User Interface Analysis on Job Matching Information System Using Eight Golden Rules

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Abstract. This research aims to analyze the user interface of the job matching information system in an interactive website environment. The job matching information system is an approach that makes it easier for SMK N 2 (Vocational High School) graduates, Padang Panjang, Indonesia, to understand the industrial world and help them discover suitable jobs. The research method used in this study is the eight golden rules technique. Several experiments yielded information on whether the interface is per the user's desires, such as a user-friendly, straightforward interface, to name a few. The population in this study are teachers and alumni of the RPL department (software engineering), with a sample of 50 people. Data processing is accomplished by allocating questionnaires. Based on the results, our system achieved the goal of designing a pleasing interface that can bridge the user and the system, delivering comfort and satisfaction in a user interface. The final upshots of this study indicate that our proposed system is reasonably applicable in the real world based on the several values obtained from predefined parameters.

Keywords: Eight golden rules · job matching · user experience · user-friendly · user interface

1 Introduction

At present, every information system has an interface that bridges the gap between the user and the system itself. One information system to others has different interfaces according to their functions. On the condition that a system has a decent user interface, it makes users feel delighted; otherwise, an inadequate user interface could provide unpleasant experiences for the users [1]. The user interface is the part of the system that will be controlled by the user to achieve and carry out the functions of a system. The user interface combines system elements, user elements and interactions between them [2]. Specifically speaking, the user interface has a significant role in the effectiveness of an information system.

Based on the aforementioned concerns, every system developer is required to design the best possible user interface (UI) appearance to make it easier for users to use the system or known as user-friendly [3]. The concept of user-friendly in a user interface refers to pleasant to use, meaning that the system has a characteristic or ability possessed by an application program that is comfortable to operate. In general, many information

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systems have complex user interfaces that make users experience difficulties in using them and cause errors in use. Therefore, the user interface of the information system is essential [4].

SMK N 2 Padang Panjang currently has an information system to facilitate graduates in understanding and entering the industrial world, namely the Job Matching Information System (JMIS). As with the system in general, every activity carried out has a customized UI for each user. In the system development process, efforts are made so that the system display (UI) always looks dynamic [5]. Efforts to develop this system pay attention to the principle of the Human-Computer Interface (Human and Computer Interaction), which uses the eight golden rules method or the eight golden rule principles [6]. Schneiderman developed this method with several rules, including consistency, informative feedback, use of shortcuts, dialogue with a specific scope, error prevention, action return, user control center, and reduction of short-term memory [7]. Previous research has applied the method of eight golden rules on e-commerce information systems giving good results based on the acquisition of scores from 8 categories. It can be interpreted that this method is effective to be used in assessing a User Interface. Therefore, research was conducted on the Job Matching Information System by looking at these opportunities. A significant difference from previous research is that the Job Matching System is an educational information system with Student/Teacher users, so that the User Interface assessment carried out can be used as a guide for designing applications for the world of education.

2 Research Method

2.1 Schneiderman's Eight Golden Rules

Schneiderman's eight golden rules are leveraged in this research to assist designers in addressing several issues in interface design [8]. For this objective, the eight golden rules deliver significant benefits with their eight heuristics, namely strive for consistency, enable frequent users to use shortcuts, offer informative feedback, design dialog to yield closure, offer simple error handling, permit easy reversal of actions, support internal locus of control, reduce short-term memory load [9]. In short, an interface must be well-designed and "user-friendly" to improve user usability [10]. In short, an interface must be well-designed and "user-friendly" to enhance user usability. Therefore, due to the benefits mentioned above, we have thoroughly selected this method as the main guideline to analyze our user interface design for the job matching information system.

2.2 Research Questions and Techniques

The core system component of this research is the eight golden rules approach applied to the job matching information systems that we developed for SMK N 2 (vocational high school). This technique is employed in designing a pleasing user interface to satisfy several objectives. Thus, the eight elements need to be considered in the system interface design. These eight elements have been implemented in the job matching information system by distributing questionnaires to software engineering Graduates. The following are the points of research question in this paper: **Study of literature**. At this stage, a

literature study is carried out by collecting and learning various sources of information such as books, journals, proceedings, and to name a few others. **Determining research variables.** The research variables are compiled based on the eight golden rules principles. The research variables consist of unique variables: consistency, informative feedback, use of shortcuts, dialogue with a specific scope, error prevention, return of action, control center on the user, and reduction of short-term memory. **Determining data sources.** The population in this research is derived from system users, i.e., students of SMK N 2 Padang Panjang, Sumatera Barat, Indonesia. The sample in this study was 50 students of SMK N 2 Padang with the field of software engineering expertise. **Determining research instruments.** At this point, the research instrument parameter is used to derive several data distributed information through questionnaires disseminated to teachers and students, each item referring to the research variable. Population is carried out by broadcasting questionnaires compiled with many research variables referring to the eight golden rules principles. **Data processing.** The questionnaire data is processed, taking the average question of the indicator's results. **Analysis.** We have analyzed the results of the previous steps. The analysis was carried out based on the selected approach and technique. **Conclusions and suggestions.** In the last stage, we construct conclusions based on the data analysis. We also highlight several pros and cons of implementing our proposed scheme.

3 System Appearances

The graphical user interfaces on the job matching information system interact with visual representations on digital control panels. In order to enter the main menu, the users are required to fill in the national student identification number (NISN) and Password; after entering the correct NISN and Password, the main menu will be active and accessible. There are several menus on the job matching information system's main page: online classes, regular classes, and sending messages (Fig. 1).

In the "Online Class" menu, the students can see a list of classes that will be conducted for the ongoing and upcoming online learning. In the case of the "Routing Class" menu, the students can see the entire list of classes they have enrolled in. Furthermore, the students can also download the uploaded syllabus, lesson plans, and learning resources

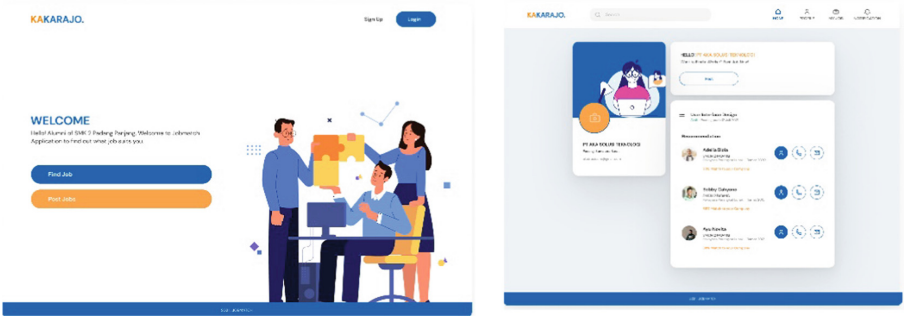

Fig. 1. Registration and Login Page, User Interface Design (http://findyourwork.online/)

by clicking the "View Class" button. There is also a "Send Message" menu option; This feature is used to chat with teachers and other students. The online class schedule can be managed by clicking the "Add Schedule" button. The teachers can see a list of their teaching classes and upload the syllabus or teaching materials by clicking "Details". In the "Student" option, the teachers are able to look up the student's data, such as class and subject.

4 Result and Discussion

In this section, we elaborate on the results and discussion of the job matching information system (user interface analysis) using the eight golden rules method. The data and respondents are from SMK N 2 (Vocational High School) graduates, Padang Panjang, Indonesia. The questionnaires are distributed to the graduates containing eight variables: consistency, shortcuts, feedback, closure dialog, simple error handling, reversible action, putting the user in control, and reducing short-term load. The name of variables and questionnaire results can be seen in Table 1.

We thoroughly select the questions for students and teachers corresponding to each variable. We also set the score for questionnaire results from 1 up to 4. We obtain the total score for each variable by calculating the average and the score from teachers and students. These total scores are investigated afterwards to know the users' feedback.

Table 1 describes the name of variables used (based on the eight golden rules) and the questionnaire results. The scale used to determine each variable's value is the Likert scale. The Likert scale measures the user's perception of an object by giving a statement agreeing or disagreeing. In determining the acceptance scale, we have managed a score

Table 1. The name of variables and questionnaire results

Variable	Indicator	Questions	Questionnaire Results (SCORE)				Total	Total Score
			1	2	3	4		
Consistency	Teacher.1	The usage of color composition in the job matching system is impressive	0	6	32	12	50	**169.5**
	Student.1	There is no change in the menu structure on each page	1	18	26	5	50	
Average * Score			**0.5**	**24**	**87**	**58**		
Shortcuts	Teacher.2	Provision of easy-to-understand shortcut menus	0	4	34	12	50	**149**

(*continued*)

Table 1. (*continued*)

Variable	Indicator	Questions	Questionnaire Results (SCORE)				Total	Total Score
			1	**2**	**3**	**4**		
	Student.2	Provision of easy-to-understand shortcut menus	0	18	24	8	50	
Average * Score			**0**	**22**	**87**	**40**		
Feedback	Teacher.3	Users easily understand the form of information messages	0	2	36	12	50	**159**
	Student.3	If an error occurs, the system will notify the user	2	3	30	15	50	
Average * Score			**1**	**5**	**99**	**54**		
Closure Dialog	Teacher.4	In terms of finding student data, it is easy	0	0	34	16	50	**164**
	Student.4	In terms of class data search is done easily	0	0	38	12	50	
Average * Score			**0**	**0**	**108**	**56**		
Simple Error Handling	Teacher.5	Handling by the website will be quickly given if the user makes a mistake	1	4	27	18	50	**162**
	Student.5	Response will be done quickly if the system has an error	0	6	26	18	50	
Average * Score			**0.5**	**10**	**79.5**	**72**		
Reversible Action	Teacher.6	Users can return easily to the previous page	0	2	40	8	50	**156**
	Student.6	In using this website errors can be easily undone	0	6	32	12	50	

(*continued*)

Table 1. (*continued*)

Variable	Indicator	Questions	Questionnaire Results (SCORE)				Total	Total Score
			1	2	3	4		
Average * Score			**0**	**8**	**108**	**40**		
Put User in Control	Teacher.7	Users feel comfortable in uploading material on the system	1	1	28	20	50	**152.5**
	Student.7	Users feel comfortable in downloading materials	0	18	26	6	50	
Average * Score			**0.5**	**19**	**81**	**52**		
Reduce Short – Term Load	Teacher.8	In its use, the commands presented are easy to understand by the user	0	6	32	12	50	**152.5**
	Student.8	In its use, users do not need to remember much about each command	2	5	36	7	50	
Average * Score			**2**	**11**	**102**	**38**		

range to measure the extent to which respondents assess the system. The range scores are designed as follows [11]:

$$\begin{aligned} &Lowest\ Score = \\ &(\text{Number of Respondents} \times \text{Minimum Score}) \\ &\quad = 50 \times 1 = 50 \end{aligned}$$

$$\begin{aligned} &Highest\ Score = \\ &(\text{Number of Respondents} \times \text{Minimum Score}) \\ &\quad = 50 \times 4 = 200 \end{aligned}$$

The value categories are defined as follow:

Poor: 50 up to 80
Not good: 81 up to 110
Acceptable: 111 up to 140
Good: 141 up to 170

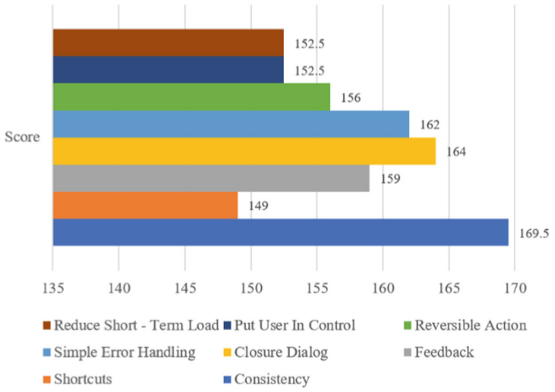

Fig. 2. The Result of Analysis Using the Eight Golden Rules Method

Excellence: 171 up to 200

Based on the results of the UI analysis on the job matching information system using Schneiderman's eight golden rules method, it can be understood that the respondents stated that the proposed system is sufficient, which can be interpreted as follows:

The first variable requires consistency between pages and co-related features, aiming that the user can recognize which pages are being accessed while connecting with the current-used application/feature. Concurrently, the shortcut variables can be understood as a tutorial and user guides illustrating how to use the application. In terms of feedback variable, it does not have to be in the form of a user's responses; but also, in the form of a change in the interface for every action taken. To understand the rest of the variables, we suggest the readers follow up on this reference [12].

Eventually, based on the results, our system achieved the goal of designing a good interface that can bridge between the user and the system, providing comfort and satisfaction in its use. Applying the eight golden rules method has proven promising results in designing job-matching information system interfaces. It is worth noting that the various features in the user interface can be considered to be developed and analyzed using multiple methods and approaches (Fig. 2).

5 Conclusions

In this paper, we have analyzed several essential points of user interface designed on job matching system using Schneiderman's eight golden rules method. Based on the feedback from the respondents, we can convey that our user interface design is sufficient to be applied to the real world, where the lowest score is set to 50, and the highest score is 200. We also notice that Schneiderman's eight golden rules are suitable to be the backbone of this research since the golden rule points can reach the research questions of this paper. Likewise, the rules are unique, and there are benefits and drawbacks to each decision taken. For future works, we consider adding more features to be analyzed with various approaches. The more complex the features of a system, the more challenging

it is to design an exemplary user interface. Furthermore, the decent features of a user interface can provide different feedback from the users.

References

1. Vatsal Sharma and Ankit Kumar Tiwari, "Index Terms-User Interface Study, User Experience Theory, Design Process, Tools for creating user interfaces, and other essentials," *World J. Res. Rev. (WJRR)ISSN2455–3956*, vol. 12, no. 6, pp. 41–44, 2021.
2. D. Dharmayanti, A. M. Bachtiar, and A. P. Wibawa, "Analysis of User Interface and User Experience on Comrades Application," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 407, no. 1, 2018, doi: https://doi.org/10.1088/1757-899X/407/1/012127.
3. R. Sumarlin, "The Review of User Experience and User Interface Design of Hospital Information System to Improve Health Care Service," vol. 225, no. Icobest, pp. 177–180, 2019, doi: https://doi.org/10.2991/icobest-18.2018.39.
4. Y.-K. L. Hyeji Kim, Inchan Jung, "Understanding the Negative Aspects of User Experience in Human-likeness of Voice-based Conversational Agents ANONYMOUS AUTHOR (S)," *Proc. ACM Conf.*, vol. 1, no. 1, pp. 1–15, 2022.
5. S. Lee, J. H. Lee, and J. Kim, "User-friendly graphical user interface software for ideal adsorbed solution theory calculations," *Korean J. Chem. Eng.*, vol. 35, no. 1, pp. 214–221, 2018, doi: https://doi.org/10.1007/s11814-017-0269-9.
6. S. Ramkumar, K. Sathesh Kumar, T. Dhiliphan Rajkumar, M. Ilayaraja, and K. Shankar, "A review-classification of electrooculogram based human computer interfaces," *Biomed. Res.*, vol. 29, no. 6, pp. 1078–1084, 2018, doi: https://doi.org/10.4066/biomedicalresearch.29-17-2979.
7. V. Wang, N. Xu, J. C. Liu, G. Tang, and W. T. Geng, "VASPKIT: A user-friendly interface facilitating high-throughput computing and analysis using VASP code," *Comput. Phys. Commun.*, vol. 267, p. 108033, 2021, doi: https://doi.org/10.1016/j.cpc.2021.108033.
8. G. Baltzopoulos, R. Baraschino, I. Iervolino, and D. Vamvatsikos, "Dynamic analysis of single-degree-of-freedom systems (DYANAS): A graphical user interface for OpenSees," *Eng. Struct.*, vol. 177, no. September, pp. 395–408, 2018, doi: https://doi.org/10.1016/j.engstruct.2018.09.078.
9. M. R. Hanifa, H. B. Santoso, and Kasiyah, "Evaluation and recommendations for the instructional design and user interface design of coursera MOOC platform," *2019 Int. Conf. Adv. Comput. Sci. Inf. Syst. ICACSIS 2019*, no. 2014, pp. 417–424, 2019, doi: https://doi.org/10.1109/ICACSIS47736.2019.8979689.
10. K. Hornbæk, B. B. Bederson, and C. Plaisant, "Navigation Patterns and Usability of Zoomable User Interfaces with and without an Overview," *ACM Trans. Comput. Interact.*, vol. 9, no. 4, pp. 362–389, 2002, doi: https://doi.org/10.1145/586081.586086.
11. L. D. Putri, "Evaluasi User Interface Web Commerce Menggunakan Aturan Eight Golden Rules," *Indones. J. Appl. Informatics*, vol. 5, no. 2, p. 94, 2022, doi: https://doi.org/10.20961/ijai.v5i2.41935.
12. R. Y. K. Isal, H. B. Santoso, and E. R. Novandi, "Development and Evaluation of a Mobile-Learning Application Based on the Felder-Silverman Learning Styles Model," *Int. J. Emerg. Technol. Learn.*, vol. 16, no. 15, pp. 107–124, 2021, doi: https://doi.org/10.3991/ijet.v16i15.24165.