User-Centered Design Method in the Analysis of User Interface Design of the Department of Informatics System's Website

by Dr. Sutedi, S.kom., M.t.i

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User-Centered Design Method in the Analysis of User Interface Design of the Department of Informatics System's Website

Melda Agarina[1], Arman Suryadi Karim[2], Sutedi[3]

[123] Department of Information System , IIB Darmajaya, Jl.Z.A. Pagar Alam No. 93, Lampung, Indonesia
agharina@darmajaya.ac.id; armansuryadi@darmajaya.ac.id; sutedi@darmajaya.ac.id

ABSTRACT

The user interface is a fundamental aspect of building a website. A proper analysis of user the interface design system will have a profound impact on the actual use of a website. Many cases of website building result in minimal usability and low traffic. The purpose of this study is to analyze the user interface design of the Department of Informatics System's website. The website mainly serves as an information portal for students in the department. It also provides features that students can access to assist them in either academic or non-academic activities and improve the general effectiveness and quality of the department. User-centered design (UCD) method is used as the basis of the present analysis. At UCD, the process of user interface design engages the users to provide feedback or evaluation via a questionnaire for improving a website's interface, accessibility, and usefulness. The analysis on the Department of Informatics System's website shows that its interface design and usability have generally been satisfactory despite several shortcomings, which need quality improvement and further development

Keywords: user interface, UCD, website

I. INTRODUCTION

Along with the times, the development of information technology makes people work to see the news and search for various information offered in cyberspace. With the advancement of technology, there are two that have a negative and positive impact on technology today. Starting from any news that we might be able to see on social media, information is once more useful information for us to be able to take advantage of all the activities that exist today. We also need to know about technology all activities can run easily and practically for all our activities going forward

Positive impact The development of technology in today's circle can make it easier to find information and facilitate work depending on how we use technology that can benefit us and others. but on the one hand there are also negative impacts, namely, the negative

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impact of technological development among today many teenagers who are wrong to use this technology which is only for personal gain that is used for things that are not responsible for what they do. Through technology that uses this internet network can make it easier for us to transact easily and quickly, and can educate teens to recognize technology well

The campus website is a number of web pages that contain all information about the campus such as: vision and mission, campus profile, majors in it, about lecturers, and many others. And the most important and many benefits are that by using a website or website we can register on a campus online or also called "Online Registration". With the "Online Registration" can save time and money for prospective students in implementing registration. So that distance is no longer a barrier to being able to register quickly, precisely and efficiently. The current era is rarely or even no campus that does not have a website because it would be very unfortunate if a campus does not have a website. Very many benefits are presented when using a website. In addition, the website can also be used as a medium of communication between parties in higher education with students and other parties, such as parents, prospective students and various other agencies

Website utilization is one of the important roles in an institution that is in the information system department IIB Darmajaya. Information systems majors website is a media liaison between students of information systems majors with related sections namely with department heads, department secretaries and lecturers as well as administrative sections related to activities in information systems majors. From the statement above, the Information System Department website user interface requires detailed analysis to measure the level of ease of use, satisfaction, and efficiency of a website which is a measure of the sustainability and development of the website. In this study the method used to analyze the user interface is the User Centered Design method. The User Centered Design (UCD) method itself is a new paradigm in the development of website-based systems. User-based design is a term that is currently used to translate design philosophy. The concept of UCD is the user as the center of the system development process, and the goals or characteristics, context and environment of all systems

2. LITERATURE REVIEW

2.1 Human Computer Interaction (HCI)

Human Computer Interaction (HCI) Human Computer Interaction (HCI) or interpreted as human computer interaction, is a multi-disciplinary focus on the design, evaluation and implementation of computer system interactions used by humans and other things around them (Preece et al. , 2002). Ease of use (usability) is a crucial issue in HCI, because it becomes an important aspect to assess the quality of user interfaces (Parlangeli et. Al,

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1999). Dix et. Al (2004) adds that the main focus on HCI is how humans use computers as tools to do, simplify and support their work. Usability requirements of a product, including the internet and computer systems can be identified if the product is designed according to user needs. Usability evaluation goes hand in hand with the familiarity of HCI.

2.2 User Interface Design

The user interface is a series of graphical displays that can be understood by computer users and programmed in such a way that it can be read by a computer operating system and operates as it should. The user interface is one of the factors that determine the increase in traffic on a website. Because users interact with programming logic through the user interface. And the user interface design itself becomes very important considering the more effective and efficient a design, the more comfortable the user will spend on the website [4]. To find out whether a website's usability is effective and efficient, an evaluation is needed

2.3 *User Centered Design* (UCD)

Is a method of design that focuses on user needs. In relation to Information Systems, User Centered Design is part of the SDLC (System Development Life Cycle), so that application designs developed through UCD will be optimized and focus on the needs of end-users so that applications that will follow the needs of users and users do not need to change behavior to use the application.

To run a UCD properly requires experimentation, iteration and experience when experiencing failure. Therefore there are principles in UCD that can be used as a guide in running UCD, including:
Understand the user clearly, along with the work done and also the environment in which the user is located
.
1. The design is based on an evaluation carried out on each iteration.
2. Prioritizing usage experience.
3. Involving the client in making and designing designs.

User Centered Design Process

The process in UCD requires designers to integrate investigative elements (eg, surveys and interviews) and generative elements (eg, brainstorming) to provide and define user needs. In general, the process of UCD is in the form of iteration, namely repetition and evaluation carried out in each process before proceeding to the next process. In general, there are 4 stages in the UCD process, namely:
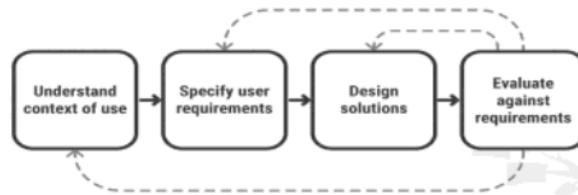
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Figure 1 Stages of the UCD Process

1.   Understand Context of Use

The system designer must understand the context of the use of the system such as who will use the application, for what they use it and in what situations they use the application.

2.   Specify User Requirements

After the designer understands the context of use of the application, it can proceed to the next process which is to determine user requirements (user requirements). In this process the designer must be able to determine the needs of users in the business and objectives to be achieved.

3.   Design Solutions

The next process is to design solutions from the User Requirements that have been explained in the previous process, this design process will go through several stages ranging from rough concepts, prototypes to complete designs.

4.   Evaluation Againts Requirements

Evaluation will be carried out by involving users who will use, the evaluation is carried out starting from 1 process and proceed to the next process

Principles in UCD

1. Focus on Users Design must be connected directly with end users or prospective users through interviews, surveys and workshops at the time of design. The aim is to understand the user's cognition, character and attitude and anthropometric characteristics. Its main activities include data retrieval, analysis and integration into the design information of the user about the characteristics of the task, the technical environment in the organization.

2. Integrated Design The design must include user interfaces, support systems, technical support and procedures for installation and configuration settings.

3. From the Beginning Continues to User Testing The only successful approach in designing a user-centered system is that empirically needed observations about user behavior, careful evaluation of feed backs, insight into solving problems, and strong motivation to change designs .

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4. Interactive Design The system being developed must be defined, designed, and repeatedly tested. Based on the test results of the behavior of the function, interface, user documentation assistance system and approach to training.

Four key steps in development, namely planning, design, implementation and management of the system. To develop a system, based on the picture above can be done with four approaches:
1. Soft System Methodology (SSM) SSM is more focused on planning.
2. Open Task Analysis (OSTA) OSTA is more focused on the initial steps of design.
3. Multiview A complete methodology with a range of planning to implementation.
4. Star Life Cycle The main focus is on design

2.4 Reference Text and Citations

1. Research by Yuri Vanli Akay, Alb. Joko Santoso, F. L. Sapty Rahayu by title "Metode User Centered Design (UCD) Dalam Perancangan Sistem Informasi Geografis Pemetaan Tindak Kriminalitas (Studi Kasus : Kota Manado)" the purpose of this research is to produce a geographic information system design mapping crime in the city of Manado with User Centered Design to capture the needs of users in this case the police and the community. The method used in the design is the User Centered Design (UCD) method and for data collection using literature studies, interviews, and questionnaires. This research resulted in a geographic information system design mapping crime in the city of Manado with UCD to capture the needs of users

2. Research by Ikhda Uswatun Khasanah, Muammar Fachry, Nadia Saphira Adriani, Nanda Defiani, Yopis Saputra, Ali Ibrahim by title "Penerapan Metode User Centered Design dalam Menganalisis User Interface pada Website Universitas Sriwijaya" In this study the authors conducted an analysis on the Website of Sriwijaya University to measure the feasibility of User Interface on the website by using UCD method (User centered Design). UCD is a user interface design process that focuses on interface, accessibility, and Usefulness in user interface design that involves the user as the center of the process by providing input or assessment in the form of questionnaire. The final result of this study is the User Interface assessment of the UNSRI website (Sriwijaya University) conducted by the user. And from the results of this study found that 43.8% of students expressed satisfaction on the Interface of the UNSRI's website

3. Research by Jeffry Andhika Putra, Lukito Edi Nugroho, Rudy Hartanto by title "Redesain serta Evaluasi Website Menggunakan Pendekatan UserCentered Design (Kasus: Universitas Janabadra Yogyakarta)" This study aims to redesign interface of Universitas Janabadra's website by focusing on User-Centered Design (UCD) approach and evaluating

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new design to identify factors influencing user's desire to using website. The results of website redesign evaluation show that developed design included in GOOD category, a mean score of 141 with a minimum score of 46 and a maximum score of 184, there are four categories: Not Good, Fair, Good, and Very Good, with interval values per category 34,5. This can be interpreted that new website design can be received well and get full-supported for immediate implementation. Based on the results of research on data obtained from Universitas Janabadra, it can be concluded that the responsive flat design has been successfully wet proved by adaptation of look, menu, and function when website accessed. The successful implementation of website redesign is influenced by suitability of tasks and technology in accordance with what expected and support of leadership to user and availability of facility's condition support to access Universitas Janabadra's website

4. Research by Miftahul Huda, Wing Wahyu Winarno, Emha Taufiq Lutfi by title "Evaluasi User Interface Pada Sistem Informasi Akademik Di Stie Putra Bangsa Menggunakan Metode User Centered Systems" Design This study uses a user centered design systems with some aspects of the variables in the form of Visual Clarity, Consistency, Informative Feedback, Explicitness, Appropriate functionality, Flexibility and control. The sampling technique in this study using simple random sampling technique with a number responeden 30. Results from this study shown that the overall academic information system otherwise well. While the results show that the respondent's response assessment of academic information system on flexibility and control aspects of assessing 4.44% for an answer "strongly disagree", 27.78% for an answer "do not agree", it shows that there are still many users of information systems academic difficulty in using it.

5. Research by Ikrima Nuha Arifin, Herman Tolle, Retno Indah Rokhmawati by title "Evaluasi dan Perancangan User Interface untuk Meningkatkan User Experience menggunakan Metode Human-Centered Design dan Heuristic Evaluation pada Aplikasi Ezyschool Evaluation" is done for determining the success rate of applied UX to meet user needs and satisfaction. The purpose of this study are to find usability problems based on heuristic principles and designing the solution design based on evaluator suggestions, severity ratings and Google Material Design (guidelines). The Human-Centered Design (HCD) approach was used because the design development approach and interactive system focus on the user and user needs. The Heuristic Evaluation (HE) method was used to find and assess usability problems based on heuristic principles with the help of experts as evaluators. The initial data collection was carried out by conducting interviews with EzySchool stakeholder regarding the analysis of the application usage context. Initial heuristic evaluation (involving 3 evaluators) produced 17 problems as a baseline for user needs to design a solution design. Iterate have been done once because of time limitness. The results of this study are a comparison between the initial evaluation and solution design results along with better solution design in UX which is indicated by a decrease of 10 heuristic problems so that only 7 problems were found in the solution design

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6. Research by Melda Agarina˒ Sutedi Arman Suryadi Karim by title Evaluasi User Interface Desain Menggunakan Metode Heuristics Pada Website Sistem Informasi Manajemen Seminar Institut Bisnis dan Informatika (IBI) Darmajaya" The purpose of this research is to evaluate the user interface design on the conference website at IBI Darmajaya, considering that the Seminar is a routine agenda of the Research and Community Service Development Research Institute (LP4M) IBI Darmajaya. Conference activities have been carried out by IBI Darmajaya starting in 2012. In this study utilizing the Heuristics Evaluation method. Heuristics are evaluation methods that are useful in determining errors in interface design. The heuristic method is used because in these methods it has indicators that can facilitate the analysis process. The results generally show that the interface design, ease of use (usability) of the conference information system at IIB Darmajaya has been quite good based on evaluation, but there are some things that need to be improved, and obtained important notes for the improvement and development of the seminar conference quality

7. Research by Wijang Widhiarso, Jessianti dan Sutini by title Metode UCD (User Centered Design) Untuk Rancangan Kios Informasi Studi Kasus : Rumah Sakit Bersalin XYZ This writing aims to design an information kiosk application at XYZ Hospital which provides information relating to hospitals using the UCD method. Method Data mining used is interviews and observation of end users, and literature studies. Results it is expected that this design is able to provide better services, especially in terms of delivery of information to the public and consumers regarding XYZ Hospital

II. METHOD

There are methods for data collection and designing the information system as follows:

3.1 Data Collection Method

a. Literature Study
Methods in this research is understanding and references from journals, books and other media which are related to the process of data processing generally or specifically for using the expression and supporting theories that are in order to provide general data processing process or specifically for using the expression and supporting theories that are in order to provide general data processing.

b. Interview

Interview is the process of interaction with users and managers, while the user is a student and lecturer while the website manager is the administration department of the department. In this interview several questions were asked of both the advantages and disadvantages felt during the process of using the website.

c. Questionnaire

Quisioner is done using information in determining benefits and weaknesses and weaknesses that are in the system which has walked now. In the distribution of this quisioner distribution to 15 lecturers of the information system (from the number of lecturers there are 25 people). Questionners are also provided to a number of active students who are 130 students as well as quarisioners are provided to academic / BAAK, PLPP parts and student parts

3.2 . User-Centered Design

User-centered design is a project approach that puts the intended user of a site at the center of its design and development. It does by talking directly to the user at key points in the project to make sure the site will deliver upon their requirements According to Wijang Widhiarso et al. UCD is a per design philosophy that puts the user at the center of the study of the system development process. Based on four principles in the development of UCD-based systems, namely: focus on the user, integrated design, initial design developed for the user, and interactive design. According to ISO 13407: 1999, there are four main stages in building an UCD-based system, namely: requirements gathering: understanding and determining the context of use, requirements specification: determining user needs, design: building and designing designs and prototypes, and evaluation: conducting user-based assessments (user) in using the system. Many methods are used in UCD, but of the many methods, there are thirteen of the most popular methods according to Bernard Schindlholzer's research:

Table 1 General Methods Used in UCD

No	Measure
1	Field Studies (Including Contextual Inquiry)
2	User Requirement Analysis
3	Iterative Design
4	Usability Evaluation
5	Task Analysis
6	Focus Groups
7	Formal Heuristic Evaluation

8	User Interviews
9	Prototype Without User Testing
10	Survei
11	Informal Expert Review
12	Card Sorting
13	Participatory Design

4. RESULT AND DISCUSSION

Information System majors website developed to meet the needs of users with a variety of menu choices to suit their needs, with the main function of each menu as a menu for the transaction process or a menu to be able to provide information from each user's academic process. Users who are related to the Information Systems majors website are students, lecturers, department heads and department secretaries, and department administration staff.

The website consists of 10 main menu. All available menus can be accessed by users, namely students, lecturers and the academic section. At the moment to be able to access data on the website the participant is not given a login and password, the website currently available is still an information website or company profile and all users have the same access

Table 2 menu available on the information systems majors website

No	Menu	Sub Menu
1	Home	Main course
2	Profile of Study Program	Vision and Mission Objectives
		Organizational Structure
		Study Program Accreditation
3	Academic	Curriculum
		Academic Calendar
4	Lecturer of Study Program	-
5	Department Info	Department News
		Announcement
6	Download	Contains downloadable data
7	Mahasiswa dan Alumni	Information on Student and Alumni Names
8	Jurnal Simada	Directly connected to the journal.darmajaya.ac.id website
9	APS 4.0	-
10	E-Prog	Directly connected to the website filkom.darmajaya.ac.id/e-prog

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Figure 2 Menu Available On The Information Systems Majoring Website

Figure 3 View Of Main Menu

Figure 4. Display Menu Profile Of Product Sub Structure Organization

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Reliability test reliability is an index that estimates which a measuring instrument can be trusted or reliable. To answer the reliability of the cronbach alpha reliability coefficient formula questionnaire with the formula

$$r_i = \frac{k}{(k-1)}\left\{1 - \frac{\sum s_i{}^2}{s_t{}^2}\right\}$$

$ri = k\ (k-1)\ \{1- \sum si2\ st2\ \}$
K = Maquin Quadrat Between Subjects
$\sum si2$ = Mean Square Error
$st2$ = Total Variant

The formula for total variants and item variants:

$$s_t{}^2 = \frac{\sum X_t{}^2}{n} - \frac{(\sum X_t)^2}{n^2}$$
$$s_t{}^2 = \frac{JKi}{n} - \frac{JKs}{n^2}$$

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JKI = Total Square Of All Items
JKS = Total Square Of Subjects

No	Aspect	Total Respondents	Total Score	Maximum Scores
1	Visul Clarity	150	328	897
2	Consistency	150	578	863
3	Informative Feedback	150	459	550
4	Explicitness	150	212	355
5	Appropriate Functionality	150	650	754
6	Flexibility And Control	150	551	679

5. CONCLUSIONS

After conducting an Interface Evaluation on the Darmajaya Information Systems Department website using the User-Centered Design method, the following conclusions can be drawn:

The information displayed at the beginning when the system is running is adequate, there is already a fairly complete menu that can be accessed by the user. But there are a number of things that need to be improved so that user convenience is even better and user-friendliness characteristics. One of them is that the gallery menu is still not available. Student data also cannot be accessed by students. It is hoped that the system can be integrated with the academic system in IIB Darmajaya. Then suggestions for further research can be compared with other methods in order to obtain maximum measurement results

REFERENCES

[1]   Ikhda Uswatun Khasanah, Muammar Fachry , Nadia Saphira Adriani , Nanda Defiani , Yopis Saputra , Ali Ibrahim6., 2018, "Penerapan Metode User Centered Design dalam Menganalisis User Interface pada Website Universitas Sriwijaya", INTEGER: Journal of Information Technology, Vol 3, No 2, 2018: 21-28

[2]   Jeffry Andhika Putra, Lukito Edi Nugroho, Rudy Hartanto., 2017, "Redesain serta Evaluasi Website Menggunakan Pendekatan UserCentered Design (Kasus: Universitas Janabadra Yogyakarta)", CITEE 2017, ISSN: 2085-6350, Yogyakarta, 27 Juli 2017

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[3] Miftahul Huda, Wing Wahyu Winarno, Emha Taufiq Lutfi. 2017. Evaluasi User Interface Pada Sistem Informasi Akademik Di Stie Putra Bangsa Menggunakan Metode User Centered Systems Design. Jurnal Ekonomi Dan Teknik Informatika Vol. 5 No. 2 2017

[4] Ikrima Nuha Arifin, Herman Tolle, Retno Indah Rokhmawati, 2017 "Evaluasi dan Perancangan User Interface untuk Meningkatkan User Experience menggunakan Metode Human-Centered Design dan Heuristic Evaluation pada Aplikasi Ezyschool", Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, Vol. 3, No. 2, Februari 2019, hlm. 1725-1732

[5] Yuri Vanli Akay1, Alb. Joko Santoso2, F. L. Sapty Rahayu3, 2015 "Metode User Centered Design (UCD) Dalam Perancangan Sistem Informasi Geografis Pemetaan Tindak Kriminalitas (Studi Kasus : Kota Manado)", Prosiding Seminar Nasional ReTII ke-10

[6] Melda Agarina, Sutedi, Arman Suryadi Karim, "Pembangunan Sistem Informasi Manajemen Seminar (Nasional dan Internasional) pada IBI Darmajaya" 2019, Vol 1 (2019) Seminar Nasional IIB DARMAJAYA

[7] Wijang Widhiarso, Jessianti dan Sutini "Metode UCD (User Centered Design) Untuk Rancangan Kios Informasi Studi Kasus : Rumah Sakit Bersalin XYZ", 2007, Jurnal Ilmiah GI MDP, Volume 3 Nomor 3

[8] Kurniawan, H. (2018, April). Strategy Development Of Human Source Competitiveness Strengthening With Learning Media System Analisis Model. In *Prosiding International conference on Information Technology and Business (ICITB)* (pp. 9-12).

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