Changing user needs and motivation to visit a website through ad experience: a case study of a university website

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Abstract. An organization's website is one of its most crucial part in supporting the success of an organization. It can be used as a media campaign and acquaintanceship. Because of its importance, then user engagement is needed. User engagement is a crucial mediator in the process of persuasion involving interactive media. The user's engagement in building the organization's website is still low, especially on the university website. In this article, we developed a university web with a push notification to attract the user. Push notification implies not only a change in the interface between users and technology; they also imply changing user dynamics and patterns of use. This article discussing the use of push notifications can change the interest and motivation of web users. The questionnaires analyzed with User Experience Questionare+(UEQ+) conducted on respondents identified that users' motivation to open and contribute to revisit websites increases.

1. Introduction
A website is one of the media used to disseminate information. With the website, users can access information quickly and accurately. The intensity of updates and the topics discussed on the website are the factors that determine the intensity of the website visits [1]. Universities or faculties usually have their websites. Unfortunately, the existing websites are generally not fully utilized.

Information on a university website is usually less informative; even the current information tends to be disseminated more often through other media such as Whatsapp social media, either through groups or private chats [2]. This fact results in information that is not well accommodated and even raises doubts from the academic community regarding its correctness.

Apart from the information that is not accommodated precisely, these factors also impact the website itself. When websites rarely update information, and academics find it faster and easier to get information through social media, the impact is decreased in the intensity of faculty or university website visits [3]. Starting from this, the writer initiated the idea to strengthen the function of the faculty website.

The strengthening effort that the author will make is to design a push notification system and social media sharing from website posts. With the push notification, when the website has an update of information and the push notification will be run to users' accounts, it will strengthen the web's function as a medium of information and have implications for frequent updates. Frequent updates make web content more awaited from the user [4] It also bring a piece of backup information if the website is down and make a backup solution for user and prevent from data loss [5] and than this will
be trigger users to interact through the Faculty's website or university. Other than that in the development process, the author does not forget about website design because it is more effective at attracting readers than the system inside [6].

2. Push notification and social media sharing

Push notification, which is also called push technology, remote push, or native push, is a communication channel where messages sent to application users are displayed in the marked device's notification centre [7]. Generally, push notification works when there is an interaction between push API and notifications API. The Notifications API allows applications to control system notifications to users[8]. Meanwhile, the push API provides service workers to handle messages from the server to the client when the application is active or not.

Based on the picture above, the interaction begins with permitting the user to send notifications. The system then registers with the push notification service provider. Once registered, the system can present notification information to users. Apart from that, users can also interact with notifications, such as changing settings for notifications.

Social media services, such as Facebook, Twitter, LinkedIn, Youtube, or Flickr, provide platforms for creating online communities, connecting people, and sharing information. The dissemination of information through social media nowadays makes the audience more interested than official pages or academic journal channels[10]. Even now, social media has entered the general public, which includes interpersonal relationships and psychological well-being, citizen participation and involvement in politics, as well as for media and online journalism [11] [12] [13]. Therefore, social media has become a constitutive part of the distribution and consumption of online news. In social media, several actors play a role in the wire flow of online news distribution, namely followers, users who like, and comment users. Followers are the user who likely to see a post; users who like are people who have liked the posts we share, and the last is users who comment, namely people who have seen and commented on what has been shared. When described in topology, the topology of news dissemination is as follows:

![News Sharing Topology in Social media](image-url)
3. Research Methodology

In the implementation of this study, the authors applied gradual and iterative research. Gradually it means that all processes carried out by the researcher are carried out by the researcher in completing the stages in his study. Iterative or repetition is carried out if it is felt that the investigation has not found common ground for solving the problem; it will be repeated the stages of the research carried out. The research stages that will be carried out by researchers use the following research stages:

a. Analysis

The analysis was carried out by researchers of existing faculty webs using screening of each display and function that already exists on the web. After being analyzed, the author will review each collection, whether the function/module/widget from this website is used and frequently accessed by visitors or not. The review process uses the User Experience Questionnaire + (UEQ +) on an existing website. UEQ + itself is an extended version of the User Experience Questionnaire. The UEQ analysis represents six factors: attractiveness, perspicuity, dependability, efficiency, novelty, and stimulation [14][15]. However, UEQ + can mean more factors. To complete the statement, the authors include a questionnaire in UEQ +, which is used to analyze the faculty web in the following table 1:

Table 1. UEQ+ Questionnaire

| Scale          | Item Left   | Item Right |
|----------------|-------------|------------|
| Attractiveness | annoying    | enjoyable  |
|                | bad         | good       |
|                | unpleasant  | pleasant   |
|                | unfriendly  | friendly    |
| Efficiency     | slow        | fast       |
|                | inefficient | efficient  |
|                | impractical | practical  |
|                | cluttered   | organized  |
| Intuitive Use  | difficult   | easy       |
|                | illogical   | logical    |
|                | not plausible | plausible |
|                | inconclusive | conclusive |
| Visual Aesthetics | ugly    | beautiful |
|                | lacking style | stylish |
|                | unappealing | appealing |
|                | unpleasant  | pleasant   |
| Dependability  | unpredictable | predictable |
|                | obstructive | supportive |
|                | not secure  | secure     |
|                | does not meet expectations | meets expectations |
| Value          | inferior    | valuable   |
|                | not presentable | presentable |
|                | tasteless   | tasteful   |
|                | not elegant | Elegant    |
| Comprehensibility | complicated | simple     |
|                | unambiguous | ambiguous  |
|                | inaccurate  | accurate   |
|                | enigmatic   | explainable |

The UEQ + method requires data retrieval using a seven likert scale, with the left being negative values and the right contains positive values. Negative values are detailed in the left item column in table 1. In contrast, positive values are detailed in the right item column.

b. Design

After conducting the screening, the researcher estimates what functions need to be reduced or added to attract visitors to visit, read the web and even contribute to filling the website's content. After estimating what modules need to be redesigned or added, the researcher makes a mockup or prototype display of the developed website.
c. Implementation

After all the modules and functions are designed, it is time to do the coding process. The coding on this website can use a parallel concept by looking for existing and recommended plugins, or researchers can make their custom widgets manually.

d. Testing

The test is repeated using UEQ + to determine whether the redesign process is correct.

The implementation concept applied in this research is implementing push notifications, namely implementing the Telegram API into the faculty website. The topography of the application of Telegram into push notifications can be seen in the image below.

![Diagram of inter-web data communication and push notifications]

**Figure 3.** Topology of Inter-Web Data Communication and Push Notifications

### 4. Results and Discussion

#### 4.1 Result

In the analysis phase involving students and lecturers who are the academic community of researchers, the seven UEQ+ factors are still low; here are the results of the UEQplus analysis obtained from the analysis stage:

| Scale              | Mean | Cronbach Alpha |
|--------------------|------|----------------|
| Attractiveness     | -1.30| 0.81           |
| Efficiency         | -0.07| 0.87           |
| Intuitive Use      | -0.23| 0.74           |
| Visual Aesthetics  | -0.57| 0.69           |
| Dependability      | -1.12| 0.66           |
| Value              | 1.43 | 0.78           |
| Comprehensibility  | -0.52| 0.63           |

The results obtained at this analysis stage are calculated from the average scale obtained. The minimum value of each scale is -3, and the maximum of the UEQ + scale is 3. From the results obtained, it can be seen that the mean value of all scales shows a minus value except for the value scale. This minus result shows that the faculty website is not yet attractive, less efficient, as seen from the results, still close to the number 0, not intuitive to use, not visually aesthetic. Understanding the user is also quite challenging to use. In Table 1, it is explained that there is a Cronbach alpha column. This Cronbach alpha column shows whether the data used is valid; according to Griethuijsen, 2014, the acceptable value in data validation for Cronbach alpha is more than 0.6.

After the writer found the problem, the writer made a redesign process and made improvements in appearance. The author also adds a push notification as an advertisement inserted into the Telegram
with the topology shown in Figure 3. Then the new design is analyzed again by applying UEQ+. The following are the results of the analysis of the new design:

### 4.2 Discussion

The UEQ+ test results in the final stage showed an increase in the test session. The attractiveness value, which was -1.30, now increased by 1.73, this shows that the new design website is more interesting to look at; Efficiency testing, which was previously -0.07, now changed to 1.73, this shows that the website is more efficient; The intuitive use test that was previously -0.23 has now increased to 2.01, this shows that the new website is easier to use, in terms of visual aesthetics, which previously got a value of -0.57, now it has become 1.25. This shows that the website with a new design has a more attractive visual; in terms of dependability, which increased to 0.88, indicates that the information is more reliable; the value that previously received a positive value, namely 1.43, has now increased to 2.19, this shows that the website's functionality is better than before; In terms of comprehension, namely comprehensibility also increased from -0.52 to 0.46 now, this increase shows that users understand this website better than before. In detail, the results of UEQ+ analysis on the new website design are shown in Table 3.

**Table 3. Results of Website Analysis Using UEQ+ (After the web redesign)**

| Scale                  | Mean   | Cronbach Alpha |
|------------------------|--------|----------------|
| Attractiveness         | 1.73   | 0.68           |
| Efficiency             | 1.73   | 0.68           |
| Intuitive Use          | 2.01   | 0.68           |
| Visual Aesthetics      | 1.25   | 0.72           |
| Dependability          | 0.88   | 0.66           |
| Value                  | 2.19   | 0.76           |
| Comprehensibility      | 0.46   | 0.62           |

The author also performs forecasting calculations on website visitors. Forecasting calculations are used to estimate the number of visitors in November and December. Forecasting is carried out, expecting the exponential smoothing formula. An exponential smoothing method is a powerful tool for predicting calculations in time series, predicting future demand, and reducing investment costs [16]. The formula for exponential smoothing, namely

\[
F_t = F_{t-1} + \alpha(D_{t-1} - F_{t-1})
\]

**Description:**

- \(F_t\) = Current Demand Prediction
- \(F_{t-1}\) = Previous Demand Prediction
- \(\alpha\) = Exponential Constants
- \(D_{t-1}\) = Real Request

The following are the results of the prediction using exponential smoothing:

![Figure 4. Predictive Graph of Increase In Visitors](http://mga.unnes.ac.id)
It can be seen from Figure 5, after the addition of visitor push notifications has increased, even after it is predicted that in the following months, there will be an increase in the number of web visitors.

5. Conclusion
Push notification is a system that allows the user to configure and get a notification. Through push notifications embedded in a website, users will revisit a website. This study shows that the addition of a push notification and design changes according to the suggestions analyzed using UEQ + can increase website visitors. Of course, it must be accompanied by continuing to add informative content to the website.

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