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Analysis and Design of Promotional Information Systems for Part-Time Workers and Freelancers with Heuristic Evaluation Testing Method

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A B S T R A C T

During the current COVID-19 pandemic, many have lost their main jobs. Besides that, there are also many people who need a side job outside their main job for various reasons. There are also people who have the skill but find it difficult to find normal jobs. Then from the employer's side, many also find it difficult to find the best candidate that fits them. For this reason, an information system was built where this system will become a forum for job seekers and also employers, where job seekers can promote themselves according to their skills. Employers will also be able to easily find and select the best candidates according to what they want. This system will be built using the Extreme Programming (XP) methodology. This system will use the Heuristic Evaluation calculation method. After testing with usability aspects, it is known that this system needs to be repaired immediately because the calculation results show that the system is on a scale of 3 and is included in the category of major usability problems. It is hoped that this system will facilitate communication between employers and job seekers.

INTRODUCTION

Lots of people are interested in having a side job outside of their normal job. Many factors cause many people who want to have a side job, including those who need more money for their needs in addition to the salary they get in their normal job. There are also those who use side jobs to fill their spare time. There are also those who use side jobs to hone their skills outside of their normal jobs. For students, usually side jobs are also intended so that they can learn independently, and also as an initial simulation before they enter the real world of work.

At this time especially in the current state of the COVID-19 pandemic, it is very difficult for people to find work. Many have been affected by this pandemic, one of which is the occurrence of layoffs or commonly abbreviated as layoffs. When they are affected by layoffs, they will try to find another job or build a business. Of course, there are many abilities that everyone has in addition to their normal job. However, not everyone can get a

side job easily. Many factors can make it difficult for many people to find a side job, one of which is the lack of information on available job vacancies.
Usually, job seekers still use the conventional way or the old way. Job seekers are still looking for job vacancies by trying to go to the job provider or see job advertisements in print media [1]. There are also those who are still looking for job vacancies through people closest to them. These methods are considered less effective to be applied in the era of information technology as it is now.
However, at this time there are still very few platforms that job seekers or employers can use. The focus of the problem that will be studied here is where job seekers can have a place to promote themselves according to their competencies. This also applies to employers who have a place to find job candidates that match what is needed and also so that job vacancies are no longer messy on the internet. Sometimes, lots of candidates try to apply for the job, but the candidate is not what they wanted. So, it would be better if employers could directly choose the best suitable candidate and according to what they want.

I. METHODS

Promotion

Promotion is an activity that serves as a tool to communicate between a company and consumers with the aim of persuading and influencing consumers in transaction activities according to the needs and desires of the consumers themselves by using tools that can support the promotion [2].

Part-Timer

A part-time worker or commonly called a part-timer is someone who works full time or a fixed time, but does not want to look for another job or is not looking for a job [3].
In part-time workers, they work less when compared to full-time workers. In Indonesia, part-time workers are limited to a maximum of 35 hours per week.

Freelancer

Freelancers are also known as on-demand workers or workers who are ready to work anytime when needed [4].
Freelancers arise because of the need for workers who are experts in certain fields by various companies. Most freelancers use the internet and other technological tools to create a comfortable work environment for themselves.

Extreme Programming

Extreme Programming or abbreviated as XP is a methodology used to develop software and also this methodology is part of agile software development methodologies with a focus on coding as the main activity carried out in the software development lifecycle. Extreme Programming when compared to more traditional software development methods, emphasizes the process of developing software that is more responsive to user desires (“agile”) [5].

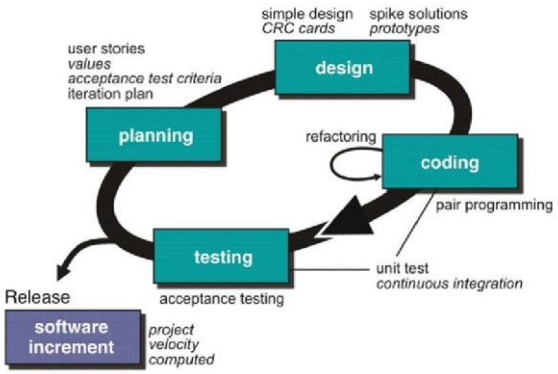

Figure 1. Extreme Programming Methodology Diagram

Heuristic Evaluation

Heuristic Evaluation or HE is a method used to measure how far the usability or usability problem of a software that focuses on the interface design or software interface.
Heuristic Evaluation is used to get feedback or feedback from users or users to software developers who use the software. This is done

to find out how far the interface or interface of the software developed matches the user's needs. Heuristic Evaluation is known as an activity carried out by experts whose purpose is to examine an interface on a software and evaluate every element of an interface that is based on a list of usability guidelines accepted by heuristics. The use of this method before the stage to directly test a software by the user or users can reduce the number of design errors and the severity of the design in a software [6].

Heuristic Evaluation is a method used to evaluate usability with the aim of identifying and then improving a software design effectively by using heuristics that gather and relate to each other.

Usability has a focus on the attributes possessed by the system and the actions taken to avoid errors or problems that exist in usability. Usability also provides an overview of how far a product, especially software, can be used by the user or users in order to achieve a goal by measuring the effectiveness, efficiency and satisfaction factors in using the product. Usability measurement needs to be done on an information system or a software because the system user or user immediately wants to understand what is and is presented by a system. For this reason, a system must be evaluated with appropriate standards to determine the state of the system. A very relevant evaluation can be used to find out about an interface design standard and also the level of usability of a system. This is done by measuring the system using a method, namely the usability method, one of which is Heuristic Evaluation or HE [7].

The Heuristic Evaluation method has ten statements designed by Molich and Nielsen [8]. This test is used by the users as an assessment instrument for the software being tested so that the user or users can clearly give their assessment of the software. The ten testing instruments on the usability heuristic evaluation are presented in the table below [9].

Table 1. Ten Usability Heuristic Evaluation Testing Instruments

Instruments	Definition
Visibility of System Status	This instrument is used to assess whether a program can always provide information to the user or users about the running process and also provide clear information to the user or users.
Match Between System and The Real World	This instrument serves to assess whether the program uses a language in which there are phrases, words, and concepts that are familiar or familiar to the user or users.
Use Control and Freedom	The instrument used to assess or measure whether the user or users can freely use the program, in other words the user or user does not get a forced process and also the user or user can undo or redo.
Consistency and Standards	This instrument is used to evaluate the program whether the user or the user finds words or icons ambiguous or confusing which makes the user or users make mistakes.
Error Prevention	This instrument serves to assess how a program can handle or prevent errors that can be made by the user or users.
Recognition Rather than Recall	This instrument is used to see if a program can minimize the use of user memory or users in remembering things such as choices, meanings of pictures, and other information in the program.
Flexibility and Efficient of Use	This instrument is used to see whether the program created can make an activity or job faster, and also whether the program has shortcuts compared to conventional methods.
Aesthetic and Minimalist Design	This instrument is used to see if the program created has menus or sections or information that is not related to the needs of the user or user.
Help Users Recognize, Dialogue, and Recovers from Errors	This instrument is used to see if a program can display an error message and also the error is easy to handle.
Help and Documentation	This instrument is used to find out whether the program created can be run without reading the help or the existing documentation and

	also the program can easily find the information needed.

The equations in the Heuristic Evaluation method are described below [10]:

$$\Sigma Hx = (0 * x) + (1 * x) + (2 * x) + (3 * x) + (4 * x) \cdots (1)$$

Information :
ΣHx : Total review scores of usability sub-aspects in each usability aspect (H1, H2, … H10)
x : Usability points, worth 1/0

Then to generate the severity rating value of each usability aspect, the following equation is used :

$$sv = \Sigma \frac{Hx}{n} \cdots (2)$$

Information :
sv : The result of calculating the severity rating in a usability aspect
n : The number of usability sub-aspects in each usability aspect

The Heuristic Evaluation method can find out every problem in the usability of a software. Each problem that has been found will be assessed using the standard level of difficulty on the problem or severity rating. Severity rating can also estimate how many resources are needed in solving the problem and can provide an initial prediction of what usability principles should be added later. The level of severity rating of usability problems is determined by a scale whose description is in the table below [8][10].

Table 2. Severity Ratings

Scale	Description
0	Have no problems with usability
1	Cosmetic problem, where existing problems do not need to be fixed immediately with a note that it can be fixed if there is still time left on project work
2	Minor usability problem, where improvements are needed
3	Major usability problem, where immediate repairs are needed because errors will affect existing processes
4	Usability catastrophe, where software or system redesign is required

II. RESULT

The system is built using the Extreme Programming methodology so that it can produce a web display whose program display can be seen below.

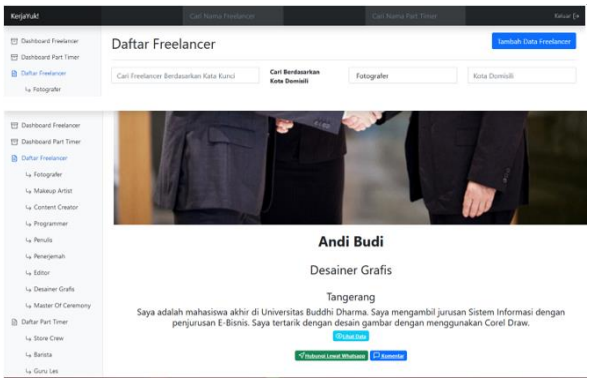

Figure 2. Freelancer List Page View

This page displays a list of all freelancers where users are only given the right to be able to view data, contact freelancers via Whatsapp and also to comment.

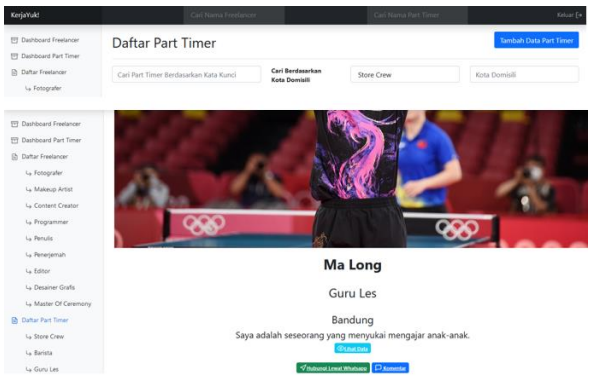

Figure 3. Part Timer List Page Display

This page displays a list of all part timers where users are only given the right to be able to view data, contact part timers via Whatsapp and also to comment.

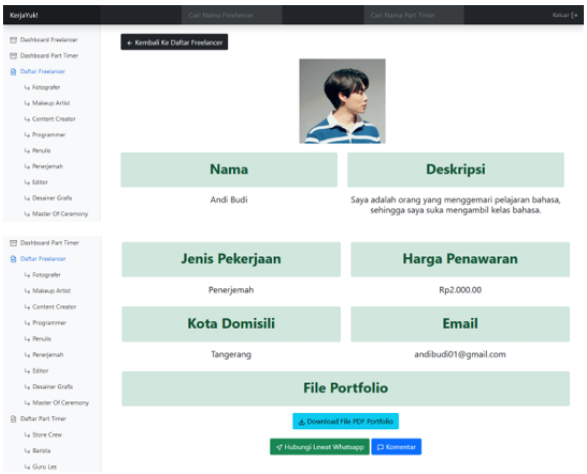

Figure 4. Freelancer Card Page View

On this page, there is information from each freelancer.

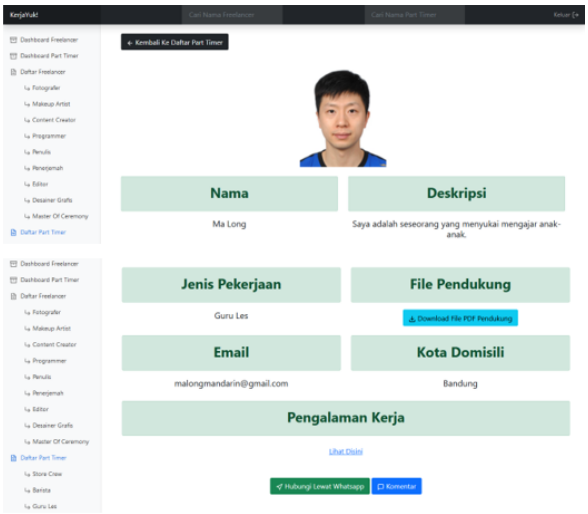

Figure 5. Card Part Timer Page Display

On this page, there is information on each part timer.

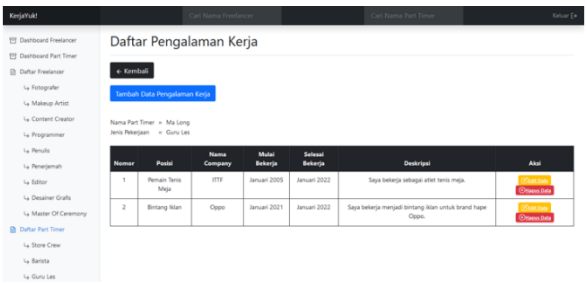

Figure 6. Work Experience Page View

On this page, there is a table of work experience owned by part timers.

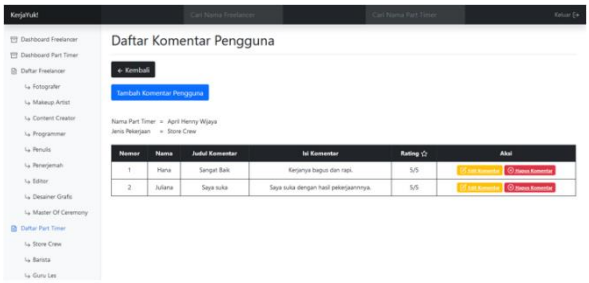

Figure 7. Comments Page View

On this page, there is a comment table owned by freelancers or part timers.

After the system is finished, the system will be tested for usability using the Heuristic Evaluation testing method.

III. DISCUSSION

This system is then tested using the Heuristic Evaluation method. The use of the Heuristic Evaluation method aims to be able to know about the values of the usability aspects of the system. Questionnaires have been distributed as data collection media. The responses that have been given by the respondents will be counted later. The questionnaire distributed consisted of 38 questions which were divided into 10 groups of questions. Questionnaires were distributed to 15 respondents consisting of 8 Part Timers, 4 Freelancers, and 3 Part Timer or Freelancer service users. Usability aspects and usability sub-aspects used in the questionnaire can be described as follows :

Table 3. Usability Aspects and Usability Sub-Aspects Used in the Questionnaire

Usability Aspect	Usability Sub-Aspect
Visibility of System Status	a. Each page has a title that describes the content of the page. b. Every symbol/icon and design scheme on each page is consistent. c. There is a visually distinguishing response when an object is given an action (selected, pressed, etc.).

	d. Menu and page names are in accordance with their contents. e. The menu display can already show the difference between the currently selected menu and not.
Match Between System and The Real World	a. The icons used are general and easy to understand. b. Menu names are written logically and can be understood by the user. c. The form/image used is appropriate. d. The use of language is correct.
Use Control and Freedom	a. Users have the convenience of being able to perform data searches. b. Users can easily return to the previous page or menu. c. Users can easily select the menu in the program.
Consistency and Standards	a. Each page has a title. b. The standard of writing on each page is consistent. c. The labels on each form are consistent, be it font, size, or paragraph. d. The web appearance on each page has the same and consistent form and content.
Error Prevention	a. There is an error message of a technical nature when it fails to access the page. b. There is a warning when the user makes an error in charging.
Recognition Rather than Recall	a. The text in the instructions is clear and unambiguous. b. Information has been well grouped. c. Use of easily recognizable symbols and images.
Flexibility and Efficient of Use	a. All page content is displayed in the correct language. b. Menu and information are well understood. c. Menu groupings and information can be easily memorized. d. There is helpful navigation on every page. e. Navigation is in the right place. f. The on-site "search" facility is easy to find.
Aesthetic and Minimalist Design	a. Menu search is easy to recognize and use especially for beginners. b. The menu layout is familiar and easily accessible to users. c. There are different color options in each action. d. The choice of font (type, size) in the program is appropriate and makes visitors feel at home.
Help Users Recognize, Dialogue, and Recovers from Errors	a. The information displayed on each page already allows users to be able to make decisions. b. The structure of each page is easy to understand. c. The title of each page is clear and informative. d. There are no irrelevant attributes, images or information. e. Can find out the mistakes made and can correct them.
Help and Documentation	a. There is a sitemap that makes it easy for users to see the menu as a whole. b. There is a help menu that can help users better.

Then the assessment data will be processed using heuristic evaluation calculations based on the usability aspects of the questionnaires that have been distributed.

Table 1. Calculation of Usability Aspects 1

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
1	1	6	9	0	0	0	9	1.8
	2	5	9	1	0	0	11	2.2
	3	8	6	1	0	0	8	1.6
	4	8	6	1	0	0	8	1.6
	5	6	8	1	0	0	10	2
Total								**9.2**
Average								**1.84**

Table 2. Calculation of Usability Aspects 2

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
2	1	9	6	0	0	0	6	1.5
	2	6	7	2	0	0	11	2.75
	3	7	8	0	0	0	8	2
	4	9	5	1	0	0	7	1.75
Total								**8**
Average								**2**

Table 3. Calculation of Usability Aspects 3

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
3	1	7	7	1	0	0	9	3
	2	11	4	0	0	0	4	1.33
	3	6	9	0	0	0	9	3
Total								**7.33**
Average								**2.44**

Table 4. Calculation of Usability Aspects 4

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
4	1	5	10	0	0	0	10	2.5
	2	9	6	0	0	0	6	1.5
	3	5	9	1	0	0	11	2.75
	4	8	7	0	0	0	7	1.75
Total								**7**
Average								**2.25**

Table 5. Calculation of Usability Aspects 5

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
5	1	4	9	2	0	0	13	6.5
	2	6	9	0	0	0	9	4.5
Total								**11**
Average								**5.5**

Table 6. Calculation of Usability Aspects 6

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
6	1	8	6	1	0	0	8	2.67
	2	11	3	1	0	0	5	1.67
	3	9	6	0	0	0	6	2
Total								**6.33**
Average								**2.11**

Table 7. Calculation of Usability Aspects 7

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
7	1	8	6	1	0	0	8	1.33
	2	8	7	0	0	0	7	1.17
	3	5	10	0	0	0	10	1.67
	4	5	9	1	0	0	11	1.83
	5	7	8	0	0	0	8	1.33
	6	8	7	0	0	0	7	1.17
Total								**8.5**
Average								**1.42**

Table 8. Calculation of Usability Aspects 8

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
8	1	7	7	1	0	0	9	2.25
	2	7	8	0	0	0	8	2
	3	6	8	0	1	0	11	2.75
	4	7	7	1	0	0	9	2.25
Total								**9.25**
Average								**2.31**

Table 9. Calculation of Usability Aspects 9

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
9	1	7	7	1	0	0	9	1.8
	2	5	10	0	0	0	10	2
	3	7	7	1	0	0	9	1.8
	4	7	6	2	0	0	10	2
	5	6	9	0	0	0	9	1.8
Total								**9.4**
Average								**1.88**

Table 10. Calculation of Usability Aspects 10

Usability Aspect	Usability Sub-Aspect	*Severity Rating* (SR)					Total SR	SR Value
		0	1	2	3	4		
A	B	C	D	E	F	G	H	I
10	1	7	8	0	0	0	8	4.0
	2	7	7	1	0	0	9	4.5
Total								**9**
Average								**4.3**

After calculating each usability aspect, the average severity rating value for each aspect is obtained, where all the average severity rating values for each usability aspect will be calculated to obtain the final value of the average severity rating value.

Table 11. Severity Rating Recapitulation

Usability Aspect	Average Severity Rating	0-4 Scale Rounding Value
1	1.84	2
2	2	2
3	2.44	2
4	2.25	2
5	5.5	6
6	2.11	2
7	1.42	1
8	2.31	2
9	1.88	2
10	4.3	4
Average Severity Rating	**2.61**	**3**

From the results of the heuristic evaluation calculations in the table above, the system has a fairly high usability value of 2.61 or a scale of 3. Scale 3 is included in the major usability program category, where immediate repair is needed because errors will affect the existing process. This means that the system cannot be launched to the user because the user interface of the system is still not perfect.

IV. CONCLUSION

The conclusions that can be drawn from this research are as follows :

a. This promotional information system can make it easier for job seekers to have a place that can be used to promote themselves by uploading the profile of job seekers into the system so that job seekers can have new income.
b. This promotional information system can make it easier for employers to have a place that can be used to select the best candidates according to their wishes by choosing their own job seekers using various selection options in the system.
c. Facilitate communication between employers and job seekers by using the help of the Whatsapp feature to be able to communicate privately.

By using the Heuristic Evaluation method, it can be seen that the system needs to be repaired immediately because the calculation results are on a scale of 3 in the category of major usability problems.

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