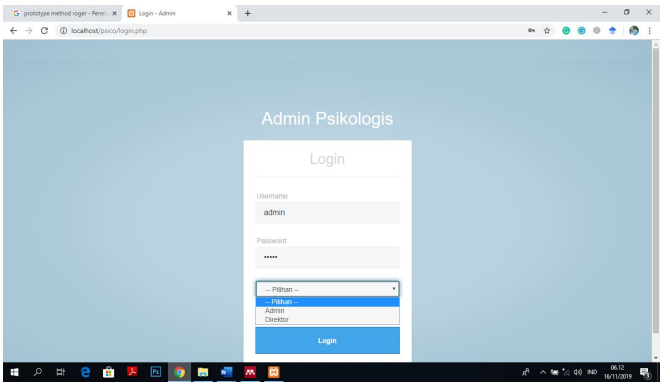

Figure 7: Interface login

Users can log in using their username and password. To get a username and password, users can register in the registry. After logging in successfully, the user clicks on the result data menu and the virtual assistant system will display the results of the interaction of the user's personality through interactions that have been done before. After that, the virtual assistant system will display predictions of career choices based on the user's personality. The results of career selection predictions can be seen as in figure 8.

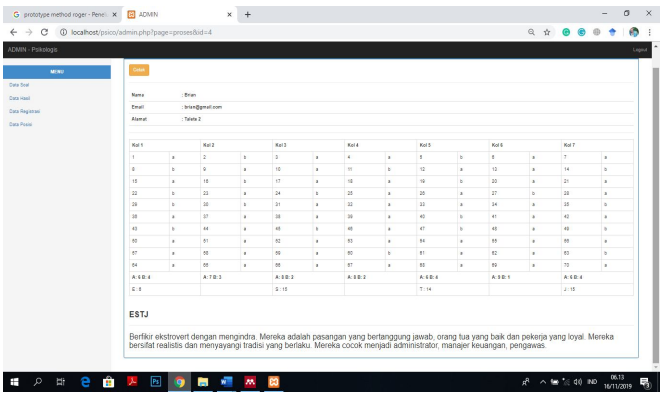

Figure 8: Interface career prediction results

This research succeeded in building a virtual assistant system that implements an algorithm built based on the MBTI personality test. The results of this research recommend the use of this virtual assistant system for every student in tertiary education so that students can quickly find out the personality they are in, helping to choose the right learning style to prepare a career that suits their personality.

The right career choice by the personality of students is believed to produce career choices that are supported and continuously pursued so that the problem of moving the profession involved is not by the career that has been selected with the personality needed.

5. CONCLUSION

This study concludes that the right career prediction can help higher education students prepare their careers early on while still studying in higher education and be able to pursue the right career according to their personality. Virtual assistants help students interact with systems that have been built so that they get accurate results with high precision. This can guarantee a sustainable career for students after graduating from higher education. The accuracy of this virtual assistant is due to the success of the system building algorithm based on the MBTI personality test that has high quality to recommend career choices for someone.

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