Investigating the Impact of User-Friendly Video Guides on Emotional States During Hospital Navigation

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Abstract
One problem for hospital visitors is getting lost in the hospital, especially when visiting for the first time because of its large size, complex layout, and many sections. This research focuses on decreasing the way in the hospital by developing video clips and maps for navigation by using the concept of User Experience (UX)). Fifty participants joined in this research. We compared the emotion with four positive - neutral - negative emotions: (1) Interesting - Boring (2) Friendly - Not friendly (3) Clam - Anxious (4) Happy -Sad. The results show that the respondents feel positive about both navigation methods. However, using video clips makes the respondents more satisfied than using maps.

Keywords: User Experience, Navigation, Emotion, Algorithm

Introduction

The various sections and rooms in the hospital are prepared to serve or support patients, such as the patient room, operating room, emergency room, X-ray room, laboratories, doctor's office, pharmacy, examination room, support services, etc. Hospital buildings are complex structures because many rooms are needed to cover all operations. The room design and layout in the hospital building are careful to ensure the flow of the people who come to the hospital, such as doctors, nurses, patients, caretakers, visitors, and pharmacists. Even though the layout is already planned, people may need clarification about walking into the hospital, especially the first time they visit.

The label, sign, or map is used to find the way to the hospital. Many hospitals use these to help navigate, but these things may not be easy to follow. However, some people have difficulty finding a way because they have a problem with their eyes looking at the label or do not understand the signs telling the way to that hospital. This problem will increase when the hospital's layout is complex and extensive. The effect of these problems is easy to get lost and confused. This can make it stressful and unsatisfying, especially if that person is dealing with an appointment with the doctor. In terms of service, this problem can affect the experience of those who use static navigation throughout the walk. Then, the design of the operation of using the material or technology to help the user is needed. Before designing or creating a new thing, the concept and idea of User Experience (UX) can help the designer to design.

User Experience (UX) design aims to tailor interactions to user behaviours and needs, prioritizing a positive and intuitive experience across systems, websites, applications, products, and services. UX design extends beyond aesthetics, focusing on creating satisfaction and ease of use. It enables users to understand functionality and achieve goals effortlessly. The core of UX design involves understanding users and analyzing their requirements, behaviours, and usage challenges. This information guides the design process, resulting in user-friendly, efficient interfaces that deliver excellent user experiences.

At the beginning of UX operations, the team and designers must understand people's emotions. There are various types of emotions, including positive, neutral, and negative. The users' emotions and experiences happen when they use that service or product. If that service and product are not good, it will affect the user's attitude and continuing use.

In this paper, we focus on using navigation material for users through design based on UX and also consider users' emotions. The clip video and maps were created and tested for use by the users. After users had used it, we asked about their emotions when they used it and which ones they would prefer to use in the future. Moreover, we find the relationship of emotions.

Literature Review

UX design is not limited to creating work or jobs. However, it is designed to create more incredible satisfaction and ease of use for the customer or user. The critical point of the design is that users can easily understand how to use it and achieve their goals very quickly. Then, before designing UX, the designer has to consider the key of UX design, which is understanding the user. After getting the information and understanding from the users, the needs, behaviour, and barriers to use must be precise. Then, take that information to design and change until that design is easy to use, efficient, and gives a good user experience.

It is very important to observe and interview the user to gather data on the customer's needs, opinions, and feelings when using the product. UX design is essential for the company and business because it helps find a better solution and defines the scope of the customer and product before production. Moreover, the steps of UX help the developer understand the customer and product more deeply. The concept of user design of UX has five main steps as follows:

1. Empathize
The first step is to empathize. To design a product or service to support customers, one must understand the user's problem. The methodology for understanding the user's problem starts with an interview with the user, using open-ended questions to encourage and motivate the user to share their experience. Moreover, observing the customer's behaviour is essential, too, because sometimes it's related to or different from the customer's answer.

2. Define
The designers have to analyze the data to get the problem's main point and understand the user's problem. The first step is to analyze the data, separate the factors of the data, find the relationship, and understand the meaning of the data.

3. Ideate
This stage involves brainstorming with the media to share opinions on solving the problem and creating new innovations. The review insight data from the define phase must be prepared. After that, try to set a clear objective for the idea session.

4. Prototype
The objective of creating the prototype is to develop before producing the finished product after getting the idea. If the finished product is produced before, the risk of failure may be higher than when creating the prototype and testing with the target group of users or customers. Also, sometimes, if the finished product is not satisfactory for the customer, it can fail. The prototype helps the designer to learn about the behaviour of humans or users. Also, the design team can test the results of solving the problem before investing in the products.

Previous studies about user experience and navigation Zhang, C., & Chen, B. (2019) proposed to enhanced experiential learning by creating a 3D virtual environment with a Virtual Reality (VR) for students. The students can design, plan, and interact with VR architectural project. The student who test this tool feel positive feed back and also feel high interested in learning through this project. Moreover, the students wanted to use more rounds for improving their performance. Kumar, D. et al. (2022) proposed to created the system to overcomes limitation of navigation tool. The problem that they found was the traditional digital mapping systems have the limitations. Moreover, the problem included GPS dependency and lack of contextual information about surroundings. This system was create and implemented by design as a mobile application for smartphones. The performance of this system can step count detection accuracy improved by nearly 0.5% and average locational accuracy of 2.5 meters. Rennick, B. (2019) proposed to improve the academic library service website. The improved website was created by considering user experience. The results after improve the service were showed that the increasing the performance of service information and also became the effective tool of the facilitating service. Chaudary, B. (2021) developed and tested the navigation assistance system for blind and visually impaired individuals. The teleguidances were used. The smartphone camera was used for attached to user’s chest and send live video to a remote caretaker. Then, the care taker could guide user for feedback and

voice communication. Sekhavat, Y.A., & Parsons, J. (2018) used Augmented Reality (AR) technology for navigation and finding the way of tourists. They found AR navigation significant impact to user experience quality. Coccoli, M., Torre, I., & Galluccio, I. (2023) studied innovative approach for enhance video-based learning experiences by hyper video educational application. The proposed system was implemented as a custom web-based video player with interactive visual tools. The results show the demonstrate the effectiveness of improving video based learning experiences. Tscharn, R. et al. (2016) compared the two types of interaction methods of new tracking technologies and touchable interfaces. The finding of this research on bare- hand interaction of tracking technology has the higher joy-of-use and better efficiency in easy navigation tasks. Meanwhile, the touchable interface, the initial use improved efficiency for bare-hand has interaction more complex task.

In the previous studies about user experience and emotion, Greenfeld, A. et al. (2018) compared the user experience and emotion of users who tested five immersive virtual reality environments: head-mounted Displays, virtual reality (VR), Mixed reality (MR), and Augmented reality (AR), to support the developer in creating exciting content. Mixed methods were used to obtain the information, such as the questionnaire, measuring mental effort, user feedback, and interviews. Jussi P.P. Jokinen (2015) investigated the different responses of emotion in human-technology interaction. The concept of emotion is also applied to user experience. Fifty joined as respondents to conducting. They found that the user's emotions depend on the situation and also the differences people deal with regarding the situation's job and the experience of the user's emotions.

Methodology

The proposed testing is to compare the interest in using navigation. The patients and the people who are not working in the hospital were respondents because they do not often walk in the hospital, so it's highly possible to lose the way in the hospital more than those working there. There are two types of navigation: video clips and maps. For the video clips, we created by considering the way to walk in the hospital. At the beginning, the point or location that the patients and the people who are not working in the hospital can use or enter were listed. Other places were missing from the list, such as the doctor's private office, staff, nurses, laboratories, or rooms are not allowed in the hospital.

After a list of rooms or locations had finished, the best way to walk or take the patients from point to point was created. Then, we walked and recorded video clips along the way. After that, we made a video clip by adding some information to help the user understand, such as turning left, turning right, or using the lift. These videos can be used on smartphones. Then, the people who use it can also walk it along the way when they are walking. Meanwhile, the map can look at the hospital's location, such as a label or map picture on the wall.

Fifty respondents participated were joined in this research. Random select respondents were used. We want to compare the emotions of the hospital customers who use video clips and maps. Four sets of emotions were used as follows:

1. The first set of emotions is the emotion of (1) Very interesting, (2) Interesting, (3) Neutral, (4) Boring (5) Very boring.
2. The second set of emotions is the emotion of (1) Very friendly, (2) Friendly, (3) Neutral, (4) Not friendly, (5) Very not friendly.
3. The third set of emotions is the pair of emotion of Clam-Anxious (1) Very clam (2) Clam (3) Neutral (4) Anxious (5) Very anxious.

4. The fourth set of emotions is the pair of emotion of Happy-Sad (1) Very happy (2) happy (3) Neutral (4) Sad (5) Very sad.

Results

The results are shown in Table 1. Overall, the comparison results of emotions between using video clips and maps for navigation guides in the hospital show that using video clips elicits more positive emotions than using maps. Most respondents felt that video clips were interesting, very friendly to use, very calm, and very happy to use. Meanwhile, most respondents feel interested, friendly to use, calm and feel neutral between happy and sad.

Table 1: The comparison results between using clip video and map for navigation in the hospital

Pair of emotions	**Total number (%)**	
	Clip video	**Map**
Interesting-Boring		
Very interesting	42.11	0.00
Interesting	**50.00**	**69.23**
Neutral	7.89	30.77
Boring	0.00	0.00
Very boring	0.00	0.00
Friendly-Unfriendly		
Very friendly	**51.28**	7.69
Friendly	43.59	**46.15**
Neutral	2.56	38.46
Unfriendly	0.00	7.69
Very unfriendly	2.56	0.00
Clam-Anxious		
Very clam	**43.24**	0.00
Clam	36.73	**43.75**
Neutral	5.17	23.53
Anxious	0.00	11.11
Very anxious	0.00	0.00
Happy-Sad		
Very happy	**31.58**	23.08
Happy	9.21	5.13
Neutral	13.16	**38.46**
Sad	0.00	7.69
Very sad	0.00	0.00

The results of Table 2 show the total of respondents who have the same feeling to prefer to use video clips and maps. Moreover, most of the thirty-seven respondents, around 74%, prefer to use video clips. Otherwise, thirteen, or 26%, prefer to use a map. The highest score for the relationship of emotion among the respondents who wanted to use the video clip was six. The set of emotions is interesting, friendly, calm, and happy. However, there is one set of five respondents. The set of emotions is very interesting: very friendly, very calm, and very happy. There are two sets of emotions, with four respondents in each set. The first set is interesting, friendly, very calm, and happy. The second set is very interesting, very interesting, calm, and happy. The results of the group of respondents who prefer to use video

clips show that they feel positive about using them. Meanwhile, only two respondents in the group who prefer to use maps more than video clips feel interested, friendly, calm, and happy. In the other set of emotions, there is only one respondent. However, they still feel positive about using a map but smaller than video clips.

Table 2: The results of the relationship of emotion

No.	Type of satisfy navigation		Pair of positive and negative emotions				Total
	Video	Map	Interesting-Boring	Friendly-Unfriendly	Clam-Anxious	Happy-Sad	
1	/		Neutral	Friendly	Clam	Neutral	2
2	/		Neutral	Very friendly	Very clam	Neutral	1
3	/		Interesting	Neutral	Neutral	Neutral	1
4	/		Interesting	Friendly	Neutral	Happy	1
5	/		Interesting	Friendly	Clam	Happy	6
6	/		Interesting	Friendly	Clam	Very happy	1
7	/		Interesting	Friendly	Very clam	Happy	4
8	/		Interesting	Friendly	Very clam	Very happy	1
9	/		Interesting	Very friendly	Clam	Neutral	1
10	/		Interesting	Very friendly	Clam	Happy	2
11	/		Interesting	Very friendly	Very clam	Very happy	2
12	/		Very interesting	Friendly	Clam	Happy	1
13	/		Very interesting	Friendly	Clam	Very happy	1
14	/		Very interesting	Very friendly	Neutral	Very happy	1
15	/		Very interesting	Very friendly	Clam	Happy	4
16	/		Very interesting	Very friendly	Very clam	Happy	3
17	/		Very interesting	Very friendly	Very clam	Very happy	5
18		/	Neutral	Neutral	Neutral	Neutral	1
19		/	Neutral	Neutral	Clam	Neutral	1
20		/	Neutral	Neutral	Clam	Happy	1
21		/	Neutral	Neutral	Clam	Very happy	1
22		/	Interesting	Unfriendly	Neutral	Neutral	1
23		/	Interesting	Neutral	Anxious	Happy	1
24		/	Interesting	Friendly	Anxious	Neutral	1
25		/	Interesting	Friendly	Clam	Neutral	1
26		/	Interesting	Friendly	Clam	Happy	1
27		/	Interesting	Friendly	Clam	Happy	2
28		/	Interesting	Friendly	Clam	Very happy	1
29		/	Interesting	Very friendly	Clam	Very happy	1

Conclusion

The layout of hospitals is complex because of the various types of rooms. It is hard to change rooms because the materials, functions, or facilities in each room are so different. Then, hospital navigation is a significant challenge for the first-time visitor. This paper presents and compares two types of video clips and maps for navigating the patients or the people who come to the hospital. Before designing the navigation, the room that the people who are not staff can enter and use was listed. The video clips and maps showed the location as the list was made based on UX. After that, we invited the respondents to test the navigation use and ask about their feelings. Four sets of emotions were chosen and compared.

The results show that most respondents would like to use video clips more than maps. Respondents' feelings were more positive when using video clips than when using maps. Moreover, the relationship of emotions is also positive. In future work, we will compare more emotions and test with the other navigation.

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