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Approach to exploring users' expectations of digital services' functionality

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Summary. The rapid adaptation of the technologies in everyday life increases the competition between companies. The constant changes in customer preferences cause the businesses to look for new ways to increase market share and consumer loyalty. There is a need for a new customer service strategy, aimed at applying principles of user-oriented design of software applications. The main purpose of our study is to propose and appraise a survey-based approach to exploring users' expectations from digital services' functionality.

Introduction

As digital services become more and more useful in everyday life the need to explore users' expectations for their functionality appears. User engagement policies are changing. In order to improve their services and attract new customers, organizations need to adapt to the dynamics in their relationships with customers. Because of that, the so-called "user experience", especially the impact on users' senses when they interact with the product or service. When they are functioning how the users expect them to be – a positive experience is created. Customers feel positive emotions that affect their

loyalty, productivity and satisfaction. All of that has a direct positive impact on investment return and conversion rates. In order to respond to changes in users' behavior, different approaches are used to examine their expectations. They are most commonly based on traditional data processing methods and methods of intellectual analysis. The purpose of the current report is to propose an approach that explores users' expectations towards the digital services' functionality and can be applied in the planning phase of the development process. The approach is approbated by exploring users' expectations for the functionality of a specific type of mobile e-commerce applications – image processing modules.

1. Importance of users' expectations research

The user experience design already plays a strategic role in the business decisions of many companies. Some specialists focus on the so-called UX strategy, which is a part of the business strategy. Jaime Levy defines it as a “high-level plan to achieve one or more business goals under conditions of uncertainty” (Levy, 2003, p. 7). According to another specialist (Amin, 2017) it is a „intersection between human elements, informational elements and desired outcomes“. Steve Baty relates UX strategy to a “collection of activities that an organization chooses to undertake to deliver a series of (positive, exceptional) interactions which, when taken together, constitute an (product or service) offering that is superior in some meaningful, hard-to-replicate way; that is unique, distinct & distinguishable from that available from a competitor” (Baty, 2009). Tim Loo specifies the UX strategy as a „long-term plan to align every customer touchpoint with your vision for user experience“ (Loo, 2017). According to him it includes:

- opinion on the current state of the user experience of your product,
- detailed vision of the change in user experience,
- expected commercial final results from the implementation of the vision,
- a plan that contains objectives and tasks with assigned priority,
- a set of key performance indicators (KPI) for the progress and success of the plan,
- plan to improve the team culture in implementing the UX strategy.

According to Jaime Levy, UX strategy is based on four tenets: Business strategy, Value innovation, Validated user research and Killer UX design (Levy, 2013, p. 15).

Based on this research, we can conclude that the successful implementation of the UX strategy depends directly on the study of the target audience of the digital service or the software product as a whole. Users' expectations and behavior change constantly. This often requires user surveys to be conducted in order to retrieve the best and most competitive ideas and to build a plan based on them to create or to improve the design of the user experience.

The quantitative and/or qualitative data obtained from the surveys summarize the viewpoint of end-users about product performance. They can be used to develop new digital services or to change existing ones with the aim of improving product experience or providing a base for the UX design of new services. In details, user research results are used to create a relevant profile for of the target audience. It provides information about: the ways customers use to reach their goals when working with a digital service; the emotions which are provoked by the design of the service; the ease of using of the user interface; the expectations for functionality, etc.

The methods used to study users' expectations can be various. Surveys, interviews, focus groups, and other sociological and marketing practices are often applied.

2. Outline the approach to exploring users' expectations

In this research the study of users' expectations is based on online brainstorming that could be used for reaching a larger audience. It is also easier to conduct and manage. We believe that the study should be conducted in the following stages: Planning; Developing Online Survey; Preliminary Processing of the Results; Analysis of Coded Responses with Software and Reporting the Results of the Analysis.

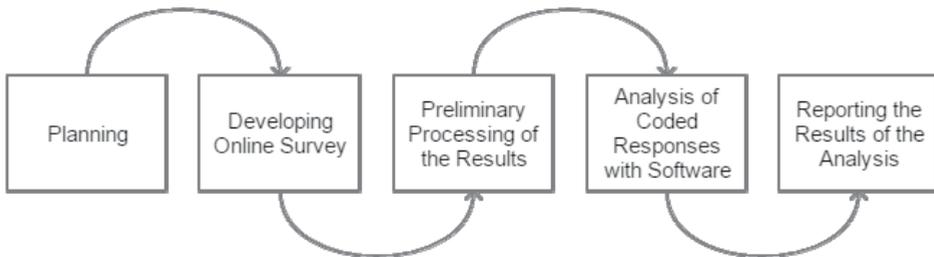


Figure 1. Approach of exploring users' expectations to the functionality of digital services

Source: own elaboration.

The stage of “Planning” is related to the need to carry out the research and whether it concerns the development of a UX strategy for a new digital service or a redesign of an existing one; formulating the expected final results of the survey; identifying possible problems in conducting the research and proposing appropriate solutions.

The “Developing Online Survey” stage involves the development of a questionnaire that identifies three main categories of functionalities: mandatory, recommended and innovative ideas. This includes the following sets of questions:

Question A: What features do you expect to be made mandatory so that you can find the app useful? – it extracts users' expectations that justify the minimum

of requirements which are needed to be implemented to develop a solid project basis.

Question B: What features do you expect to be made so that you can find the application interesting? – it extracts the ideas that are essential for the full realization of the concept about the digital service, i.e. they are recommendable;

Question C: What features do you expect to be included so that the application can become irreplaceable for you? – it extracts users' ideas that ensure the success of the project;

Question D: What additional expectations do you have for this type of mobile applications? – the answers to this question should be taken into account in the previous three groups or the functionalities that are not relevant to the implementation of the application. It is not required to fill in.

Question E: Do you have any special recommendations about the user interface? – the answers to this question direct designers to the needs of the audience with regard to the convenience of the application interface.

The questions are open-ended through which we aim to conduct an online brainstorming. A similar task is related to some challenges, especially the processing of the results from Stage 4. For this reason, there are certain requirements for filling in the answers: entering the words in English in the form of keywords separated by commas.

The “Preliminary Processing of Results” stage is a pre-processing of the received responses and shaping them into a suitable form for the qualitative analysis software. The rules set out in the previous stage for completing the questionnaire are also observed and categories for encoding the responses are created. Their formulation varies like the experience and knowledge of users. For this reason, generic categories are created according to the purpose of the described functionalities.

The “Analysis of Coded Responses with Software” stage involves applying quality analysis and content analysis software to extract and process the encoded responses.

The “Reporting the Results of the Analysis” stage summarizes the results obtained from the previous stage. We propose the formed categories of functionalities and the number of respondents expecting the implementation of a specific category to be reflected in a table.

3. Approbation of the approach

In the current study the approbation of the suggested approach has been done by exploring users' expectations about the functionality of a particular images editing module for mobile e-commerce applications. Photos are one of the first things which the buyer sees when she or he opens an online store. The visual representation of the goods and the e-commerce services is essential for the purchase. In the virtual space customers click on multiple images, compare them and usually trust and buy from those e-commerce applications where the goods are presented with quality, clear, detailed and

well-focused images that give a complete vision of the items and their details. It is recommended for the images of the goods to be shot from different angles and illuminated with the appropriate light. In order for them to be attractive and stylish it is necessary that they have a good composition.

The questionnaire we developed was spread in an online environment of about 60 users. It was successfully completed by 46 of them. That speaks of the representativeness from the sample of different age groups with different experiences in dealing with similar mobile applications. We believe that the participants are enough to pass the approach successfully. 67.39% of respondents are Android users, 21.74% are Apple iOS users and the other 10.87% are Windows users. From this distribution we can conclude that the audience expectations will be related to the functioning of similar applications designed to work under the mobile operating system that they use.

Users have the opportunity to add comments to express their opinion on the survey and to provide recommendations. Responses are retrieved from an Excel file, which is imported into a software for quality analysis and content analysis after being processed.

For the purposes of this study, the results from the following instruments are compared – eTable Utilities (Microsoft Excel plugin), combination between QDA Miner and WordStat, and RapidMiner. Quality analysis software automatically extracts the words from the spreadsheet cells and creates a report in the form of tables and graphs with the frequency of using a particular word or combination of words. RapidMiner provides machine learning and a data mining environment. It has an interactive graphical user interface and tools for pre-processing, classification, regression, clustering, association, and graphical representation of models and results. For the purposes of the study, we have applied its text-based add-in that helps with the translation of text, converting it as a vector of words, and extracting keywords and phrases.

The initial results generated by the software applications are diverse due to the variety of ways in which the names of user-defined functionalities can be formulated. This required the use of categories to describe the results. The categories are listed in Table 1.

The numbers indicate the amount of responses received for the corresponding function category. Based on the answers in Table 1, the user interface concept for the studied application is formed.

The table shows that the instruments produce roughly the same results in certain categories, while in others they have larger differences. In RapidMiner when processing the text and converting it into a vector of words, we have the statistical measure to evaluate the meaning of the word in the context of a TF-IDF (Term Frequency – Inverse Document Frequency). The statistic shows how important the word is among a collection of documents or a corpus. TF-IDF increases its value proportionally to the number of occurrences of the word, but also the frequency of the word in the body as a whole, because some words appear more often. The combination of QDA Miner and WordStat yields more accurate results due to QDA Miner's good capabilities to perform qualitative analysis.

Table 1. Comparison of the results of the eTable Utilities, QDA Miner + WordStat, RapidMiner

Expected functionality	eTable Utilities	QDA Miner + WordStat	RapidMiner
Mandatory functionality (Question A)			
Images cropping	37	38	40
Brightness correction	23	24	28
Contrast correction	23	23	19
„Red eyes“ correction	20	20	10
Social media sharing	22	23	11
Background correction	12	13	8
Rotating images	15	16	7
Resizing	12	13	15
Using filters	39	40	26
Using masks	6	6	5
Recommendable functionality (Question B)			
Applying special effects (sepia, grayscale, artistic, etc.)	35	34	29
Sound regulation	2	2	2
Blurring	5	7	2
Color editing	22	23	18
Use of emoticons	32	33	2
Drawing	15	17	5
Creating collages	2	3	2
Retouch options	21	22	17
Innovative ideas (Question C)			
Direct camera input	6	7	8
Processing of large arrays of photos	1	1	2
Geolocation	7	7	2
Automatic tone correction	12	11	8
Filters based on face recognition	5	6	6
Sharing in a cloud directory	10	13	7
Panoramic images	11	8	5
Night vision	2	2	2
Other functionality (Question D)			
Autosave	2	2	3
Convert images to a smaller size	5	5	4
History of transformations	3	4	1
Storing images in different formats	10	12	8
Image transfer	3	2	2
Low system resources	6	8	5
Select Fonts	10	11	6
Expectation about the user interface (Question E)			
Intuitive	45	46	38
Easy to use	43	45	35
Slide buttons	42	43	31
Hamburger menu	38	38	35
Follow the principles of natural perception	2	2	1
Customizing the interface	20	22	19
Usability	15	15	13
Icons instead text	10	12	9

Source: own elaboration.

Since Question D is not required to fill in, not every participant has entered a response. Six of them said they did not have enough in-depth experience with similar applications, which can also be observed by their answers to the mandatory questions - there are not enough keywords entered. Study participants who have said they have experience with similar applications and actively use them have interpreted the questions correctly. They have entered sufficiently comprehensive responses matching the expectations and meeting the rules of the questionnaire. Their contribution is mainly in terms of differentiating the answers to Question C.

Based on the survey results, we can conclude that using open-ended questions to exploring users' expectations is quite a big challenge. The quality analysis software is best suited because it allows an encoding of the responses and the analysis of the categories rather than the keywords directly, as in RapidMiner.

Conclusion

More and more IT companies put the users at the center of their developments and projects. This necessitates periodic user surveys to be conducted, because user preferences and behavior change dynamically due to the variety of products. This study proposes an approach to exploring users' expectations for the functionality of digital services. It is appropriate to be applied in the Requirements Analysis stage, in the early phases of software projects.

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PRÓBA ZBADANIA OCZEKIWAŃ UŻYTKOWNIKÓW WOBEC FUNKCJONALNOŚCI USŁUG CYFROWYCH

Słowa kluczowe: oczekiwania użytkownika, usługi cyfrowe, e-commerce, eksploracja tekstu, strategia UX

Streszczenie. Pod względem szybkiej adaptacji technologii w życiu codziennym, zwiększonej konkurencji między przedsiębiorstwami i ciągłych zmian preferencji klientów, firmy poszukują nowych sposobów zwiększenia udziału w rynku i podniesienia lojalności konsumentów. Niezbędna jest nowa strategia obsługi klienta, a mianowicie zastosowanie zasad projektowania aplikacji zorientowanych na użytkownika. Głównym celem artykułu jest zaproponowanie i zatwierdzenie opartego na ankietach podejścia do badania oczekiwań użytkowników odnośnie do funkcjonalności usług cyfrowych.

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Cytowanie

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