

Design Data Flow Diagram for Supporting the User Experience in Applications

Wati Wulandari¹
and Albertus Dwi Yoga Widianoro²
Information System Department,
Faculty of Computer Science,
Soegijapranata Catholic University, Indonesia
¹watiwulan95@gmail.com
²yoga@unika.ac.id

Abstract - The application is a medium which currently widely used by the public. Many people are using app because it is easy when doing some activities, without meeting up. When making an application, developer should consider the cheerfulness for its consumer or commonly referred to User Experience. Because nowadays, people looking for the application not only see the advancement of technology it, but also comfort, convenience, and excitement that can be earned. To develop an application, developer has to go through several stages. One of them is describing the process of the application, from the beginning until the end of the application is used, or commonly referred to DFD (Data Flow diagram). By displaying details of every element of the application, it would be easier for users when using the app which will indirectly affect the convenience of using the app.

Keywords - Comfort, Applications, Data Flow Diagram, User Experience

I. INTRODUCTION

Digital world is currently in development. Being able to change the analogy method is becoming easier to use and efficient [1].

The development of technology in the dissemination of information to make easy of moving information to one point to another. Developers see it as an advantage and they make an application that can be enjoyed by many people without differentiate groups of people.

We can see today, the development of applications from year to year has been increasing. The simplest example is in the 1960s, people in a long distance only communicated by mail but this time, a lot of applications can make it easier to communicate in a few minutes.

Especially, the development of app developers is supported by AI (Artificial Intelligent), which makes them much easier for mapping information that will be submitted to the users.

Build an application should consider the needs of users that want to send the information through the application.

In this case, developers should be multifunctional, as a maker, and applications users so they can know when the market of the application is maximum and compatible with the needs of users.

The first step in making an application is trying to gather data as the base of manufacture. The point of the data is the fact that describing the existence of an incident, which are usually get through the process of observation [2].

Second step is to define the data into a system. The point with a system is a group of elements that are connecting each other [2].

In developing a system it is a must to describe one by one that be a need, with a way of describing DFD (Data Flow diagram), DFD is a drawing of diagrams with the use of

phrasing to describe the system [2]. Or the logic of the data that was made to describe where they came from, which came out from the system [3].

With the depiction of the system, of course, the delivery of information on the application is much more can be accepted by the user, as the end-users who do not know about technology.

Portrayals of the system on the application will also support UX (User Experience), which define as the machinery of a product that provides a cheerfulness to users [4].

Or you can get it as someone's perception and response in using a product, system or services. The principle used in building a UX is Customer Rule, that users have the right to determine the level of their satisfaction in the use of applications product [1].

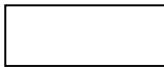
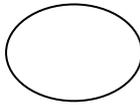
II. LITERATURE REVIEW

A. Data Flow Diagram (DFD)

In the development of applications DFD that are also referred to DAD (Diagram of Flow Data), the definition of DFD is a process of the data that describes, where are the data coming from, where are the data going out of the system, and then the data will be saved. So there is an interaction data flow to the last storage [3].

Meanwhile, according to Sutabri (2003: 163), the definition of DFD is a relationship to describe the system automatically or computerized, manualize the presentation can be rendered in the form of the system that are interconnected in accordance with the rules. Here the symbols are used to draw DFD [3].

TABLE I

No.	Symbol	The Function
1.	Entitas 	To tell you something, for example, a company that produces a jeans, in the process of making jeans requires raw materials that are supplied from other companies.
2.	Flow of data 	To show the data is being done in portray, the process should be delivered clearly because every process should have the right meaning.
3.	Process 	To show an activity is being done. The process should receive the flow of the data and produce current data.
4.	Data Store 	To show the side-way data can be in form of files or databases from a computer system.

By knowing every function to develop an application, then it would be easier for us in designing a line system application that will be used.

If a DFD is designed well, it will have an impact on the creation of a user experience for users themselves. Because the application of a user experience will greatly affect the user comfort.

B. User Experience

According to ISO 9241-210 the user experience is a response to a product, system or services. The principle, which is built in the user experience is to involve users in assessing satisfaction with the built applications. So the application of user experience in a product largely determine the success of the product. The fact is people nowadays are not looking for applications at the side of technological sophistication, but also the level of comfort that offered by the applications [1].

According to Garrett. (2011), User Experience is not the working way of a product or service, but the outside factors of the application, with a way to ask users to interact with the extent to which the level of comfort they get from the products [4].

To make the basic concepts of the user experience using two models, which are models made by Jesse James Garrett and David Armano.

Jesse James Garrett in the book The Element of User Experience: User-Centered Design for the Web. Creating a model UX aims to explain elements of the UX.

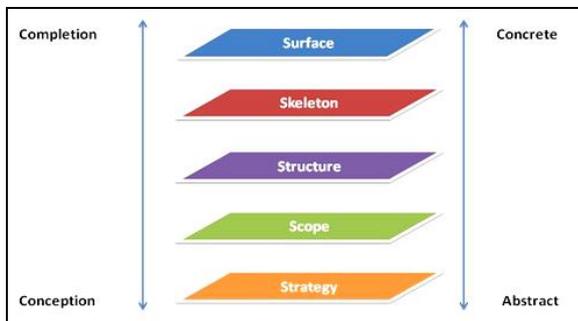


Fig. 1 Five Basic Elements UX

In fig. 1, there are five basic elements UX, which was created by Jesse James Garrett, every element has different uses including:

1. **(Strategy)** is an early stage or the most fundamental stage of the experience that will be offered to users by the product.

2. **(Scope)** to define the limits of satisfaction that will be given to users. Here, Garrett divided it into two parts, they are: in terms of interface or the contents and from the hypertext system or the context of the products offered. From the context that we need to consider is systematics functional. Since the content that should be considered is the needed information, as some products require information such as the product description, product benefits that are looked for by the readers [1].

3. **(Structure)** is creating a system information in a row, because it's linked to the

ease which would be get by the users when using products such as for example: the editor column letters, email or text message.

4. **(Skeleton)** is to arrange information about the products that will give comfort and convenience for users, for example: what should be considered when making the application is design layout, the layout of all the elements needed.

5. **(Surface)** is the final stage that is done by considering in terms of color, motion, design and so on that can be felt directly by users. So, when the product was thrown into the market has a maximum quality.

All models which were delivered by Jesse James Garrett are kinds of liner model, which means the process by process should be done if the previous process has already been done, because every process connecting each other, if you miss one of the process the user comfort in using the application can be reduced.

Regarding the UX, which was developed by David Armano, which is an Excutive Vice President of Global Innovation & Integration in Edelman Digital, such as:

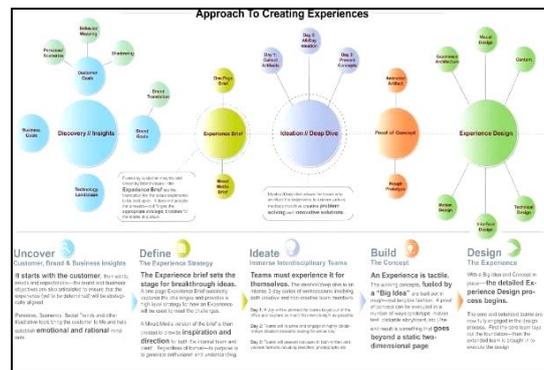


Fig. 2 Model UX David Armano

Fig. 2, defines the basic concept of the UX development, according to David Armano, such as:

1. **Uncover:** searching that underlying on motivation and interests of the customer business, brand, which are connected with insight technology.

2. **Define:** stage that aims to formulate a strategy of experience in general, in order to provide inspiration and a good way for the internal team or users.

3. **Ideate:** is the collaboration and exploration. In this process we have to understand the desires of users, by entering into their world, and play a role in their own. And then find the right approach to deliver the information to users, makes a prototype application to be one of the solutions in the development of applications.

C. Usability as the Basic Concepts of User Experience

Usability is the basic concept in the development of an UX. To measure its use in the principle of uses, usability is often equated with a user friendly. While usability asks whether has it been good use in function. Utility asks whether the function is in conformity with principles. And then usability applies it in the form of a systematical human interaction, including the installation and maintenance procedures.

According to Nielsen (1993), usability have some components, such as:

1. **Learnability:** a system should be easy to learn and be used, so users can work fast.
2. **Efficiency:** a system should be efficient when it is used because it will affect the high productivity.
3. **Memorability:** a system when it is built should be easy remembered by users, so users can use it again, though not in the same period.
4. **Errors:** system that is built should have the small level of error, so that if something goes wrong in its use, users can directly fix the false, or go back to the beginning of the process.
5. **Satisfaction:** system that is built should be able to give pleasure and comfort for each user who uses it.

Five components can be used to develop applications, by considering user experience.

III. RESULTS AND DISCUSSION

In the development of applications we need a software to make the lines of applications, ranging from the beginning of the process until the end.

The software used to make the application is Microsoft Visio Pros of 2013, step by step we need to do to make the application, such as:

1. Identify the application will be made, like anyone who has the right to access the application, to the details of any applications ranging from login to the use of applications.
2. After identifying the needs of every application has been made, the next step is to describe the application on the software Microsoft Visio Pros of 2013.
3. Applying the application DFD that have been made in the form wireframe.

Here's an example of the application which is used to remind customers about payment.

1. Identifying the process of the data that is going to be made, after identifying components that needed like an activity diagram of Login, Due View List, Update Customers Status.

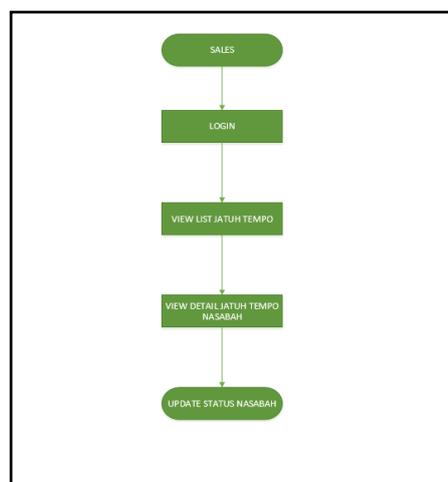


Fig. 3 Identifying the Process of the Data

2. In diagram of the “LOGIN” what users have to do is entering the name and password, for the user who do not have an account they have to create an account first.

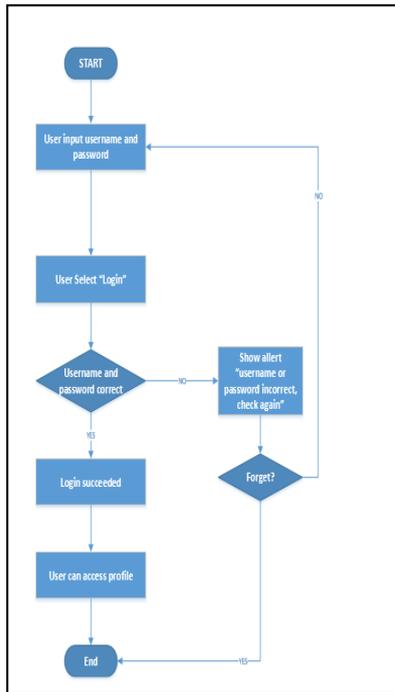


Fig. 4 LOGIN

3. Diagram of the “Due View List” that happens in here is that the user fill (Id borrowers, customer, the period of collection). After filling up, the user will go to the next step of sales view of the list, here the user must fill (Id borrowers, id customer, the period of collection, name, address, phone number, interest, penalties, the number of mortgages and payment, the date of payment). After that the users go to the next step, here the users are given the choice whether to update the status of the clients or not, if not then it will come back to the List due. If choosing a yes it will be in view of the customer deadline then the user will know due payment, the next is if at the click of “Yes” the user will do Update the status of the activity, after all in the process have done, it is over.

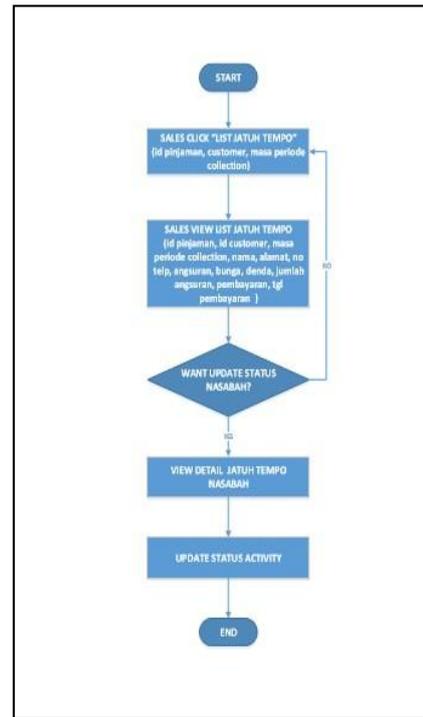


Fig. 5 Due View List

4. Diagram of the “Updates Status Customers” the data first walk into sales view of the customer due. Furthermore, in the process of Sales click update the status, if it is done, there will be a question of whether the user would pay or not if yes then Click selection value Customers Pay up. If not, there will be a question Customers don't pay, if answering “No” the users Click selection value didn't see Customers, If answering “Yes” it appears Click selection value Customers don't pay " and the process is completed. The next step after the appearance of question Customers pay is Click selection value Customers pay, then Go to camera to capture the evidence of payment from customers. After successfully capture, send proof of payment to sales, the process is done.

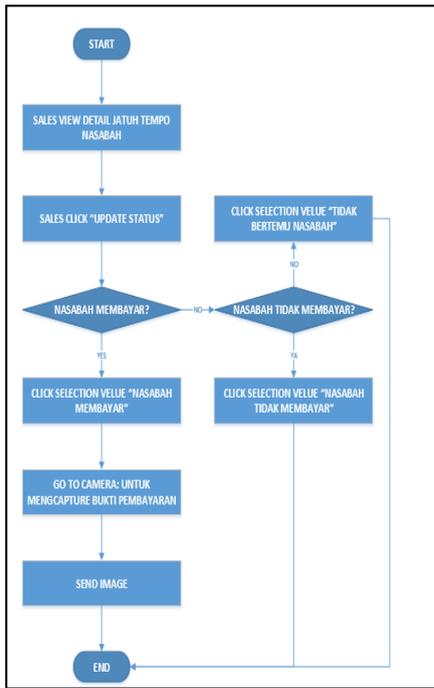


Fig. 6 Updates Status Customers

Another example, making the application is the gaming applications phams jump. Steps that must be taken in the depiction of the application of this game almost the same with the previous application:

- The identification about the needs of the game that will be made.
- The target customers of the games.
- DFD application so it can be understood by the gamers.

Here in the example of DFD depiction Game Phams Jump application: Identifying about the early process of game until it is finished to play.

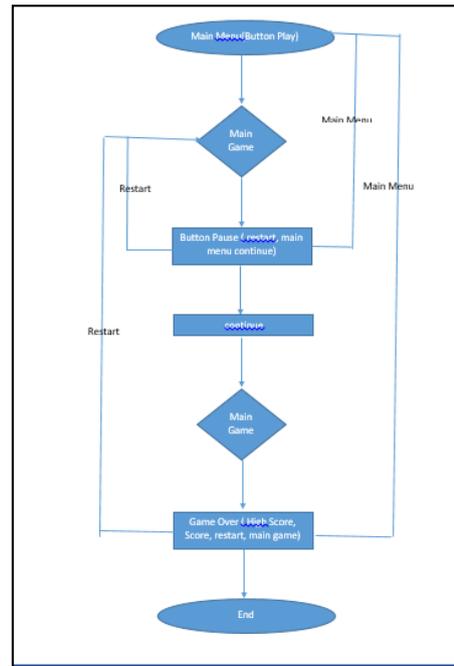


Fig. 7 The example of DFD depiction Game Phams Jump application: Identifying about the early process of game until it is finished to play.

The picture above explain the process when games are played, from “click the start button”. Then in the game is also available pause button. In the pause button there are three options, such as: the restart, the menu, and continue. The function of every button is also different if you choose restart button it would like to repeat the games from the starting point again without having to press the button play.

If choosing main menu button it will go back to the beginning of the game. If the button continue, it will start the game in the last game was played.

In the game phams jump there is also the game over which contains three options, such as: high score, score, the menu, and restart.

IV. CONCLUSIONS

Based on steps that must be taken to develop applications, it would make the following conclusion.

1. In the development of applications, first thing that need to be understood is the groove of the application to be made.

2. Because if the developers able to identify any essential elements in the application, it will provide comfort for application users, commonly called the User Experience.

3. When he was able to provide UX to the application users, then the usability of the application will be increased, and a lot of people will use the app, because they feel comfortable when using it and fun which they get in the application made.

as 13407)". <<https://www.iso.org/obp/ui/#iso:std:iso:9241:-210:ed-1:v1:en>>.

V. ACKNOWLEDGMENT

The authors gratefully acknowledge to Beasiswa Unggulan scholarship support from Bureau of Planning and International Cooperation, Ministry of Education and Culture of Indonesia.

REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)

- [1] Wiryawan, M. (2011). "User Experience (Ux) Sebagai Bagian Dari Pemikiran Desain Dalam Pendidikan Tinggi Desain Komunikasi Visual". *Humaniora*, Vol. 2, No. 2, pp. 1158-1166.
- [2] Purnama, B.E. (2009). "Pembangunan Sistem Informasi Pendataan Rakyat Miskin Untuk Program Beras Miskin (Raskin) Pada Desa Mantren Kecamatan Kebonagung Kabupaten Pacitan". Vol. 9330, pp. 72-81.
- [3] Afyenni, R., Jurusan, D., Informasi, T., and Negeri, P. (2014). "Perancangan Data Flow Diagram Untuk Sistem Informasi Sekolah (Studi Kasus Pada Sma Pembangunan Laboratorium Unp)". Vol. 2, No. 1.
- [4] Rofid Hilmi, A. (2015). "Pengembangan User Eperience Dan User Interface". Vol. 1, pp. 1-10.
- [5] International Organization for Standardization (ISO) Switzerland. (2009). "ISO FDIS 9241-210: Ergonomics of human system interaction - Part 210: Human-centered design for interactive systems (formerly known