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DEVELOPMENT FEATURES OF MOBILE APPS IN THE CONTEXT OF USER EXPERIENCE

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Abstract. A method of creating a UX pyramid for the unification of mobile app development in the context of user experience is proposed. The UX pyramid includes 5 levels - app mission, business goals, capabilities, capacity, users. This provides a basis for development strategies a user-friendly interface. The process of developing a user interface includes the stages of creating a persona, user stories, and scenarios. Such a user interface will clearly reflect the main functions of the mobile app and will meet the basic requirements for the design of interactive systems.

Key words: mobile app, UX, use-case, user interface, digital product, design, software, mobile platform, UX-pyramid, user story, persona, scenario

Introduction

Mobile devices surround us everywhere: at work, at home, in public transportation, educational, medical and sports institutions. This is a rapidly developing industry, and software development for mobile platforms is becoming more popular and accordingly, in demand every year. Today it is difficult to imagine life without a smartphone with applications for watching news on the Internet, editing documents, games and multimedia applications. Mobile devices with applications running on them make us mobile. Mobile platform is an operating system running on a mobile device such as a tablet or smartphone. The basic idea of a mobile operating system is the same as that of a conventional operating system. The main developers of mobile platforms and mobile devices are Google, Apple, Samsung, Xiaomi, Huawei.

Mobile apps

Today mobile apps are used not only for entertainment, but also for educational, medical, sports and corporative purposes. Mobile apps development is a process by which software is developed for portable devices. The software can be installed during development, downloaded by the user using various platforms for software distribution or be a Web application processed on the client or server side.

App store is a mobile application distribution platform often provided as a component of the operating system on a computer, smartphone or tablet. The app store usually takes the form of an online store where users can view different categories and genres, download and install them on their devices. Most app stores are controlled by their owners where app verification is required for compliance with certain requirements (for example, for quality and content), as well as a sales commission if the application is a paid one.

The key differences and problems that arise in the development of software for mobile platforms:

- designing user-friendly interface;
- creating tools and techniques that can:

a) accelerate time of software product launch;

b) provide application support in a rapidly changing environment.

The development of software products for mobile platforms today has a broad applicability of user experience combining elements of user psychology, business modeling, advertisement and design with the method of iterative prototyping of the user interface [1] with a gradual clarification of the requirements for the program product as a whole [2]. It is very important to identify the main criteria for combining technology, business goals and human values. With such an 'overlap', a product that harmoniously combines all the aspects, will be innovative.

Human-centered design

According to Human-centered design [2] methodology, the process of developing any interactive product, including software consists of the following gradual processes: Planning, Usage Context Definition, Requirements Definition, Prototyping, Evaluation. Figures 1 and 2 show diagrams of these processes according to ISO 9241-210:2010 "Human-centered design for interactive systems".
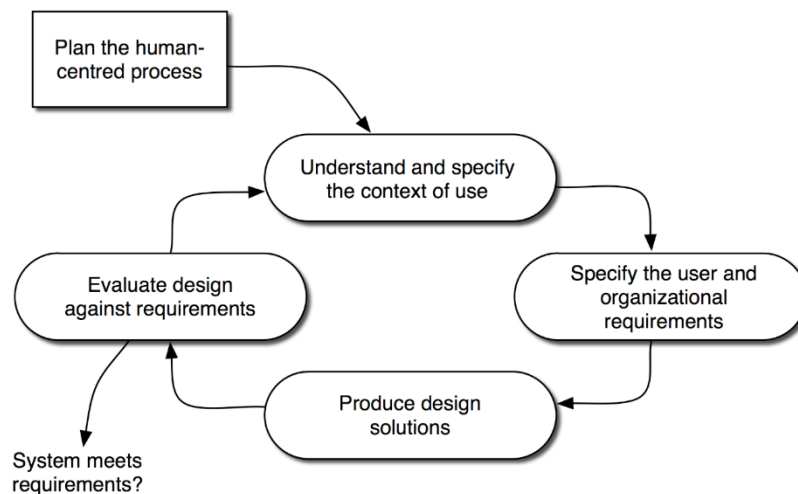

Figure 1 – Interactive program development diagram according to ISO 9241-210

The process of developing a digital product is carried out in the following sequence:

- market research;
- product design;
- UX design;
- visual design.

At the stage of market research, a study of analogues, markets, reviews, generation of ideas, discussion with the target audience, search for problems arising in the industry is carried out. At the stage of product design, a description is made - which functions will potentially be included in the product, which will not be included, which should be noted down. At the UX design stage, a UX pyramid (described below), scenarios, personas, use cases, user stories, interface solutions, wireframes, animation options, quick animated prototypes for testing, and visual design tasks are created. The last stage is visual design. It provides a visual presentation of the entire product; in the case of a successful design - the transition to the development phase.
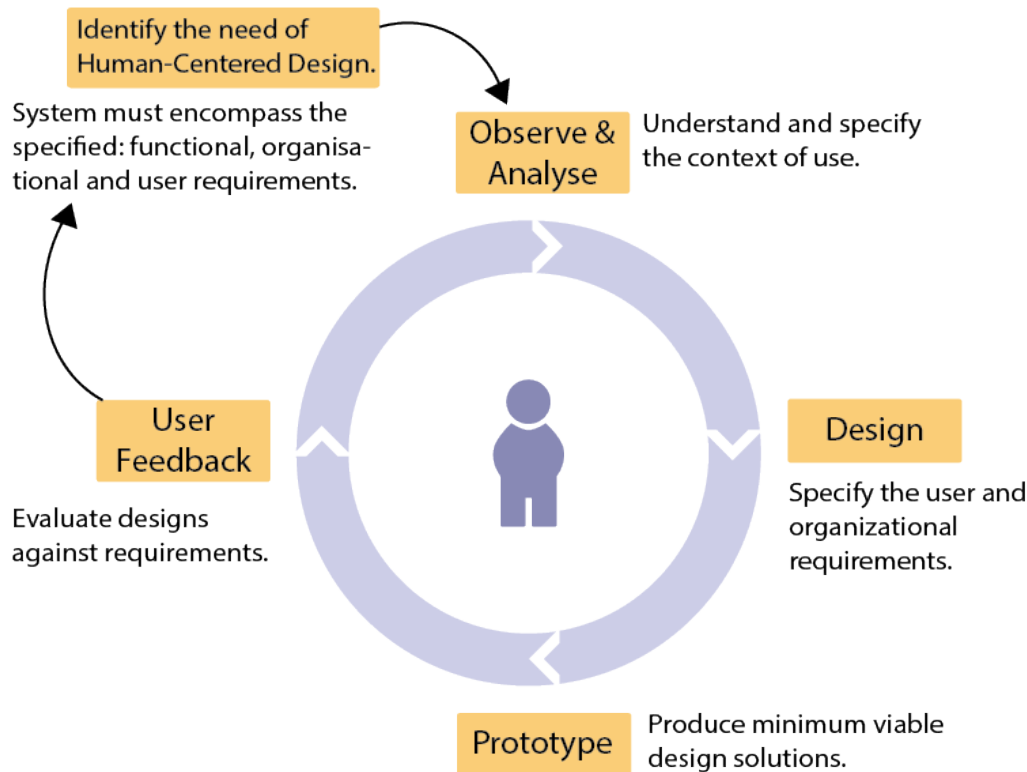
Identify the need of
Human-Centered Design.

System must encompass the
specified: functional, organisa-
tional and user requirements.

Observe &
Analyse

Understand and specify
the context of use.

User
Feedback

Evaluate designs
against requirements.

Design

Specify the user and
organizational
requirements.

Prototype

Produce minimum viable
design solutions.

Figure 2 – Stages of developing an interactive product

Definition of the need to develop a new software product can be formulated according to the goals of a particular organization (commercial or non-commercial) based on its business goals, so called developed innovative 'intentions' [3] etc. Defining the context of use involves a detailed study of the behavior of the main target audience. Based on the studies, the initial requirements for the system are formulated and a minimum working ('viable') prototype is created. The next important stage is presenting it to the target audience or further improvement. The process continues iteratively until the product is launched on the market – the context of use may be specified, requirements may change.

An important characteristic of the user interface is convenience. Usability is the degree of efficiency, productivity and satisfaction, with which the product can be used by certain users to complete certain tasks in a certain context [2]. In turn, user experience is feelings and reaction of a person as a result of a particular product, system or service. When determining UX-requirements for a digital product, the rule of 'People-Tasks-Context-Product' is applied.

The concept of the user interface is closely related to the concept of design. The main conditions for a good mobile app design are:

- clarity and certainty of the goals;
- constant feedback when performing tasks;
- complexity of the tasks must correspond to the skills and abilities;
- full concentration on the goal and involvement in the tasks performed.

As tasks are completed in the mobile app, the user must constantly feel his approach to the goal. The interface must at each moment of time give an understanding that the user is on the right track and pursues the goal, and if it's not

like that, how to return to that track. The content of the system screens should be such as to concentrate the user's attention rather than scatter it. For the user to get quality experience, the product should tell a story that is in harmony with the history of his life and will become something really important for him.

Iterative prototyping

According to the method of iterative prototyping of the user interface [1], the process is divided into three parts – 1) prototype development; 2) research on potential users; 3) analysis of results and evaluation of the current version. Prototyping is done to test interface ideas, save time and money on software development and get new ideas (make the user experience of the application better). The process is iterative – at the end of stage 3, stage 1 begins and this continues until the final version of the user interface is developed. At the stage of prototype development, it makes sense to ask the question – what should be real in the prototype? What could be artificial? In what context will users use it? The prototype has to have real ideas that will look real on the screen in your hands. Photos, texts, icons may be artificial. Users will use the app on the street on their iPhone. At the research stage of potential users, it is a good idea to ask the question – do you know how to perform such an action? Is it easy to perform such an action? How can we improve this? At the stage of analyzing the results, it is reasonable to ask the question – what works? What does not work? What new ideas does this give us? The prototype is shown exclusively to users for whom this product is intended. When communicating with potential users, it is not recommended to argue, defend ideas or reject them. Figure 3 shows the process of iterative prototyping.
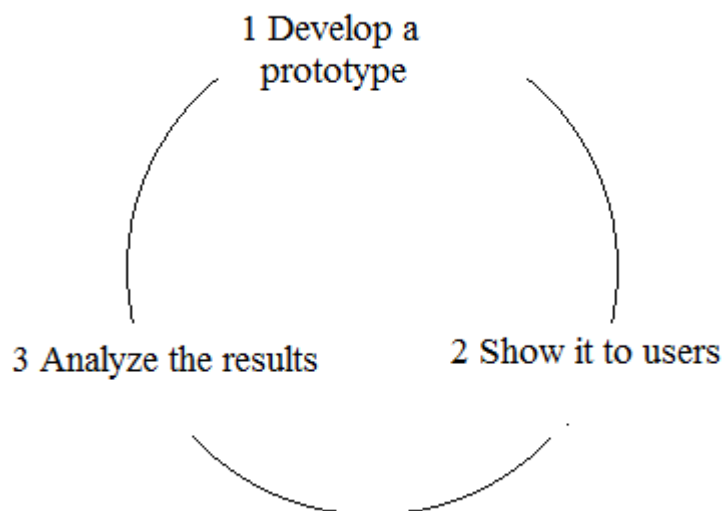

Figure 3 – Iterative prototyping

For the prototype, images, animations, interactive elements can be used. Efficient iterative prototyping allows you to minimize coding and reduce the total cost of developing a mobile application.

Proposed method

According to the methodology of user experience, the process of developing a prototype of mobile app includes:

- developing the mission, goals, capabilities, capacity of the product;

- research of potential users;
- creating a persona;
- writing scripts and contextual situations for a persona;
- designing interface solutions.

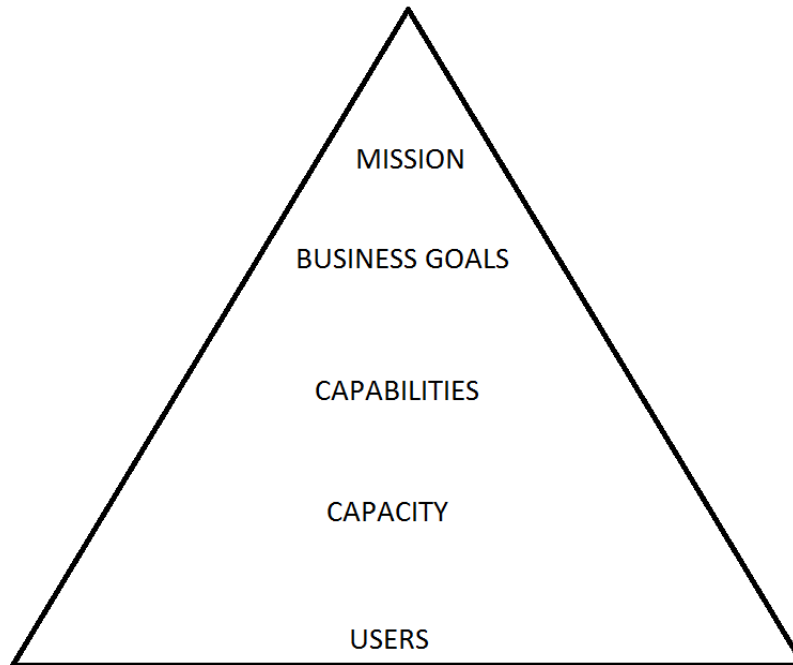One of the effective approaches is to create a UX-pyramid (Fig. 4).

Figure 4 – UX-pyramid

Mission – For what bigger reason does this product exist?

Business goals – Why does it exist?

Capabilities – What will human being gain due to the functions of the product?

Capacity – What basic functions is it able to essentially perform?

Users – Who is our user?

It is very important at the stage of creating a mobile application to know well the characteristics of the target audience (TA). If we study it in detail, we can come to the conclusion that typical roles can be distinguished among the main segments of TA. The description of the roles so far does not say much about what the product should be. As a result, we understand that we should know more about real people and thus fix this knowledge. To that end, the persona technique is used. Personas are imaginary people who are the archetypes of our users for every important segment of the target audience and include all necessary behavioral characteristics.

Advantages of using persons:

- a good way to understand the target audience;
- constant focus on the main user;
- characteristics of several people are much simpler than applying the results of studies during product development;
- empathy. By focusing on specific people, we can feel their needs, fears and emotions better, and this increases our level of responsibility for the final result.

Recommended template of a persona:
- name, education, age, occupation;
- character features;
- place of residence, family, income;
- global goals;
- goals in using the product;
- basic use cases (briefly);
- fears and stimuli;
- how will they find out about the product;
- expectations from the product;
- context of the use;
- social life;
- hobbies;
- social media;
- how do they use their mobile phone.

Characteristics directly related to the product:
- fears and stimuli;
- expectations and demands;
- how will they find out about the product;
- motivation in using the product;
- experience with the product and analogues;
- how do they currently manage the tasks that the product will manage later.

These characteristics indicate first of all what we should beware of when designing and vice versa, what to strive to meet expectations. The basic rule of 'good' user experience – 'Expected' = 'Received'.

Conclusions

The UX pyramid method is proposed, which includes the following levels – mission, business goals, capabilities, capacity, users. Based on this method, mobile app design can be done. Further work will be the study of a specific mobile app according to the proposed methodology.

Sources:

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