MEECO: GAMIFYING ECOLOGY THROUGH A SOCIAL NETWORKING PLATFORM

Danae Vara, Enric Macías, Sergio Gracia, Alba Torrents, Simón Lee

Multimedia Creation, Design and Engineering Master's Degree
La Salle – Universitat Ramon Llull

{ls24475, tm18164, ls24878, ls24783}@salle.url.edu, slee@digital-legends.com

ABSTRACT

There is an eco-revolution going on, but not many people are joining it. Meeco intends to guide, encourage and commit people to live eco-friendlier lives in a more social and enjoyable way. It uses Location Based Services, Web Services and Game mechanics to create an engaging service that wants to make a difference in everyday life, one green action at a time. This paper is an overview of the research and analysis done, the concept creation, game design and prototype implementation of the Meeco platform.

Index Terms— Ecology, Gamification, Mobile Application, Social Networking, Location Based Services

1. INTRODUCTION

Ecology, sustainability and recycling are becoming familiar keywords in our daily lives. Society is realizing that being eco-friendly is the way to take care of our world, always ensuring a proper future for us and the new generations to come.

Everybody knows what to do in order to live a greener life: they try to do it in a fully conscious way or by a generalized social behavior. But still, these actions are commonly seen as chores, boring and imposed. Why not make it fun?

Meeco is a final master's degree project that intends to guide, encourage and commit people to live greener lives in a more social and fun way: sharing real-life action and knowledge with the social network through a game.

This paper is an overview of a five-month project in which a research and analysis has been done in order to create a concept, its game mechanics and a prototype implementation.

2. PROJECT BACKGROUND

Meeco was developed as a final thesis project for the Multimedia Creation, Design and Engineering Master's degree (MCDEM) [1] at the LaSalle Business and Engineering School, Ramon Llull University in Barcelona, Spain, during the 2010/2011 course.

The MCDEM is a multidisciplinary degree where students, with backgrounds from various study fields involved in multimedia, faculty members and companies from the multimedia industry work together in an integrated team to develop a project using the SCRUM agile management framework [2]. In this case, MCDEM students, professors and Digital Legends Entertainment [3] worked as a team to create Meeco.

Digital Legends Entertainment (DLE) is a top-tier studio specialized in designing and developing videogames. Based in Barcelona, DLE creates videogames with top quality graphics available for multiple platforms, thanks to its own game engine called Karisma.

Meeco was developed by the following team:

- Danae Vara Borrell, Product designer: Game designer and Producer, responsible for the game design/mechanics and the project management.
- Enric Macías López, Multimedia engineer: Technician, responsible for the front-end development.
- Sergio Gracia Gil, IT technical engineer: Technician, responsible for the back-end development.
- Alba Torrents Sánchez, Graphic designer: Artist, responsible for the project's esthetics and usability.
- Simón Lee Hsing: DLE Design Director: Product owner, responsible for ensuring the feasibility of the project.
- Oscar García Pañella: LaSalle Professor: Game Design and Technology Advisor.
- Emiliano Labrador Ruiz de la Hermosa: LaSalle Professor: Art, Design and Creativity Advisor.

3. THE PROBLEM

All over the world, countries are becoming more aware of the importance of ecology. Public initiatives like Bicing [4], a bike sharing system established in Barcelona, or products like the Olipot [5], an oil container freely distributed in the city of Barcelona so that its residents can properly discharging used household oil, are some examples of how local administrations around the world are also taking actions into becoming greener (eco-friendlier) cities.

Private initiatives are also being developed. Companies are becoming more eco-conscious and brand communication is showing this trend. Small changes are taking place. Changes like the ones applied on the Carrefour supermarkets with the campaign "Carrefour en Positivo" [6], where the

communication shows the brand values for sustainability, services like delivering goods to clients in electric vehicles adapted by Caprabo groceries stores [7], or the creation of new product lines like the ones developed by the clothing line H&M Conscious [8] that uses organic, recycled and sustainable materials are some examples that follow a worldwide trend.

Even though more options are being created to encourage an eco-friendlier lifestyle, people in general do not seem to be serious about the importance of making changes in their everyday actions. It is true that there is an "eco revolution" going on, but not so many people are following, or at least, not as many as there should be.

People are aware of the benefit of the ecologist way of life for a big scale point of view: preserving the world and its species, stopping global warming, benefits for future generations, etc., but they are not currently adapting an eco-friendly lifestyle because they don't see the benefits these changes bring to them as individuals.

There is a need for a solution to this problem: a way to encourage each person to adapt an eco-friendly lifestyle, for a great scale benefit, while getting an individual benefit they can perceive.

4. THE APPROACH

Achieving an eco-friendly lifestyle, like any other lifestyle, is done by the adopting habits and attitudes, in this case ecological conscious ones. To do so, some needs should be approached: making people want to become greener, encouraging them to continue this habits and finding a way for them to do so.

4.1. Status

In order to make a lifestyle shift, first of all, a person should find a reason to want to change. As explained before, the sole reason of doing it for a greater benefit is not enough. This project targets the self of the individual person, the ego, especially through the concept of status, so that people can perceive a personal benefit.

Humans have the need for recognition. We all need to be accepted and perceived by others, and this can be achieved by the construction of a status, a representation of the self. Status is the subconscious force that makes people *do* something [9].

Nowadays, status is not only defined by the amount of possessions or money a person has. For this project, five status trends that make up the current statusphere [9] were studied, and how they can relate to the focal ecologic background of the project:

1. "Bigger, better, harder" This trend does not only apply to spending the most, but consuming those items that tell the most of us in terms of a story [10].

2. "Generosity" Now giving is the new taking and sharing is the new giving [11]. It is important to give back since this provides people a new status of commitment with society. This can be seen by examples like Toms Shoes [12], a brand that gives, for every pair of shoes bought, another to someone in need.

3. "Green credentials & unconsumption" Directly related to a more eco-friendly way of living. This includes consuming fewer products and creating new habits towards a greener life. Initiatives like Freecycle [13] encourage and enable a way for people to reuse and share things instead of buying new ones.

4. "In the know" People are putting more importance on the specific knowledge their peers and themselves got. It is a big status builder to know more and know something no one else knows, first. To complete this trend it is important to notice how *knowing* is not part of a status if it is not shared [14]. People like to share their knowledge and improve the collective one, even if the merit is not directly assigned to them. Dscover.me [15], Twitter [16] or Facebook [17], among many others content sharing networks, are a few examples.

5. "Connectivity" Status can also be measured by how much a person is connected: the amount of fans, followers and friends [18] a person has on its social networks, especially online. Sofalizing [19], which is socializing from ones couch via mobile devices, has become a normal way of interacting with others.

4.2. Gamification

For an action to become a habit it needs to be repeated constantly, even if is initiated without intention; after several repetitions the action becomes natural to the person and needs minimal conscious effort for it to be done [20].

Gamification [21] Involving someone into performing an everyday action while engaging in it because it is fun can be achieved through the use of game mechanics [22].

Reasons why games principles work, according to Sebastian Deterding [23], that were used for Meeco´s development include:

- Having a make believe story/goal that will help encourage the players.
- Breaking up the task of living an eco-friendlier life into small achievable tasks.
- Having a free space to share with others in a social way.

Games can be designed as toys [24] so people can learn new habits while having fun, just like children learn and as Jane McGonigal explains [25], saving the world in real life should be as easy as doing it in a videogame.

The gamer's characteristics [25] that inspire the project the most were:

- Urgent optimism, the desire to act immediately to tackle an obstacle in order to succeed.
- Social fabric, people prefer to work together with others while building stronger social relationships.
- Blissful productivity, the happiness it brings to do something, working hard, vs. not doing a thing.
- Epic meaning, the hope to make a difference, to improve and making life better.

4.3. Smartphones

Considering that the users are motivated to change their lifestyle, all that is needed is the tool they can use to achieve it.
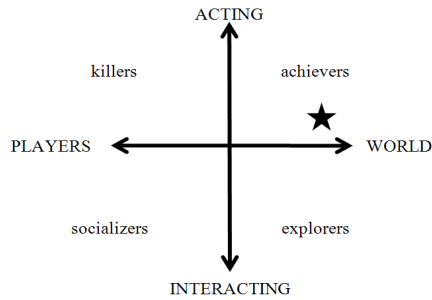
Fig. 1. Target as seen Bartle´s Players Types Interest [26]

In the multimedia universe, the mobile devices provide many advantages for a simple reason: its ubiquity enables people to access and send information of its surroundings.

In a study done by the team to 55 smartphone users, 47 of them always carry their smartphones, 5 said they only carry them when they leave home and 3 don't always have them around.

For this first prototype the iPhone smarthphone was selected to be used. It was selected due to interest of the team to develop on its platform because of its popularity and the vast interaction it allows. It was needed that the phone selected had to have a GPS chip integrated in order to make the LBS work, mobile internet access and an AppStore that worked to make the MiniGames from the platform accessed and downloadable to the same device.

5. THE SOLUTION

Meeco is a platform, where people can share their daily actions and tips, review and explore the world through a green lens, support friends on their eco-conscious choices and compete with them for the top rank, learn by playing minigames and puzzles, challenge themselves into building a green status by collecting items and connect with brands that share their same eco-values.

The Meeco platform was developed to be accessed by an iPhone Application. Location Based Services (LBS), Web Services and Game mechanics are being used to create an engaging service helps users acquire ecology habits without a big effort.

Meeco targets people, ages 23 to 45, who live in an urban context, since there is where a concentrated amount of pollutants are found, and at the same time, most green options are provided. It is designed so that the early adaptors will be people who already have a sense of eco-consciousness but are more interested in sharing their knowledge with their peers. This way, by approaching first a group of starters, a greater amount of people will follow; those who want improve their eco-status.

From a gaming point of view, Meeco is targets fringe and hardcore users. All of them described as a mix of achievers and explorers where they enjoy acting in the real world and sharing (figure 1). It is designed to be played on a mono player mode, although all players are nurtured by the common knowledge the players share.

5.2 Game mechanics

5.2.1 Space and objects

The space used to play with Meeco is the real world. The user needs real locations to virtually register the real eco-actions he/she has performed. This registry is made in an iPhone app.

The objects used are the eco-actions the users perform.

5.2.2 Goal

Meeco's goal is to obtain as much points as possible, and improve the users collection by performing eco-actions, in a regular basis and in any opportunity where a green action can be chosen.

5.2.3 Challenge

The first most important challenge the players encounter is registering actions. Actions are registered by choosing them from a list and assigning them to a real location. Since any eco-action a person does is of a certain type and done in a certain time/place, those are the variables used to register the actions.

When registering an action, the app provides the a list of the places around its location in which he/she can make a green choice, filtered list by type of action. The user selects the location where he/she is performing an eco-conscious choice and validates it.

Validation is done by following two steps: evaluates the action and selects with whom he/she wants to share this information. When the user has validated an action, a feed message will be shared with Meeco´s network, and other networks if the user choses to, stating that that person did a certain action, in a certain place and time. The user is also provided with the option to state a tip related to that location based action with the community. For example: "Joe commutes by lightrail and left a tip saying… New electronic pass, no more paper tickets!": *Joe* is the user, *commutes* is the action chosen by selecting mobility and *lightrail* is the option he chose from the list of near locations and *New electronic pass, no more paper tickets!* is the tip he typed in for that action.

In the case of the minigames, the user validates the action by accessing the game with its Meeco user.

5.2.4 Actions

The eco-actions selected to be part of Meeco are those that can be done on urban surroundings to encourage an eco-friendly way of living in cities. Actions are done in places but Meeco rates the action done by the user, not the venue itself. The actions a user can select from Meeco to record are the following:

- Mobility – The user can choose which way he/she commutes. Available options are: walking, biking, in a car, in a motorbike and using any public means of transportation available in the city.
- Recycle – The user can select from a list of places the one where he/she makes an effort to recycle. Places include

regular selective trash disposals, residue management, and any other the city has.

- Shopping – With this type of actions the user can record the action of buying products around the city.
- Leisure – These represent the action of spending the time in a place. Examples are cinemas, restaurants, sport centers, etc.
- Specials – This type of actions are assigned for 3rd party companies. These can participate and become part of the Meeco platform as partners.
- Minigames – Meeco is not only an app, it is also expandable to add new games to the platform. There is a section of the platform dedicated to include educational minigames with an ecology context. These should include a login request so that Meeco users can enter their username and receive special points for playing those games, and learning ecologic content. Points received in this section are catalogued as information points, since the user learns from the educative games.

Each type of action is assigned a color. That way the points acquired will be color-coded so the user will know his/hers actions breakdown by type.

5.2.5. Partners

There are two types of partners that can collaborate with the Meeco platform: Action Partners and Minigame Partners.

Action Partners are brands that want to improve their contact with consumers who also share eco-values. Action Partners can participate is by creating special campaigns with their products and allowing Meeco users to participate in order to improve their status in the platform/network and gain special content in their collections.

Minigame Partners are brands or developers that create minigames for the same mobile devices available for download and accessed by Meeco´s users login data.

5.2.6. Social networks integration

The user can choose if he/she wants to link his/her Facebook or Twitter account to Meeco so the actions done can also be posted on those networks. Besides external networks, Meeco has its own network of friends. Users can review what their friends just did by looking on the Timeline list of actions. Users can choose to like or dislike their friends' actions.

5.2.7. Feedback

The user gets constant feedback of all the actions he/she does. The most immediate one is the one received just after validating an action, a screen showing the points gained for that action is showed. Another feedback is perceived when the actions made are posted on the Meeco's Timeline tab where all the actions performed by the user's friends will show, including his/hers. A third type of feedback received is posted on the external social networks, if it was chosen to. Besides text, there are graphic feedbacks: the ranking bar, this shows the breakdown of points by action type related to the actions done

in the last 7 days, and the Collection area. In the Collection points gained by the user are transformed into graphic motives that the user can play around with and interact. It is a visual record of his/her entire evolution.

5.2.8. Conflict

Meeco can show different ways in which the user can encounter game conflict so that his/hers experience is exiting. First of all, the ranking bar. The user needs to be constant in its play to keep the bar from disappearing. Another conflict comes with the collection, the user needs to keep up his/her actions to maintain and improve his/her collection. And the most entertaining conflict of all is the competiveness that awakes when several friends play Meeco, since the ranking bar will place them in the hall of fame kind of ranking.

5.2.9. Collectively creating

Meeco's database is created as a skeleton prepared for it to grow. Different types of locations can be added depending on the types of actions. Users can create new locations by proposing them to the platform. Once several users have proposed the same location for an action, the location is created. This way the creation of fake locations can be decreased. Users also help create the current value of the scoring system, explained in the nest section, but cannot create new actions.

5.3. Scoring System

The scoring system is based in two point-scales that added give the resulting value of every action made. This dual point system is designed so that the users participate in creating the real and actual information of a location based action.

The first scale, a quantitative one, is made of fixed values assigned to type of actions made. These refer to characteristics of how the user participates, for example, if the user repeats an action constantly, keeps being eco-friendly away from his/her normal location or tries out new eco-actions.

The second scale, a qualitative one, is determined by ratings made by Meeco's users. Every time a user registers an action, he/she is asked to rate that action with a limited amount of points. The users review the action done and not the location, to help expand the community's ecological knowledge. For example, a user can highly rate the action *shopping at a farmers market* because he/she evaluates it as a very eco-friendly action.

The system archives and maintains the mean of a past, but short, period of time so that the ratings always are up to date. These are the points given to an action on its qualitative scale.

The user point's composition is done by adding the mean of the qualitative scale of a location based eco-action, to the points the user received for the action he/she did. For example, a user performs a first recycling registry at a waste management center and rates the action with five points, upgrading this location based eco-action mean to a 4. The 4 points of the qualitative scale are added to the 3 pints he/she receives for trying out a new eco-action, giving the user a total of 7 points.
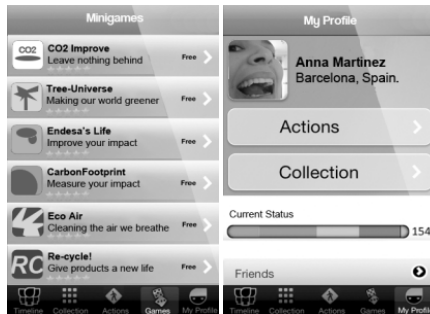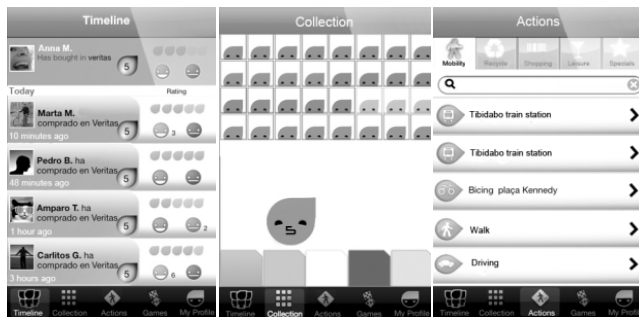
Fig. 2. Timeline, Collection, Actions, Minigames and My Profile tabs, in that order.

For Partner Actions and MiniGames a different system is used. For MiniGames, the user receives a fixed amount of points for each time he/she accesses a Meeco's platform MiniGame, and for the Partner Actions the number of points depends on the partner involved.

5.4. Implementation

There are two big blocks related to Meeco's technical development: the front-end, which is an iPhone App and minigames, and a back-end, which involves the server. As for the user experience, a specific type of aesthetics was chosen for the project.

5.4.1. Front-end

The User Interface is composed mainly of dedicated classes of UIButton and UITableView provided by Apple on iOS [25] [26]. HTML5 functionalities like Canvas2D [29] and Drag& Drop [29] are used on the Collections section for a friendlier user interface. The application is organized in five main sections (figure 2):

- Timeline - Displays all the ecological actions performed by the user and friends as images and text.
- Collection - Enlists accomplishments and badges achieved and collected by the user.
- Actions - Manages eco-actions recorded at a nearby place and shared with friends, composed of five buttons that change a table depending on the selection. The selection process is enabled by the iOS MapKit library dedicated to

Location Based Services (LBS). The device's GPS location searches the database for physical locations (venues, transports, etc.) related to the ecological actions nearby. Any executed action can be shared usingTwitter [16] and Facebook [17] through their APIs [27] [28] to update the user's status on each.
- Games – Displays mini-games related to the Meeco platform.
- My Profile - Logs actions and shows friends and user rankings.

5.4.2. Back-end

The web server part acts as the platform brain. Hosted inside the web server there are, besides the web services, the logics for the games (scoring system) and the different management tools. The web server part of Meeco is programmed in PHP [32]. Figure 3 describes how Meeco's different parts are connected.

All the information needed for the app to run is in the server. This information is organized in databases and tables, all of them implemented using the MYSQL [33].

All data is stored in the web server is. It is accessed and accesses the app in order for the platform to work. This communication is made through web services that use the JSON [34] programming language.

5.4.3. Aesthetics

As for what aesthetics is referred, a subtle reference to ecology was used while including a leaf-like item in the logo. The colors used, all bright and saturated, where used to make the app more enjoyable and less formal. Still, the shape and color of the letters and the simplicity of the icons talk about the objective seriousness.

The aesthetics of the project respond to a need of the user to feel identified to the platform, but still not in a discrete way which does not act as a flag of environmentalist, but more as a symbol of someone who is living an eco-conscious lifestyle.

6. CONCLUSIONS

The Meeco platform has been tested shortly on its alpha and beta stages, and some changes in its interface have already been made. It has proven, for now, to help implement ecological habits in peoples' life, thanks to the need of relating real life actions to a score, competitiveness and social network support. The testing has agreed that with the use of Meeco, the eco-chores which used to be boring are now somewhat more enjoyable to do.

The platform is being thoroughly tested with more users and during longer periods of time, to fully evaluate the changes in lifestyle the users have adopted. Another result expected to get, after exhaustive user tests, is the values assigned to the scoring system. It is important to adjust the values in further versions to the ones that potentiate the flow of the evolution of the usage of the platform. Changes are still to come in newer versions.

Action Partners and Minigame Partners are yet to be approached to evaluate the potential this platform can have for brands to connect with their customers.

As for today, the Meeco database has only been created for the city of Barcelona for terms of testing. As a future line, more cities and data will be added to the server in order to expand the network.

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