

USER INTERFACE AND USER EXPERIENCE IN GAME APPLICATIONS

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By

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Abstract

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<p>The value and benefits of user interface (UI) and user experience (UX) are widely recognized in the modern world and are seen as an integral part of many fields. This thesis integrates UI, UX and end users understanding in process of Game development.</p> <p>The concept of UI & UX is still unclear, as witnessed by more than twenty-five definitions and on-going argument about their different aspects and attributes. This missing consensus forms a problem in creating a link between UI, UX and Game development: How to take the UX of end users into account when it is unclear for Game developers what UX Stands for the end users, and how to implement along with UI.</p> <p>Furthermore, currently known methods to estimate, evaluate and analyse UX during Game development are biased in favour of the phases where something concrete and tangible already exists. It would be beneficial to further elaborate on UX in the beginning phases of Game development.</p> <p>This research is implemented through user needs studies, user interface design, and user evaluations. The research studies focuses on Human- Computer Interaction. The resulting design implications suggest that the following aspects should be considered when designing mobile user interfaces for Game applications:</p> <p>Finally, this Thesis discusses the latest developments that enable alternative ways to support Games and applications on mobile devices in the future.</p>	
Keywords: Mobile user interface, user experience, user centred design, usability,	

Be a Design Minded Developer

Creating an Application for Everyone, Is like Creating it for No-one.

Preface:

User Interface plays a vital role in Games. In terms of visibility, its design and precision holds the primary importance for depicting the exact amount of information for the intended user. Every minor decision taken for the designing of UI can contribute to the Games both positively and negatively.

As gamers and game developers we know that immersion is everything. When you are immersed you lose track of time and become involved in what the game is presenting. A major factor in what makes or breaks immersion is how easy it is for your user to convert an idea into an in-game action- that is, how fluid your game's User Experience (UX) is and how well-designed its User Interface (UI) is.

A game hurts itself by providing too little information or too many inputs, confusing the user with unhelpful prompts or making it hard for a new user to interact. Poor UI design can even break your game completely.

Furthermore, User Experience design is everyone's responsibility. The code that put pixels on the screen and audio input and output is all related to UI. And the rest of the code we write on backend which have a direct impact on the UX. It means it exclusively delivers user interface. So over all UX makes your users happy.

Therefore, my study is intended to highlight the strategies that are currently being used for successfully designing UIs, UXs and make appropriate suggestions for betterment of UI designs based on case studies and research findings.

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Chapter- 1

Introduction

1. Introduction:

Thinking about the importance of the Game applications in people's daily life, it is easy to see the gaming going on mobile. Gaming will not be bound to Personal Computers (PCs), but mobile devices will provide players with access to entertainment anywhere, anytime. Mobile devices can be used for performing many tasks that were earlier possible only on a PC. Especially, people are increasingly using Internet services on the go, as their mobile devices are always with them and capable of offering access to Internet services.

However, as the technological sophistication of a mobile device has grown, player interfaces of mobile applications are becoming more complex to use. The mobile device has a limited set of resources compared to a PC in terms of input and output capabilities, processing power, connectivity, and memory. This means that the player interface design cannot be directly transferred to a mobile device from a PC. In addition, the mobile context can be totally different from the one where a PC is used. When the player is using a mobile device, he might be on the move and have only a limited and possibly fragmented time to spend on a task. The fragmented nature of mobile environment needs to be considered in interaction design for mobile applications.

Today, mobile devices are starting to reach maturity in terms of new technologies. The level of battery performance and Internet connectivity are satisfactory, and mobile devices are small and light-weight. The latest models have various new input mechanisms, such as touch and voice input. Hence, as the mobile devices have become mass-market commodities, more emphasis is needed on the player experience of mobile devices and applications: aesthetics, usability, utility, and emotional aspects need careful consideration.

This Thesis is about defining design implications for mobile player interfaces of Gaming services. It covers the challenges and limitations of a mobile device and aims to specify the design implications that give guidance on how to design mobile player interfaces for Gaming services to enable a positive player experience. The player interfaces should be designed for mobile usage, simple and enjoyable to use, and hide unnecessary technical details from the player.

1.1 Focus and scope

The goal of my research work is to study how to design mobile player interfaces that enable the use of Games much efficiently. My research belongs to the field of Human-Computer Interaction (HCI), which focuses on researching the interaction between a human and a computer. My focus area is the interaction between a human and a mobile device, in other words, whenever a human uses a mobile device to access to any game. By means of the research, I aim to define how the player interfaces can be designed in a way that hides the technical details but offers a pleasant player experience. The Thesis explores mobile player interfaces for Game services via two approaches: a mobile software application and a mobile Game application.

1.2 User Interface

Designers of mobile interfaces are becoming more prominent in today's faced-paced game space, while mobile-optimized games may lighten the burden on a game developer; some prefer building a full featured game instead.

Player interface is the representation of the Game or Game to the player. It is displayed in terms of pictures, sounds, colours, and text. The communication with the player on behalf of a Game is performed by using a UI. Therefore, the minor details in designing as well as displaying the UI play a vital role in creating an impact of the entire Game to the player. There are various aspects involved for the measurement of whether a UI design is successfully communicating the intended impression to the player or not.

For designing a good UI that can represent the intended amount of information to the player, it is very important to maintain the involvement of the intended player (persona) of the Game throughout the designing process. In this way, the design will be made according to the expectations of the player and thus will be successfully utilized. In order to represent the intended information in the Game or software, it is important that the UI design is made by taking the objectives of the game or Game under consideration. Otherwise, the intended information will not be conveyed to the player and the results can affect the expected outputs of the game at hand.

A good UI design is always expected to have a good error handling strategy, so that the end-player is not irritated by repeated attempts for doing a task. It is also important to let the player know exactly what error occurred so that he can take further steps accordingly. This factor is extremely important for Game development. It is important that a UI design is tested against varied platforms so that when it is viewed by a player, it should display all the information as originally designed. Proper manuals for the usage and help instructions should be given to the players, so that the new player of the game can be appropriately accommodated. It is important for a UI good design to have 'appropriate' information displayed in it. This information should not be too much or too little. It should just be enough to represent what is intended to be conveyed to the player.

The contribution of this study will be towards the compilation of the current strategies for designing mobile UI. The primary focus will be given to the successful methods and techniques that can be applied with focus on a set of recommendations after detailed analysis of a set of different game applications. The study will also discuss the UIs of different games, in this way the detailed data regarding the negative and positive aspects of all the designs will be gathered along with the strategies applied on each design. In the end, the results will be based on the actual results from the data collected after the study of UI from varied categories. The main goal of the thesis is to investigate different aspects of a UI design that play a vital role in depicting the Game quality. In addition to this the study will also discuss in detail all the Game quality measures and techniques. Based on the measures and techniques to determine Game quality, the UI designs will be evaluated. The study also

aims to take into account mobile UIs belonging to varied genre for checking the characteristics of a successful mobile UI design.

1.3 User Experience:

Two words: User. Experience

Before delving into the work practices of user experience design, a rather mundane point ought to be made: user experience is two words—*player* and *experience*. Such a point seems pedantic, more than not, definitions and discussions gloss over this fact when explaining the origins of the term. The two words that compose player experience—*user* and *experience*—pervade human-centred design and computational technology development. As such, UX is not entirely new, however, neither is UX simply a composite of existing ideas. Player experience is somewhere in between.

User experience unites two key concepts in the design and development of technology. The first concept is *the player*. *The user* is a concept that marks the current, proposed, eventual, or speculative person who interacts with a product, service, or Game. The player guides inquiry and decision-making in the processes of design by specifying and situating constraints, desires, and uses of a product, service, or Game.

“How the player interacts with the game and how we collect the data and take that data and use in design in order to make the best it can be, before it hits the show before it is downloadable or after the fact in to be able to improve it on updates”. So, it’s a living process, it is multidisciplinary, it draws from psychology, it draws from social science, cognitive science, physiology, even things like anthropology, economics, probability and statistics, there is a lot of fields we can make entry to this field to contribute, alongside we can understand the things like a possibly AI research , programming, development, human behaviour.

In the past we just focused on usability, practical aspects of this, learnability, memorability, how is the program to be learned, easy to be learned, may be enamour to get into there, memorability is how to remember what in there, efficiency, you have to make 15 different clicks to get into there what you want it, to be able to control, or to acquire that loot, nobody likes errors, things that going to affect the gameplay, affect the player experience, a kind of satisfaction, that is kind of regional kind core of usability, so UX brings a whole other area which focuses on affective nature of things , how player feel about the game, what is the motivation of playing it. With research process and without affecting the players game.

Furthermore, the player is an epistemological construct developed for and by designers to limit inquiry and creation. Beyond the functional purpose of knowing what to make, the player is an ideological concept that has roots in early Twentieth century

humanism. Design theorist Richard Buchanan explains that design became aligned with broader humanist ideals of individual freedom, aspirations, and agency in response to the conquering impulse of the Industrial Revolution. (Buchanan 1995a) Buchanan's observation points out that design and humanistic agendas are not one in the same. From this humanist tradition, the ultimate goal of design is supporting the needs of people. While the term player (that is, rather than human) muddles this ideological position, the player invokes a sense of perspective, ownership, and responsibility in the creation of products. The player is commonly associated with the ideas of player- or human-centred design.

Design practitioner Jon Kolko explains that "[t]he process of human-centred design relies heavily on modelling target players in an effort to create a prototypical audience for design. A model is a representation of a real thing, and a model of a player is a representation of a real person." For Kolko, the player is *the* formative construct underlying player-/human-centred design, a position seconded by fellow practitioner Dan Saffer. (Saffer 2007) Buchanan comments that the reductive nature of the term player is problematic as it assumes a humanistic agenda insofar as a human abides by the terms of use, broadly construed. While this debate is important, the salient point is that *the player* is a historicized and debated concept. While the player pervades discussion within design, it is not the only way to orient design. The player (human or otherwise) provides a sense of scale (the individual) during the creation of products. As we will see, this scale can be problematic when used in circumstances when scalar differences are difficult to articulate and to reconcile.

The second term and concept is *experience*. Experience is meant to indicate the current, proposed, eventual, or speculative character of using a product, service, or Game system. Within technology design and development, experience has a shorter and less wide-reaching history. Within HCI and design studies, definitions of experience span interests from holistic perspectives and life worlds (Hassenzahl 2008; Forlizzi and Battarbee 2004) to more narrow discussions of the emotional and affective register of products. (Battarbee and Koskinen 2005) Across these definitions, experience emphasizes embodiment and context when considering the scale of use. The particular meaning aside, the rise of the term experience coincided with the emergence of phenomenological approaches to the design of computational Game systems. (Harrison, Tatar, and Sangers 2007) In particular, experience challenges the sufficiency of notions like utility and usability by probing the ways we live with products rather than just accomplish tasks with them.

Where the player is an embodied entity and identity, experience is dynamic, temporal, and contingent. Experience tangles the needs, desires, and aspirations of players in the world through—and sometimes in spite of—the objects, environments, and interactions players have. The term experience embodies ideas beyond tasks, work, or process, and encourages conversations of *living with* a product, service, or Game system over time. Together these two terms—*player* and *experience*—compose the noun *player experience*. UX exceeds the sheer sum of its parts, and cannot be simply traced to the emergence of one or the other term. Player and experience are in tension within their composite. The player seems to reduce humans to the terms of products, and experience seems to humanize products by situating them within the world. In short, player experience is a term in its own right that cannot be completely separated from its parts.

You can't just say player experience; you have to say player experience
something. Player experience research. Player experience design.
Player experience by itself is really too vague to be anything.
Player experience is the experience a player has. Like
"What do you mean by player experience?"
Player experience is exactly what the word says: the experience of the player.

While there is obviousness to the term, as both Nolan and Katrina point out, the obviousness of player experience is precisely what leads to its vagueness, or, more precisely, its vastness. In many ways, player experience *is* just that—*the experience a player has*. UX does not veil itself as something unnameable. However, what player experience lacks in complicatedness, it certainly makes up for in complexity. *The experience a player has* is multi-valance and vast, shifting with the player over time and across settings. Capturing, quantifying, qualifying, and acting upon *the experience a player has* is a rather difficult task given that such an experience is subjective, context-dependent, tacit, and dynamic in time and space.

Even more, the apprehension of another's experience may, for all intents and purposes, be impossible. Adding these two concepts together has a combinatorial effect—*who are the players? what experiences do they have?* Even asking simple questions such as *what aspects are important to pay attention to with regards to a player's experience?* is not without problems. Player experience design is, then, paradoxical. First, UX *is not* complicated in certain ways. It is legible and understandable in broad ways, and shares language with which many are familiar. Second, UX *is* complicated in certain ways. It is not legible and understandable in many particular ways, and is often used and invoked in ways with which many are unfamiliar (or told to be so). Again, UX is in tension, and this tension motivates the case study. Between the specific and the general is the actuality of player experience. In short, player experience is many things at once without being anything singular. While the literature dealing with player experience spends a great deal of time defining and bounding the term—a clear recognition of its vastness and complexity—player experience, when observed in use, is always in tension.

1.4 Research approach:

The goal of design-science research is to implement an innovation and evaluate its utility. The motivation for building a new innovation is either the lack of that innovation or the low quality of old innovations. As an outcome, design knowledge prescriptions developed, which can be used by a professional to design solutions to problems. The prescriptions are of a heuristic nature; they should be used as a solution concept and described as "if you want to achieve Y in situation Z, then something like X will help". These heuristic prescriptions need to be translated to a specific problem at hand. This Thesis aims at giving design implications in regards to designing mobile player interfaces for Internet services.

The design-science process includes two stages: build and evaluation. In the build process, the specification of the innovation is first constructed by the researcher and players, and then implemented including design alternatives. Finally, the build process may evaluate the innovation compared to existing solutions if there are any.

The evaluation process, in turn, measures aspects such as completeness, simplicity, elegance, understand ability, and ease of use of the innovation [94]. Both of the applications described by this Thesis have followed the process of design-science. The evaluation of the applications has been conducted as player tests with a special focus on player experience and usability.

1.5 Overall Result

The overall result of this Thesis defines the design implications for mobile player interfaces of Games. The design implications are mainly based on the Player Experience study but completed with the findings of the Image Player Interface study. The design implications suggest that the following aspects should be considered in the player interface design:

- Content optimization
- Utilization of desktop and mobile usage patterns
- Full exploitation of device capabilities
- Compensation for device resources
- Content update

The aim of this thesis is also to present UX knowledge from UX professionals and end players with different demographics and abilities as it pertains to Game development. My interest, research question and the missing consensus about UX provide the rationale for the following three main objectives (O) of the dissertation:

- O1: *Raising the UX knowledge among Game developers.*
- O2: *Considering the attributes of UX by utilizing statistical player profiles in the early phases of Game development.*
- O3: *To prototype and test a utility that assists in meeting O1 and O2.*

The claim formed from the above research question and objectives is:

This claim will be proved by combining knowledge of Game development projects with research information from the fields of UX and Game development. This practical and theoretical know-how is supplemented with UX information from UX surveys conducted as part of the research.

- *A link between end players, UX professionals, Game development, and UX theory.*
- *A designed, prototyped and tested UX utility for early phases of Game development, called the Wizard of UX.*

Chapter- 2
Literature Review (UI)

2 User Interface Design

The main purpose of player interfaces is that they should match and satisfy the skills and expectations of its players. A game will always be judged by its players not by its functionality, but by its interface design. Many games are never played because of the poor interface design as this will confuse the players and will lead many catastrophic errors.

2.1 Human factors in interface Design

There are many human factors which should be considered before designing an effective interface. These factors could be like limited memory as most of us cannot remember more than seven things at one go and if a player is presented with more than seven things to remember instantaneously he is more susceptible to make mistakes. It is natural that players make mistakes when they use new interface Game and things like alarms or messages might panic the player and will become the reason for more mistakes. When they use new interface Game and things like alarms or messages might panic the player and will become the reason for more mistakes. There are different kinds of people who think differently and prefer different things like pictures, special audible, menu style, text etc. and there are people with different physical and mental capabilities and a designer should keep all this in mind before designing an effective player interface which can be used and appreciated by everyone.

2.2 UI Design Principles

There are some principles which when followed will make a developer a good interface designer. The player interface should look familiar to the player i.e. it should be based on the use terms rather than recent concepts like clicks times, modules which can be replaced by clear click, on drag etc. consistency should be followed when commands and menus are taken into consideration. They should appear similar in format and punctuation. There should not be any confusion to the player when using or operating a command and he should be able to predict the operation and consequences of commands. Players should be having the options of recoverability to allow them to overcome their mistake.. The interface program should be provided with short manuals to guide the player and player diversity should be observed to make the interface to support different players.

2.3 Usable Design

An effective usable design includes three different designs that are important for each aspect. They are,

- Interaction Design
- Information Design
- Interface Design

To achieve a perfect design all the three designing characteristics should be included and overlapped. Failure of any one of these designs will lead to the failure of the

whole design. A Game with good information and interface design will not be successful unless there is a good interaction with the player.

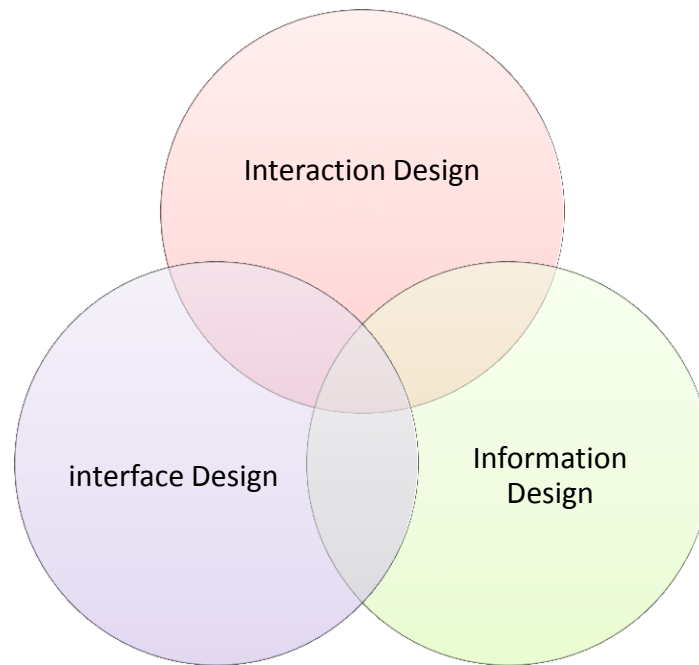


Figure 2.1: shows the usable design

2.3.1 Interface Design:

An interface should be designed with proper colours and objects. Colours should be used restrictively with a meaning. Proper colour pairing should be observed and at the same time people with colour blindness should be taken into consideration. Objects like buttons, menus, and icons should be used. Navigation should be made easy. Proper style of interaction should be followed with proper language and symbols. A bad interface will produce a useless style.

‘Golden’ rules to be followed in creating an effective interface design.

Rule 1	Consistency of the Game
Rule 2	Shortcuts for the convenience of frequent players
Rule 3	Feedback information
Rule 4	Designing dialog boxes to show the status
Rule 5	Recoverability to minimize errors
Rule 6	Action reversal-undo
Rule 7	Design in a way that the player is in control of the Game.
Rule 8	Minimize instructions and information to make it easy for the player to remember things

Table 1: represents ‘Golden’ rules to be followed in creating an effective interface design.

2.3.2 Information Design

Present the information properly so that the player finds it easy as to who is the intended recipient, adaptation of information, text, graphical objects, photos, diagrams, Information regarding the relationship between values and change of information must be present. Use of colours should be in a proper way when showing the change in the Game system status and colour coding can be used to let the players know about the task they are performing. Colours should be used restrictively when it comes to dark colours and they should be used in a thoughtful and create way. Proper colour pairings should be observed.

The game system should be able to predict what the player is doing and give messages relevant to the situation, experienced players would not like long messages and new players might not be able to get enough information from short sentences so both types of players should be taken into consideration and allow them to use message conciseness. Messages should be given out in way that different classes of players should be able to handle it depending on their skills. When expressing a thought in a message they should be tailored in a way that it gives out the message in a positive way and it should not sound funny.

2.3.3 Interaction Design

When designing an interface Game system things to be taken into consideration are like the age, culture and background of the player, the players mobile interface knowledge should be assessed and also his ability to adapt to the game. Navigating and finding help should be made easy for the player when searching for information. Help should be provided for the function, to interact and learn. Use of different lighting, sounds can be done to attract the player. The player should not feel any stress or pressure.

2.4 The UI Design Process

The UI design is a process where the players interact with the designers, There are three important essential activities in this design process.

2.4.1 Player Analysis

In this analysis process we develop a task that the players do in other words understanding what the players do with the Game. To develop an effective interface we have to understand what the players want to do with the Game. Player analysis should be described in such a way that it is easily understood by the players and other designers. Scenarios are one of the ways of describing the analysis. Some of the requirements from the scenario are help in using appropriate search terms as the players may be unaware of them. Searching and request copies to the related material must be carried out by the players.(persona).

2.4.2 Game system Prototyping

The development of prototype Game helps in guiding the evolution of the interface. Prototyping process with early paper prototypes are use as the basis for automated prototypes.

2.4.3 Interface Evaluation

In interface evaluation we collect the players experience with the interface. Evaluation of interface design should be done to know its suitability. Full scale evaluation is not practical for the Game and is also very expensive. Generally interface is evaluated against the usability specification. Interface evaluation based on usability attributes evolution is conducted. Evaluation of player interface design in a systematic way can be an expensive process.

This process involves graphics designers and cognitive scientists. Cheap way to evaluate an interface is by surveying players by questionnaire. Players should rate the questionnaire with their own experience and background. Observation-based evaluation involves players watching as they are playing Game. Specially equipped evaluation is required for complete video analysis. Analysis of recordings help the designers to find if the interface requires too much hand movement or unnatural eye movement will do.

Chapter- 3
Literature Review (UX)

3 User Experience Design

This chapter gives an overview of UX, distinguishes it from experiences and presents the current research status, definitions, viewpoints and demarcations of UX. Definition, in theory, is easy since the ISO 9241-210:2010 standard defines UX as follows: “A person's perceptions and responses that result from the use and/or anticipated use of a product, Game system or service.”. However, according to Jokela, who was part of the ISO 9241-210:2010 standard working committee, the definition may not be the best possible. Apparently the definition and meaning are not that easy since UX is an umbrella term. For some UX might equal with UI (User Interface), for some it might be usability, and for some it might be anything vaguely related to players and technology. The following are a selection of UX views from various sources:

3.1 From experiences to UX

User Experience as a field of research is young, but plain experiences have been designed long before the Common Era, e.g. ancient Greek comedy and different forms of theatre are the first forms of designed experiences. Stone Age cave drawings may be considered experiences, despite their actual meaning being anything from borderlines to 'I was here' to a sanctum marker. Millenia later, many great writers and poets, like William Shakespeare designed experiences for people in the form of love, sexual passion, tragedy, comedy, death, etc. Still, the attitudes towards experiences have not always been flattering.

For example the Scottish moral philosopher Adam Smith, the founder of modern capitalism and economics, stated in 1776: “*The labour of a menial servant, on the contrary, adds to the value of nothing*”. By menial servant he means unproductive labourers and according to him some of the most frivolous professions were: “*churchmen, lawyers, physicians, men of letters of all kinds; players, buffoons, musicians, opera-singers, opera-dancers*“. Work conducted by these professions according to Smith is “*unproductive of any value, and does not fix or realize itself in any permanent subject.*”

3.1.1 First thoughts

The basis for modern UX study was provided by the American psychologist and philosopher, John Dewey, whose pragmatic thoughts about experiences in art, education and nature caused experience theory to enter the mainstream around. For Dewey the essential conditions of life, such as breathing, eating and warmth, experienced through a person's senses were the determinants of experience. Aesthetic experience, according to Luoju, who follows the ideas of Dewey, is a common name for specific qualities that are highly valued and an ideal form of experience towards which everyday experiences are striving.

3.1.2 Influence of war

During the First World War the development of sophisticated devices made great advances, especially in the area of warfare. This naturally led to increased interest in human characteristics and abilities, as humans were needed to operate these new devices. Typically the research was conducted with a form of trial and error which continued until an appropriate candidate for a pilot, etc. was found. Rumour tells that Russians selected their tank operators with the following criterion: Anyone who is small enough to fit the cramped quarters of the tank became an operator. Greater consideration of human factors began in the latter stages of World War Two when it was noticed that human interaction with sophisticated technical devices is not an easy endeavour.

For example, effective placement of control knobs and more accessible displays in cockpits were studied, which can easily be equated with modern day player interface research. After the World War Two the USAF (United States Air Force) published a 19 volume summary of their research into HFE (Human Factor Ergonomics) conducted during the war. During the Cold War, many research laboratories on both sides conducted human performance and engineering research, leading to the development of branches like human-engineering, psycho-physics and aviation psychology. Clearly, this research was not made public since it was related to military technology. At the same time, civilian industry also established HCI (Human- Computer Interaction) research groups in areas like reliability and logistics, which eventually led to the integration of human factors into software system design.

As the Cold War thawed, the military saw an opportunity to co-operate with academia and their research gradually became more public. In 1954 Abraham Maslow wrote *The Third Force* dealing with the basic needs of humans and psychological aspects of human behaviour. He began this work during the early days of World War Two and the target was no more or less than; *"I wanted to prove that human beings are capable of something grander than war and prejudice and hatred."* At that time there were several competing psychologies, but Maslow wanted to integrate these various truths into a whole truth. He also felt that existing theories could not solve human problems and could not explain all verified human behaviours.

Instead of accompanying or extending existing theories, he was sure that by combining subjective and objective parts a great deal more about human nature could be rationalized. An important finding of Maslow was that if the subjective approach is ignored, some human behaviour remains meaningless. In Maslow's analyses, basic human needs were divided into three different categories; physiological needs, basic needs and growth needs. Human beings are motivated by the first two, which are species-wide, apparently unchanging, and genetic or instinctual in origin. The most powerful needs are naturally the needs for physical survival, which influence human behaviour, but only as long as they are unfulfilled.

Physiological needs are food, liquid, shelter, sex, sleep and oxygen. Maslow states that when those are satisfied, higher needs like safety and security emerge, and when those are met, growth needs assume importance. He listed truth, goodness, beauty, aliveness, individuality, perfection, necessity, completion, justice, order, simplicity, richness, playfulness, effortlessness, self-sufficiency, meaningfulness, self-esteem, esteem by others, and love & belongingness as growth needs which are all equally important. Despite the fact

that this list is more than 50 years old, lots of similarities to modern HCI and UX study can be seen, suggesting that human aspects of UX attributes are integral to UX research.

3.2 UX - Still a mystery?

UX has evolved greatly since Adam Smith's times and has branched out such that currently the concept covers a very wide area. As mentioned earlier, although ISO has produced a standard and definition of UX, even those who participated in the standard preparation working committee admit that it leaves a lot of open questions. Moreover, academic UX professionals do not seem to support this definition and cannot reach a mutual agreement about the UX issue.

The UX research site *All About UX* (footnote 1 page 1) has listed 27 different definitions from various sources and, not surprisingly, their list is not complete. Everyone seems to have their own opinion about what UX is and what attributes or aspects should be included under the umbrella term. Multiple books and many publications concerning experiences and UX also draw attention to this issue, but little consensus exists. There is not even consensus whether UX can be both negative and positive. Nevertheless, the concept, be it termed player experience, experience, overall player experience, an experience or something else, has been widely adapted to almost every imaginable context and it is a widely used term in the Internet.

A Google search with “*superior player experience*” leads to 1 480 000 hits (07/05/15) and if the word superior is dropped out, hit count jumps to 69,8 million. According to Buxton, this is a problematic situation since when a word means almost anything or everything; it actually means nothing. Extending the idea further, a sentence from Game metrics comes to mind; you cannot control what you cannot measure and you cannot measure what you cannot define. At the Dagstuhl seminar (2010), some UX professionals admitted that the point had been reached where UX is too broad a concept to be actually useful in practice. They suggest that instead of trying to identify every aspect of UX, concentration on demarcating the field of UX is needed.

This was not a common agreement since some researchers do not want to limit the research field. Even before this proposal for demarcation, attempts to classify and handle UX with different approaches had been made. UX has been sub-divided into ‘an experience’, ‘experience’, and ‘co-experience’. Forlizzi and Battarbee explain 'Experience' as: “*the constant stream of “self-talk” that happens while we are conscious. Experience is how we constantly assess our goals relative to the people, products, and environments that surround us at any given time.*” 'An experience' can be articulated or named, “*has a clear beginning and end and often inspires emotional and behavioral changes in the experiencer*”.

Co-experience includes the social context and occurs “*when experiences are shared with others or created together*”. Roto, on the other hand, sees overall UX as an extension to UX; “*the overall player experience is formed out of use case experiences and perceptions and information received outside the use cases. The overall player experience affects the player experience of the next use case*”, which follows the idea by Makela & Fulton Suri . It is not only academic research that works around UX, e.g. Nokia have defined their own UX elements, by mapping compatible UX attributes into them. These elements are utility, usability, social value and enjoyment. Utility and usability are directly taken from the

commonly accepted pragmatic side of UX and social value was picked based on brand slogan “*Connecting People*”. The remaining unmapped attributes Nokia placed under the enjoyment element. Their intention was to define a set of elements that would be applicable for all Nokia products and would reflect the brand core, but they admit that it might be beneficial if each product had at least its own target level for each element.

3.3 Clarifying the mystery

During the past decade number of potential UX models has been proposed to clarify the cloud of uncertainty around UX . At the subsections below UX models are presented with following divisions, hedonic – pragmatic, temporary – long-term, and other methods.

3.3.1 Hedonic vs. pragmatic

A common way to categorize UX is to use a division into hedonic and pragmatic sides. In some cases the hedonic side is called emotional, holistic or experiential, and pragmatic side termed, functional or instrumental, but the meaning behind the differing terms is nearly the same. The hedonic side according to Hassenzahl emphasizes individuals' psychological well-being and supports the achievement of be-goals. These be-goals are commonly recognized as stimulation, identification and evocation. Stimulation means that the product must be stimulating to use, for example, it has to offer players new impressions, insights and opportunities because all individuals have a 'need' for personal development.

Individuals want to be seen by others in a special way and therefore they need to be able to identify themselves through physical objects like web pages. Thus a product must have a way to communicate this identity to others. Evocation basically means reviving memories of past events, like an old computer game. The pragmatic side is concerned with the product's utility and usability in relation to the task at hand, as well as its perceived ability to support the do-goals. So, the pragmatic product will offer an effective and efficient way to complete the task. An example will clarify the differences. Someone might own a chainsaw that does its job well, is cheap, has a three year warranty and is just fine for their needs. In this case, the chainsaw is pragmatic. If someone has a high end DE WALT chainsaw from winning a contest in which a neighbour lost, then the chainsaw is hedonic because it has emotional value. Hassenzahl uses a four locker categorizing software system to describe product characteristics emerging from hedonic and pragmatic attributes.

In the lower right corner a Toyota Avensis can be found, which is the current car. It is great to drive and has enough space for all, but it do not have any emotional attachment to me, nor does it make the neighbors jealous. Therefore, to me, it is not hedonic, only pragmatic. The final locker in the upper right is the 'dream box,' which contains an Audi RS6, one of the world's most powerful (and expensive) family cars. It would be pragmatic, with space, the latest safety devices and probably many other desirable features. Certainly this car would also make almost every neighbour jealous so therefore it would also be hedonic.

Novak and Schmidt studied the importance of hedonic stimulation while collaborating with large displays in a travel agency. They found that in general positive player attitude toward the Game was strongly related to hedonic attributes in both the client

and the travel agent. Arguments about the Hawthorne effect (things that are measured, evaluated, etc. will be more effective since the work moral of test people is increased) and the effect of novelty of their large touch sensitive display can be put into question. It would be interesting to see whether their test results can be replicated once the system has been used for years. Nevertheless, their finding about the importance of hedonic stimulation undoubtedly has validity. Vaananen-Vainio-Mattila and Waljas have developed both pragmatic and hedonic evaluation heuristics for web service user experience. They conclude that while of interest, the task is challenging since many attributes belong to both the hedonic and pragmatic sides.

They also concluded that not all heuristics are usable in every situation and that some situations require additional heuristics. Interpretation of pragmatic and hedonic sides and their dependency or in-dependency vary, but an important question is raised; is it possible to design emotions or are emotions too ephemeral. The problem with the division into pragmatic or hedonic attributes is the fact that it is sometimes difficult to decide if something is pragmatic or hedonic. In addition, many attributes affect both sides either directly or indirectly.

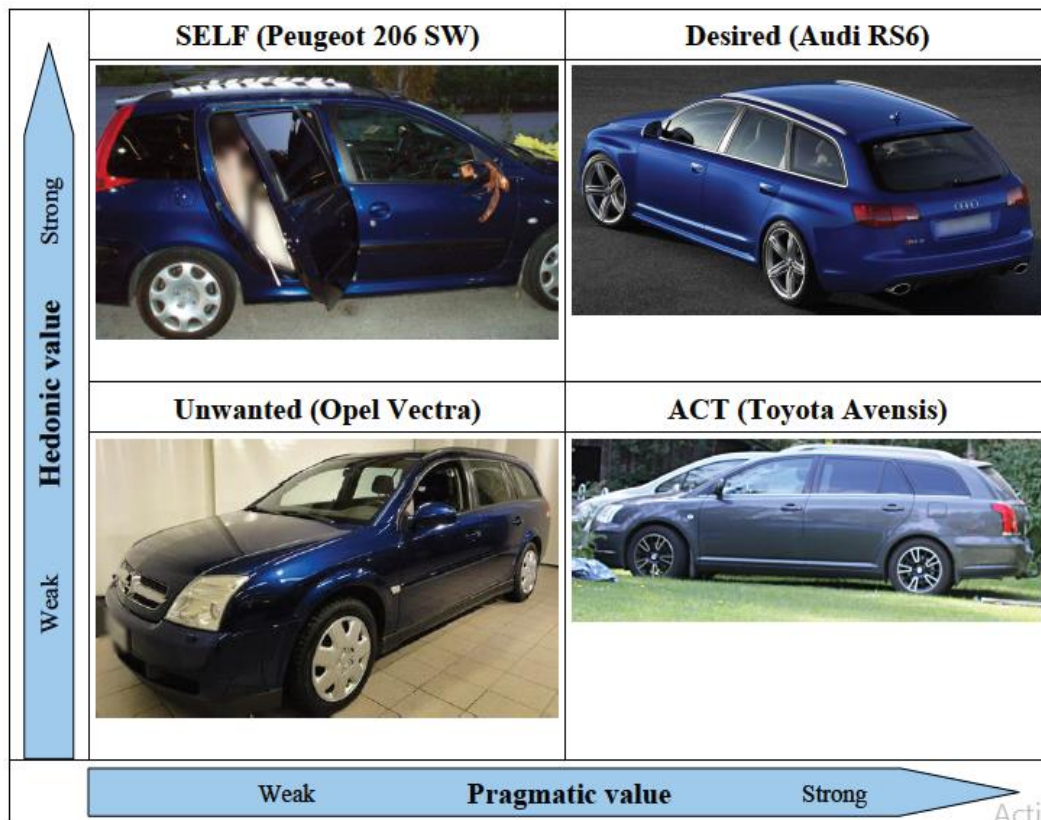


Figure 3.1 Hedonic and Pragmatic example

3.3.2 Temporary vs. long-term

The majority of UX research concentrates on temporary UX, which happens at the moment when the player experiences the effects of his or her actions and reflects on this experience. According to Law et al. this is the core area of UX. Still, anticipated UX is formed before the actual usage and have effect to UX. In this dissertation, anticipated UX is considered with attributes brand and expectations. Three different UX factors; context, player and Game, affect both temporary and long-term UX. Temporary UX is closely tied to the context aspect, which is the broadest of the three aspects.

This aspect contains the social context, task context, temporal context and physical context that come from the outside Game and player. This complexity makes it the most difficult one to fully take into account. Consequently, the next day the temporary UX of the same Game exactly and the same task might be different due to e.g. different temporal and social context. The player aspect is strongly dynamic because players are dynamic. This aspect considers current mental state of player e.g. emotions and motivation, as well as current physical state of player like accessibility.

For example, if a player has just performed vigorous gymnastic exercises and his or her hands are shaky, a good UX is unlikely to be achieved with a Game that requires a lot of accuracy with a mouse or other pointing device. The Game aspect is everything that is designed and implemented in the Game that naturally influences the UX of the player. Further on, according Roto Game aspect includes also all Game that affect to Game under investigation. Attributes like accessibility, aesthetics, functionality, interaction and stability are categorized under this aspect. It also contains objects that players have added to the Game, which might,. Long-term UX is formed cumulatively and can be viewed as the stable background that the temporary UX slowly moulds over time.

Long-term UX is sometimes called as overall UX or cumulative UX. Regardless of the precise term used, the area has been recognized, and experts seem to think that UX research over a longer time span might affect findings since the temporal and dynamic nature of UX cannot be seen in a few minutes or even few hours. In theory, temporary UX always has some effect on long-term UX, but little research in this area has been reported, possibly due to the fact that study of long-term UX takes a lot of time and academics rarely have enough resources or time to conduct such longitudinal studies. Still few retrospective methods like DRM (Day Reconstruction Method), iScale, CORPUS (Change Oriented analysis of the Relationship between Product and Player) and UX Curve have been developed.

On the other hand, if a company were to conduct such a study they could gain considerable benefits for future product development and most certainly would not be willing to share their knowledge with competitors. Luoju states in her dissertation that temporal UX alone might not be enough as a basis of design. Moreover, she also finds that bad temporal UX did not affect overall good UX of players of a fitness heart rate monitors. In fact, she states that the effect of short-term UX on long-term UX is almost zero. This raises the question: How much bad short-term UX is needed that it affects long-term UX? This is a similar question to the problem with sand grains and a pile; if you add one grain of sand to table, is it a pile? When you add another one is it a pile already? Where is the line between

individual grains and a pile? The relationship between the grains and the pile is similar to that of short-term bad UX and long-term UX; everyone is an expert about themselves.

3.3.3 Other models and views

Folstad advocates simple measures and adhoc models rather than complex models and a mass of attributes. He supports his statement with examples like Amazon book ratings and YouTube video ratings, which both use just one measure to indicate the quality of a target. This is an effective way to rate something that already exists and could be used, for example, as an evaluator of long-term UX. However, the approach does not provide answers to the question of how to know what to fix if the ratings are low. Folstad's method is suitable for summative evaluation that is used for selecting the targets that require more observation e.g. formative evaluation.

By utilizing this approach, the amount of work could be reduced radically, since there is no need to run thorough tests on every target. Holistic viewpoint have also be used to consider UX. This view is interested in human needs, view of life and consciousness. In other words, the human is seen as an entity built from physical, mental and social elements. The holistic approach can be traced back to Dewey. His holistic view links together a wide range of areas, such as; emotions, memory, plans, environment, thought processes of the player, consciousness, interests and reactions to current conditions.

Dror for example has taken the holistic view and states that not only the technology and its performance that should be considered in technical development. Instead, wider factors of the context must be taken into account during design and development to ensure the success of new technology. He claims that if these critical factors are not taken into consideration, the result might be a failure of the new technology even if it is technologically superior compared to others. Luoju in her dissertation presents a similar approach. She claims that the dissertation by Roto uses unnecessary and unhelpful approaches that will lead to cognitive reduction of experience due to the lack of a holistic view.

Nevertheless, on the same page, she admits that some methods might be practical for product development, but not suitable for seeking scientific knowledge Finally UX can also be considered from the cognitive viewpoint since cognition is based on brain structure and how it functions . However, going into the cognitive processes of human mind is far out of the scope of this dissertation.

Chapter- 4

Problem Identification

4 Research and design methods

Next Chapters introduce the research and design methods used in the research. First, Chapter 3.1 introduces the Human-Centred Design (HCD) process that describes design activities throughout the life cycle of interactive Game.. Chapter 3.2 gives an overview of the discipline of interaction design that defines the behaviour of products and Game that a player can interact with. After that, Chapter 3.3 presents player experience design that aims to impact positively the overall experience a person has with a particular interactive Game.

4.1 Human-centred design

ISO 13407 describes the HCD process (Figure 3.1), in which the end-player need, wants, and limitations are considered at each stage of the design process of a Game. HCD can be characterized as a multi-stage problem solving process that not only requires designers to analyse and foresee how players are likely to use the Game, but also to test the validity of their assumptions in regards to player behaviour.

We have based our design process on these principles. Contextual Design is a process that follows the HCD standard and defines explicit steps and deliverables for each stage of the design process. It is based on observing how people work, and the data gathered steers all design decisions to discover the optimal design for products. It also includes techniques for managing the design process in a multi-disciplinary teams and keeping the focus on the data gathered through the player observations. Contextual Design has the following parts:

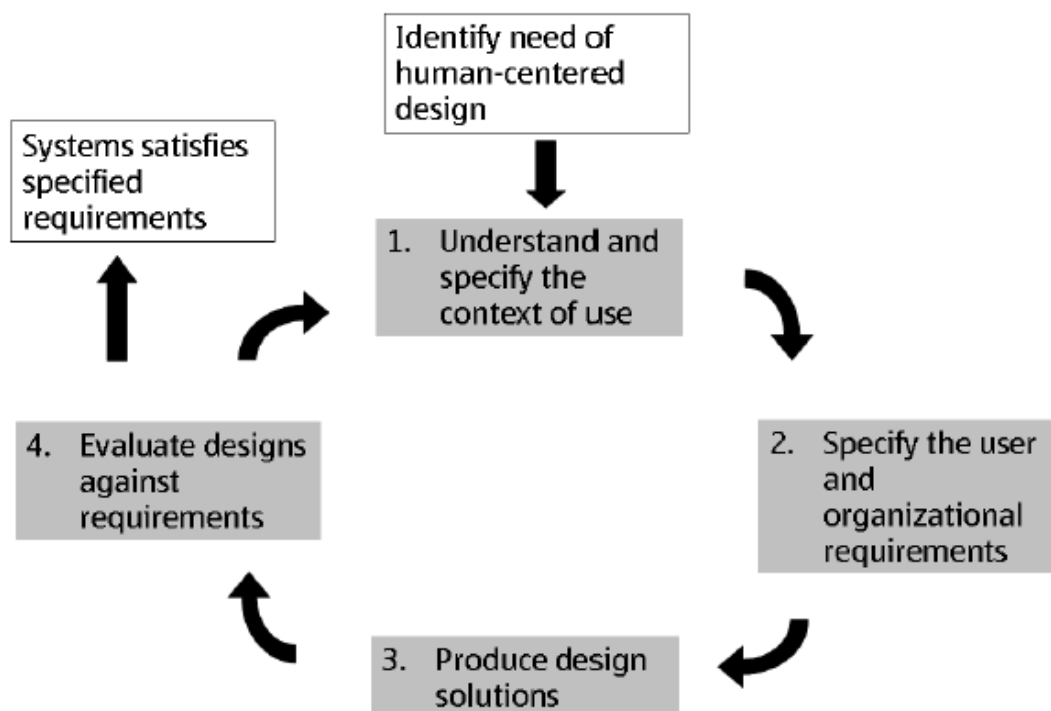


Figure 4.1: ISO 13407: Human-centred design process.

Contextual Inquiry, work modelling, consolidation, work redesign, player environment design and mock-up, and test with customers. The Contextual Inquiry phase includes contextual interviews with players, which are conducted in a real environment where players use the particular Game. In a contextual interview, the interviewer's role is to be an apprentice and learn from players how they use the Game currently. Also, the interviewer and the player form a partnership, in which the interviewer aims at understanding the work practice.

We have followed the process of Contextual Design for player needs studies introduced in this Thesis, as it is a successful method in the development of mobile devices . However, we have used the more simplified and efficient version of the process as described. Personas are a tool for enhancing engagement and reality in a design process, which is why we included them in our HCD process. They are a good method to engage and communicate with real players in design, development, and testing to proceed more effectively. Personas also help the design team and real players to imagine the actions people would or would not take in the scenarios they are put in 30 and facilitate innovation

4.2 Interaction design

The goal of interaction design is to design interactive products to support people in their everyday and working lives. Thus, it follows the principles of HCD. Interaction design is about understanding the goals that people want to achieve with a certain technology [65]. It will lead to player interface designs that focus on more detailed look and feel aspects of a product. This Thesis has utilized the process of interaction design to create player interfaces for Mini-map and Image Exchange. Interaction design defines four basic activities to create interactive products:

1. Identify needs and establish requirements.
2. Develop alternative designs that meet those requirements.
3. Build interactive versions of the designs so that they can be communicated and accessed.
- 5 Evaluate what is being built throughout the process.

Many researchers have defined design principles for player interfaces to guide what should be provided and what avoided to making them usable. For example, both Norman and Nielsen have defined a set of design principles to simplify tasks in player interfaces. Nielsen's ten principles for player interface design are listed in Table 3.1 and they are consistent with Norman's principles.

These principles make sure that the player can figure out what to do with the Game and the player can tell what is going on. These principles for player interface design guide the design process to fulfil usability goals that can be defined for interactive products. Precedes defines the goals as follows

Principle	Description
Visibility of Game status	Keep players informed about what is going on, through appropriate feedback within reasonable time.
Match between Game and the real world	Speak the players' language. Follow real-world conventions, making information appear in a natural and logical order.
Player control and freedom	Support recovering from mistakes by offering functions for undo and redo.
Consistency and standards	Be consistent with and follow platform conventions.
Error prevention	Aim at eliminating error-prone conditions or present players with a conformation option before they commit to the action.
Recognition rather than recall	Minimize the player's memory load by making objects, actions, and options visible.
Flexibility and efficiency of use	Support both inexperienced and experienced players.
Aesthetic and minimalist design	Contain only relevant information on dialogues.
Help players recognize, diagnose, and recover from errors	Error messages should be informative for players.
Help and documentation	Aim at designing the Game to be used without documentation, but also provide help if needed.

Table 4.1: Design principles for player interface design

The products should be easy to learn, effective to use, and enjoyable from the player's perspective. Similar objectives have also been defined for mobile player interfaces that emphasize that the aspects of the mobile context need to be incorporated into the requirements [54, 135, 65]. These objectives include consistency, stability, and designed to be used on the go. When the interaction design process takes into account the principles and the usability goals, the conceptual model of the applications should evolve into one, where the player can predict the effects of his actions. Norman defines three aspects of a conceptual model: the design model, the player's model, and the Game image as seen in Figure 3.2. The

design model is the model of the product that the designer has in mind, while the player's model is what the player develops to explain the operation of the Game. In an ideal case, these models are the same, but in reality, the designer and the player communicate through the Game image. To make the Game understandable and usable for the player, the conceptual model and its three aspects must be consistent.

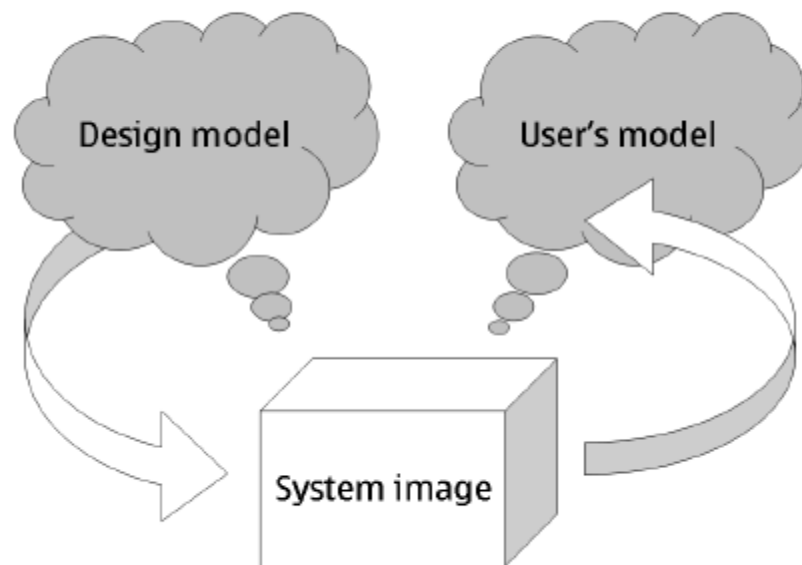


Figure 4.2: Three aspects of conceptual model.

4.3 Player experience design

Researchers in the HCI community have developed meanings and models for player experience that have aspired to understand people's goals and actions when they interact with a product. There have also been studies that focus on interactions between individuals and products and the player experiences that result from those. In addition, some research studies describe the issues that must be considered in the design and evaluation of a product to create a pleasant player experience. Next, I will present the research methods that were used when designing the Minimap and Image Exchange applications.

They aim at defining player experience and then describe the design guidelines and processes that have been defined to create products with a compelling player experience. Hassenzahl has presented a model for player experience that takes into account both pragmatic (individuals' behavioural goals) and hedonic (individuals' psychological well-being) attributes of a product. Hassenzahl considers the model in a similar way to Norman who identified the three aspects of a conceptual model of a product : the key elements of the model can be seen from a designer's perspective and a player's perspective. A designer defines a feature set for a product that forms the intended product character. The feature set includes content, presentation style, functionality, and interaction style. When a player starts

to use a product, he constructs a personal version of the product character, the apparent product character, based on his perception of the product features. This character consists of pragmatic and hedonic attributes. Moreover, using a product with a particular product character in a particular usage situation has certain emotional and behavioural consequences. These consequences may vary as the specific usage situation is not always the same. Roto and Rautava have built on the earlier studies on player experience definitions and have defined player experience elements that consider the brand promise of Nokia. These elements are utility, usability, social value, and enjoyment, and they have been used in the player experience evaluations of Image Exchange.

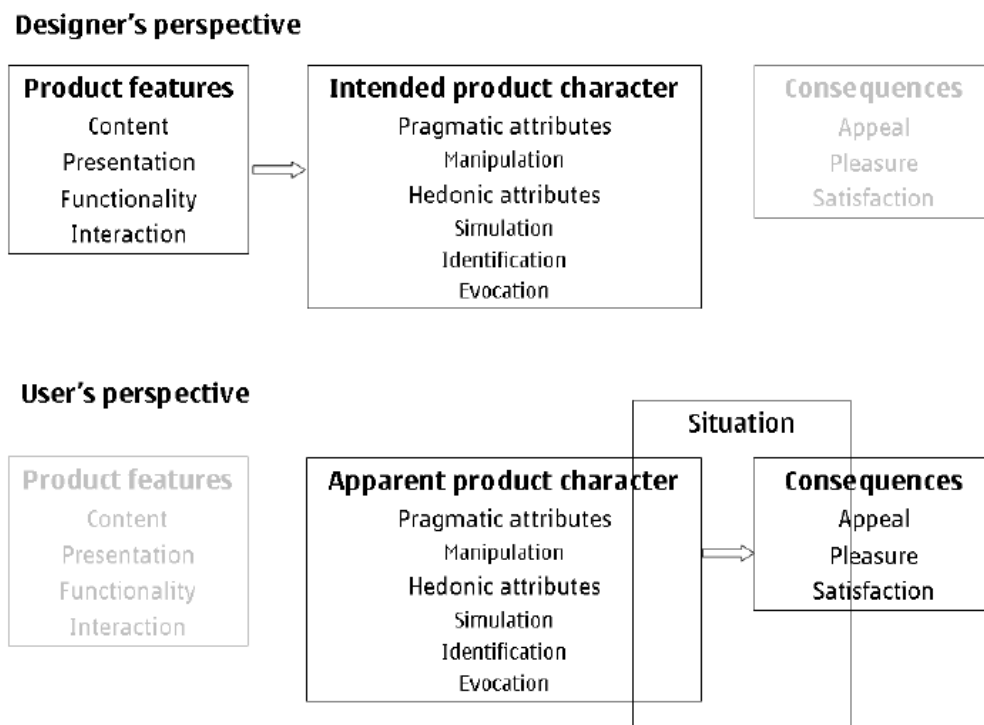


Figure 4.3: Key elements of the model of player experience from a designer perspective and a player perspective

Besides explaining the model of player experience, researchers have been developing design processes that take into account player experience. At its best, a product would offer the player an optimal player experience, "flow", in which the player feels that his skills match the needed challenges when using the product. The player's goals are clear, he can fully concentrate on the task at hand, and he gets constant feedback on how he succeeds in the task. The player experience goals of an interactive product have been defined as satisfying, enjoyable, fun, entertaining, helpful, motivating, aesthetically pleasing, supportive for creativity, rewarding, and emotionally fulfilling. Jordan has proposed a hierarchy for player needs that can be used in product design.

The first level is the functionality; the product is useless and will cause dissatisfaction if it does not contain the necessary functionality or cannot perform the expected tasks. Thus, we need to have an understanding what the product will be used for and the context of use. The second level is usability; once the product has the required functionality, it should be easy to use. Finally, the third level is pleasure; the products should

bring emotional benefits for the player. Hiltunen suggests a similar approach: when a technology is mature enough, more emphasis should be placed on the player experience of a product [54]. Jordan proposes four main stages to describe how pleasurable products can be designed and a set of methods to achieve that goal:

- Understanding the people for whom the product is designed
- Understanding the practical, emotional, and hedonic benefits required from a product
- Linking these benefits to the product design
- Evaluating design solutions

Norman defines three levels for product design that are based on the emotional and cognitive Game of the human brain. The levels of brain processing are visceral, behavioural, and receptive: The visceral level is the automatic, primitive layer, which makes fast judgments; the behavioural level controls the everyday behaviour; and the reflective layer contains consciousness, feelings, and emotions. These three levels of brain processing translate into three different kinds of design aspects. Visceral design refers primarily to the initial impact of a product and its appearance.

It is mostly about the physical characteristics of a product. Behavioural design is about look and feel and how the product is used - traditionally researched by usability studies. Finally, reflective design is how one experiences the product afterwards, how it makes one feel, and about the message it sends to others. Self-image and culture are also important aspects of reflective design. These three levels can be used to define and evaluate player experience of a product.

The following conclusions can be derived from the research related to player experience design. First, it is essential to understand the people who the product is designed for. Second, the products should be easy to use and useful to establish a firm ground for a positive player experience. Third, we need to understand the emotional benefits that are related to using a product to enable a pleasurable player experience. Fourth, the designs need to be evaluated by real players.

Chapter- 5

Results & Discussions

5. Evaluation and analysis for User Interface

In this Chapter I am sharing my personal experiences and evaluation over the problems. I have found that interface design is one of the toughest parts of creating a game. With so many different screens, and so little screen space, every pixel needs to be thought. I have recently redesigned the interface for our game, because i realized the user experience simply did not work as we intended. There was too much information on screen at one time, and without a clear focus, people did not understand what they were looking at. People looked at the screen for about 1 second, then clicked on the “Next” button and started the next level. In other words: The interface simply did not do its job. So, these are some evaluations I made for future designs.



Figure 5.1: The crowded victory screen that is currently getting a full make-over.

5.1 Determine the platforms

The First step is to find out which platforms your interface will support. We are supporting iOS and Android at launch. This seems simple enough, but in fact we need to support for the following screens:

iOS device resolutions:

- iPhone 3GS and equivalent (480 x 320 pixels)
- iPhone 4(S) and equivalent (960 x 640 pixels at 326 ppi)
- iPad 1 & 2 (1024 x 768 pixels)
- iPad 3 retina (2048 x 1536 pixels at 264 ppi)

Android device resolutions:

- Samsung, HTC, Acer, Asus – resolutions are all over the place!

The displays for iOS are fairly straightforward. There are two aspect ratios, and retina simply doubles the pixels. If you are only developing for iOS only, you could consider making 2 different interfaces: One for iPhone / iPod Touch, and one for iPad. Design it at retina resolution and scale it down to fit the older models. For Android, however, there are so many different devices out there that it is impractical to create a custom interface layout for each one. We therefore chose two basic resolutions (one for phones, one for tablets). We worked with the Samsung Galaxy S2 and the Droid, but any popular device will do. We then make sure that the design matches those resolutions perfectly. The interface should scale and adapt to other resolutions. It will not be perfect on those devices, but it will work without too much extra effort.

5.2 Determine the orientations

This is an obvious but easily overlooked step. Will you support portrait or landscape orientation? Or both? This is a critical question before you do any design work at all. Choosing one orientation cuts your work in half. For our's we use landscape only, because the game simply plays better in landscape mode. Don't be lazy though – there are many different mobile gamers out there, and they each have their own preferences. Play around a bit to see what works and what does not. Then stick to that decision.

5.3 Search for references

There are so many great games out there, that it would be silly not to look for references. Buy some games, make screenshots of the interface and take a bit of time to think about the decisions these designers made. Will they apply to your game? These are some of the iPhone games I have looked at for the Momonga interaction design:





Figure 5.2 Interfaces for Angry Birds, Heroes of Kalevala, Squids, and Tiny Wings.

The trick here is to look beyond the visual splendour and identify the purpose of the screen. Bluntly copying a design won't make you smarter, and it might not fit your specific goal. Ask yourself these questions:

- What information do I need to convey to the user?
- What kind of functionality does the user need?
- What needs to stand out from the rest?
- What is the context for this window?

5.4 Make the Screen Flow

Before you start on the individual screens, make a list of all the windows your game will have. This is your to-do list for the upcoming weeks. When you have that ready, it is time to make a flowchart of all those screens. I call it the “screen flow”. It is a handy flowchart that states how do all those screens relate to each other. When you complete a level, which screen comes first? Should you be able to go to the high score list from the main menu? These are tough questions, and you will probably have to make changes to the screen flow as you progress through the design process.

Screen flow for project Our Game

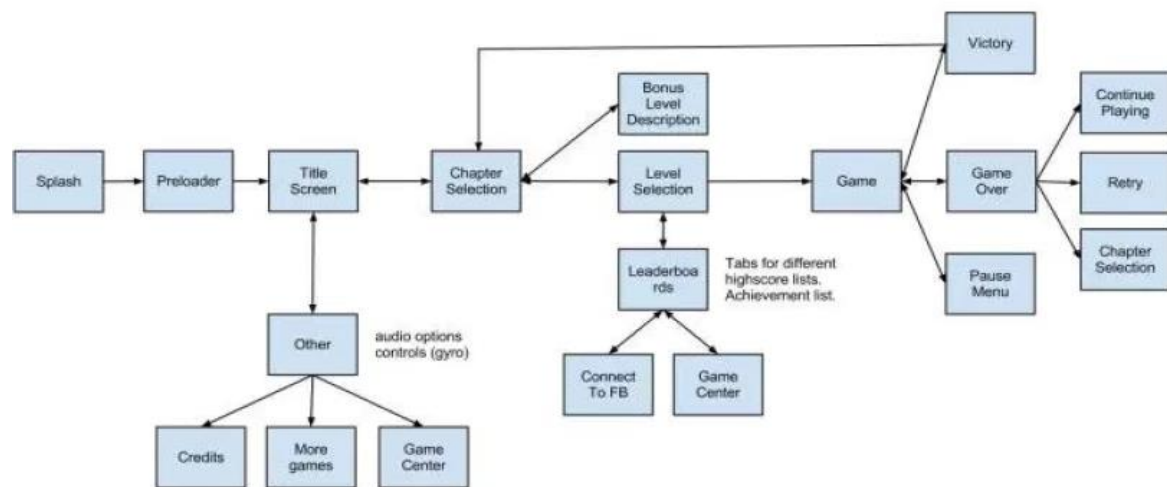


Figure 5.3: Example interface flowchart.

It has a main menu, a victory sequence, a game over screen, level selection screen, all the things the game needs to work well. The screen flow tells you which buttons need to be on every screen. Players need to be able to progress to the next window and in most cases, move back to the previous one.

5.5 Choose the functionality

The next step is to choose the functionality of the screens. This is where you actually start the interaction design for your game. An interface does two things: It provides information and it allows the user to do something. It is your job to decide what information should be on the screen and what actions the user can take. I make small and simple sketches of what buttons the interface should have, and what info should be displayed. These sketches are small and rough – they don't take into account size and positioning. The question here is: To Be Or Not To Be. Should the button be here or not? Where you place it, and how big it is, that is for the next step.

Here are some examples of this:

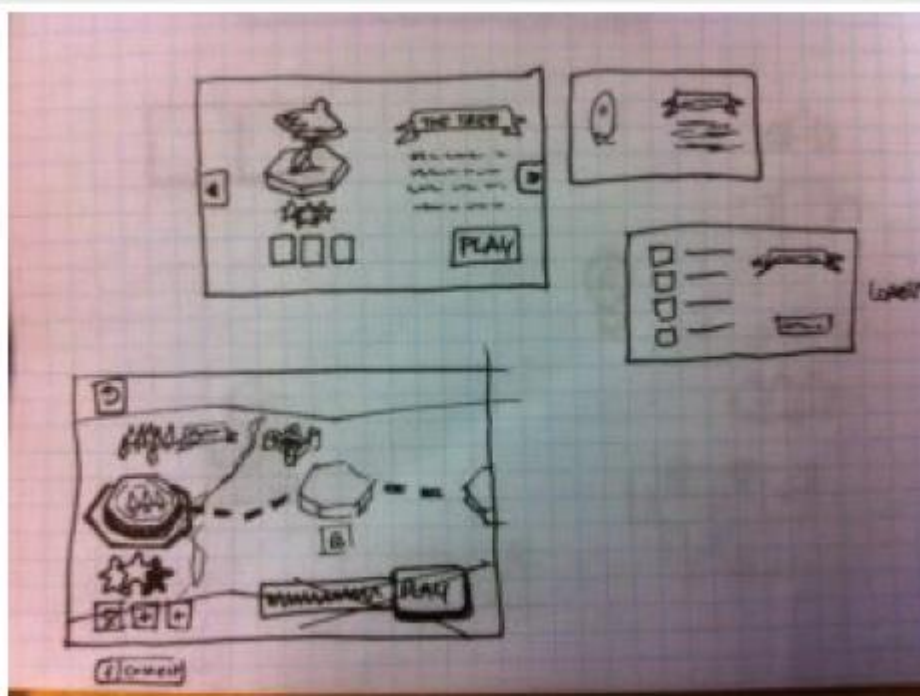


Figure 5.4: Sketches of Screen interface

Depending on my mood and the stage I'm in, I sometimes sketch with a marker, sometimes on super small stickies, sometimes in Photoshop. Some things to keep in mind: Less is more. Keep information and buttons to a minimum.

5.6 Make the Wireframes

This is where things get Photoshoppy! The next step is about making the basic layout of the screens, without colour. This is still about interaction design, but this time we start to think seriously about positioning and size. In step 5.5 you were probably making a doodle on a napkin, but a wireframe is more than that. It is a guideline for the designer, and you want to do the thinking for him.



Figure 5.5 wireframe for user interface

Here are my tips for wire-framing your game interface: Use a template that supports all your device resolutions. Before you start, sit down with your programmers to discuss the implementation. Along the way, sit down with your programmers regularly to verify that your design is feasible. In Photoshop, make a group for every screen of your game. Fill them with your wireframes as you go along. When making a destructive change, copy the entire group and start with a new one. You can always go back that way.

One grid to rule them all:

- Create your guides and stick to them, no matter the platform or screen you are working on.
- Work in grey scale. Emphasize buttons with colours if you need to.
- No rounded corners yet: you will do a lot of re-sizing and plain rectangles are much easier to work with.
- With Drop-box you can easily test the designs on your target devices.
- Save it as jpeg in Drop-box, and open the design right on your iPhone.
- I like to save the designs as jpeg often. In the end I have all chronological steps in numbered files.

5.7 Create the design

This is where the Photoshop Guru takes over. That could be you. If you did your design work well, the making of the actual shiny interface should be a breeze in the park. Of course, that is not how it works in real life. No matter how well you thought everything through, when it is time to really make the thing there will always be gaps to fill. Stay in close touch with your Photoshop Guru and be prepared to answer some tough questions. Make sure that you allow for creative freedom, and stick to your guns when necessary. I won't go into the little details of photoshopping an interface, but I have one tip for designing for mobile games: **Work with vectors**. We have made the mistake to work in pixels on our previous interface, and when the iPad 3 came out with its fancy retina display, we had to do the whole thing over again.



Figure 5.6 Design the interface About time.

5.8 Test and iterate

This is the part where you get to do the whole thing over again. All jokes aside, in this step the programmers take over the show and implement the designs in the game. Of course this will be a breeze and there will be champagne and happy faces. In your dreams. Be prepared to do things over again. Design is a wicked problem: You only know if it works when you have built the darn thing and see it in action. So test your interface, and get back to the drawing board when necessary. We are currently in the process of a complete redesign of the interface. This hurts: We spent a lot of time designing the old layouts and the

visuals were carefully crafted. We spent weeks on it. But it didn't work. So we have to do it again. This time in vectors for retina, and this time with a better interaction design. Could I have known that the old design would suck? Maybe. Looking back, it is quite obvious. But then again, we had to see it in the hands of testers to actually know it for sure. And that is simply the way it is. So here you are: The 8-step guide to interaction design for iOS and Android games. I hope this makes your life a bit easier and your designs a bit better.

Chapter- 6

Results & Discussions

6 Evaluations and Analysis for User Experience

Mobile is the future of everything. Mobile technologies are changing not only the way we search the web or play games, but the way we live. So it's not surprising that this growth attracts investors, who in their turn, make the mobile platforms accessible for wider masses. There is a lot of discussion about how to create usable mobile apps with smooth and flawless UX, but few people talk about the mobile game-player experience.

6.1 What Is Playability and Player Experience?

Playability is the degree to which a game is fun to play and usable, with an emphasis on the interaction style and plot-quality of the game. It's the quality of gameplay. Just like Norman's 10 Heuristics that have become rules of good usability, there are a number of playability heuristics that serve as game design evaluation tools. Playability heuristics are a set of guidelines to improve game design, while player experience is about improving gaming.

6.2 UX Challenges in Mobile Games

Mobile games are not like PC or console games. There are major differences between these three main gaming platforms that need to be considered in terms of player experience.

- Screen size. PC and console games are played on “huge” screens compared to mobile games. This greatly affects design.
- Ergonomics. Probably the biggest challenge in mobile user experience is that players actually hold the gaming device in their hands. This means that the player holds both the game controls and the screen, which makes it harder to design an ergonomic user interface.
- Touchscreen controls. Touch screens lack tactile feedback, which makes it harder to provide the same level of gaming experience as PC or console, especially in more complex games.

Considering all the limitations and opportunities, mobile game developers seem to specialize more in casual games where mobile gaming has more to offer. But how can we use the strengths of the mobile platform while minimizing the discomfort of small screens and weird controls?



Figure 6.1 Casual Game

6.3 Create Easy and Friendly Tutorials

There is a general belief that players hate tutorials. It's not true. Players do hate tutorials that are heavy with text, boring and take a long time to complete. Unfortunately, this is the state of most mobile game tutorials. Some developers prefer not having a, But a good tutorial can be helpful for player experience. It creates an instant understanding of the game storyline and basic controls, which improves game play and ease of use. A usable tutorial is short and comprehensible with as little text as possible. It engages users to play right away. Make sure to have a “skip tutorial” option for experienced users and for the rest, keep the tutorial completion time under 1 minute. Two Dots does a great job with its tutorial. As you play elementary levels of the game, you also learn to play along the way.



Figure 6.2 Two dots user interface

6.4 Design for Small Screens

Limited screen space makes every inch of it more valuable and designers have to use it wisely, considering also how users hold the device. In most PC games, action buttons and controls are studied in the corners of the UI, which is natural for a desktop experience but on mobile it becomes unusable. The average mobile user has a hard time reaching the corners of the screen. So it's better to keep the most important buttons in the centre of the screen. This mainly refers to portrait view, but in many cases with all the disadvantages of touchscreens in mobile gaming, there is one unique tool that makes all the difference gestures. This is one of the reasons why touchscreen mobile games have such huge success. Who wouldn't love to play car race game while tilting the screen like a real steering wheel instead of just pressing a key?



Figure 6.3 Touch screen games

Gestures make game play more natural and more enjoyable. It also offers good ground for innovative solutions that can make games extra fun. But try to keep those gestures on an intuitive level. It doesn't make sense to use already familiar gesture of pinching to zoom for something entirely different. Instead you can delve deeper into your game storyline and try to come up with new gestures that are inspired from human behaviour and can benefit the experience for players. A great example of real-world inspired gestures can be found in the perennial favourite Angry Birds, where you use swipe to catapult birds.



Figure 6.4 Angry birds Gestures

users hooked regardless of minor faults and poor design. Take for instance [Flappy Bird](#) — it doesn't boast sleek and usable design, nor does it use intuitive gestures. It's all about tapping. But it did below out app store charts because it is fun.

6.5 Principle for game UX

However games are not only fun. Actually, taking back principles of game design, the “fun element” is the cherry on the top of the cake, but not the most important. This is because games are basically rules based systems and they can influence people's behavior. No wonder people talk a lot about the concept of [gamification](#) (the use of game design elements and game design thinking into nongame contexts) as a way to extract the best of the game design components to apply into contexts that are usually boring. This is because gamification is about motivation. It's making people do something that they are not very keen to do, but if we design this experience properly, then we will have a massive behavior change. In the middle of this conversation, UX appears to be the biggest challenge of the implementation of gamification. Well, as we know, UX could have a strong relationship with games and game like activities. If we take as an example Hassenzahl's Model, it is clear that good UX refers to a combination of product features (content, presentation, functionality, interaction), product character (composed by pragmatic and hedonic attributes) and a consequence, which enhances pleasure, satisfaction and it's appealing to the user.

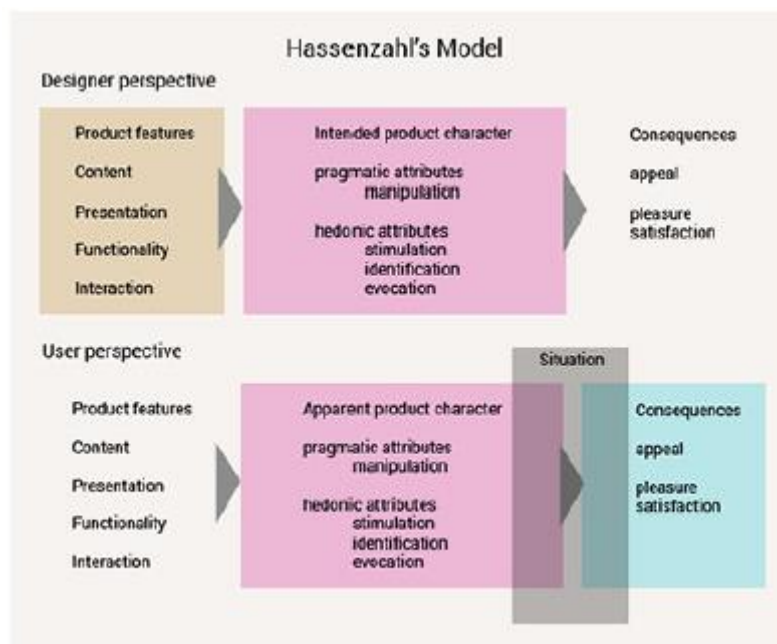


Figure 6.5: Based on Hassenzahl .

Well, from my point of view it is clear that game elements could be combined to UX. For example, according to Hassenzahl “good UX is the consequence of fulfilling the needs for autonomy, competency, stimulation, relatedness and popularity”. If we put all those elements together they have a strong relationship to motivation. Therefore, it is possible to say that if we achieve good UX, we will be able to motivate the user to perform

specific tasks. For that I will try to combine the elements of game design, gamification and UX together and try to bring a better perspective of all those concepts together. Just to mention, gamification is not a game, but a design process involving motivation.

Conclusion and Future work

If a game is able to design a good set of UIs that are created under the golden principles of software quality, then it is likely that the game will be widely appreciated and played by the intended audience. Among those principles are efficiency, conciseness, portability, consistency and reliability, but in reality there is a never ending list of the rules and principles that can generate an even better set of UIs. For achieving the high goals of progress and effective communication of the game perspective, the UIs should be designed under close and calculated supervision of the stake holders, and the end users should be involved in the process of construction and design

Building a delightful player experience is certainly easier said than done, but thankfully mobile games are pretty flexible and you can make almost any UI change even after launch. Make sure to track how players interact with the game interface to understand where they are facing difficulties and improve the UX accordingly.

As we saw, gamification as a design process that focuses in a behaviour outcome, powered by motivational aspects. The application of gamification in UX process is crucial for a more persuasive and meaningful experience. However there is still a lot to think about this topic. Also, in UX design management, gamification could be employed as a way to make the team to work better together. But again, this is all about motivation and all our understanding about it. So if you're interested, have a look in the references mentioned in this post. I can't wait to see what will come next!

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