

Gamification in the inDAgo HelpMe application

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Abstract

The changing demographic structures in western societies have led to a higher need for assistance for elderly people in their everyday lives (Peters et al. 2010). Staying mobile is very important for the quality of life, but is anything but simple when getting older. The research project inDAgo¹, a project initiated by research facilities in and around the city of Darmstadt, Germany, targets this problem. A first result of this project is the HelpMe application (app). By means of this app, elderly people can easily transmit in difficult situations a call for help to a network of trustworthy people willing to assist. They then receive quick and uncomplicated support by helpers in their vicinity.

1 Introduction

The aim of the research project inDAgo is to provide a new level of mobility for elderly people. In cooperation with other research partners, User Interface Design GmbH (UID) is working on the creation of a multifunctional mobile device which shall offer elderly people personalized guidance from one location to another.

A first result of this project is the HelpMe application (app). The goal of this paper is to describe a first prototypical example of this app. The basic idea behind this approach is to create a network of trustworthy individuals willing to assist elderly people in difficult situations. A person in need can simply send a *call for help* via the HelpMe app. Potential helpers in the vicinity are notified and can confirm the help via their smart phones which guide them to the caller. In case nobody in the vicinity is willing to help, the sent call is forwarded to the inDAgo headquarters that initiates further steps. To visualize this idea, a dynamic prototype of this app was created. It includes *gamification* elements in order to maintain a high and on-going motivation to use the app amongst both target groups: elderly users and young helpers.

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The first step was the identification of requirements that a good gamification concept has to fulfill. Based on Breuer's (2011a) theoretical elaborations and in accordance with Bartle (1996), a gamification concept was created that specified certain game mechanisms appealing to specific types of players. Based on this gamification concept, the information architecture and interaction concept were developed, serving as a foundation for the visual design.

2 Gamification Concept

According to Deterding (2011), gamification can be seen as the use of game design elements in non-game contexts. Zichermann and Cunningham (2011) define gamification as the process of game thinking and game mechanics to engage users and solve problems. Gamification hence uses game mechanisms in a non-game context to bind users and to animate them to solve problems. This means, gamification combines a marketing element with problem solutions, turning discouraging, hard, and boring tasks into easier, interesting, and motivating problem solving. But it is important that the user enjoys engaging with a product's user interface (UI) and is fully immersed in the activity. This state is called a *flow* (Csikszentmihalyi, 2008). Breuer (2011a) mentions different requirements to achieve flow. At first objects have to be defined clearly. The user shouldn't be overburdened nor under-challenged. At next the user needs quick and clear feedback. And at least bothersome influence factors should be avoided.

If gamification is applied intelligently and efficiently, users will have a high level of motivation to engage in the game. Various factors can motivate people. External factors, such as rewards (extrinsic motivation), as well as internal motivation, such as achieving the users' individual goals (intrinsic motivation), can stimulate a user to act. As Zichermann and Cunningham argue, both forms are legitimate forms of motivation (Zichermann & Cunningham 2011, pp. 27ff.). However, if someone has been motivated extrinsically once, he has to be rewarded repeatedly to stimulate and maintain motivation, while internal motivation is long-lasting and does not rely on outside factors.

2.1 Types of gamers

The challenge with gamification is to design it in a way so that the user thinks he is pursuing a self-imposed objective. The way to get the user to think and act accordingly is to mix extrinsic and intrinsic motivation incentives. However, different types of gamers are motivated differently. Bartle identifies four types of game players located in the four corners of a two-dimensional axis (Figure 1). The type of player depends on whether a player is focused on *playing* or the *world*, and whether a player type rather tends to *act* or *interact*. These four types of game players are ideal types. In reality, a *Socializer* can also feature characteristics of a *Killer*, *Explorer*, or *Achiever*.

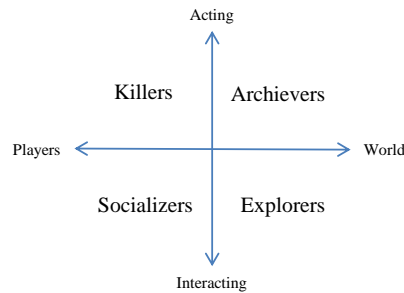


Figure 1: The four types of players according to Bartle (1996).

2.2 Game mechanisms

To motivate a player, certain stimuli have to be translated into specific game mechanisms. Specifically, these mechanisms have to support a user in achieving his set of goals, provide clear feedback on the user's progress, interconnect users with similar objectives, and generate flows (Breuer 2011b). Basic game mechanisms are *points*, a key measure for a player's mastery of the game, but also *levels*, *high-score* lists, *badges*, and *challenges*.

Based on Bartle's types of gamers, a number of game mechanisms reflecting motivational features for every individual type of player were compiled. This guarantees that a broad variety of people will be motivated by the game mechanisms. According to Wodke (2013), the following game mechanisms were included in the concept: *systems of points*, *systems of level and hierarchy*, *high scores and statistics*, *social interaction*, and *systems of achievements*.

Among different kinds of *points*, experience points are very important. These are points that accumulate with achieved tasks. They are hence different from pay points in the sense that they cannot be exchanged for goods in the context of the game. It is also possible to receive reputation points by receiving ratings from other players.

The *level system* should also be well conceived, because it represents the afore-mentioned points. Levels give the player a good impression of where to position his expertise and experience, and the corresponding points display how far away he is from stepping up to a higher level (cf. von Ahn & Dabbish 2008).

The main bulk of points is often achieved by completing *challenges* which become more difficult the further players progress in the game. It is important that the player is neither over-burdened nor under-challenged in any way. To create challenges, time limits to solve certain tasks are often used. They set clear, achievable, and non-trivial objectives. If the challenges are well chosen, the user is likely to put more effort into certain tasks (cf. von Ahn & Dabbish 2008).

High scores show the user's name and amount of points, sorted according to the number of points all the players in the list have accumulated. One can differentiate between non-discouraging high scores and infinite high scores. Non-discouraging high scores position

new users in the middle of the hierarchy, no matter what level they have. Below them, all their friends are listed that do not have as many points as they do. Also, new users can see the distance left to draw and overtake users immediately above. When the player is among the top 10 or 20, the list can be displayed “normally” (reflecting the real order), listing all players in one list, beginning with the first (Zichermann & Cunningham 2011, p. 50). The risk is that players feel demotivated when they lose their position on the list or do not improve. One solution is to split up the long list in order to alleviate discouraging effects (Zichermann & Cunningham 2011, pp. 51ff.).

3 Design Concept

In the inDAgo-project a user centered design approach based on ISO 9241 (DIN, 2010) is used. To gather valuable information about the target group a context analysis was conducted. This enables to model *personas* and *scenarios* on which the design concept relies. Personas are fictitious people with, nevertheless, very specific characteristics. They act as users of a certain product in the context of scenarios (Pruitt & Adlin, 2005). Scenarios narratively describe typical situations in which personas interact with a product as realistic as possible. For the purpose of illustrating a typical use-case for the HelpMe app, we have created two personas: Nils Bauer and Rosemarie Herzig.

3.1 Central personas

Nils Bauer is a helper persona. Nils is 25 years old and has been studying in the city of Darmstadt for three years. Although he did not grow up in Darmstadt, he knows his way around very well. Before he started his studies, he completed his alternative national service in a senior-citizens home where he experienced at first hand the everyday problems of elderly people. Because he would like to stay involved in helping the elderly, he has registered with the inDAgo network some time ago.

Rosemarie Herzig is the persona of a senior citizen. Since her husband passed away, 85 year-old Mrs. Herzig lives in her apartment near Darmstadt by herself. Because her grand children live in the vicinity, they often visit her. She uses a wheeled walker to support herself when moving around. When Mrs. Herzig goes into town, she takes it with her on the bus or tram. Her children have given her a mobile phone as a present which she does not use though. Because her typewriter got broken, her grandchildren have given her a computer which she used to register on Facebook. Her posts can be followed at <http://blog.indago-projekt.de/rosemarie.html>.

3.2 Example scenario

Nils is in the town center of Darmstadt. His smart phone notifies him that he has just received a message from the HelpMe app. On the display he is informed that he was just granted 1 helper point because he has been available for five consecutive hours now. On the

whole, Nils has already collected 21 points. A few minutes later the app alerts him that someone is in need of help. Nils sees on his display that Rosemarie Herzig requires assistance and that he is only a few minutes of walk away from her. So he decides to accept the call.

According to the app, he is not the only potential helper in the vicinity, but as he is the first to accept he receives 3 helper points. The app guides him to Mrs. Herzig's current location in the western part of Darmstadt. As this is the first time Nils has accepted a call from this part of the town, he receives 2 extra points. Having arrived at Mrs. Herzig's position, he helps her carry home her heavy shopping. Afterwards, Nils confirms in the app that he has completed helping Mrs. Herzig and enters a short description of what he helped her with. The app indicates to Nils that he has just completed a new achievement since this is the first time he has helped someone with heavy shopping. Nils sets off to attend a lecture.

On his way, his app notifies him that Mrs. Herzig has rated his help positively, giving him a thumbs-up rating. This new rating elevates Nils level from the level *First Aider to Good Soul* because he has accumulated sufficiently many helper points, has been available for a sufficiently long time, has offered his help often enough, and has received sufficient thumbs-up ratings from different parts of the city. He is now able to post his level promotion on platforms such as Facebook or Twitter. Having arrived at the lecture theatre, Nils switches his status from *available* to *not available*.

4 Prototype

Based on scribbles, wireframes and low-fidelity prototypes, an HTML prototype was created using the wireframing and prototyping software Axure. In contrast to a low-fidelity prototype, an HTML prototype is nearly completely functional, i.e. all interaction elements react to the user's input. The prototype can be viewed under the following URL: <http://share.d.com/YXP7YF>.

The prototype altogether consists of 11 different screens that can be separated into two categories. The first category contains screens that are accessible and functional only if the user is available to help others (cf. subsection 4.1). These screens allow the user to view statistics and cultivate contacts. Besides, the user can switch between six different views via corresponding menu items: *home*, *town*, *friends*, *points*, *badges*, and *settings* (cf. Figures 2-6). The second category provides screens that can be only viewed while the user is in the process of helping as described in subsection 4.2.

4.1 Screens while being available

The *home screen* is the screen the user accesses first when opening the HelpMe app. The screen quickly and clearly displays information about the helper, his contacts, and the town he is helping in. In the top part of the screen, the user can view his profile picture, name, current level, received ratings as well as the name of the town. Below this information, the user can view a newsfeed providing information about his activities, the activities of his

friends, or the activities of other helpers. The user can also filter the feed so that for instance only his activities or ratings are displayed, or solely the activities of his friends. Furthermore, any helper can send messages from here to the community of helpers in his city. In this way the helpers within a community can communicate with each other. Summarizing, the home screen provides a clear overview of relevant information and enables the user to access all areas of the app without opening the menu (Figure 2).

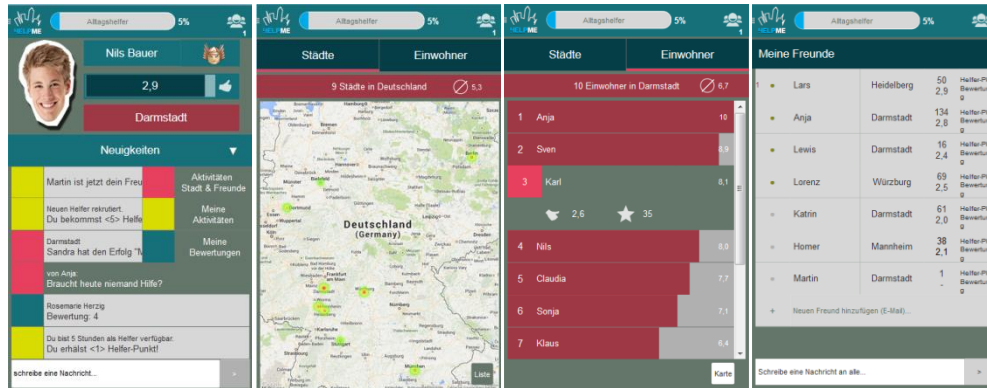


Figure 2: The “home screen” (left), the two tabs of the “town screen” (middle) and the “friends screen” (right).

The *town screen* (Figure 2) displays all information concerning the helper’s town. The screen is split up into two areas which can be switched via tabs. The first tab, the town-related part, provides a comparison of different cities. On a heat map, the user can view all the towns in his home country in which the HelpMe app is used. Differently colored and sized markers give the user a good impression about where people, on the average, have offered their help most frequently. The heat map can be transformed into a list displaying a high score of towns. This list is calculated from the average number of residents’ ratings, the number of helpers’ activities, and the number of helpers in the town.

The second tab on the town screen, the residents-related part, refers to all the helpers located in the user’s city. In this view, the user can look at a map displaying all helpers currently assisting another person. The helper is represented by a level-specific icon. This view can be changed in order to display a high score list of all helpers in the user’s city which is calculated from the number of helper’s activities, points, and rankings. Opening a list item provides detailed information about a user’s ranking and number of points.

On the *friends screen* (Figure 2) the user can add friends to his list, delete them from it, or stay in contact with other friends. The list provides information about the current status of a friend, that is to say whether the user is currently available to offer help or not. Clicking on the friend’s name opens the chat function enabling the user to send and receive messages, or to view previously received or written messages. At the bottom of the friend list, a button is provided by which the user can add new contacts or invite his friends to the helper network via email. To delete a friend from the list, the user simply has to swipe the screen from right

to left and confirm the deletion of a contact afterwards. If no friend is selected, a user can send a status update to his friends if required, as done in many common social networks.

The *points screen* (Figure 3) provides the user with a quick overview of his current level, the number of gathered points, and the ratings from people he has helped so far. This information, either culminated or averaged, is displayed at the top of the screen. Below this screen section, a scrollable dashboard-like list summarizes all previous activities. While scrolling, one list item in the middle of the screen is always focused yielding the following information: the name of the person that was helped as well as the date of the activity is displayed in the left half of this list item. On the right hand side, the points received for an activity are shown. Moreover, a thumb icon (either pointing up, down, or to the side) shows the user how the help seeking person has subjectively rated the quality of his help.

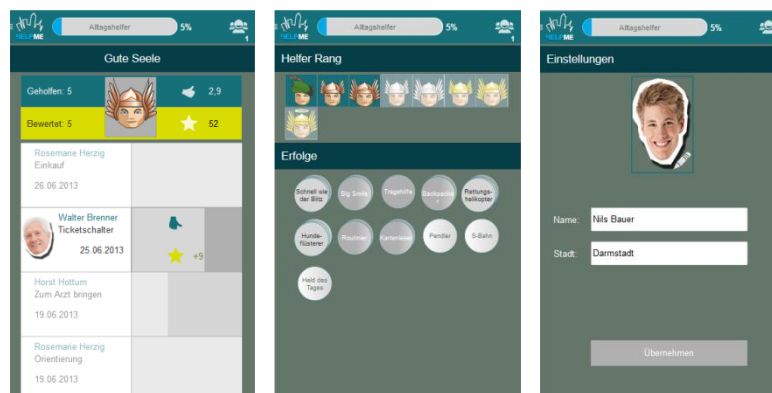


Figure 3: “Points screen” (left), “badges screen” (middle), and the “settings screen” (right).

The *badges screen* (Figure 3) lists the user’s achievements and mastered levels over time. Those levels that have not been reached yet are shaded. Below all available achievements are listed. Since an achievement is attained in three consecutive steps, up to three circular badges per entry are displayed on top of each other. The individual levels differ in their color. Clicking onto a certain mastered rank or achievement opens up an info box displaying the achievement’s title and requirements. When the user clicks on a rank or achievement which has not been completed yet, the title of the achievement as well as the needed progress to reach the next level are displayed in percentage points. It is important to note that the user does not know how many activities or points remain to reach the next level.

In the *settings screen* (Figure 3), the user can change his profile picture, name, and town. When a user enters a new city, the full name of the town is filled in by means of autocomplete. In the future it is planned to offer the user more possibilities for adjusting certain settings. A possible scenario could be, for example, to allow the user to change the screen design according to his individual taste.

4.2 Screens while helping

The second set of screens is only accessible during a call for help. They cannot be selected manually via the main menu. The first of these screens, the *call for help screen* (Figure 4), appears as soon as there is an incoming call. If a user accepts the call, the *navigation*, *help*, *arrival*, and *completed* screens appear in consecutive order according to the status of the activity.

With an incoming call, the user receives the most important information about the person in need. A picture of the caller is displayed in the upper left corner of the screen. Next to it, on the right hand side, an info box displays the person's name, age, and other useful information, such as whether the caller is using a wheeled walker (Figure 4). The caller's exact location and the estimated amount of time it would take for the helper to reach this position are displayed in an extra box directly underneath. A visible map of the surrounding area displayed in the background highlights the suggested route the user should take. At the bottom of the screen there are two buttons: touching the left button labelled with X declines the call while touching the right one accepts it. The helper has 60 seconds to decide which option to choose. The button to accept the call also acts as a backward progress bar allowing the user to see how much time he has left to make a decision. The user's status bar is not visible on this screen.

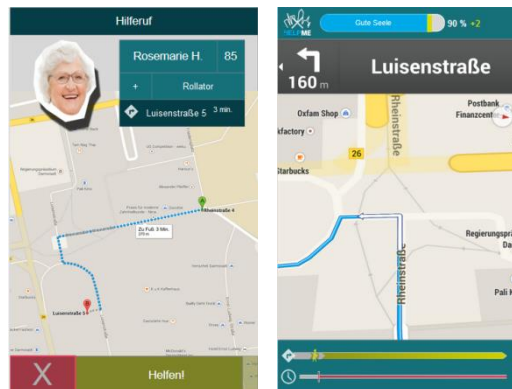


Figure 4: The user receives an “Incoming call” (left). The HelpMe app navigates the helper to the caller (right).

The *navigation screen* (Figure 4) is based upon the Google maps navigation for pedestrians. The user's status bar is shown here at the top. Beneath the map two progress bars are located. The top bar (green) displays the distance already covered. The bar below (red) represents a virtual clock which deliberately displays slightly less time than actually required to reach the destination. This *race* against time shall motivate the user to hasten his pace. In case the helper needs slightly more time than required, both the caller and the helper receive a message allowing them to contact each other via phone and to coordinate the time and place independently of the HelpMe app. On arrival, the user is shown a screen displaying an enlarged picture of the caller which makes it easier to identify the person in need among other people. In case the user does not find the person in need, he still has the possibility to make a

phone call. Once the user has arrived at the right location, he has to make a confirmation by pressing the corresponding button displayed in the app.

When the user is in the process of helping, (Figure 5) the app is inactive by default. However, the user may open the app in order to view all relevant information about the person he is currently helping. After the caller has successfully been helped, the helper again has to make a confirmation by using the app. The helper is obliged to describe how exactly he could assist the caller. This information is important to calculate the points and to assess the level of achievement. A variety of predefined categories can be selected to describe the type of help that was offered. In case none of those predefined categories apply, the user can enter a description manually by choosing the corresponding option (Figure 5).

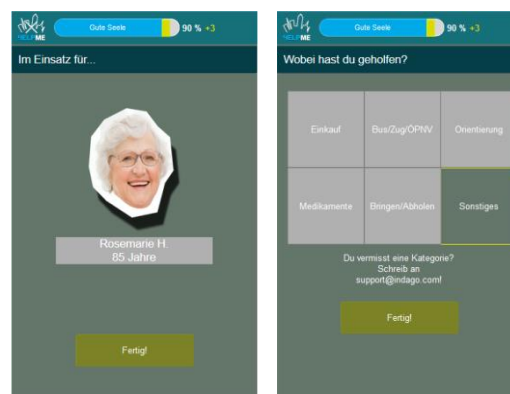


Figure 5: Look of the HelpMe app while the user is helping (left). The user describes the type of help (right).

5 Summary and Outlook

The HelpMe app can be regarded as the first tangible result from the inDAgo project. Based on low-fidelity prototypes, game mechanisms and game elements were translated into a dynamic HTML prototype. Personas interacting in a realistic scenario were developed to make the everyday use of the app tangible. The app uses game elements, such as points and levels, to encourage the user to be committed to the cause of helping elderly people.

There are still many opportunities for improvement. Firstly, some game elements that were originally planned, such as the mechanism of teams, were left out. This was due to the fact that there are too few users for the time being. We suggest introducing and extending the following game elements and mechanisms in the future: *team building*, *extension of levels*, *creation of new achievements*, *forming a social network within the app (network of helpers)*, *chat features*, and providing actual material rewards.

Furthermore, certain game elements were omitted from the game since the ensuing incentives would not have been appropriate for the overall social context of the game. For example, we *deliberately* decided to *not show* to the user how many points or ratings still have to be acquired in order to advance to the next level. In this way we wanted to avoid that people

offer their help simply for the sake of the game, and not for the objective of helping the elderly. If a player received a call for help from a part of the town in which the user has already fulfilled his quota of helping, the user would not have the incentive to help anymore, because he would not gain anything in the context of the game.

Other elements were already omitted early in the development stage. Detailed statistics, for example, are difficult to integrate usefully into a mobile app. An idea for the future is to create an additional online platform on which users can view statistics and use other features of the app, such as the chat function. The challenge of consciously omitting such functions is to find a suitable way to motivate a gamer in the first place. Why should a user fitting the profile of an *Achiever* try to accumulate achievements when he does not know how to do that? On a more general level, this problem addresses the question how to motivate players permanently, especially highly experienced users. How far can the app's system be extended to ensure its long-term success? These challenging issues require further in-depth work. Furthermore a next step is to evaluate the additional value of gamification in this app.

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