TALLINN UNIVERSITY

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Implementing Game Design Process and Game Elements in Mobile Application. The Case of *Walk With me*

Master Thesis (20 EAP)

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Author's Declaration

I hereby declare that thesis "Implementing Game Design Process and Game Elements in Mobile Application. The Case of *Walk with me*" is a result of my independent work and effort. I certify that to the best of my knowledge it does not infringe upon anyone's copyrights. Where other sources of information have been used, they have been acknowledged. This thesis has not been submitted anywhere for any other comparable academic degree.

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Abstract

This master thesis covers the first design stages of mobile application *Walk with me* – an application for popularising walking and facilitating spending time outdoors. Game design as a process and game elements as variety of motivating tools are applied in the design process. The purpose of this thesis is to find out how to implement game design process and game elements in mobile application having a playful and engaging experience as a result.

The study has been conducted within the frames of design research and it consists of two main stages: concept and elaboration. Before conducting the design stages an overview about different approaches of game design process and game elements is presented.

Concept of *Walk with me* was evaluated via interviewing sessions with an expert and with representatives of target group. Results of interviews gave the input for refining the concept and defining game elements in the next elaboration stage.

During elaboration stage two iterations were conducted: the first with paper prototype and the second with functional prototype. Prototypes were playtested for getting feedback to the design in realistic conditions and for evaluating whether the mobile application is found playful and engaging enough for being popular among target group.

As the result of research it could be stated that implementing game design process and game elements in *Walk with me* was successful and the development of the application should be continued with next stages.

Keywords:

Game design, game design process, game elements, gameplay, mobile applications, mobile guides, prototyping, paper prototyping, functional prototype, playtesting.

Table of contents

List of figures

List of tables

Introduction

Author of current thesis was inspired by Jesse Schell's provoking questions in his book "The Art of Game Design: A book of lenses" (Schell, 2008):

- What is an experience I had in my life that I would want to share with other people?
- In what way can I capture the essence of that experience and put it into my work?

Answering these questions the author of this thesis was led back to a following experience. In year 2011 when Tallinn was The European Capital of Culture Linnalabor, organization which calls itself a testing ground for urban innovations, created an urban orienteering game "**Maastikumäng**" for exploring areas of Kalamaja and Pelgulinn (Linnalabor, 2011). Based on experience of author of current thesis the game was very interesting and enjoyable to play. Simple activity as walking in the city environment was turned into a quite playful and engaging one. At the same time it was **physical** – it took about 4 hours by walking; it was an **outdoor activity** – it made to re-explore urban environment and realize that even places passed every day can be interesting and have their own story and charm; and it made to **learn and experience something new** – in every checkpoint there was a question to answer by looking around or challenge players knowledge. Altogether the whole game experience was fun and catchy. Playing it with friends made it even more valuable – it brought out **social** factors and collaboration.

But the gameplay itself was not very comfortable in **technical support** point of view. Participant had to print out a game sheet in format A3 preferably in colour print. So the large-scaled map was a quite unhandy to use during the game. Also there was no **feedback** for the player. During the walking there were occasions when it was not clear is the current location the same as the requested spot on the map. The answer sheets were for submitting on paper to post box of Linnalabor or electronically by e-mail. So to send answers the participant had to re-type them from crumpled paper. From author's own experience the feedback was needed more operatively and the supporting facilities could have been more interactive.

Taking Schell's suggestion into consideration author decided to try to capture and share the same great experience of playing game "Maastikumäng" by creating her own outdoor game which motivates people to spend time outside, walk around and which also gives several meanings to the walking – physical health and new knowledge. But at the same time the activity should be supported

by a well-advised **technical solution** which is very easy and handy to use. The whole process from deciding to go walking to finishing it should be playful but seamless – participant should be able to enjoy all benefits of walking and looking around, at the same time all organizational issues are solved unobtrusively. It should be an upstanding alternative for example for going to the cinema or theatre. The title of the full package of this engaging walking activity is ***Walk with me***.

As the technical solution is one of the most important challenges the **choice of the technology** should be made – which device and which type of software should support the game and how. Computer science researchers as well as companies are also devoting an increasing attention to physical activities. The developed products fall in three categories (Buttussi, Chittaro & Nadalutti, 2006):

- computer supported physical games;
- virtual trainers;
- mobile applications and devices for physical activities.

As the *Walk with me* will be rather mobile and played outdoors then computer supported physical games will not be a suitable category. Also a category of virtual trainers is not the best match because the essence of *Walk with me* will not be sports.

Therefore the author assumes that the most suitable category among described by Buttussi et al. is a mobile application for physical activities and the supporting device for such an game as *Walk with me* is the **smart phone**. Smart phone is something that is already in most of our pockets, also going walking; it comprises a full readiness for computing an application for interaction between the user and the pre-defined system; it has an ability to know our location and give us directions. So out of three abovementioned categories author has chosen **mobile application** as a format of technical support and framing.

According to The Nielsen Company among all mobile applications games already are and continue to be the most popular category (The Nielsen Company, 2010). Sixty-one percent of smartphone owners report using a game application in the past 30 days. Therefore creating a game as a mobile application is not new phenomenon.

Also an increasing amount of scientific publications indicates a wide research interest in exploring how mobile applications can be designed and used to support a wide range of intellectual and physical activities (Spikol & Milrad, 2008).

Phenomena what is less researched but still discussed and practiced, is gamification - the use of game design elements in non-game contexts (Deterding, 2012). Walking as an activity by default is not a game or related to gameplay. The definition for a word "walk" is "to move with your legs at a speed that is slower than running" (Merriam-Webster, 2014). But as the goal of *Walk with me* is to offer, besides a movement or physical activity also a playful experience, using game design approaches and game elements become relevant. This is the reason why the author has chosen game design as an approach to change walking as an activity more popular, practiced and enjoyed. Author's experience of playing Linnalabor's "Maastikumäng" also confirms that the assumption that **redesigning walking** as an activity through "game lens" could incur successful result. So author has chosen the domain of **game design** as an underlying approach for designing the mobile application *Walk with me*.

Goal of current thesis is to **carry through pre-production phases for creating a mobile application for walking facilitator called *Walk with me***. The output of thesis should be usable input for next phases – for assigning the work to system architect, analyst and developer.

Besides carrying out the first phases of creating a mobile application, current thesis focuses on following **research questions**:

- How the **theory and practice of game design** is adaptable for creating application for facilitating spending time outdoor and walking around?
- How to adapt **game design as a process** to a design of a mobile application?
- Which **game elements** as variety of tools for motivating and engaging participants should be implemented?

1. Literature review

In current chapter author gives an overview of literature about three core concepts necessary for designing a mobile application *Walk with me* as targeted in introduction – game design process, game elements and mobile guides.

1.1. Game design as a process

As there are different approaches to software development process there is also a variety of understandings how games should be created and designed. In this chapter a review about how different authors have described game design as a process is given. In the parallel it is analysed how these approaches could be implemented in design of *Walk with me*.

As presented in Figure 1 Ernest Adams has divided the process of game design into three major parts (Adams, 2010):

- **concept stage** – carried out first and its results do not change;
- **elaboration stage** – most of the design details are added and decisions are refined through prototyping and playtesting;
- **tuning stage** – no new features added, only small adjustments are made to polish the game.

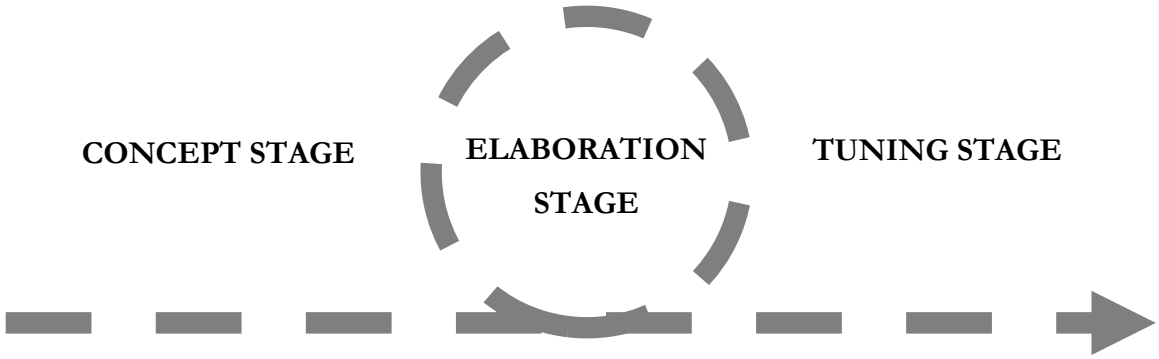

Figure 1. Three stages of the game design process (Adams, 2010)

Every stage consists of certain steps presented in Table 1. Adams' suggestion that decisions made during concept phase should not change later forces the game designer to build up his or her confidence. During this stage the **fundamental choices** are made and it is quite predictable that

game designer's ideas will not match with every friend and colleague's understandings. Still author assumes that sharing ideas with others could be useful especially for a beginner.

Table 1. Tasks performed in three design stages (Adams, 2010)

CONCEPT STAGE	ELABORATION STAGE	TUNING STAGE
▪ Defining the fundamental game concept, including the game's genre ▪ Defining an audience ▪ Determining the player's role in the game ▪ Thinking about how to fulfill the player's dream	▪ Defining the primary game mode ▪ Designing the protagonist ▪ Defining the game world ▪ Designing the core mechanics ▪ Designing additional modes ▪ Designing the first playable level ▪ Writing the story ▪ Building, testing, and iterating	▪ Entire design is locked and no more features may be added to the game ▪ Small adjustments to levels and core mechanics ▪ Polishing – removing imperfections

Defining a **target group** is certainly relevant in project designing *Walk with me*. The decision of technology already made in advance of smart phone mobile application leave out people who do not have a smart phone. But predictably more choices defining representative players will be made.

The determination of **player's role** becomes more relevant in video games where a player can pretend he or she is someone else – take someone else's role. Still it cannot be excluded that it is also possible to design a walking game which puts a walker into a certain role, e.g. a treasure hunter.

Considering the target audience author of current thesis as a game designer should ask which **needs and dreams** could be fulfilled through the game *Walk with me*. It could be a wish of being healthier, need to be physically more active, more social or other.

During elaboration stage the first **prototype** will be constructed, tested and improved iteratively. But before being able to prototype gameplay modes, protagonist, game world, core mechanics, levels and a story should be defined (Adams, 2010). In case of *Walk with me* different **gameplay modes** could be interpreted as different views in mobile application, e.g. a view of choosing a walking tour or a view of navigating. As well as in games there is one primary mode, e.g. in car racing game a mode of driving car, and additional modes, e.g. choosing a car, there is also a primary and additional

views in *Walk with me*. Defining the **protagonist** relates to the role of the player described in concept phase. Depending on if the player will have to take some role in game there will be a protagonist or not. As we know that the mobile application *Walk with me* will perform a supporting function for actions in real world (walking), there is no need to create a full **game world** but transitions between real world and application should be thought through.

Core mechanics is the heart of a game (Adams, 2010) and it is important also in *Walk with me*. Core mechanics consist of the data and the algorithms that define the game's rules and internal operations in detail. **Levels** in the context of *Walk with me* could be represented in different walking tours – playable packages which will create the experience of a game. Levels can be just different, but also can represent different degrees of difficulty. Walking as a physical activity by default is not related with **stories**, but it is possible to create associations with one or different stories to offer some mind activity also.

After defining all abovementioned components "cooking and tasting the game soup" will begin – making several versions of **prototypes** and **playtesting** them. Tuning stage will "lock the recipe" and only minor refinements will be made.

Schell has his own view of game design as a process (Schell, 2008). As presented in Figure 2 he divides design stages into seven steps:

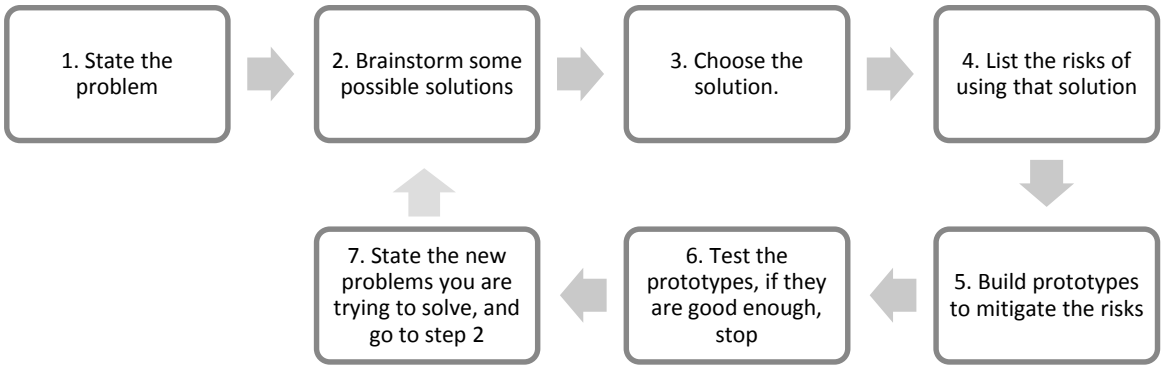

Figure 2. Game design loop (Schell, 2008)

In comparison with Adams' and Schell's approaches to game design process Schell is more general and Adams is more specific describing different stages. There are some overlaps but also some differences. When Schell is talking about stating a problem and finding possible solutions for the

problem Adams is calling to fulfil player's dreams. What is covered less by Adams is risk assessment stressed by Schell. Schell suggests to carry out a stage when is considered all things that could go wrong and generated also solutions (Schell, 2008). Schell as Adams also emphasises prototyping and testing. Schell states that the prototype should not be digital and it could be done on paper to save valuable time resource.

In game design as a process **iterative approach** is very common. It is confirmed by all reviewed authors – Adams, Schell, Salen and Zimmerman. Adams (Adams, 2010) asserts that unless a game is very small, iterative approach should be used. But he also states that not all parts of the design process can be revisited. Some such as the choice of concept, audience, and genre, should be decided once at the beginning and should not change thereafter.

Salen and Zimmerman add that even learning to design games should be iterative – by learning from the feedback for the things they make. There's no hands-on guide to game design process, but the iterative way of thinking is emphasised (Salen & Zimmerman, 2004). Iterative approach itself is not firstly introduced in game design, but it has its own demodulation in it. Iterativeness in game design is a cyclic process that alternates between prototyping, playtesting, evaluation and refinement (Figure 3). In these cycles design decisions are made based on the experience of playing the game while it is in development. Salen and Zimmerman also point out that the rough version (e.g. paper prototype) of the game should be prototyped and tested as **early** in the design process as possible to test its fundamental rules and core mechanics. So the play itself becomes an act of the design process. Prototyping and testing in a very early stage avoids the situation when prewritten design documents often hundreds of pages long become obsolete and dismissed as soon as production development starts. The reason why iterative design is so important lies in the fact that it is impossible to completely predict the experience of a game. But experience itself is a ground reason why the game is played.

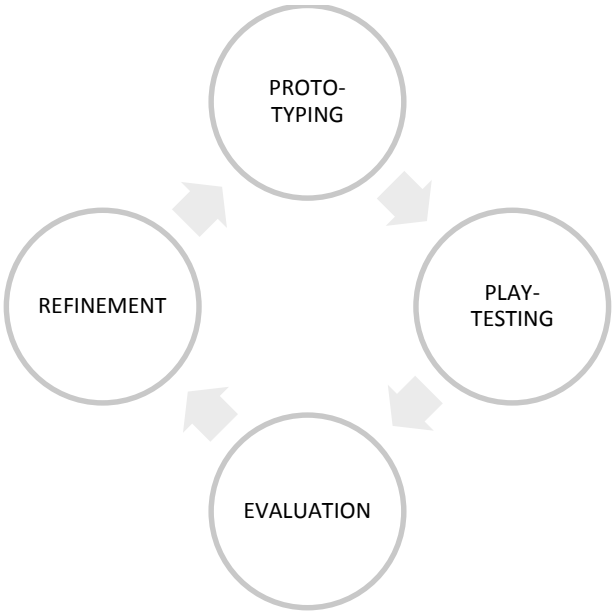

Figure 3. Iterative design process (Salen & Zimmerman, 2004)

At the same time Adams recognizes the danger of irresolution – iterative refinement is not an excuse to introduce major changes into the game late in its development, nor to tweak it endlessly without ever declaring it finished (Adams, 2010).

1.2. Game elements

In previous chapter some of game elements were already mentioned, e.g. levels and stories. As there is no one acknowledged list of game elements, in this chapter the review about different classifications and lists of game elements contained in games will be presented and analysed. It should be also noted early that different authors use different terms: game elements, game challenges, and game mechanics. The goal of current thesis is not to analyse the use of terms. This thesis aims to compose a diverse list of pieces that could be implemented in *Walk with me* to make walking as an activity more desirable and engaging.

According to Karl M. Kapp game elements are what make a game motivational, exciting and irresistible. He also points out that any game element separately cannot make an engaging,

immersive learning environment. The relationship between different elements is what makes ta game engaging (Kapp, 2012).

As presented in Table 2 Kapp describes twelve different game elements that are more common.

Table 2. Game elements (Kapp, 2012)

GAME ELEMENT	CONTRIBUTION TO GAME PLAY
Abstraction of concepts and reality	▪ Helps the player manage the conceptual space being experienced. ▪ The cause and effect can be more clearly identified. ▪ Extraneous factors are removed. ▪ Reduces the time required to grasp the concepts.
Goals	▪ Adds purpose, focus, and measurable outcomes. Visually understanding how far you are from a goal provides incentive, feedback, and an indication of progress as well as a measurement against others. ▪ Goal gives the player the freedom and autonomy to pursue it using different approaches and methods.
Rules	▪ Operational rules – describe how the game is played. ▪ Constitutive rules or foundational rules – underlying formal structures dictating game functionality. ▪ Implicit rules or behavior rules – govern the social contract between two or more players. ▪ Instructional rules – govern the learning within the process of the game.
Conflict, competition, or cooperation	▪ Conflict – challenge provided by a meaningful opponent. ▪ Competition – challenge where opponents are constrained from impeding each other and instead devote the entirety of their attentions to optimizing their own performance. ▪ Cooperation – act of working with others to achieve a mutually desirable and beneficial outcome.
Time	▪ Motivator for player activity and action. ▪ In some cases can also be a resource that needs to be allocated – pushed player to prioritize activities. ▪ Can be compressed to show consequences of actions more quickly than during the natural course of events.
Reward structures	▪ Leaderboards, badges, rewards, points. ▪ Extra abilities of prizes that can be earned for accomplishing certain tasks within the game.
Feedback	▪ Feedback on progress toward goal, amount of life or energy left, location, time remaining etc. ▪ Designed to evoke the correct behavior, thoughts, or actions.
Levels	▪ Game levels – level- or mission-based structure whereby players progress from one level to the next as they move toward end of the game. ▪ Playing levels – degree of difficulty the player chooses when he or she first enters the game. ▪ Player levels – level of experience and skills the player receives playing the game.
Storytelling	▪ Underlying story provides relevance and meaning to the experience, context for the application of tasks, and guide action.

Curve of interest	▪ The flow and sequence of events that occur over time that maintains the player's interest.
Aesthetics	▪ Appropriate and aligned visuals, attention to detail, simple contrasts or colorful backdrops create an immersive environment that contributes to the overall game experience. ▪ The cues and small details add to the game environment and convey meaning.
Replay or do over	▪ Gives the player permission to fail. ▪ Allowing to fail with minimal consequences encourages exploration, curiosity, and discovery. ▪ Failing several times before success instills the feeling of accomplishment once a winning state is achieved.

Adams' approach to game elements is on higher level. He defines four essential elements of a game (Adams, 2010):

- **Play** – participatory and interactive form of entertainment, where choices and actions affect the course of events; includes the freedom to act and the freedom to choose how to act.
- **Pretending** – act of creating a notional reality in the mind; real world concepts, situations and events have significance and certain meaning in game world.
- **Goals** – objects defined by the rules.
- **Rules** – definitions and instructions that the players agree to accept for the duration of the game.

Comparing game elements described by Adams with elements described by Kapp "goals" and "rules" are recurring and overlapping, "pretending" can be matched with "abstraction of concepts and reality". But one term "play" incorporates all the interaction performed by player and with player.

Many game elements presented by Kapp are defined by Adams as **game challenges**, such as (Adams, 2010):

- **time pressure** – e.g. time counting, accomplishing something before someone else;
- **memory and knowledge challenges** – e.g. trivia questions;
- **exploration challenges** – e.g. finding keys, hidden passages;
- **conflict** – e.g. survival, reduction of enemy forces;
- **economic challenges** – e.g. gathering resources;
- **conceptual reasoning challenges** – e.g. detecting hidden meanings;
- **creation challenges** – e.g. aesthetic success.

Adams (Adams, 2010) also stresses that to make a game more entertaining following aspects should be considered:

- **aesthetics** – game has to be designed with a sense of style and created with artistic skill;
- **harmony** – every element and aspect of the game should fit together into a whole;
- **storytelling** – story helps player to relate with the game and understand the flow of events;
- **risks and rewards** – every risk should be accompanied by a reward, it raises the level of tension and makes success or failure more meaningful;
- **novelty** – introducing new elements and changes in gameplay makes the game enjoyable;
- **learning** – so long as a game keeps offering new things to learn, it remains fun;
- **creative and expressive play** – people love to create and design things;
- **immersion** – losing track of the outside world, immersion could be tactical, strategic or narrative;
- **socializing** – people love to play games together.

Schell (Schell, 2008) introduce the **elemental tetrad** presented in Figure 4. Elements that are in the upper part of the figure, e.g. aesthetics, tend to be more visible for the player. Schell states that none of four elements is more important than the others. Every element of these four is essential and demand decisions designing every game – considered separately and also together as a whole.

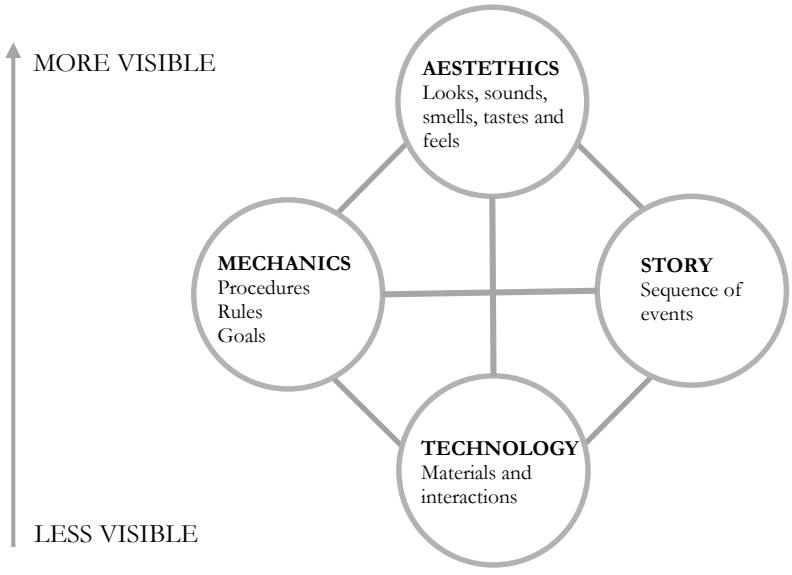

Figure 4. Elemental tetrad (Schell, 2008)

As Adams listed different types of game challenges, Schell describes six types of **game mechanics** in more detail (Schell, 2008):

- Every game is played in some kind of **space**. Schell suggests inspecting the space without any visuals or aesthetics – only an abstract construction. Game space defines the various places that can exist in a game which are relationships or connections between one and another. Space can be discrete or continuous. Space can have different dimensions, also boundaries.
- Within game space there are different **objects**: characters, tokens, and scoreboards etc., anything that can be seen or manipulated in a game. Objects have one or more **attributes**, e.g. in racing game a car has a maximum speed. Each attribute has a current **state**, e.g. 260 km/h could be the state of a maximum speed. Objects are nouns, attributes are adjectives. Attributes can be static or dynamic. Not all objects, attributes and states have to be public to the player at the first place. Some of them can be discoverable or remain known by the game only.
- Next important game mechanic is **actions** – verbs of a game. There are operative actions – base actions a player can perform, and resultant actions – only meaningful in the big picture of the game. Resultant actions can be performed via different operative actions.
- The most fundamental mechanic is **rules**. Rules add the goal to the game. The rules can be divided in different types, e.g. operational, foundational, behavioural etc. The most important rule is the object of the game. There is one ultimate goal and different sub-goals. Good game goal is concrete, achievable and rewarding.
- Focusing on the player, **skill** is also considered as a game mechanic. Skills can generally be divided into three main categories: physical, mental and social. Some of the skills could be improved during the gameplay.
- Game mechanics that concerns interactions between all of other five is **chance**. Chance means uncertainty and uncertainty in turn means surprises, surprises are an important source of human pleasure, and the secret of fun.

Six categories of game mechanics described by Schell draw a structural and distinctive architecture of a game. Every piece of a game could be placed in a certain spot according to this classification.

Reviewing all varieties of game elements by Kapp, by Adams and by Schell very versatile assortment of different ingredients of successful game is presented. All three reviewed authors have asserted that usage of every element should be deliberated, reasoned and they should constitute a whole.

As the result of analysis of above presented approaches author of current thesis proposes the list of essential game elements:

- **Goals** – the ultimate goal and also sub goals for accomplishing the high level goal; related to and depending on the story of the game.
- **Gameplay** – structure of the game; what the player has to do and how; what makes the player motivated and interested.
- **Challenges** – assignments for the player – pieces of the gameplay; related with time, knowledge, memory, exploration, conflict, competition, cooperation, economic, conceptual reasoning, creation etc.
- **Rules** – regulations and limitations for the gameplay.
- **Feedback** – communication about the progress, consequences to the actions, rewards and other features for interaction from game to the player.
- **Facilities** – devices (e.g. computer program, mobile application), materials, pieces (e.g. board, map) and other objects supporting and mediating the game; visible part of it is considered as game aesthetics.

Author's list of game elements is taken as underlying input for designing *Walk with me*.

1.3. Mobile guides

Mobile guides are defined as "systems that guide mobile users by providing local and location-based services, such as navigation support and tourism information" (Schmidt-Belz, 2003).

Digital guides often borrow design features from existing sources of information in use, such as **guidebooks**, **tour guides** and **tourist information centres** (Graham & Cheverst, 2004). Of these three, clearly the guidebook in comparison with tour guide or tourist information centre is less intelligent and lacks the dialog with the visitor. *Walk with me* should be an analogue of a tour guide – companion who is smarter than the participant, who solves all issues related to the organizational part of the tour and interacts with the participant.

Mobile guides can be characterised by five dimensions (Kray & Baus, 2003):

- **Basic features**, such as the positioning technology deployed within the system;
- **Situational factors**, including the user's ability to select content;
- **Adaptation capabilities**, such as the system's adaptability to user position;
- **Interface and user interaction**, the system's support for multiple modalities and natural language, for example;
- **Architecture** or the network and system technology used to develop the guide.

While developing mobile guides following restrictions of mobile computing should be considered and evaluated (Kenteris, Gavalas, & Economou, 2009):

- restricted energy capacity – considered in the duration of the walking tour;
- cost of wireless connections – the capacity of the data requested and downloaded via internet;
- amount of memory and storage space – the capacity of data saved into the smart phone device;
- display size – there is lots of different display sizes, but the application should be usable and aesthetical in all of them;
- small and hard to use keyboard – the application should not ask participant to type long texts.

1.4. Previous projects

Next several projects are reviewed which have integrated aspects of "game", "walking" and "mobile" – similarly as *Walk with me* will do. The purpose of the review of previous projects is to get ideas and information about possible solutions also from the practical side, in addition to theoretical approaches reviewed above. In this chapter some reviews also cover research, e.g. *GUIDE* and *Trammate* – evaluating mapping problems, *MOPET* – combining mobile guide and fitness, *Skattjakt* – combining physical activities and mobile games to promote novel learning practices. Results from previous research are valuable input for author of current thesis in creating and designing *Walk with me* – implementing game design process and choosing game elements.

1.4.1. Geocaching

Geocaching is the expression of 21st century's hide-and-seek. In essence it is a kind of a GPS-enabled treasure hunt. It is an activity of hiding a waterproof container in a particular location, then publishing the latitude and longitude coordinates of the location on a geocaching web site (the worldwide version – geocaching.com; the Estonian version is geopeitus.ee) for other "geocachers" to find using a GPS device.

Ever since the first geocache was hidden in 2000, the hobby has grown considerably and now there are several hundred thousand caches hidden worldwide (O'Hara, 2008). A cache will contain a "log book" to be signed and dated by those who have found the cache and potentially "treasure" depending on the size of the cache. Such "treasure" is generally low in value, consisting of small toys, coins and travel bugs. Participants exchange this treasure – if they take something from the cache they must leave something of similar value. One version of geocaching is a Multi Cache in which participants go to several caches to get enough information to work out coordinates to a final cache containing the log book and treasure. Another variant is the Puzzle Cache where participants solve a puzzle to work out the coordinates of a cache. On the web site, each cache has its special web page where all information about the cache is presented: the coordinates, contextual information about the cache, the site, maps of starting points, a puzzle to work out the coordinates, useful tips or things to look out, cache logs and related photos for etc. Each cache has a two-digit rating of difficulty: a first digit rating difficulty of terrain; a second rating difficulty of the puzzle (e.g. a 5-5 is the most difficult).

There are hundreds of smart phone applications supporting geocaching, e.g. *Geocaching* – application for Android by Groundspeak Inc (Google Play, 2014). This mobile application as illustrated in Figure 5 helps player to:

- spontaneously find nearby geocaches;
- plan a geocaching adventure;
- log findings;
- navigate to geocaches with a map or compass view;
- view geocache details, photos and hints.

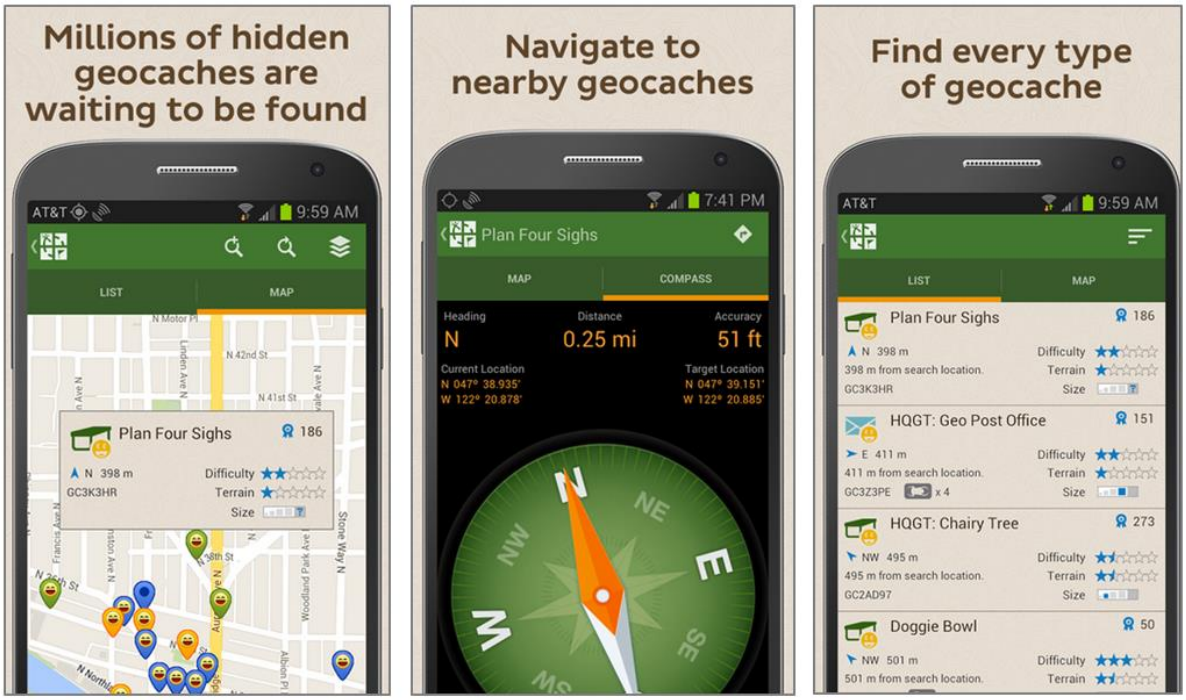

Figure 5. Android application for Geocaching (Google Play, 2014)

1.4.2. MOPET

Buttussi et al. have investigated the use of mobile guides in fitness activities, proposing the Mobile Personal Trainer *MOPET* application (Buttussi et al., 2006), which brings mobile guides and fitness activities together. *MOPET* uses a GPS device to monitor user's position during her physical activity in an outdoor fitness trail. It provides navigation assistance by using a fitness trail map and giving speech directions. In addition *MOPET* provides motivation support and exercise demonstrations by using an embodied virtual trainer, called Evita, who shows how to correctly perform the exercises along the trail.

Buttussi et al. have evaluated the effect of *MOPET* on users' motivation as well as its navigation and training support on real users (Buttussi et al., 2006). They analysed GPS logs, questionnaires and videos of users' performance, which showed that *MOPET* is more useful than fitness trail maps for helping users to orient themselves in a fitness trail. *MOPET* is also more effective than informative boards or posters for learning how to correctly perform exercises.

1.4.3. Skattjakt

Spikol and Milrad involved children in the design process of mobile game Skattjakt to give new insights regarding the nature of their learning practices while learning with games (Spikol & Milrad 2008). Skattjakt ("treasure hunt" in Swedish) was conceived and developed to encourage young people to get physically active by solving a mystery surrounding a castle located on the university's campus. The game was inspired by the ideas behind treasure hunts activities and the sport of orienteering, a traditional running port involving navigation with a map and a compass.

Spikol and Milrad found that by working with the students in the post-game activities and through the design practices they could see how the players become more engaged in the activities by connecting the skills of making games to playing games. Using the co-design approach together with mobile games for exploring new learning practices show some promises in dealing with the challenges of creating authentic and engaging activities that combine physical motion and gaming (Spikol & Milrad 2008).

1.4.4. GUIDE and Trammate

Graham and Cheverst have studied the mapping problems in mobile guides – mapping the physical and the virtual planes during interaction with mobile guide (Graham & Cheverst, 2004). They state that failure to design for effective mappings can cause the failure to match users' expectations and a consequential loss of trust. They drew from two evaluations of two mobile guides: the GUIDE project from the University of Lancaster, England and the Trammate project from the University of Melbourne, Australia.

Graham and Cheverst describe six **characteristics of mapping problems** – issues concerning some element of coupling of dependency between the mobile guide and the physical world:

- **Determinism** – the intelligence of information provision and the constraints imposed on interaction with the system.
- **Transparency** – obviousness of the mappings between the system and the real world.
- **Accuracy** – the correctness of information.
- **Indexicality** – the broad contextuality of information: if information is provided in a context where it makes sense and in an appropriate manner given that context.

- **Predictability of content** – what a mobile guide may choose to present to a user given the current situation.
- **Predictability of behaviour** – how a mobile guide may choose to present a given piece of information to user given the current situation.

The **GUIDE** project resulted in a tour guide application developed for the City of Lancaster. The GUIDE system integrated the use of personal computing technologies, wireless communications, context-awareness and adaptive hypermedia in order to support the information and navigation needs of visitors to the city of Lancaster.

Based on evaluation by Graham and Cheverst the GUIDE had following problems:

- Determination and indexicality – user was over-determined: user could not see the information about attraction in the distance.
- Accuracy and transparency – guide did not have the entire information user needed to make sense of his situation; what was presented to user did not reflect that the system could not accurately determine his location.
- Predictability of content and behaviour – how the information was presented was not predictable: the guide presented changed information during repeated visits, but on third visit it was unpredictable and surprising for the user because the change was to big; some places did not have an audio description.

The **Trammate** project evaluated a functional prototype that integrated wireless communications, simulated location-awareness, a geospatial data service and a database of tram route information. The system supported journey planning for and travelling on the tram network in Melbourne, Australia.

Based on evaluation by Graham and Cheverst the Trammmate had following problems:

- Determination and indexicality – information in application was under-indexed, system did not deliver tram information based on the time and users' location; the map was represented in high level but not in low level.
- Accuracy and transparency – mapping between what is presented in the guide and the user's situation was not correct; information given to the user lacks transparency and thus the mapping between the information in the guide and the real world was confusing the user.

- Predictability of content and behaviour – guide was not predictable concerning what it presented to the user of the real world, it did not displayed the destination when the user was expecting it.

Graham and Cheverst do not consider a one-to-one coupling between problem and characteristic to be possible or even desirable. The goal of describing these characteristics is to understand key issues with developing context-aware devices better with a view to proposing solutions.

Graham and Cheverst emphasize that the **trust** in mobile guides is an important issue as also in the design of e-commerce websites. They conjecture users' trust can be gained and lost and regained over a short period of time. This is also pointed out in evaluation reports – users express how their trust to the mobile guide and especially to mapping issues changes.

Graham and Cheverst propose five interaction paradigms to provide assistance to designers building context-aware mobile guides:

- **Guide** – acts like a decision support system and can be compared to a guide on a hiking tour; exhibits "intelligence" through proactively making recommendations, and providing assistive information.; it also passes some initiative to the user during dialogues and filters information presented to the user.
- **Local** – acts like an information repository and can be compared to a local expert on a particular geographical area; tends to be more passive than a guide; respond when queried, passing all initiative to the user during dialogues; limited "intelligent" filtering of information.
- **Chaperone** – acts like an expert system and can be compared to a guardian; system interacts with the user only if they are doing something wrong.
- **Buddy** – idea of cooperation and shared responsibility for completing the user's work is important; has elements of the expert system, decision support system and information repository; exhibits high level of "intelligence" concerning its interaction with the user.
- **Captain** – acts like an expert system and uses an interaction paradigm similar to an on board navigation system in a car; takes initiative during dialogues and utilizes "intelligence" to filter information presented to the user heavily.

Each of the interaction paradigms described above can be understood in terms of the characteristics of mapping problems. Table 3 below maps the six mapping characteristics onto each of the

paradigms, with a view to gaining a better understanding to leverage design for context-aware mobile guides.

Table 3. Interaction paradigms and mapping characteristics (Graham & Cheverst, 2004)

	GUIDE	LOCAL	CHAPERONE	BUDDY	CAPTAIN
Determination	Medium	Low	Low	Medium	High
Indexicality	High	Low	High	High	High
Accuracy	High	High	High	Medium	High
Transparency	Low	Low	Low	High	Low
Predictability of content	Medium	Low	Medium	Low	Medium
Predictability of behaviour	Medium	High	High	High	High

Based on Graham and Cheverst paradigms author has chosen Local and Buddy to the main interaction approaches for *Walk with me*.

The Local paradigm has low determination, indexicality and transparency, but exhibits quite high predictability of content and high accuracy and predictability of behaviour. It is likely the Local paradigm would be effective at maintaining trust in stable situations where the domain is well-modeled.

The Buddy paradigm has medium determination and accuracy, high indexicality, transparency and predictability of behaviour and low predictability of content. The Buddy paradigm is likely to be effective where domain is not well-modeled and the situation is unstable.

1.4.5. Camelot

Game design methodology for children has been studied in example of the game Camelot – mobile outdoor game for small groups of children (Verhaegh, Soute, Kessels & Markopoulos, 2006). Camelot was designed with the aim to encourage social interaction between the players and to encourage physical activity. Design methodology suitable for designing for children was studied by

recording and reflecting upon the lessons learnt by applying a range of techniques for involving children in the design of interactive systems.

Camelot is a game where players collect virtual resources to earn parts of a physical castle. They are divided into two teams, and the team that finishes the castle first wins. The game is divided in four phases and at the end of each phase a part of a castle is built. At random times in the game a virtual ghost appears who can steal resources from the teams. To avoid this, teams have to quickly get to the ghost; the team that is the last to reach the ghost loses all acquired resources of the current construction phase, though completed construction phases are untouched.

Game design consisted from following stages:

- **User study:** Study to gain a first impression and understanding of how children play games outdoors, and what makes such play fun for them.
- **Concept design and evaluation**: Three different game concepts were developed at first and tested via paper prototypes and explaining scenarios.
- **Eventual game concept design**: taking into account the results of the concept tests, Camelot was designed.
- **Design of a tangible user interface**: Prototyping with Phidgets, evaluation with Peer tutoring.
- **Form design:** Choosing certain shapes for the collectors and resources.
- **Prototype implementation:** Developing prototype for acquiring virtual resource, displaying acquired resources, storing resources at the castle construction site and for other functionalities.
- **Evaluation of the final design:** final playtesting and reflection.

2. Research strategy and methods

Current thesis can be described as a design research. Artifacts of the research were: different approaches to game design process; classifications of game elements; smart phone as a device and technological platform.

Research problem "How to implement game design as a process and game elements in mobile application" was solved using game design process. Author chose the approach of Adams described in chapter 1.1 as an underlying procedure of designing *Walk with me*. The choice in favor for Adams was made because Adams's approach is the most comprehensive and systematic. As presented in Figure 6 in current thesis the first two stages – concept stage and elaboration stage (out of two iterations) was covered, and the third stage – tuning stage was not covered.

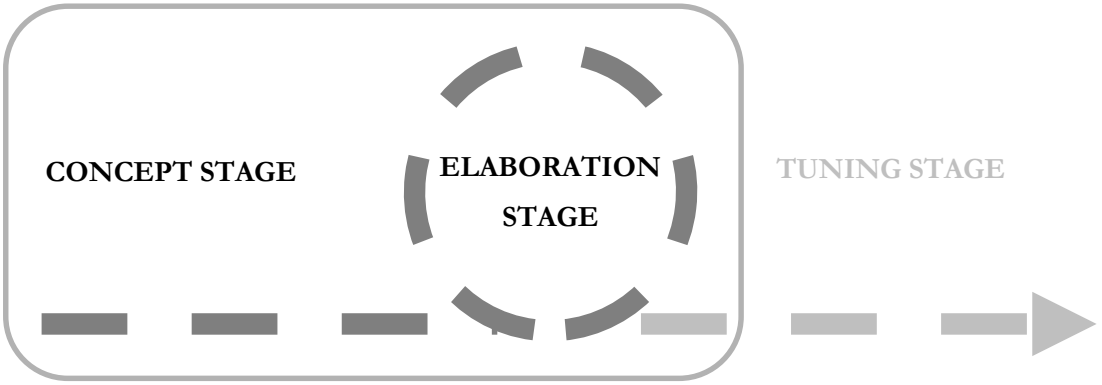

Figure 6. Game design stages represented in current thesis

In more detail the structure of current research is visualized by Figure 7 below.

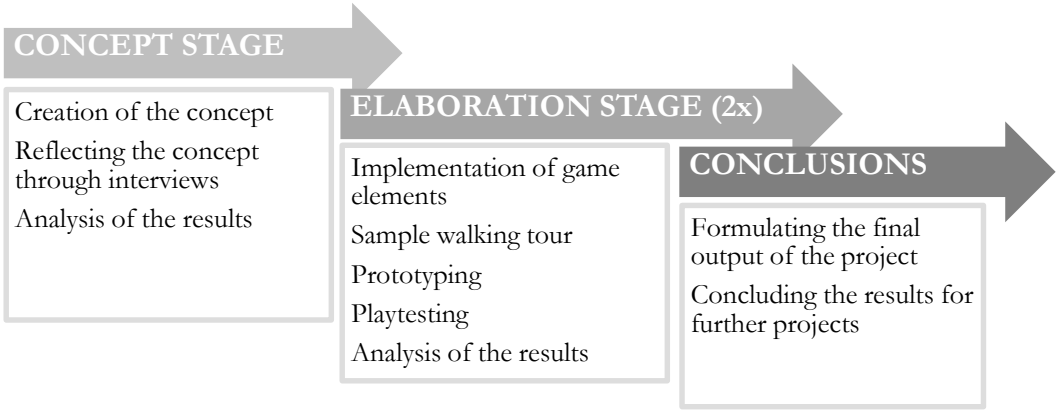

Figure 7. Structure of design research of Walk with me

At first author created a **conception** of a game *Walk with me*: genre, audience, player's role and dream that will fulfill through the game. The concept was initiated from author's cognition about target group's needs, but while it was created after thorough literature review about game design, mobile interactions and other related topics, the concept is influenced by these theories. The concept of *Walk with me* is presented in chapter 3.1.

After having a concept author carried out **interviewing sessions** with four representatives of the target group and one interview with the expert of game development. Interviewing step is not initially a part of Adams' game design process, but he still confirms that reflecting ideas with other people (friends, colleagues etc.) will improve the concept (Adams, 2010). Schell describes this method as focus groups – sessions where potential players are interviewed about their likes and dislikes, in an attempt to determine whether they like a game idea that a designer is considering (Schell, 2008). So the purpose of interviews was to get insights about the concept from different people, not to gather quantity of data. Insights and feedback were used for improving concept and building up the application in more detail.

Interviews with representatives of the target audience were held in a **semi-structured format** (Ley, 2013). Questionnaire guided the interviewing process but interviewer changed the order of questions and also reformulated them depending on current situation. Interviews were audio-recorded. Questions (Appendix 1) were formulated in a format to get qualitative information: opinions, experiences and attitudes.

Interviewees of target group were selected from author's professional circle; therefore most of them are also experts in some topic related to this thesis, e.g. project management or interaction design. Interviewees of target group stay anonymous, but main characteristics are presented in Table 4.

Table 4. Sample of interviewees and their characteristics

NO	AGE	SEX	FIELD OF OCCUPATION
1	34	Female	Accounting, finance
2	32	Female	Project management
3	37	Male	Web development
4	30	Female	Interaction design

The expert interview was carried through in **unstructured format** with Siim Puskai, co-founder at Stagnation Laboratory. The purpose of the expert interview was to reflect the concept of *Walk with*

me and get feedback from a person who has knowledge and experience of game design and development.

The results of all interviews are presented in chapter 3.2.

During **elaboration stage** the game design turned more into detail. The list of game elements proposed in the end of chapter 1.2 was taken as the basis for defining game elements for implementing in *Walk with me*. The result of this stage is presented in chapter 4.1.

If Adams suggests creating also the first playable level in elaboration stage (Adams, 2010) then in the context of current project it was formulated as first walkable tour – realistic sequence of checkpoints and the content for it. The sample walking tour was also a crucial input for a prototype. See the information about sample walking tour in chapter 4.4 and Appendix 2.

Based on the concept, all the design decisions made in the elaboration stage and the sample walking tour, the **prototype of a mobile application** was created. As it is suggested to carry through prototyping and testing iteratively (Salen & Zimmerman, 2004) there were also two iterations: in the first iteration creation and testing the paper prototype (Appendix 3) and in the second functional prototype (Appendix 4). The functional prototype was created as a clickable wireframe. Wireframes were created using Microsoft Paint and the web platform InVision was used for making the prototype interactive. As InVision has also a functionality of sharing and it makes the prototype accessible also via smart phone, it was used also for testing. Testers could use their own smart phone so the possible interfering effect of unfamiliar device was minimized. The decision of choosing InVision was based on author's previous experience of similar project.

Because even a veteran designer cannot exactly predict what will and will not work before experiencing the game firsthand, it is suggested that the game designer does **playtesting** (Salen and Zimmerman, 2004). Playtesting is method about getting people to play the game to see if it engenders the experience for which it was designed (Schell, 2008). Playtesting helps to get answers for questions raised in previous design stages, e.g. do players understand how to play? how long should the game last? which parts of the game are the most fun? etc. Playtesting of *Walk with me* was carried through in realistic conditions – walking through the sample tour and using the prototype of the mobile application. As presented in Table 5. Sessions of playtesting there were in all **five playtest sessions**: two of them with paper prototype and 3 of them with functional prototype. As

one session was carried out with two testers at the same time six persons were involved altogether. Results of playtesting *Walk with me* are presented in chapter 4.5.

Table 5. Sessions of playtesting

1st ITERATION – *Paper prototype*			
NO	AGE	SEX	FIELD OF OCCUPATION
1	32	Female	IT operations, banking
2	37	Male	Web development
2nd ITERATION – *Functional prototype*			
NO	AGE	SEX	FIELD OF OCCUPATION
3	30	Male	Computer hardware
4	35 + 35	Female + Female	IT operations + Retail business
5	31	Female	Engineering

After completing two iterations of prototyping and playtesting conclusions about results of the design research were made (see chapter 5). But as the project of creating the mobile application consists more issues and takes more steps than it could be covered in current thesis, the work for creating *Walk with me* will continue.

The local value of the research is the design of a mobile application *Walk with me* – concept and prototype. Global output is the conclusion about implementing game design process and game elements in mobile application – suggestions whether and how to implement game theories and practices in creating mobile application.

3. Concept stage

This chapter covers the first stage of current design research – the concept stage. During this stage the concept of *Walk with me* was created and evaluated via interviews.

3.1. Conception of *Walk with me*

Concept of *Walk with me* was created based of Adams' approach (Adams, 2010). At first background and author's assumptions were presented. After that fundamental game concept, game genre, target audience and player's role were defined. In addition the business model was briefly described.

3.1.1. Background and assumptions

Nowadays in modern society using the time most **productively** is a ubiquitous issue. People search and apply different methods for time and task management aiming to get more done during limited time period and as a result to have more free time – time for relaxation, exploring the world and spending time with friends and loved ones.

Deciding how to spend free time also incurs **choices**. There are countless different variants of spending free time. Possible choices practicable outside of home are: sports, cinema, café, theatre, shopping, museum etc. The most of these choices focus on a certain aspect (e.g. sports to physical activity, museum – getting new knowledge). Many of mentioned activities (e.g. cinema, café, theatre, also sports when done in sports clubs) mean spending time indoor. Also many of these (e.g. cinema and theatre) are quite passive not social although these are often chosen for friends or couples.

Therefore an activity that could help to take the **maximum out of limited and valuable free time** is needed – an activity which could combine several aspects and benefits, for example physical activity, spending time outdoor, communicating with friends, learning and entertaining.

Walking as an activity offers a moderate physical load and people have positive associations with walking (Kaczynski & Henderson, 2008). But walking itself by default has no purpose (unless it is going from point A to point B) and this could be the reason it is not practiced very often. To have more arguments for walking (besides physical activity) a person should generate the purpose by himself. This requires some pre-work (searching for interesting places and creating a walking tour of them). Still walking has a potential for combining different side-activities with it to get more benefits

out of it. So the designer assumes that relating walking with a goal and offering an entertaining experience people would go walking with pleasure.

3.1.2. Fundamental game concept

Mobile application *Walk with me* will fulfil a **dream** to take the maximum value out of free time. It takes a walking as a physical activity and adds learning, entertaining and social aspects to it. Also it gives arguments and meaning for spending more time outdoors.

***Walk with me* is a location-based mobile application – a platform which consist different tours for walking entertainingly and meaningfully.** It puts all important choices related to going out (such as where to go, what to see etc.) into attractive **walking packages**. Taking the cinema as an analogy choosing among different walking packages should be as easy as choosing among different movies. The advantage is the dependence of time and location is lower.

Walk with me offers similar experience as walking on the city streets as a tourist. It does not mean it forces to go crowded tourist spots. Conversely it makes to **notice and admire small and simple things in surrounding environment**. As a tourist in foreign city it is easy to do – everything is new and interesting, but in home-environment some kind of mind-set change is needed to switch on a "fresh mode".

3.1.3. Game's genre

Walk with me is an **adventure game** in a format of smart phone application – it incorporates physical activity, puzzles, exploration, learning and collecting objects.

3.1.4. Target audience

Target group of *Walk with me* is adults possessing and using smart phones. For entertaining kids and teenagers there are already thousands of mobile applications and games. In comparison there are significantly less entertaining applications for adults. Certainly there can be also users among teenagers, but focus is on adults.

Target user is a person who:

- is rather **active** – he or she do not have to be an athlete or physically in an excellent shape, but he or she should like the idea of walking around outdoor and exploring the environment;
- is **curious** about the world – he or she likes to try new and interesting things and acquire new knowledge;

Walk with me is at the same time suitable for a single participant, couples and also small companies (e.g. family, group of friends).

Walk with me is first of all for **local** people. There are hundreds of tourist guide mobile applications for locations around the world, but there is no guide for locals. Of course a person who has already passed all must-see sightseeing spots and wants to discover the area from different perspective (e.g. exchange students) *Walk with me* could be also suitable. As the lack of physical activity is more common among people living in urban areas the target of current project is also **urban**.

3.1.5. Player's role

Player's role in *Walk with* me is to spend time outdoor and do it by walking. He or she has to choose suitable walking route for him or her and pass all checkpoints of the tour. For passing checkpoints he or she has to walk to certain checkpoint and accomplish tasks given by the mobile applications.

3.1.6. Business model

Walk with me will be free to use and play for everyone, definitely in the first stage. The preliminary project of developing the application will be financed via donations and volunteering. After having a considerable amount of clients the idea of application will be introduced to managers of cafeterias, restaurants or other businesses suitable for integrating with walking tours. *Walk with me* is presented as a marketing channel for these businesses and therefore there is a potential to get additional finances as commission fees. During one tour application gives 1-3 different suggestions, e.g. gallery, bakery and cafeteria, but these suggestions are rather informative and can be skipped. So it is possible to pass walking tours also without buying anything.

Marketing of *Walk with me* will be driven mostly by social media. Walkers share their experience, so their friends get to know about the new application and it creates the amplification effect. In addition communication in public media (e.g. participating in television) will support the marketing strategy.

3.2. Results from the interviews about the conception

As described in chapter 2 the concept of *Walk with me* was evaluated via interviews. In all five interviews took place which gave an important input for further design stages. Results of interviews are presented in two following chapters: results of interview with an expert and results of interviews with representatives of target audience.

3.2.1. Interview with an expert

Expert interviewee **Siim Puskai** has been in front of IronCurtain Entertainment – business developing online games. Its first title was Utopia Revolution, a social strategy game. He has also collaborated to the GameFounders – the accelerator project for game start-ups.

At the present Puskai is a co-founder at Stagnation Laboratory. Stagnation Laboratory conceptualizes designs, builds and markets business-to-business and business-to-customer online services that need to penetrate different platforms and devices for reaching maximum audience without needing to invest into several different applications for each platform.

As an expert in current project he has the experience in game design and development, also in mobile as a device and a platform and also as a representative of the target group.

Interview with Siim Puskai took place on March 20, 2014. The interview itself was carried out in unstructured format. The topics on which the interview focused the most were:

- usage of different game elements;
- players' willingness to pay for such a game;
- using player as a co-producer of the content;
- social aspect of the game.

In general Puskai confirmed that the core concept of the game has potential and is worth to work on.

Variety of game elements and their usage were in discussion. Puskai stated that there is a considerable group of people who can be motivated by game elements that reflect the progress, e.g. levels and points. According to his opinion players do not expect for very deep meaning for the progress. He gave an example from his own experience, application Wakoopa that is used on desktop computers for tracking the usage of different applications. Monitoring application itself

reflected the data in different graphs and using as many different applications as possible was complimented. There was no productivity or other practical purpose in this application, but he found it engaging in some period. Also he mentioned that there are players whose ultimate goal in the game is to pass all the levels or earn all badges. All together Puskai was convinced that some kind of built-in progress structure meets expectations of certain audience and helps to engage players. He recommended integrating the progress structure and elements in the game concept as early as possible. He also agreed that there is also a group of people who do not need challenge, so he approved that having different modes – with and without the challenge – could be one solution. Another way is not to accentuate challenging game elements too much and let more challenging players aim to levels and points and others get by.

About charging money for playing Puskai suggested definitely avoid this at least at the early stage of launching and promoting. He shared his own experience that it is possible to instigate a group of fans, basically a support group out of players who are ready to test the beta version of the game and give their feedback and suggestions for improving the final result. Charging money from the first day could kill that kind of initiative. He emphasised that at first the target group should get the experience – the taste of this game – and afterwards it is possible to evaluate whether to turn the price on. One funding schema he also suggested is donation. It is often used by start-ups and Puskai found it in some cases even more profitable than charging every player. Implementing a successful donation system requires deep-laid communication message – explanations what is the purpose and what would be direct and indirect benefits for the donator.

The idea of letting players to contribute to the content creation seemed reasonable to interviewee. He believed it has a huge potential, but at first the game should consist enough existing high-quality content set as an example. He also suggested adding links (e.g. referring to Wikipedia) to the game content for players who are eager to study more about the certain building, historical person or else that have popped up during the playing and walking.

Puskai saw a social aspect also as a potential way for engaging players. According to him Endomondo – mobile application for running and other sports – has implemented social approach as a game element very successfully. In Endomondo it is possible to create your own social circle that motivates and challenges to exercise more and improve physical conditions.

Conclusion

- Game elements reflecting progress should be definitely considered.
- Integrating progress structure in the game concept as early as possible was recommended.
- Good visualisation of the information will make the game more usable and aesthetic.
- Financing the game via donation was suggested.
- Having an output shareable to social media has a motivative effect.

3.2.2. Interviews with representatives of target group

As described in chapter 2 interviews with representatives of target group were carried out with four persons. At first some questions about habits and preferences of spending free time were asked and discussed. After that the conception of *Walk with me* was introduced and different aspects of the game were discussed. The full list of interview questions is presented in Appendix 1.

If asked how interviewees spend their free time especially **versions of spending time outdoor** following preferences were mentioned:

- going to some natural environment (park, seaside, forest) for walking or hiking;
- exploring some interesting area or neighbourhood by car;
- walking alone, with friend, with dog;
- running;
- taking photographs;
- spending time in the countryside, doing some physical work in the garden.

Every interviewee mentioned at least two different versions of spending time outdoors. Every interviewee associated it with positive **benefits** such as:

- physical activity;
- getting fresh air;
- resting from the noise;
- good feeling;
- relaxation.

There were more interviewees who prefer spending time with company, but two persons also willingly do it alone.

The most of interviewees pointed out that in summers they spend more **time outdoors** – about 5-10 hours per week, and less time in winter time – about 2-4 hours per week. Every interviewee told that he or she would like to spend more time outside of the walls.

Different **problems** were mentioned by interviewees why they don't spend more time outdoors:

- limited free time;
- no purpose of going out;
- no company.

After introducing the **concept of *Walk with me*** (see chapter 3.1) the first reaction was positive among all interviewees and all of them would at least try the application. **Spontaneous comments** about the concept:

- question about coverage of different areas (urban, also other cities besides Tallinn);
- checkpoints of the walking tour should be in logical sequence, otherwise it would be frustrating;
- the advantage of this application is that you can use it anytime;
- the idea of combining different benefits – getting smarter while physical activity – was approved;
- it will encourage people to go out more often;
- it could be similar as a guide (educating about history for example);
- it would be fun practicing with friends.

When asked to imagine the mobile application and describe what it should do interviewees expressed that if **choosing a suitable walking tour** they expect to see the distance and approximate duration. Interviewees expected that tours are also classified by different areas (e.g. Kadriorg, Pirita, Kalamaja in Tallinn). In some cases the necessity of viewing the tour on map and having a list of tours nearby (considering players current location) were mentioned too.

Discussing about the **tours** in more detail interviewees confirmed they expect that the tours are divided in some **categories**, e.g. architecture, history, culture, gardening etc. But they also said that

there should be a mixed category e.g. involving checkpoints from various categories. On the whole people expected to have lots of different tours in the application.

When an idea about having a **virtual guide character and story** in each walking tour opinions were different. Two interviewees found it unnecessary or even disturbing; one found it helpful and supportive; one was neutral about the virtual guide.

Discussing about **competition** in the game most interviewees found it unnecessary. They expressed that having a challenge of time, score of right answers or else would change the essence of the activity. There will be more emotions related to competition and less related to free relaxation and exploration. Still they mentioned that tracking time, calories or steps would be useful and informative. One interviewee told that she would like to have two modes: one with a challenge and another without.

Talking about tasks in **checkpoints** one interviewee came out with an idea of taking picture at checkpoints. At the end of a tour a collage of all pictures is created and the collage could be shareable to social media. **Sharing** the activity in social media was mentioned also as a separate requirement – interviewees want to let their friends know their experience.

About application offering **informative and educational story** at each checkpoint interviewees confirmed that by default it should be short and simple. But two of them expressed that there could be hyperlinks to more detailed information (e.g. Wikipedia).

The **content** of tours and checkpoints was also discussed. All interviewees found that the quality of the content is important. It should be interesting, based on true facts; it should be something not easily discoverable from internet. When asked how they take it if the content would be created by other players, it was not rejected but the necessity of moderation for assuring the quality was mentioned; without thorough moderation the player do not know what to expect.

Finally the **commercial** aspect of the application was discussed. Most of interviewees assured that they would be ready to pay for using *Walk with me* application, but then the quality and uniqueness of content is even more important. In general a fee per tour was preferred not subscription. Also the need for getting a "taste" of it before paying was popped out.

Another commercial aspect was suggested – offers of **take-away drinks and food or recommendations for cafeterias**, bakeries or other commercial spots inside the application. This idea was also welcomed positively, but only if it stays recommendatory not compulsory; any of the

checkpoints of tour should not be commercial. One interviewee told that it would add another dimension to the walking activity and enables to share emotions afterwards. In general interviewees did not expect having payment functionality inside the application, but one of them found it disciplinary and suitable when the offer is about a concrete product (e.g. cup of coffee). Opportunity to reserve a table was also mentioned. In addition to places related to food and drink, museums, galleries and design shops were brought forth.

Conclusion

- The concept of *Walk with me* was welcomed with positive feedback.
- The assumption was confirmed that walking as an activity lacks purpose and combining it with other activities would result successfully.
- Target users do not expect many game elements:
    - tour itself gives a goal;
    - having a challenge (e.g. time counting) is not expected;
    - having a virtual guide character and story in every tour got ambivalent opinions.
- People are expecting lots of different tours, therefore creating enough content with high quality could be a difficult issue.
- People are ready to pay for using *Walk with me*, but only after „tasting" it.
- Recommendations about food and drink spots are welcome.

4. Elaboration stage

This chapter covers the second stage of current design research – the elaboration stage. The elaboration stage involved defining game elements for implementing in mobile application *Walk with me*, creating example of a walking tour, creating prototype based on a sample tour (paper prototype in first iteration and functional prototype in second iteration) and playtesting.

4.1. Game elements

In current section the chapter 1.2 is taken as basis and game elements of *Walk with me* are described.

4.1.1. Goal

The most important game element in *Walk with me* is the goal. This is what makes the difference between simple walking (getting from point A to point B by foot) and walking with mobile application *Walk with me*. *Walk with me* gives a goal and meaning for the walking activity. The ultimate goal of *Walk with me* is **spending time outside, getting new knowledge and exploring the environment**.

4.1.2. Gameplay

As presented in Figure 8 the gameplay of *Walk with me* consists of following steps:

- Choosing the **walking tour**;
- **Walking to checkpoints** of the tour;
- Passing **tasks at the checkpoint** (as many times as there is checkpoints during the tour):
    - **introduction** of the checkpoint (walker action is to observe information and environment);
    - answering to a **quiz question** related to the checkpoint (right and wrong answer both lead to the next step);
    - completing a **photo assignment** – task of taking a picture (application gives a guideline or a topic for the photo).

- After passing all checkpoints and tasks – **summing** up, making a collage out of photos taken during the tour, sharing the experience.

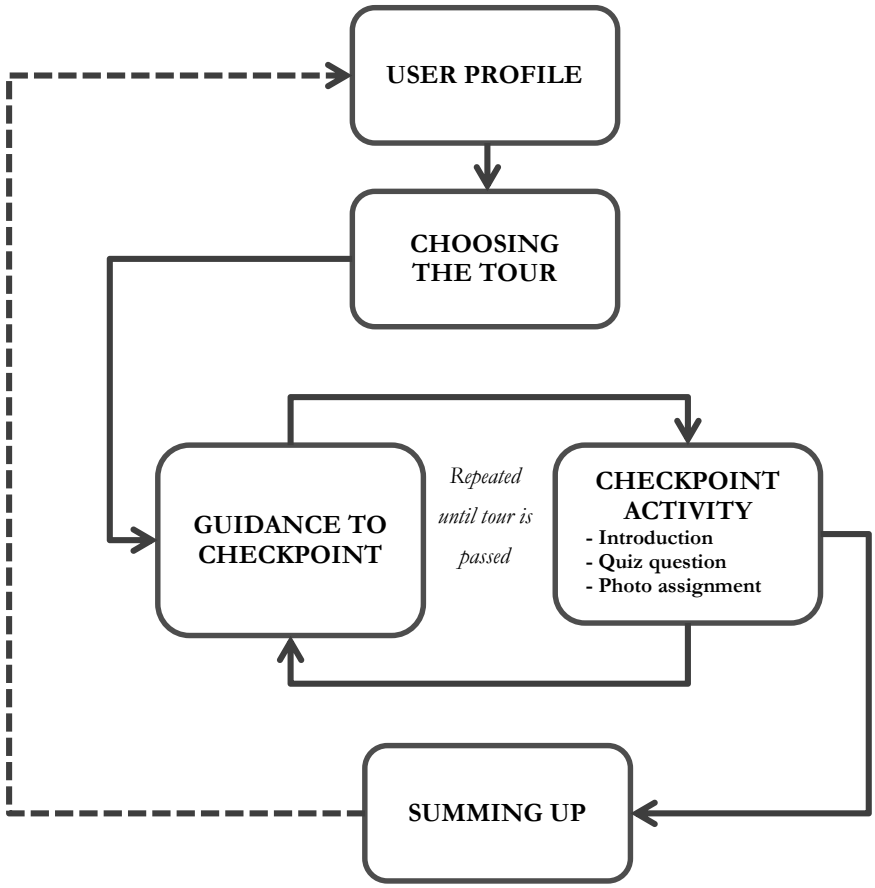

Figure 8. Gameplay of Walk with me

Gameplay of *Walk with me* has five different **game modes**:

- user profile;
- tour selection;
- guidance to checkpoint;
- checkpoint actions;
- summing up.

For using *Walk with me* a simple profile of the player will be created. It is carried out in **profile mode**. It is also possible to use the application and get access to walking tours without registering and signing in, but having a registered user profile it affords to track user's history of walking tours and other statistics later.

To go for a walk player has to choose the tour at first in the **tour selection mode**. By default the application shows the list of three tours nearby the current location of the player. But if the player wants to review more tours and make the choice among wider selection then there is also a list view with different filter options (e.g. category, distance, area). As in the tour list view there is only the most important information about each tour presented, there is also a detailed view for each tour where more information about the tour location and content is presented. The goal of this mode is to help user to find the most suitable walking tour.

If the player has chosen the walking tour and started the game the mode of **guiding to the next checkpoint** will be used. In this mode player sees his own current location and also a location of next checkpoint on the map. In this mode the there is less interaction with the application. But depending on the tour application could present recommendations of different digressions (spots for take-away drinks, cafeterias, bakeries, pottery shop etc.) during this mode. Still the main goal of this mode is to help player to arrive to the next checkpoint.

After arriving to the checkpoint which is validated by GPS positioning the **mode of the checkpoint activity** is presented. It is the **primary** game mode because in this mode the most of the actions, entertaining and educating is going on: an announcement about arriving to the right spot, introducing the checkpoint, presenting the puzzle, solving the puzzle, accomplishing the photo capturing task.

After passing the mode of a certain checkpoint the application will guide the player to the next checkpoint and the cycle will repeat until all checkpoints are passed.

When the player has arrived to the finish of the tour there is a mode of **summing up**. In this mode the results will be presented (number of right puzzle answers, duration, steps,) and also a collage of photos captured from each checkpoint will be created for sharing to Facebook. The data and captures from the tour will be stored in user profile.

The **motivation** for passing the tour and using the mobile application is driven by getting new knowledge (via checkpoint introduction and quiz question) and bringing out participant's creativity

(via photo assignment) while walking. *Walk with me* motivates people to notice small and simple things – information is put into small packages which are easy to pick up. Participant knows the checkpoints of the tour, but he or she does not know what information is offered there and which tasks should completed. So the aspect of anticipation and surprise is driving the player towards the ultimate goal of passing the tour. The step of answering a quiz question is presented in a friendly way – the goal is not to get only right answers, the goal is to discover some new knowledge. Photo assignment adds an opportunity to express participant's creativity and personality. So the fun part of the *Walk with me* is the experience and emotion of **discovery, astonishment, learning and creativity.**

4.1.3. Challenges

The gameplay of *Walk with me* includes following challenges:

- **Knowledge** challenges – formulated as quiz questions.
- **Exploration** challenges – formulated in walking tour itself and also in some quiz questions.
- **Creation** challenges – accomplishing photo assignments and creating a photo collage in the end of the tour.

4.1.4. Rules

For achieving challenges the player of *Walk with me* should follow four main rules*:*

- Only one walking tour can be walked at the same time.
- Walker cannot pass the tour without passing all checkpoints of the tour in the sequence given by the application.
- For passing a checkpoint walker have to be physically at the certain location.
- For accomplishing tasks at the checkpoint walker have to answer the quiz question (right and wrong answer both are accepted) and take a photo assigned by the application.

4.1.5. Feedback

Feedback is given in following moments during the game:

- Walking towards the checkpoint – the icon of walker is moving on the map as the walker moves him- or herself).
- Arriving to the checkpoint – notification via vibration or sound by the smart phone; the introduction of the checkpoint is viewed and walker can check if the photo presented in the introduction is matching the place he or she actually is located.
- Answering the quiz question – after choosing the answer application gives feedback whether the answer was right or wrong and also a short explanation.
- Taking a photo – after capturing the photo the photo itself is presented on the screen and if the walker wants he or she can take another picture.

4.1.6. Facilities

Walk with me will be created using mobile technology. It will be computed as a **smart phone application** to Android, iOS and Windows Phone operation systems. For minimizing the effort of computing the same thing for different operation systems the approach of **hybrid application** is chosen. Hybrid application is partly native (code inside the smart phone itself) and partly web-based (code in web server). So the part that should be coded separately for different operation systems is the native part and the web part can be reused. Another important advantage of hybrid application is that it will be downloaded from application store and the store can be seen as a marketing channel itself (Budiu, 2013).

During walking GPS should be enabled for positioning the walker and giving feedback. The access to the internet is preferred, but if there will be also an opportunity to walk without internet connection (then the map and other data are pre-downloaded to the phone).

All pictures taken during the walking tour will be saved on smart phone memory space, so these photos are reviewable later also without the *Walk with me* application.

4.2. Game world and protagonist

Walk with me is operating in **real world**; it does not take player to some kind of imaginary place. On the contrary it places the player in direct contact with real environment by guiding him to interesting places, showing amusing details and telling surprising stories.

As well as there is no fictive world in *Walk with me* there is no fictional protagonist. The main **protagonist is the player himself** with his own character and creativity.

4.3. Story

Walk with me as a platform nor walking tours separately will not consist any fictional stories. So the story as one of game elements will be not implemented in *Walk with me*. In concept phase the same issue was discussed with interviewees with the question of having a virtual guide in each walking tour. But as this issue got ambivalent opinions the author decided not to implement the story element at least in the first launch.

But still there will be some interesting and inspirational pieces of information in each checkpoint of walking tour. *Walk with me* creates a feeling of having a walking mate – the storyteller who introduces different places, reveals interesting information and brings out participant's creativity. So the walker can observe information offered by application and create his or her own story out of it.

4.4. Example of walking tour

Author of current thesis have created a sample tour for walking in Kadriorg, historical and diverse borough in Tallinn. As presented in Figure 9 the route consists of six checkpoints.

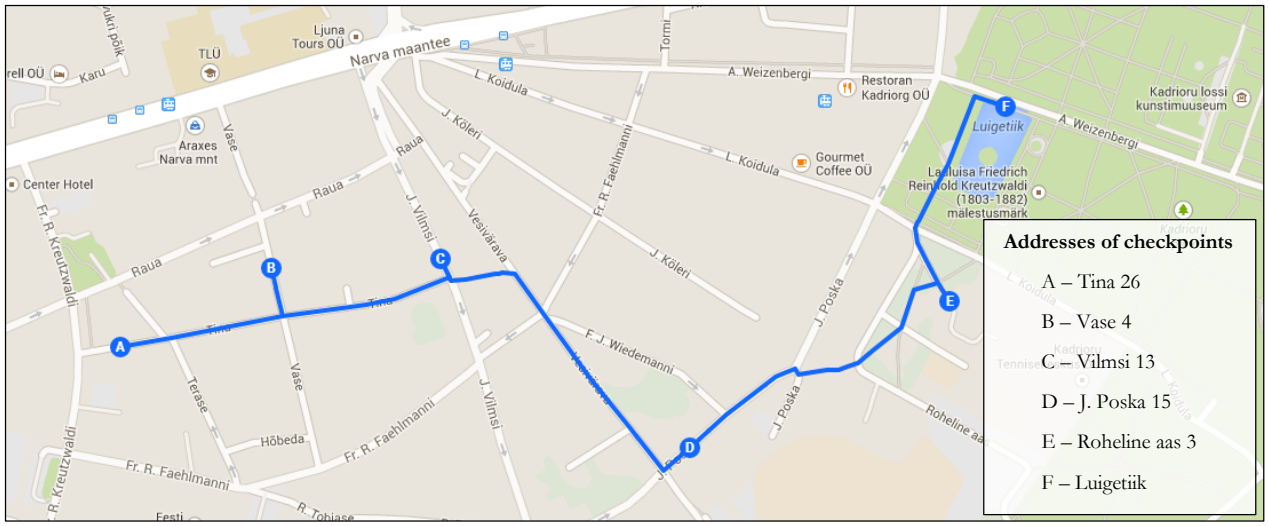

Figure 9. Map of sample walking tour in Kadriorg

As defined in the gameplay structure presented in chapter 4.1 if there are six checkpoints, there should be also six introductions, quiz questions and photo assignments to pass the tour. For example at the first checkpoint Tina 26 the content is:

- **Introduction**: Tina 26 is an example of Art Nouveau built in the beginning of 20th century. Architects of the building were Burman and Perna – first professional architects in Estonia. Initially the building was divided into two separate and very spacious apartments through two floors.
- **Quiz question:** Is Tina 26 a tile, wooden or panel? Right answer: wooden. Explanation: Tina 26 is plastered wooden house. Also a brick wall between Tina 26 and its neighbor building gives you a hint. This brick wall avoids the distribution of fire among wooden houses.
- **Photo assignment:** Let's notice how interesting dormers Tina 26 has. "Dormer" is a window that is in a part of a building that sticks out from a slanted roof. Please find the dormer you like the most and capture it.

In every checkpoint all these three components are provided. The full content of the tour is presented in the Appendix 2 and it based on a guidebook for a walker "Kadriorg. Jalutaja teejuht" by Nerman (Nerman, 2011). Some pieces of information was also added from reference books.

4.5. Results of the playtesting sessions

Before carrying through playtesting sessions following questions were formulated:

- Is the idea of the application clear for the walker?
- Is there some kind of information that is needed more at the moment of choosing the walking tour?
- How intuitive is the guidance to the checkpoint?
- Which expectations are for the notification of arriving to the checkpoint?
- After completing the tour will the testers miss the review of the quiz questions?
- Which emotions and reactions will come up among walker(s) – in general and while accomplishing tasks?
- Which part of the game is more engaging and which part is less?
- How the application is used if there is more than one walker?
- How likely would people use *Walk with me* if it would be ready for real?

Both playtesting with paper prototype (Appendix 3) and with functional prototype (Appendix 4) was conducted by the author of thesis. At the beginning of the test session rather short information were given. Testers were told that they have heard about a mobile application which helps to spend time outdoor by walking and they have downloaded the application from the store. The playtest conductor walked with testers during the whole tour. While testing the paper prototype conductor gave pieces of prototype one by one depending on the tester's actions. While testing the functional prototype the tester opened the prototype in his or her own smart phone and clicked it by him- or herself during the walking. While both iterations the role of GPS was fulfilled by the conductor – she offered information about the location and guidance to the checkpoint. While testing, the conductor took notes about questions and thoughts expressed by the tester(s). Also data about right and wrong answers was gathered. After passing the whole tour a short post-game interview was carried through.

The results of playtesting were in general positive – testers enjoyed walking with *Walk with me* and there were no incident when the tester did not understand the game or application. As testers did not know the content or the gameplay before testing, it was interesting to observe the process how they learned what the game is about.

The first steps (registering, signing in and choosing the walking tour) were passed quite quickly and easy. Some of the testers preferred register and some chose to go directly to the list of walking tours (see Figure 10 below). But two times a question popped up about why the walker should register.

Figure 10. The opening view of the functional prototype

As testers also knew the session is carried out in Kadriorg the selection of the walking tour was easy. It was mentioned twice that the short "teaser"-text presented in the detailed view of the walking tour was intriguing and excited walkers' interest (see Figure 11 below). None of the testers mentioned that they missed some kind of information while choosing the walking tour. It was more likely that some of the information was unnecessary, e.g. estimated time.

Figure 11. The detailed information about the walking tour in functional prototype

When the walking activity was started every tester wanted to position him- or herself. They expected that the prototype also had a full map-functionality (see Figure 12 below). Testers tried to interact with the map (e.g. zoom in with two fingers) to see the street names. Also they expected that the information about meters to the next checkpoint is very accurate also in the prototype (which was not). After explaining that orienteering and guidance is performed by the conductor the map view was not in focus anymore. Still the testers understood that there is an icon presenting their current location and they expected that the icon moves when walker moves. But the question about the intuitiveness of the map functionality was not fully answered because the limitations of the prototype.

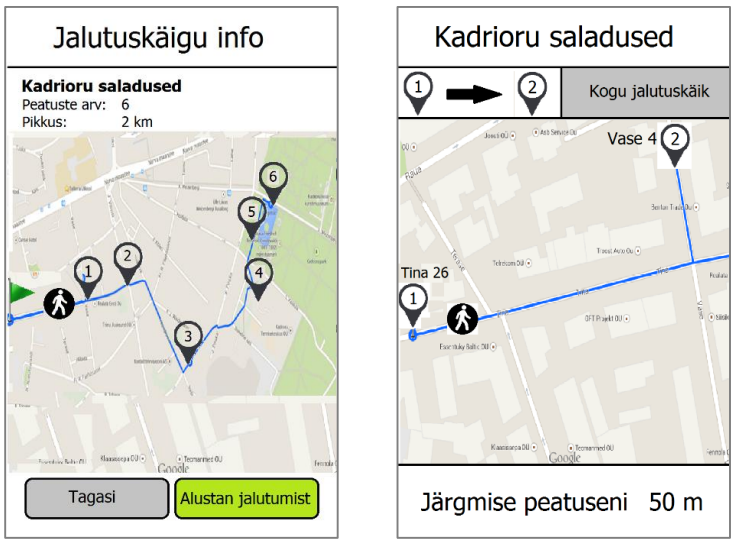

Figure 12. Map views of functional prototype

Testers told that when walking to the checkpoint they would not look at the phone screen constantly. There is also an exact address presented by application, so it is possible that walker observes the address of the checkpoint and already knows where to go. But sometimes the sign of the street name or the number of the building is missing. So when arriving to the checkpoint a notification (sound or vibration) about arriving to the right spot is necessary. Testers also found that the small picture helps them to understand which building is the correct spot (they noticed when the picture was different in the prototype).

While reading the introduction (see Figure 13 below) about the checkpoint testers also examined the building or location itself. So the goal that people could explore and discover their environment was

achieved. Most of the testers mentioned that the quiz question was unexpected, but in all cases they added that it was a positive surprise. Testers found that the explanation with the question feedback (right or wrong answer) is very nice – it help to understand and remember the new information. Also it was mentioned that the new information is presented in fair packages (easy to remember). In the first iteration playtesting showed that two of questions were not suitable: one was too obvious (walker had to read a sign which was visible) and another question was too subjective (walker had to count different types of windows, but people won't see differences similarly, so there could not be one right answer). So these quiz questions were changed.

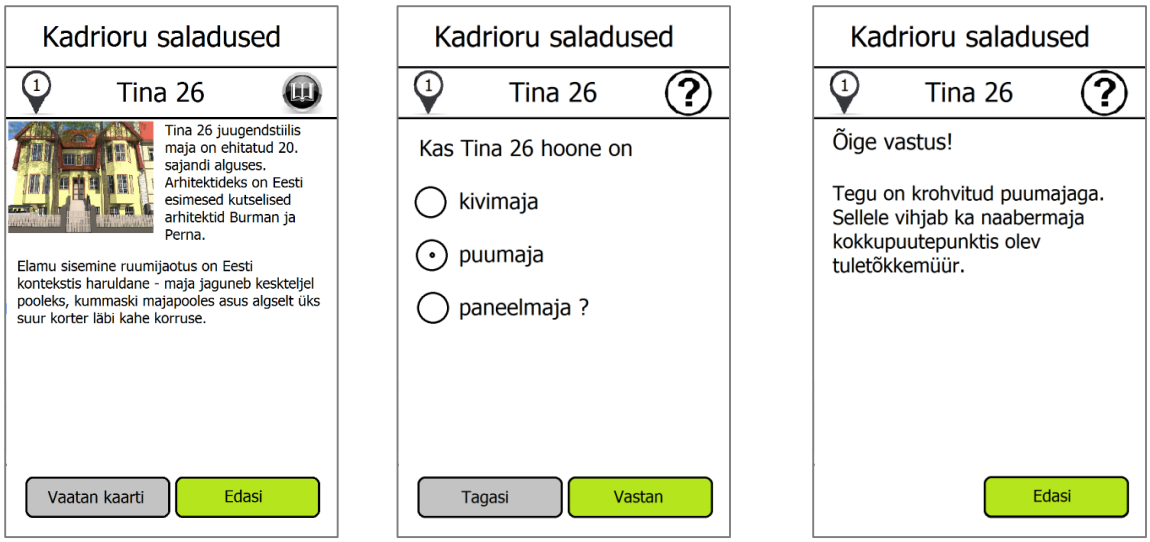

Figure 13. Checkpoint's introduction and quiz question in the functional prototype

Photographing assignments were all understandable. In first iteration more creativity was revealed because the prototype did not include the picture. In second iteration the prototype itself limited the possibility to play this task through, because there was already a picture (see Figure 14 below). But still some testers commented if they would have captured something different than presented in prototype. Also there were occasions when walker wanted to capture more pictures than expected by the application. For example the application required the photo of the sky, but the walker wanted to take also the photo of the building.

Paper prototype **Functional prototype**

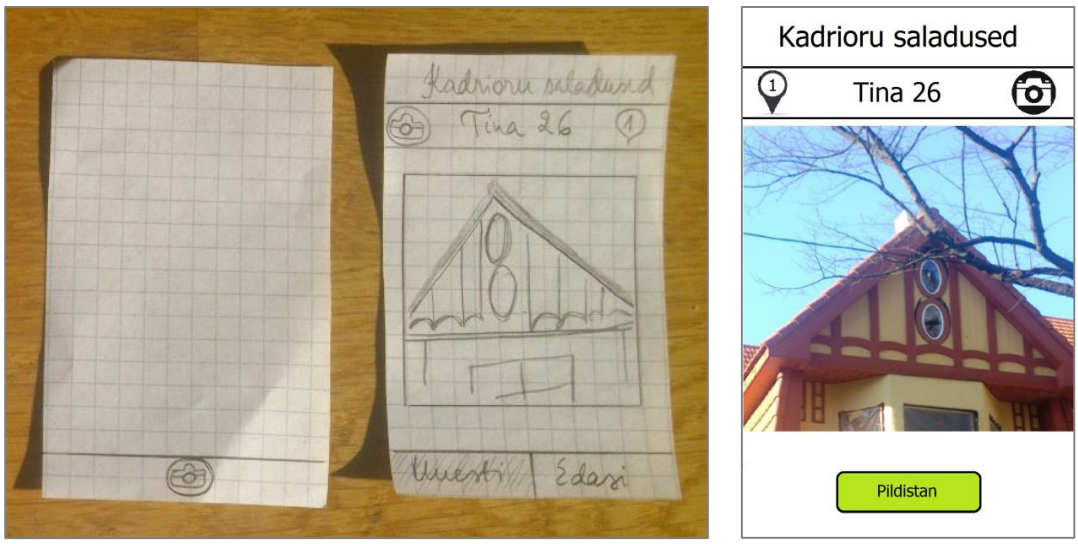

Figure 14. Photographing view of paper and functional prototype

During passing the first checkpoint there were more surprising emotions. Testers learned that there are two assignments at each checkpoint and understood that they cannot go on before accomplishing them. In few cases it seemed like the tester expected that he or she can move on after reading the introductive information, but after presenting assignments they understood the gameplay. So the idea of the application became clear for the walker during the walking.

Testers expressed different emotions and reactions during the test tour: astonishment when they learned something new, joy when they answered right, a little embarrassment when they answered wrong, they giggled when the application said something humorous, satisfaction after completing the tour. In general the emotion stayed very positive during all test sessions.

When after completing the tour it was asked which part liked the most, different feedback was given. Educative aspect (new knowledge via quiz questions) and photo assignments were mentioned most often.

One test session was carried out also with two test-walkers and they used one device (see also Figure 15). One walker took the guiding role and read the information out loud or showed the screen also for the co-walker. While answering quiz questions there were a discussion between co-walkers and they found the consensus. Photo assignments were carried out by the leading walker. So it depends on actual co-walkers how they cooperate, interact and share tasks.

Figure 15. Playtesting with functional prototype and two test-walkers

Statistics of the answers of the quiz questions showed that approximately 45% of questions were answered right. When asked whether the questions were too difficult testers answered that this was not a problem. They did not feel bad about answering half of the questions wrong. They understood that there is no competition, they racked their brains just for themselves and felt content of getting new knowledge. For example one tester mentioned that later she could tell these facts also for her friends.

It was expected that there is an opportunity to share the *Walk with me* experience somehow to social media. Most of testers expected Facebook, but also Twitter was mentioned.

Conclusion of playtesting

- In general the result of playtesting was very positive – *Walk with me* brought out positive emotions and testers found it interesting and enjoyable.
- Five testers out of six confirmed that they would definitely use *Walk with me* if it would be available for real. They found that the application would help them to get outside because it gives a target and meaning to the walking. Also they mentioned the mind-broadening and eye-opening effect as a positive bonus.
- It was not clear for testers why they should register or is it possible to walk without registering and signing up. So a short explanation about it should be presented in the beginning.

- "Teaser" of the walking tour was inviting and engendered curiosity.
- Testing the map functionality was rather high level, because it assumes more detailed functional prototype. Test sessions carried out under this thesis showed that requirements to orienteering functionalities are quite high. So it should be focused and tested definitely in next iterations.
- Testers expected that they have access to the tour content also later, e.g. when they want to remind a certain fact or information.
- It did not directly come up during the test sessions, but the opportunity of cancelling the tour was missing in the prototype.

Also some proposals and ideas were presented by testers:

- It should be considered that in some cases tours that start and end in same spot would be preferred, e.g. when walkers do not know the area very well or they come by car.
- There is a requirement that the application could be able to work also in the background, for example when the walker wants to make a call or read a text message.
- As one of the testers was amateur-photographer he would have wanted to make the selection among photos more thoroughly or even to take the photo with his own camera not with smart phone.
- There could be a supporting website of *Walk with me* where all photo collages are presented and can be rated by other users. This could also add some additional motivation for walking.

5. Conclusion

The purpose of this master thesis was to understand how game design theories and practices are adaptable in designing a mobile application for walking facilitator *Walk with me*. Game design as a process and game elements as variety of motivating and engaging tools were in focus. During this thesis the first stages of designing *Walk with me* were carried through.

At the beginning the research problem were described via author's experience of the "Maastikumäng" and then research questions and goals were presented.

Before deciding final research strategy and methods a review about literature of three concepts – game design process, game elements and mobile guides – were made.

The overview about game design as a process showed that there is no unique acknowledged approach for design stages. But what was stressed by all reviewed authors was iterativeness – continuous cycles of prototyping, playtesting, evaluation and refinement. Still not all parts of the design process can be revisited. Some such as the choice of concept, audience, and genre, should be decided once at the beginning and should not change thereafter. These suggestions were followed also in this project.

After understanding the process of game design, elements that are characteristic for the game were reviewed. Game elements defined by different authors were analysed, synthesised and list for implementing in designing *Walk with me* was proposed. Also it could be concluded that implementing game elements in non-game activities should be thoroughly elaborated and reasoned.

As the technological solution of *Walk with me* will be a mobile application for smart phone a short review about mobile guides and its' characteristics were done. Also an overview about restrictions of mobile computing was presented that should be considered and evaluated while designing *Walk with me*.

In the end of literature review six similar projects were briefed. These were projects which have integrated aspects of "game", "walking" and "mobile" – similarly as *Walk with me* will do. It helped to get ideas and information about possible solutions also from the practical side, in addition to theoretical approaches reviewed previously.

After full literature review author was ready to define the strategy and methods for the current design research. The approach to design process was chosen and two design stages – concept and elaboration – were defined in detail.

Design process started with the concept stage while following aspects were covered: game's genre, audience, player's role and dream that will fulfill through the game. The concept was evaluated via interviewing sessions: one expert interview and four interviews with representatives of the audience. Results of interviews gave the confidence to the author that the idea of *Walk with me* is positively welcomed and the belief that there is a potential demand of such a mobile application was supported. The expert emphasized that game elements reflecting progress and giving feedback would be the most important for this application. Representatives of the target group confirmed that walking as an activity lacks purpose and that is the reason walking is not so often practiced, but adding a goal and combining it with other activities would result successfully.

During elaboration stage game elements of *Walk with me* were defined and described. Afterwards the first walking tour was created with all the content and assignments for the walker. Based on sample walking tour the prototype of the mobile application was designed – in the first iteration as the paper prototype and in the second iteration as the functional prototype. After both iteration playtesting was carried through – test sessions conducted in real walking conditions with representatives of target group.

Results of playtesting sessions confirmed that there is a considerable audience for *Walk with me* because five testers out of six confirmed that they would definitely use the mobile application if it would be available. They found that the application would help them to get outside because it gives a target and meaning to the walking. Also they enjoyed the mind-broadening and eye-opening aspect of the application.

Issues that should be improved in further stages are map functionality and the mode of user profile.

The orienteering functionality was covered in both iterations in rather high level, but observing testers the requirements to navigating functionality is high. Therefore it should be redesigned and playtested in next iterations.

As the prototype focused on the gameplay and walking tour, the mode of user profile was less covered and several questions rose. It was not clear for testers why they should register or is it possible to walk without registering and signing up. So an explanation about it should be presented.

Testers also expected that they have access to the tour content also later. Therefore the refinement of the user profile mode should be also a part of next iterations.

Playtesting sessions also brought out many ideas for improving the *Walk with me* for meeting special occasions, e.g. when the walker is a photographer and prefers to take photos with his or her own camera. Also some requirements for the software were revealed, e.g. the application should be able to work also in the background and there should be an opportunity to cancel the walking.

Further work will continue with next stages of the design. As mentioned above some iterations of elaboration should performed, prototype will turn into code, until it is possible to enter tuning stage while entire design will be locked and no more features will not be added.

In conclusion the implementation of game design process and game elements in project *Walk with me* was successful. There were no major conflicts – the design process was smooth and adapting game elements in walking resulted as a *gamified* activity which is awaited by the target group. So it can be suggested to use game design approaches in developing mobile applications. But it cannot be escalated to all mobile applications. The goal of current project was to design an application for playful experience. If the concept of mobile application is not related to gameplay and there is no goal of enrich the application with game elements then implementing game approaches will not be suitable.

As the author of this thesis has an experience with different development processes (waterfall, scrum) it can be noted that the strength of game design approaches is the focus of the ultimate goal – offering a playful and engaging experience. Therefore author suggests to look also non-game projects through "game lens" to validate whether the ultimate goal is achieved.

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Kokkuvõte (Abstract in Estonian)

Käesolev magistritöö kajastab mobiilirakenduse *Jaluta minuga* esimesi disainietappe. *Jaluta minuga* on rakendus, mille eesmärk on populariseerida jalutamist ning aidata kaasa sellele, et inimesed veedaksid rohkem aega vabas õhus. Disainiprotsessis on kohaldatud mängu disaini erinevad etapid ja mängu elemendid kui vahendid loomaks motiveerivat rakendust. Töö eesmärk on uurida, kuidas mängu disaini protsessi ja mängu elemente täpsemalt mobiilirakenduse arenduses juurutada, et tulemuseks oleks mänguline ja kaasahaarav kogemus.

Uurimistöö on rakendus loov uuring ehk arendusuuring, mis koosneb kahest peamisest etapist: kontseptsioon ja viimistlus. Enne disaini etappide läbiviimist on esitletud ülevaade erinevatest lähenemistest mängu disainiprotsessile ja mänguelementidele. *Jaluta minuga* kontseptsiooni on hinnatud ekspertintervjuu ja sihtgrupi intervjuude abil. Intervjuude tulemused andsid sisendit kontseptsiooni täiendamiseks ja mänguelementide määratlemiseks järgmises viimistlemise faasis.

Viimistlemise faasis viidi läbi kaks iteratsiooni: esimene paber prototüübiga ja teine funktsionaalse prototüübiga. Prototüüpe testiti läbimängu meetodi abil, et saada tagasisidet disainile võimalikult realistlikes tingimustes. Lisaks hinnati, kas mobiilirakendust peetakse piisavalt mänguliseks ja kaasahaarvaks, et olla populaarne ja kasutatud sihtgrupi seas.

Uurimistöö tulemusena võib väita, et mängu disaini protsessi ja mänguelementide juurutamine rakenduses *Jaluta minuga* oli edukas ja rakenduse arendust võib jätkata.

Keywords:

Mängu disain, mängu disaini protsess, mängu elemendid, mobiilirakendused, mobiilsed giidid, prototüüpimine, paberprototüüpimine, funktsionaalne prototüüp, läbimäng kui testimeetod.

Appendices

Appendix 1. Interview questions

- How do you spend your free time?
- How much time do you spend outdoors?
- Which activities you like to do outside?
- Would you like to spend more time outdoor?
    - If yes, what would encourage you to spend more time outdoor?
    - If no, why not?
- Do you prefer spending time outdoor alone or with company? Why?
- What about *Walk with me* application? (high level concept and steps are described)
- What should this mobile application do or enable?
- If the concept of mobile application for walking is acceptable, are you ready to pay for using it?
- Would you be interested of buying also some drinks and food with the package of walking?
- Would you expect a challenging aspect from the game?

Appendix 2. Content of the sample walking tour

Jalutuskäigu pealkiri: Kadrioru saladused

Teema: Varia

Peatuste arv: 6

Pikkus: 2 km

Jalutuskäigu tutvustus:

Kas tead, et Kadrioru kaunite puumajade vahel on peidus ka kolm hruštšovkat? Kas tead, mis on kastellaanimaja? See jalutuskäik viib Sind nende ja mitmete teiste huvitavate kohtade juurde. Jaluta minuga!

1. Tina 26

Sissejuhatus ja tutvustus:

Tina 26 juugendstiilis maja on ehitatud 20. Sajandi alguses. Arhitektideks on Eesti esimesed kutselised arhitektid Burman ja Perna. Elamu sisemine ruumijaotus on Eesti kontekstis haruldane – maja jaguneb keskteljel pooleks, kummaski majapooles asus algselt üks suur korter läbi kahe korruse

Küsimus:

Kas Tiina 26 hoone on kivimaja, puumaja või paneelmaja? Vastus: Puumaja. Selgitus: Tegu on krohvitud puumajaga. Sellele vihjab ka naabermaja kokkupuutepunktis olev tuletõkkemüür.

Pildistamisülesanne:

Märka, kui huvitavad ärklid on sellel majal. "Ärkel" on katusest eenduv osa. Leia omale meelepärane vaatenurk ja jäädvusta üks ärklitest.

2. Vase 4

Sissejuhatus ja tutvustus:

Siin paikneb ansambel kolmest nn hruštšovkast: Raua 24, Vase 4 ja Tina 26. Hruštšovka tüüpprojekt ehk "1-317 seeria" töötati välja 1956. Aastal. Kadrioru hruštšovkad on erilised, sest siin on välja ehitatud ka tüüpprojektis ette nähtud maa-alused garaažid. Mujal jäeti need tihti ehitamata.

Küsimus:

Kui suur pindala oli hruštšovka tüüpprojektis arvestatud ühe inimese kohta? 9, 12 või 15 ruutmeetrit. Vastus: 9 ruutmeetrit. Selgitus: Hruštšovka ideoloogia lähtus ülimast efektiivsusest ja ökonoomsusest. Inimese kohta arvestati pindalaks 9 ruutmeetrit. Isegi diivanit peeti luksuseks, selle asemel eelistati kušetti.

Pildistamisülesanne:

Hruštšovkat ei peeta just kõige kaunimaks arhitektuuriliseks lahenduseks. Leia aga enda jaoks üks vaatenurk või element, mis sinu jaoks hruštšovka juures kõige ilusam tundub.

3. Vilmsi 13

Sissejuhatus ja tutvustus:

Vilmsi 13 on üks armsamaid näiteid Kadrioru varasemast ja madalamast hoonestusest. Selle maja täpne ehitusaeg pole teada, aga tõenäoliselt jääb see 19. sajandi teise poolde. Tänava poole jääva otsaviilu iseloomulikud detailid on väga mitmetest aegadest, sest hoonele on hiljem ehitatud juurde- ja kõrvalehitusi.

Küsimus:

Millist stiili esindab hoone ümarkaarne pööninguaken? Juugend, klassitsistlik või slobodaa. Vastus: Klassitsistlik. Selgitus: Tegu on eheda näitega klassitsistliku stiili elementide kasutusest puumaja ehituses. Klassitsistlik arhitektuur saab inspiratsiooni antiikehitistelt. Omased jooned on lihtsus, rangus ja reeglipärasus.

Pildistamisülesanne:

Kas panid tähele, et sellel "puupärlil" on teisigi kauneid aknaid? Leia enda jaoks inspireerivaim ja jäädvusta see fotole.

4. Poska 15

Sissejuhatus ja tutvustus:

1903. aastal asutasid närviarst Weiss ja psühhiaater Hirsch aadressile Poska 15 Eesti esimese sanatooriumi. Sanatoorium keskendus just närvihaiguste käes vaevlevatele patsientidele. Lisaks oli Kadrioru sanatoorium esimene meditsiiniasutus tsaari Venemaal, kus katsetati elektriravi.

Küsimus:

Millist neist haigustest ei liigitata närvihaiguste alla? Epilepsia, reuma või hüpertoonia. Vastus: Hüpertoonia. Selgitus: Epilepsia ehk langetõbi ja reuma on mõlemad närvihaigused. Hüpertoonia on aga kõrgvererõhutõbi, mida liigitatakse südame- ja veresoonkonnahaiguste alla.

Pildistamisülesanne:

Erinevate närvihaigusteni võib viia ülekoormus ja stress. Selleks, et Sinul seda ohtu ei tekiks, tee palun vahelduseks ja rahustuseks üks pilt taevast!

5. Roheline aas 3

Sissejuhatus ja tutvustus:

Oled jõudnud Kastellaanimaja ehk lossivalitseja maja juurde. Õieti on tegemist pealossi kavatist jäljendava väikese hoonete ansambliga. Kastellaanimaja 6-toalises korteris veetis kirjanik ja diplomaat Eduard Vilde oma viimased eluaastad. Korter kingiti talle 60. sünnipäevaks.

Küsimus:

Millist neist ei ole Eduard Vilde romaan? „Kõrboja peremees", „Mäeküla piimamees" või „Külmale maale". Vastus „Kõrboja peremees". Selgitus: „Kõrboja peremees" on hoopis A. H. Tammsaare romaan. Tammsaare memoriaal-muuseum asub muuseas samuti Kadriorus, aga sinna läheme mõni teine kord.

Pildistamisülesanne:

Kuna see maja on ikkagi lossivalitseja maja, siis tee siin foto teemal „Mina lossivalitseja" (ei pea olema *selfie*).

5. Luigetiik

Sissejuhatus ja tutvustus:

Oleme jõudnud jalutuskäigu viimasesse punkti – Kadrioru südamesse, Luigetiigi äärde. Luigetiik rajati 1723.. aastal Peeter I käsul. Tiiki varustavad veega Lasnamäe paekalda alt immitsevad allikad. Kunagi voolas nendest allikatest kulgev oja maa peal, aga juba 19. sajandil suunati need ojad maa-alustesse rennidesse.

Küsimus:

Kadrioru pargis on enne Luigetiiki asunud veel üks suuremõõtmeline tiik. Kus see paiknes? Kas Presidendi kantselei kohal, Kadrioru staadioni kohal või KUMU tänase sissekäigu ees. Vastus: Presidendi kantselei kohal. Selgitus: Tiik paiknes tänase Presidendi kantselei kohal. Tiiki nimetati Miraaži tiigiks. Kui hiljem rajati juurde ka Luigetiik, siis hakati Miraaži tiiki kutsuma Ülemiseks tiigiks ja Luigetiiki Alumiseks tiigiks.

Pildistamisülesanne:

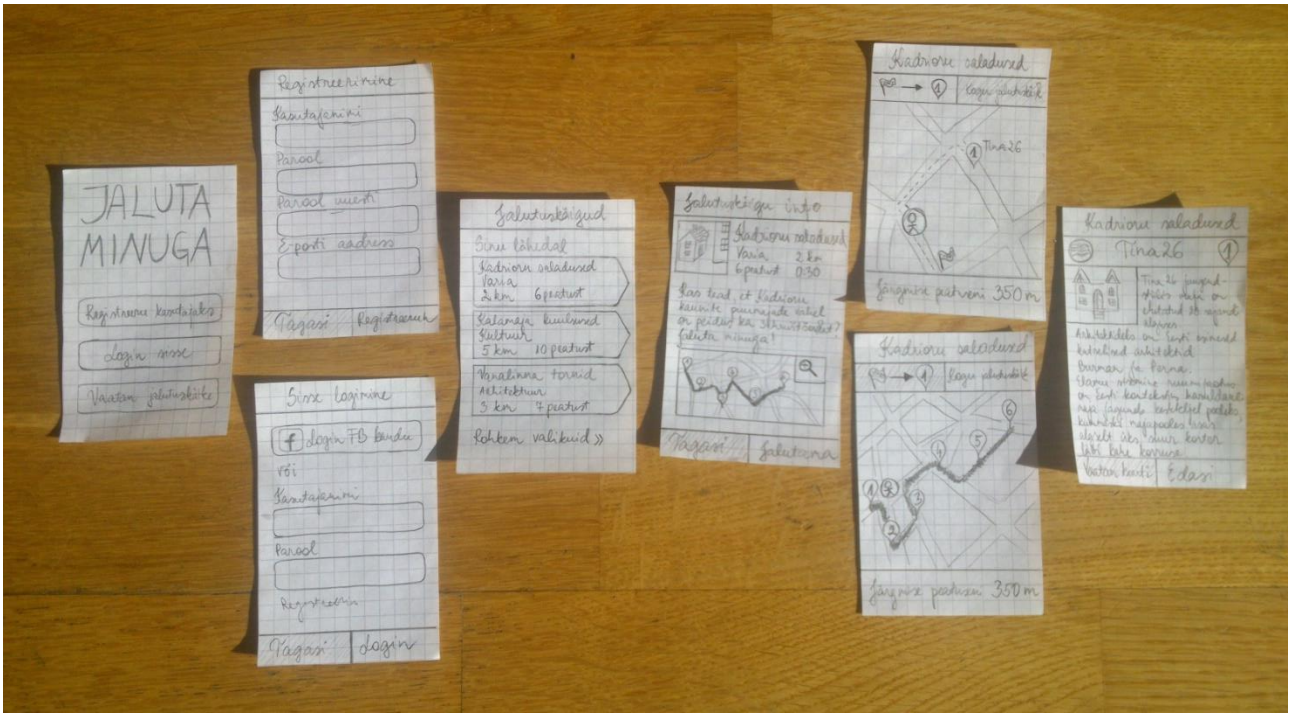
Viimaseks pildistamispähkliks on ülesanne jäädvustada ühes kaadris Luigetiigi keskel paiknev paviljon ja vähemalt üks veelind.

Kokkuvõte

Kiik, konn ja käbi – jalutuskäik sai läbi!

Vaata jalutuskäigu ajal tehtud pildid ja vali nendest 6 kokkuvõtvaks kollaažiks.

Appendix 3. Photos of paper prototype of Walk with me



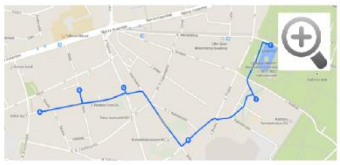
Appendix 4. Wireframes of functional prototype of with me

Jalutuskäigu info

Kadrioru saladused

Teema:	Varia
Peatuste arv:	6
Pikkus:	2 km
Kestus:	0:30

Kas tead, et Kadrioru kaunite puumajade vahel on peidus ka kolm hruštšovkat?
Kas tead, mis on kastellaanimaja?
See jalutuskäik viib Sind nende ja mitmete teiste huvitavate kohtade juurde. Jaluta minuga!



Tagasi | Alustan jalutumist

Jalutuskäigu info

Kadrioru saladused
Peatuste arv: 6
Pikkus: 2 km

Tagasi | Alustan jalutumist

Kadrioru saladused

Järgmise peatuseni 350 m

Kadrioru saladused

Järgmise peatuseni 350 m

Kadrioru saladused

1 Tina 26

Tina 26 juugendstiilis maja on ehitatud 20. sajandi alguses. Arhitektideks on Eesti esimesed kutselised arhitektid Burman ja Perna.

Elamu sisemine ruumijaotus on Eesti kontekstis haruldane - maja jaguneb keskteljel pooleks, kummaski majapooles asus algselt üks suur korter läbi kahe korruse.

Vaatan kaarti | Edasi

Kadrioru saladused

1 Tina 26 ?

Kas Tina 26 hoone on

- ◯ kivimaja
- ⊙ puumaja
- ◯ paneelmaja ?

Tagasi | Vastan

Kadrioru saladused

1 Tina 26 ?

Õige vastus!

Tegu on krohvitud puumajaga. Sellele vihjab ka naabermaja kokkupuutepunktis olev tuletõkkemüür.

Edasi

Kadrioru saladused

1 Tina 26

Märka, kui huvitavad ärklid on sellel majal. "Ärkel" on katusest eenduv osa.

Leia omale meelepärane vaatenurk ja jäädvusta üks ärklitest.

Avan kaamera

Kadrioru saladused

1 Tina 26

Pildistan

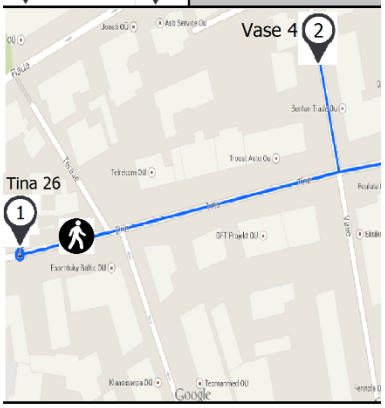
Kadrioru saladused

1 Tina 26

Uuesti Sobib, edasi

Kadrioru saladused

1 → 2 Kogu jalutuskäik



Järgmise peatuseni 50 m

Kadrioru saladused

2 Vase 4

Siin paikneb ansambel kolmest nn hruštšovkast: Raua 24, Vase 4 ja Tina 16.

Hruštšovka tüüpprojekt ehk "1-317 seeria" töötati välja 1956. aastal. Kadrioru hruštšovkad on erilised, sest siin on välja ehitatud ka tüüpprojektis ette nähtud maa-alused garaažid. Mujal jäeti need tihti ehitamata.

Vaatan kaarti Edasi

Kadrioru saladused

2 Vase 4 ?

Kui suur pindala oli hruštšovka tüüpprojektis arvestatud ühe inimese kohta?

- ◯ 9 ruutmeetrit
- ⊙ 12 ruutmeetrit
- ◯ 15 ruutmeetrit ?

Tagasi | Vastan

Kadrioru saladused

2 Vase 4 ?

Vale vastus!

Hruštšovka ideoloogia lähtus ülimast efektiivsusest ja ökonoomsusest. Inimese kohta arvestati pindalaks 9 ruutmeetrit.
Isegi diivanit peeti luksuseks, selle asemel eelistati kušetti.

Edasi

Kadrioru saladused

2 Vase 4 📷

Hruštšovkat ei peeta just kõige kaunimaks arhitektuuriliseks lahenduseks.

Leia aga enda jaoks üks vaatenurk või element, mis sinu jaoks hruštšovka juures kõige ilusam tundub.

Avan kaamera

Kadrioru saladused

2 Vase 4 📷

Pildistan

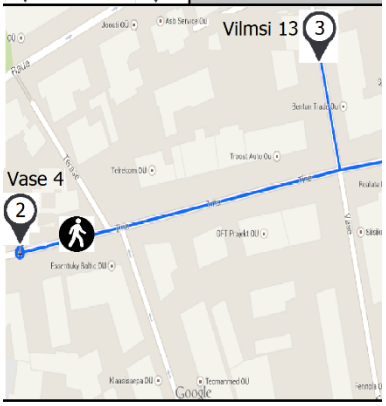
Kadrioru saladused

2 Vase 4 📷

Uuesti | Sobib, edasi

Kadrioru saladused

2 → 3 Kogu jalutuskäik



Järgmise peatuseni 210 m

Kadrioru saladused

3 Vilmsi 13

Vilmsi 13 on üks armsamaid näiteid Kadrioru varasemast ja madalamast hoonestusest.

Selle maja täpne ehitusaeg pole teada, aga tõenäoliselt jääb see 19. sajandi teise poolde.

Tänava poole jääva otsaviilu iseloomulikud detailid on väga mitmetest aegadest, sest hoonele on hiljem ehitatud juurde- ja kõrvalehitusi.

Vaatan kaarti | Edasi

Kadrioru saladused

3 Vilmsi 13

Millist stiili esindab hoone ümarkaarne pööninguaken?

- ○ juugend
- ◉ klassitsistlik
- ○ slobodaa

Tagasi | Vastan

Kadrioru saladused

3 Vilmsi 13

Õige vastus!

Tegu on eheda näitega klassitsistliku stiili elementide kasutusest puumaja ehituses.

Klassitsistlik arhitektuur saab inspiratsiooni antiikehitistelt. Omased jooned on lihtsus, rangus ja reeglipärasus.

Edasi

Kadrioru saladused

3 Vilmsi 13

Kas panid tähele, et sellel "puupärlil" on teisigi kauneid aknaid?

Leia enda jaoks inspireerivaim ja jäädvusta see fotole!

Avan kaamera

Kadrioru saladused

3 Vilmsi 13

Pildistan

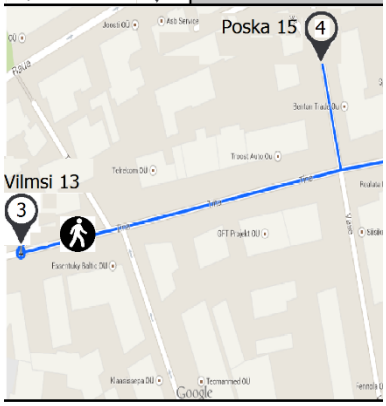
Kadrioru saladused

3 Vilmsi 13

Uuesti | Sobib, edasi

Kadrioru saladused

3 → 4 Kogu jalutuskäik



Järgmise peatuseni 110 m

Kadrioru saladused

4 Poska 15

1903. aastal asutasid närviarst Weiss ja psühhiaater Hirch aadressile Poska 15 Eesti esimese sanatooriumi.

Sanatoorium keskendus just närvihaiguste käes vaevlevatele patsientidele.
Lisaks oli Kadrioru sanatoorium esimene meditsiiniasutus tsaari Venemaal, kus katsetati elektriravi.

Vaatan kaarti | Edasi

Kadrioru saladused

4 Poska 15 ?

Millist neist haigustest ei liigitata närvihaiguste alla?

- ◯ epilepsia
- ⊙ reuma
- ◯ hüpertoonia

Tagasi | Vastan

Kadrioru saladused

4 Poska 15 ?

Vale vastus!

Epilepsia (langetõbi) ja reuma on mõlemad närvihaigused.

Hüpertoonia on aga kõrgvererõhutõbi, mida liigitatakse südame- ja veresoonkonna haiguste alla.

Edasi

Kadrioru saladused

4 Poska 15

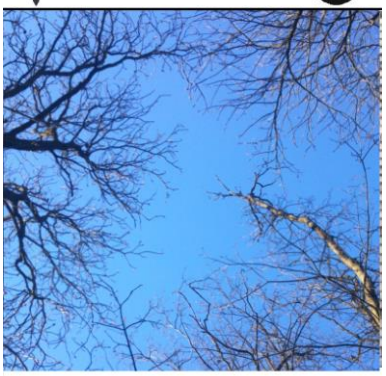
Erinevate närvihaigusteni võib viia ülekoormus ja stress.

Selleks, et Sinul seda ohtu ei tekiks, tee palun vahelduseks ja rahustuseks üks pilt taevast!

Avan kaamera

Kadrioru saladused

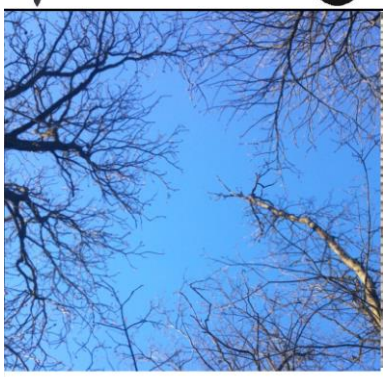
4 Poska 15



Pildistan

Kadrioru saladused

4 Poska 15



Uuesti | Sobib, edasi

Kadrioru saladused

4 → 5 Kogu jalutuskäik

Järgmise peatuseni 110 m

Kadrioru saladused

5 Roheline aas 3

Oled jõdund Kastellaanimaja ehk lossivalitseja maja juurde.
Õieti on tegemist pealossi kavatist jäljendava väikese hoonete ansambliga.

Kastellaanimaja 6-toalises korteris veetis kirjanik ja diplomaat Eduard Vilde oma viimased eluaastad.
Korter kingiti talle 60. sünnipäevaks.

Vaatan kaarti | Edasi

Kadrioru saladused

5 Roheline aas 3 ?

Milline neist ei ole Eduard Vilde romaan?

- ○ "Kõrboja peremees"
- ◉ "Mäeküla piimamees"
- ○ "Külmale maale"

Tagasi | Vastan

Kadrioru saladused

5 Roheline aas 3 ?

Vale vastus!

"Kõrboja peremees" on hoopis A. H. Tammsaare romaan.

Tammsaare memoriaal-muuseum asub muuseas samuti Kadriorus, aga sinna läheme mõni teine kord...

Edasi

Kadrioru saladused

5 Roheline aas 3

Kuna see maja on ikkagi lossivalitseja maja, siis tee siin foto teemal "Mina lossivalitseja" (ei pea olema selfie).

Avan kaamera

Kadrioru saladused

5 Roheline aas 3

Pildistan

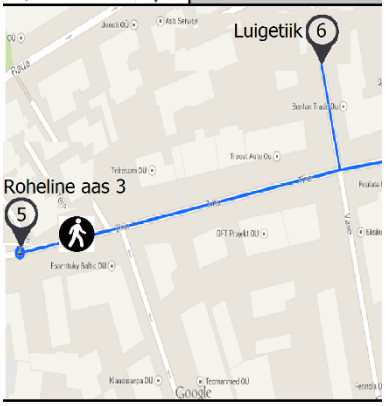
Kadrioru saladused

5 Roheline aas 3

Uuesti | Sobib, edasi

Kadrioru saladused

5 → 6 Kogu jalutuskäik



Järgmise peatuseni 110 m

Kadrioru saladused

6 Luigetiik

Oleme jõudnud jalutuskäigu viimasesse punkti - Kadrioru südamesse, Luigetiigi äärde.

Luigetiik rajati 1723. aastal Peeter I käsul.

Tiiki varustavad veega Lasnamäe paekalda alt immitsevad allikad. Kunagi voolas nendest allikatest kulgev oja maa peal, aga juba 19. sajandil suunati need ojad maaalustesse rennidesse.

Vaatan kaarti | Edasi

Kadrioru saladused

6 Luigetiik ?

Kadrioru pargis on enne Luigetiiki asunud veel üks suuremõõtmeline tiik.
Kus see paiknes?

- (•) Presidendi Kantselei kohal
- ( ) Kadrioru staadioni kohal
- ( ) KUMU tänase sissekäigu ees

Tagasi | Vastan

Kadrioru saladused

6 Luigetiik ?

Õige vastus!

Tiik paiknes tänase Presidendi kantselei kohal. Tiiki nimetati Miraaži tiigiks.

Kui hiljem rajati juurde ka Luigetiik, siis hakati Miraaži tiiki kutsuma Ülemiseks tiigiks ja Luigetiiki Alumiseks tiigiks.

Edasi

Kadrioru saladused

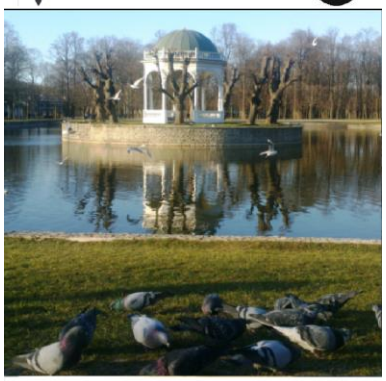
6 Luigetiik

Viimaseks pildistamispähkliks on ülesanne jäädvustada ühes kaadris Luigetiigi keskel paiknev paviljon ja vähemalt üks veelind.

Avan kaamera

Kadrioru saladused

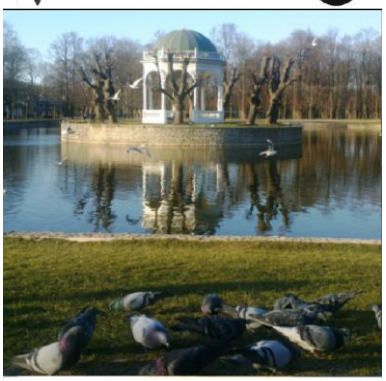
6 Luigetiik



Pildistan

Kadrioru saladused

6 Luigetiik

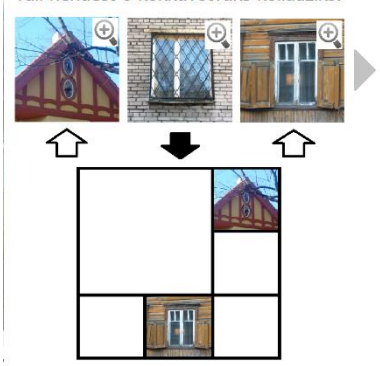


Uuesti | Sobib, edasi

Kadrioru saladused

Kiik, konn ja käbi - jalutuskäik sai läbi!

Vaata üle jalutuskäigu ajal tehtud pildid ja vali nendest 6 kokkuvõtvaks kollaažiks.

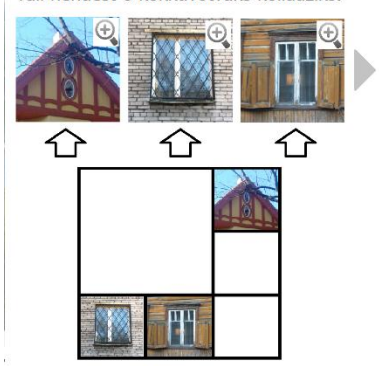


Sobib, edasi

Kadrioru saladused

Kiik, konn ja käbi - jalutuskäik sai läbi!

Vaata üle jalutuskäigu ajal tehtud pildid ja vali nendest 6 kokkuvõtvaks kollaažiks.



Sobib, edasi

Kadrioru saladused

Jagan jalutuskäiku Facebookis

Lõpetasin just jalutuskäigu Kadriorus ja ...

Tagasi | Valmis


Minu jalutuskäigud
Kadrioru saladused
Jalutusime 24.04.2014
2 km 6 peatust
Meil on sulle veel mitmeid põnevaid jalutuskäike pakkuda...
Lähme jalutama