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The Impact of Using Technology (Technostress) with the Forward Chaining Method as a Decision Support System

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ABSTRACT

This research focuses on the development of intermittent use of computer intentions, namely behavioral intentions in the termination phase, in the context of software engineering lessons, at Akubank Nusantara and AMIK Indonesia which uses a curriculum with more practice than learning material and this shows a very important role . This study aims to build an expert system application using the forward chaining method as a tool to measure instructor level and student learning. With this application, it can help academics and the quality sector to predict problems as early as possible so that they can be addressed in enhancing further learning. Research data used for diagnosis are symptoms as well as technostress disorders and information handling solutions. This research succeeded in making an expert system design to diagnose the technostress level of instructor and student learning by applying the Forward chaining method and analyzing calculations IF THEN ELSE, so that the application can measure computer-based learning technology.

1. Introduction

The application of information technology in the world of education is needed to improve learning, as well as universities that use computers as a means in the learning process. However, the use of media and computer-based applications in increasing learning also has negative and positive impacts for users and is known as technostress symptoms.The term stress is often used to refer to a dynamic condition and physical, mental, or emotional factors can cause stress. The term stress is a neutral term, in other words, stress does not have to have a negative value, stress also has a positive value [1]. Technostress is excessive use of technology and will result in stress on activities that will create a decrease in overall performance [2], [3]. In addition, technostress can significantly influence the intention of teachers and students to use technology, technostress also mediates the emergence of stress on educational institutions and the intention to use technology [2], [7]. It has been proven that technology influences learning satisfaction and achievement at the student level. However, the impression of technostress that gives additional stress to students majoring in computers has never been done in-depth research [4], [5], [6]. Technostress is a negative effect on human attitudes, ways of thinking, applying, and psychology that is generated directly or indirectly through the use of computer-based IT [8]. Limitations of human cognitive abilities and slow adaptability to rapid technological development may have a negative effect on the effectiveness of IT use and individual productivity [9].

Stress in the workplace is recognized as contributing to and impacting health problems and quality of life [3], [10]. The World Health Organization (WHO) believes that work patterns have changed somewhat due to the increased use of IT [11]. They claim that most organizations respond to prevent and eliminate health risks in the workplace, namely physical risks and especially psychological risks that affect mental health. WHO also states that training personnel and adjusting equipment are required to reduce workers' mental health risks [3]. Several studies have proven the impact of technostress on changes in individual behavior [4], [6]. The studies found that individuals who experienced technostress had low productivity, job satisfaction, and decreased commitment to the organization. Meanwhile, this study focuses on the antecedents of technostress but its impact. The direct antecedent of technostress is the stressor himself.

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Likewise, as explained earlier, this study limits stressors to two constructs, namely work overload and job insecurity. Previous research found that there is a relationship between job insecurity and the perception of technology [12]. The study of resistance to technological change identifies the fear of losing work as a source of resistance. Individual worries are often related to fear of being unused or higher requirements for learning new skills. Permanent changes in IT and the number of workers' choices widely available makes individual resources likely unused. Furthermore, due to limited cognitive resources, individuals often feel excluded from the latest developments.

This research focuses on developing a decision support system as an assessment tool for students and lecturers on the intention to use discontinuous computers, namely behavioral intentions in the termination phase, in the context of software engineering lessons, where Akubank Nusantara and AMIK Indonesia use a curriculum with more practice than learning material and this shows a very important role. This study tries to avoid stress and develop alternatives to intentions to use discontinuously, which researchers identify as behavioral responses to learning practical subjects in computer laboratories. The study also tested and validated the effect empirically in an experimental context monitoring individual students who stopped using games and computer lab lessons for a certain period of time and turned to alternative learning.

Based on this problem, it is necessary to do further research to analyze and find out the factors and impacts that will result from technostress symptoms on the use of computers in practicum learning. In the design of this decision support system using the forward chaining method. The results of this study aim to find out what factors and the impact of technostress on students and lecturers, so that the decision support system built can be used as an expert system in analyzing technostress.

The decision support system is a tool to measure the decision-making process [13], [14], [24]. Decision support systems are also needed as a tool to measure the psychological level and performance of lecturers and students [15], [16], [17]. The application of the forward chaining method has been widely used in the psychological field [15] and psychiatry [18], [19].In the research of Yusuf et al (2016), the forward chaining method can be used to produce a diagnosis in the form of a record along with the follow up of each type of stress that is obtained [20]. The same thing was done by Kardian (2017), where the results of the study applied forward chaining inversion methods to provide information about psychiatric treatment facilities by utilizing Google Maps to provide more precise navigation to users.

Wijaya and Firdaus (2006) explain that the expert system can be used as a tool to determine a person's stress level. Forward chaining and backward chaining methods are the elaboration of the use of inference methods and are a correlation matrix measurement tool and are translated in the assessment table make it easy to analyze the knowledge base in the relaxation program for stress management [21].

Juniawan (2017) also conducted research with the title of using the method of forward chaining in the design of expert systems diagnosing psychiatric disorders, this study resulted in psychological system design. The use of forward chaining method in designing the development of the premise, namely first reasoning, and then testing the truth of the hypothesis. The results of this study are the design of an expert system for diagnosing psychological disorders which in future studies can be developed into a final application that can be applied and used by the community [19].The forward chaining method used in making an application starts from a collection of facts [20] and then a conclusion is drawn using the best-first search technique [22]. With the application of the method of forward chaining can help people to predict a problem as early as possible so that it can be the first treatment directly by yourself before being treated medically by a doctor [23].

2. Research Methodology

2.1. Research Framework

The research framework of the decision support system implementation on the impact of the use of learning technology (technostress) with the forward chaining method has several stages of the research framework as shown in Figure 1.

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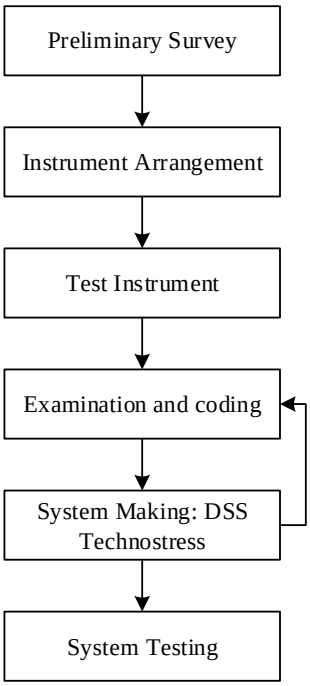

Fig 1. Research Framework

In Figure 1, it can be explained that the research framework consists of 6 (six) stages, namely;

a) Initial survey: the researcher conducted interviews with several lecturers and students.
b) Instrument Arrangement: Researcher Arrange research instruments based on indicators that have been determined based on research variables.
c) Research instrument test: the researcher circulates as many as 20 exemplary research instruments to lecturers and students. Data collection: researchers collect the results of the distribution of questionnaires to each lecturer and student and create a knowledge base that is used as a reference for the main source of information in making this system.
d) Examination and coding: the researcher checks the completeness of the questionnaire content and carries out the coding process of the questionnaire and gives a score on each answer with an expert who is made the knowledge base.
e) Making the system: data analyzed, then represented into a computer programming language and compiled with an interface that can be used by users that can be accessed online.
f) System Testing: The results of making the system will be tested before being used by other users.

2.2 Research Tools and Materials

Overall there are five variables that will be used in this study, namely: Computer Anxiety, Perceived Usefulness, Perceived Ease of Use, Work Overload, Job Insecurity, and Technostress. The five variables will be captured variations with instruments adapted from previous research. This is in order to avoid errors in data collection, given the previous instrument has been used and validated many times, thereby increasing researchers' confidence in the data capture capacity of the instrument, the list of operational definitions of variables and instrument sources is detailed as follows.

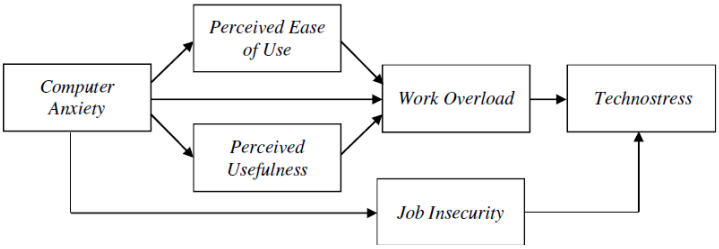

Fig 2. Research Conceptual Framework

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Furthermore, the research data used for diagnosis so that the information system needs to be complex consisting of data regarding technostress disorders, technostress disorder symptom data information, and data handling solution information

3. Results and Discussion

Expert system applications that are built utilize PHP Native as a basic application and MySQL is used as database management, for the author interface using bootstrap and CSS, HTML5, JQuery, and JSON so that the display becomes more attractive and easy to use by users. In Figure 3, it is the main form that consists of submenu master diagnoses, symptoms, knowledge, lecturer and student data, reports, passwords, logouts, and users, as shown in Figure 3.

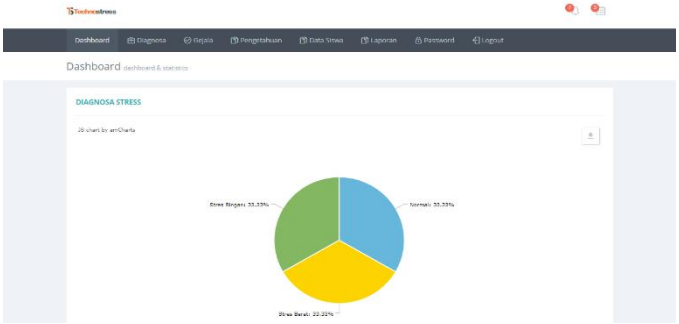

Fig3. Main Menu Form

The diagnostic input form is used as a page to input diagnostic data, which is the criterion of the influence of stress levels. The diagnostic form consists of the code information and the name of the diagnosis, and on this page, the editing, deleting and export of data in the form of pdf, excel and JSON can be done as shown in Figure 4.

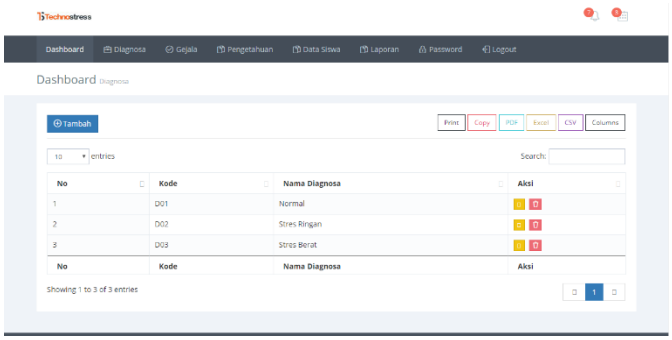

Fig4. Form of Diagnosis

The symptom form as shown in Figure 5 is information consisting of symptom codes, and symptoms where the application manager can also edit, delete and export data in pdf, excel, and JSON form.

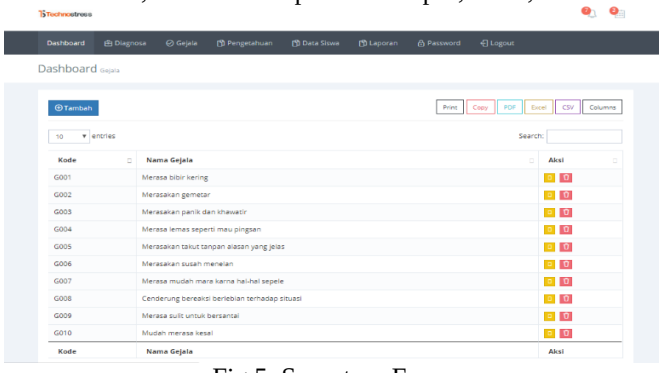

Fig 5. Symptom Form

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A knowledge input form is a form where the application manager can edit, erase knowledge data where this form is a rule set of the symptom condition and stress diagnosis. Where it contains IF and THEN of the question. The following is a display of the results of the assessment in Figure 6.

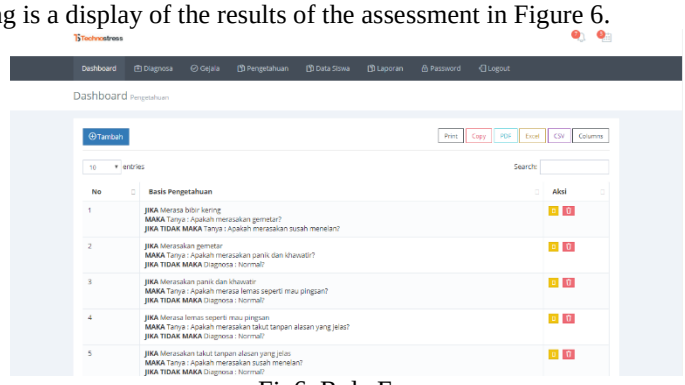

Fig6. Rule Form

The consultation form contains information about questions that have been arranged with various symptoms and diagnoses that will later produce information containing choices from lecturers and students later.

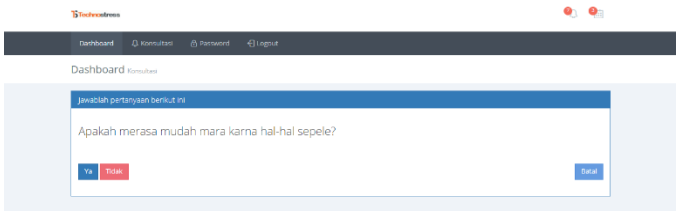

Fig7. Consultation Menu Page Display

In this result, the information will be published regarding diagnostic choices and lecturer and student discussions. In this analysis using the forward chaining method, so the results received are in accordance with the diagnosis chosen by the user from the form of filling out the consultation, as shown in the following figure:

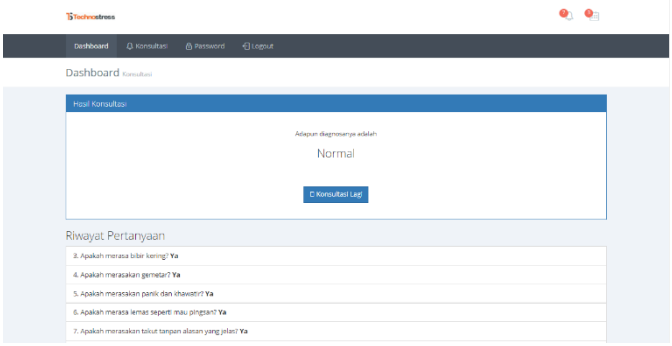

Fig8. Form Assessment Results from in Forward chaining

The results in the expert system application of the developed forward chaining method also have information in graphic form to make it easier for the application manager to see the percentage of symptoms arising from the use of learning technology, as shown in the figure below:

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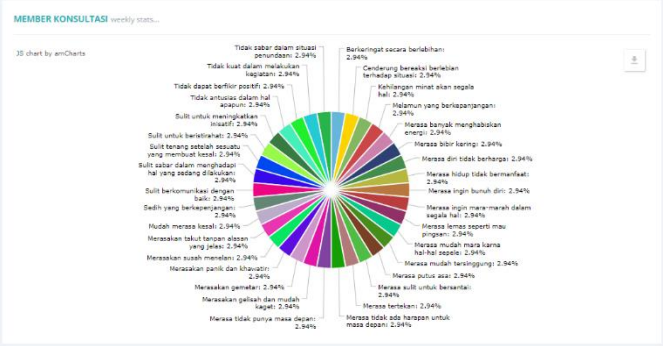

Fig9. Form Chart Result Assessment Model Forward Chaining

4. Conclusion

This research succeeded in making an expert system design to diagnose the learning technostress level of lecturers and students of Akubank Nusantara and AMIK Indonesia by using the forward chaining method and analyzing computer-based learning technostress measurements.

5. Acknowledgments

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