

# Model for Career Development Information System Information and Communication Technology based on Expert Systems in the Industrial Revolution 4.0

Kasman Rukun, B.H. Hayadi

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## Abstract:

This research in the field of Information and Communication Technologies (ICT) careers in Informatics Engineering students based on expert systems to answer the challenges in the era of industrial revolution 4.0, where this research was conducted in the final semester students to find out career profiles in the field of what is potential for students to become a reference for working in the field of Information Technology, especially Informatics Engineering and expertise in accordance with the achievement and mastery of the material field with a proven 80 to 100 according to the achievement of the Semester Learning Plan (SLP) in each course, then if the student reaches the value of 80 to 100 then it is declared successful and becomes a determinant of career profile by managing the forward chaining method on the expert system so that students can find out their profile for potential work.

**Keywords:** Career, Information and Communication Technologies, Expert Systems, Semester Learning Plans.

## I. INTRODUCTION

Every individual has the right to succeed in achieving a good career in accordance with the job he chooses. However, someone often chooses a career for the wrong reasons, maybe because of the wishes of parents or on the instructions of the teacher. Even though knowing the character and personality of themselves will lead someone to the ability to choose suitable jobs and achieve high achievements in that career[1].

As a career counselor in an R&D work force management and staffing organization, employees ask me for information about the company and for counsel about their careers. Many wonder what the criteria are for achieving career satisfaction. There are three interactive criteria: 1. skill and proficiency; 2. visibility and credibility; and 3. sponsorship by peers and management. The functional relationship may be described as follows[2].

$$\text{Career Satisfaction} = \left[ \begin{array}{ccc} \text{skill and} & \text{visibility and} & \text{sponsorship by peers} \\ \text{proficiency} & \text{credibility} & \text{and management} \end{array} \right]$$

Education is an effort undertaken by students to create a learning process so that students can develop their potential to be useful for him, nation, state and society[3]. Education as embodied in GBHN (1973) is a conscious effort to develop lifelong inner and outer personalities and abilities within school.

If the individual character is the type of person who is active and sociable, it may be difficult to work behind a desk all day. If the individual character is shy, it might not be convenient to have to deal with many people[4].

Expert systems have an important role in making decisions quickly and accurately. An expert system is a computer-based system that uses knowledge, facts, and reasoning techniques in solving problems that can usually only be solved by an expert[5].

In the inference engine, the forward chaining

method is used as a technique for selecting career profiles that match themselves. One of the career tests used to choose a job profession, according to Australia's ISC (Industry Skills Council), set 157 professions in the ICA11 Information and Communications Technology Training Package Release 2.0.16 PF (Personality Factor). Knowledge representation is a method used to encode knowledge in a knowledge-based expert system [6].

There are two approaches to controlling inference in rule-based expert systems, namely backward chaining and forward chaining [7][8][9]. 157 reasoning techniques in the professional use a forward chaining technique because the statement starts from the fact first to be able to test the truth of the hypothesis. 157 professions were given a score of 80 to 100 and interpreted using computers. The results of the score profile on this variable can be compared with the profile of dozens of jobs to determine the similarity between the respondent's nature and the nature of each work group [10][11][12]. This is based on the need for expert system applications to provide career recommendations in the field of work.

## II. METHODOLOGY

Based on the background and formulation of the problem in this study, the type of research conducted is research and development (R & D)[13]. "Research and Development is a process or steps to develop a new product or perfect existing products that can be justified "[14][15].

The development method is "The research method used to produce certain products and test the effectiveness of these products". Research and development methods are also defined as research that is intentional, systematic, aims or directed at finding, formulating, improving, developing, producing, testing the effectiveness of products, models, methods / strategies / ways, services, certain procedures that are superior, new, effective , efficient, productive and meaningful[16][17][18].

Career department development procedures use this expert system that uses the 4-D development

model (four-D Model). According to Thiagarajan (1974) suggests that, the steps of development research are abbreviated with 4D, which is an extension of Define, Design, Development, and Dissemination, which is shown in the picture 1.[19][20].



Fig. 1. Steps of Development Research 4D.

## III. RESULT AND DISCUSSION

The results and discussion in this journal include the implementation of the interface and testing of expert systems. The tests used are validation testing, and accuracy testing.

In this journal only displays a special menu display, namely Student Profil Form, where the initial data is to get the initial information of students and alumni of Medical Engineering, then determine the value of the achievement of each subject according to the achievement in the Semester Learning Plan (RPS) with the value 80 up to 100 please check then process and a recommendation report will appear.

With the example of Rule as follows:

If the Information Technology course is "yes" and Web Technology "yes"

Then career 2D / 3D artists, animators, assistant animators, and assistant web designers

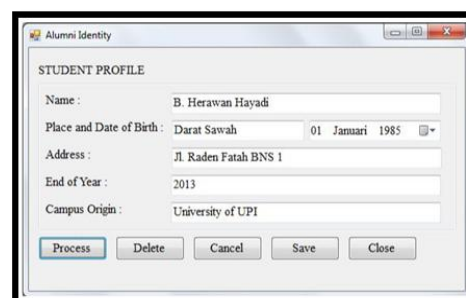


Fig. 2. Results of student profile form

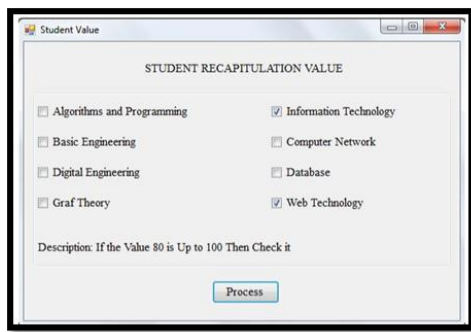


Fig. 3. Determination of Rule by doing a checklist on the course.

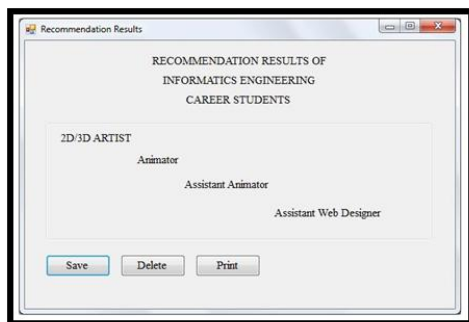


Fig. 4. Results of Recommended Career Profile of Informatics Engineering Students.

#### IV. CONCLUSION

Based on the implementation and test results of the expert system on the career recommendations of Informatics Engineering students, then conclusions are obtained: 1. Grouping qualifications into forms of work provided by experts, affects the recommendations of the work profession. 2. The tasks in each work profession greatly affect the career carried out by experts. 3. The R & D approach method and using Forward Chaining reasoning techniques and 4-D models can produce expert systems that can provide results matched with job qualifications. 4. The profession of work recommendation expert system has a system performance that is able to run well in accordance with the functional requirements of a career. This is evidenced by the results of testing. 5. The profession of work recommendation expert system is able to provide a value range of 80-100 values that is used to recommend work professions accurately, effectively, and efficiently. While testing the final

results that recommend the work profession provides 100% accuracy of the career.

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