

Technical Design Document

Empaville Role Play Game & E-democracy tools

The following services are to be subcontracted as part of the **DARE Digital environment for collaborative Alliances** to **Regenerate urban Ecosystems** in middle-sized cities.

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1. THE GAME

Concept

Empaville is a role-playing game that simulates a gamified Participatory Budgeting process for an imaginary park in the city of Empaville, integrating in-person deliberation with digital voting.

Participatory Budgeting (PB) is a decision-making process in which citizens deliberate and directly decide how to spend part of a public budget (Sintomer, Herzberg, Röcke & Allegretti 2012). The game is based on real PB experiences, simplified and combined with gamification elements in order to provide an educational and critical experience on public participation.

The game involves offline and online phases, allowing participants to also use Information and Communication Technologies (ICT) adaptations to implement democratic processes.

All the online phases of the game take place within the EMPATIA UX (User Experience) digital platform that technologically supports the process.

Empaville covers the topic of democratic innovations (Smith 2009), with the simulation of a Participation Budgeting process. Moreover, the game is inspired by and critically employs the dynamics and analysis of gamification.

As has been analysed, in the recent years, gamification has emerged as an important trend in the field of public participation. Participatory processes frequently apply game dynamics to promote the engagement of a more diverse set of actors and to incentivize participants' behaviours. In particular, it is possible to frame the role-playing game Empaville in the cluster of "pervasive games," defined by Deterding (2014) as a game that can "take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world" (p. 37).

Goals

The role play Empaville aims to foster the culture of public participation and its digital evolution, providing critical tools to the participants in order to reveal limits, potentialities and challenges on the use of technologies in public participation.

In particular, the game seeks through gamification and direct experience to reach the following objectives:

1. **To stimulate the role of citizens as proactive actors in the community.**
This goal is framed in the citizens' empowerment, key element for a substantial and effective participation.
2. **To empathize with other categories of the society,** potentially different from the personal perspective in terms of gender, age, profession and social status. This allows to highlight the complexity of social instances and to promote the importance of mutual respect within the community.
3. **To encourage collaboration in conflict situations and to promote the group work on civic issues** as approach able to overcome the one to one dialogue with the institutions.

4. **To provide the possibility for politicians, technicians and public officers to sit on the side of simple participants in participatory processes**, understanding the procedural and practical difficulties and discussing how to improve organization and tools.
5. **To point out the positive and negative elements of the digital democracy**, with particular reference to the balance between safety and privacy on the one hand and accessibility and consequent increase of participants on the other. This goal is crucial to convey the need of extreme seriousness, attention and technical skills.
6. **To strengthen the role of the game as a learning method for adults as well as for children**. This point, deeper examined into the "Gamification" section, promotes critical learning through empirical experiences and fun, without hindering its limits and risks.
7. **To test new methods and tools in the frame of the democratic innovations**. Limited groups in monitorable environments can offer important opportunities to experiment innovative dynamics, platforms and tools, both online and offline, which can be applied later in real processes. The simulation also offers a more secure environment to safeguard the ethical aspects, subject to the information and consent of the participants.

Methodology

Empaville uses gamification to create an attractive, fun, and participatory context within its activities, but also to analyse the ludification of democracy.

It is possible to identify the following main elements of gamification in Empaville:

1. **Learning By Experience:** through a fun and practical approach, participants quickly acquire higher and more durable skills than by texts or tutorials;
2. **"Projective Identity"** (Ramirez & Squire 2014): the role-playing game requires leaving their own identity and social role to impersonate a character; this encourages participants to leave their habitual learning context and offers them the opportunity to act with different behaviours.
3. **Competition:** even in the presence of a purely symbolic prize, the context of the game pushes the participants to engage in the competition, both as individuals and as a group (Khaled 2014).
4. **Time Pressure:** in strictly reduced time, participants are pushed to focus on the problem and act. It is interesting to see how it can also lead to different decisions.
5. **Story-telling:** an accurate and engaging description of the context helps the participants to identify with the game on a personal level as to be involved in it.
6. **Strategy:** individual and group dynamics, competition, and prizes stimulate participants to develop gaming strategies.

Target

Empaville addresses different targets, especially two main groups: on one hand, politicians, technicians and public officers, on the other, simple citizens. The structure

of the game remains unvaried for both groups, but partially different goals emerge and some phases take on more importance.

In particular, for the target of politicians, technicians and public officers the foci are:

- experiencing a participatory process as participants and not just as organizers; testing a digital platform for participation;
- experimenting with dynamics of digital voting; and especially discussing criticalities in the light of game
- process and data analysis, starting with the topics of safety, timing and possible distortions. Instead, for the target of simple citizens the foci are: knowing the dynamics of a participatory budgeting;
- familiarizing with an online participation platform; reflecting on the limits and potential of digital democracy;
- empathizing with other social categories; and participating in a simulation of a deliberative moment on public issues.

2. SOFTWARE DESIGN

Overview

BiPart can be defined a multi-tenant platform, because it supports several organizations and several participatory process simultaneously (e.g. municipality, school, private organization, participatory budgeting, consultation, etc.) and connect them as a unique **community of practice**.

Therefore, each organization can have its own website with all the information and features to start, perform and archive a PP. Beside facilitating the management of several participatory processes, it also allows the connection between them allowing enrolled citizens to participate in more than one process and interact and support with each other to improve their experience and processes as well as strengthen their **leverage**. (e.g. interaction between municipalities and schools PB processes from the same city). BiPart, in fact, will show all of them in a map in order to give them visibility.

The platform can manage multiple communities, organizations and processes at the same time. Even overlapping communities belonging to the same organization, like:

- a Municipality wants to start a PB for their citizens
- an organization wants to start a PB for the citizens of its Municipality
- an organization wants to start a voting session for the citizens of its Municipality

Entity

ORGANIZATION

Each organization/community has its own page, subject matter, users and moderators. They can decide to have their own community space and/or a deliberative space with as many participatory processes as they wish.

Each user has its own personal space which is disconnected from the single organization or participatory process, but it includes all of them.

People can create their own **organization** (formal or informal), invite people to join and therefore the **process**.

BiPart will show organizations in the grid/map according like if they were ideas/proposals/projects. They can therefore be sorted and filtered.

GROUPS

Groups are a set of users that belong to an organization.

Users can belong to different groups, thus belonging to a neighborhood, city, nation, etc.

Participatory processes are associated to one or more groups.

People can belong to different group.

Group can be updated according to the participatory process it is involved.

Content Management

All the contents from the modules can:

- **created** by authorized users (groups)
- **edited** (according to certain rules)
- be visualized/searched/sorted/filtered in a dedicated page (**exploring page**)
- be **shared** in social networks

Contents can be visualized:

- in a geographical map
- in a thematic map
- random grid

Sorting is about:

- the number of comments
- the data of creation
- the number of followers
- the cost

Filtering is about:

- categories
- tags
- keywords (search)

Contents from the same module are connected to each other through the **alliances**.

Proposals and projects modules have a voting system that can be activated and deactivated with the possibility of publishing the results (ranking) and technical evaluations.

While creating contents, an **algorithm** will analyse the data in the platform and show to the authors:

- similar contents already published by others (to avoid duplication and redundancy)
- different contents to take into account (to foster the others' point of view)
- statistics about categories, tags.

These mechanisms are just suggestions that are not willing to substitute the individuals' will to pursue their own objectives or change their mind.

Personal Space

It is perhaps the most important section of the platform from the point of view of people engagement. It relates to the management of the individual participation in terms of personal as well as public accountability. It is the space where people can organize and show their participation through platform.

Here users can:

- upload and update their personal data (profile setting),
- make it public or private,
- monitor all their own activities in the platform (dashboard)
- what's going on in the organizations and processes they are participating or following (timeline),
- promote themselves for their performance (**expert**)
- be accountable for their activities (**delegate**)

Once registered, people access the personal space.

Once verified, people can perform the most relevant actions in the platform such as the vote in every *space* they are entitled to do it (e.g. in the BiPart community space, in all the processes where the organizations want to involve people from the BiPart community.

Users can follow other users in order to get notification from them and their actions. Users can ask to be **deleted** from BiPart database. His/her personal data will be canceled from the DB and all the contents generated will remain anonymous in the platform.

Personal profile

Users have the following fields at their disposal:

- Name
- Surname
- Age
- City of dwelling (drop-down menu or click on the map)

Users can perform the following actions:

- change their personal data

- add further personal information to the registration data, mostly linked to skills and expertise
- authenticate and verified their profile:
 - VAT number
 - mobile number (and SMS verification code)
 - working email

ACTIVITIES - Update of user profiles and roles management

Data Visualization

The platform can upload and show in a map/grid different objects coming from **different initiatives and partners**, like:

- Active entities (with detailed processes)
- PB processes
- EMPAVILLE sessions
- Active community spaces

These objects can be **shown** together, **filtered** by category or year and eventually reachable from a different **URL** (owned by a partner).

ACTIVITIES - Update of the Data analysis and visualization system and integration with Data Management system of VIR (DARE Platform)

Types of access/authentication

BiPart guarantees a solid authentication system to perform a correct online voting sessions and then reducing fake account, proxy voting and any unauthorized votes. Is it important to cross-check not only the authenticity of the users but also the eligibility of them as voters. Login is secured by the Captcha system.

The verification and the authorization of the user is therefore **punctual**: it happens everytime it is required, not just once and for all during the registration procedure. For example, in order to vote, BiPart will check the presence of the user in the updated list of residents.

Participation on the platform can be configured in a flexible way, both from the point of view of the required data and the authentication levels necessary to perform some activities.

BiPart provides a basic registration system (light registration) and an advanced (strong registration), capable of authenticating user profiles for the execution of specific activities (for example, uploading proposals or voting).

The basic registration consists in:

- Name,
- surname,
- email
- password.

Advanced registration provide various authentication systems, which can be activated optionally:

- access via SPID;
- the insertion of the tax code of the participant, which is verified immediately (for example, residents CF in a municipality)

ACTIVITIES

- Integration of the authentication system (SPID, CODE, ...)

3. E-DEMOCRACY TOOLS

Community Space

The CS is a free-interaction area where users can participate according to their specific interests, needs and availability:

- report problems
- publish ideas of improvement of the community,
- collect followers (interested users),
- get comments and suggestions to improve the idea
- improve the idea and increase the community around it through the **alliances**
- share content on social network sites
- increase their power and influence in their social and political context

In some way, the CS is a place/tool where people can build their petition or project collectively, rather than individually looking just for signatures or external support.

Contents from the organizations' CSs can be shown in the platform available to the BiPart community. The community where they come from will be visible.

In order to get visible, organizations are therefore encouraged to invite their community to join BiPart, other organizations to do the same and to publish proposals which are therefore supported by all of them.

Deliberative Space

The DS is the core of the platform where the participatory processes are implemented, the **political space** where the community altogether take their decisions and implement their projects under common rules, steps and actions. It is the space where the government of the community (the binding or collective decisions) takes place with its democratic rules.

Each process can be described according to the following data:

- organizer (the organization, by default)
- implementer/consultant (the advisory company/ies)
- responsible(s)

In this section it is possible to "build" participatory processes by composing multiple modules, which can be organized sequentially in phases.

The user can adopt a predefined process (a combined set of modules and rules) or build a new one that can be saved in order to be reused.

E-democracy tools

Modules are the **key-component** of BiPart to create **contents**. It differs from the functionalities available and can therefore perform different actions in the community as well as in the deliberative space:

MODULE	DESCRIPTION
Information	to describe and inform citizens about the state of the ongoing process and download information material (pdf, doc, xls)
Ideas	Basic solutions and ideas around themes and about places upon which to collect followers, comments and likes and to share on social media
Proposals	Detailed contents, linked to previous ideas, to be supported , commented and then evaluated by experts (single citizens or selected people from an organization)
Projects	Feasible contents - approved by the experts - ready to be implemented (and eventually voted). Projects cannot be uploaded by anyone but has to be presented as proposals and go through an evaluation process before. They are connected to the voting tool and then be selected by different voting systems (plurality, approval, positive/negative, etc.)
Crowdfunding	Opportunity for users to support and to fund projects
Alliances	Contents from different modules are connected to each other, both longitudinally and crosswise, then inheriting click actors, like: <ul style="list-style-type: none"> - proposals can be connected to the ideas - proposals of the 2019 can be linked to the same proposals of the 2018
Priorities	To appoint people to make projects according to the users' thematic priorities.

ACTIVITIES

- Implementation of a geolocation system and mapping of needs, challenges and priorities;
- Update of the Community and Deliberative areas;
- Update the management of participatory processes
- Implementation of a gamification system (alliances);

Voting system

Being a e-democracy platform, votes are one of the main features of BiPart. Votes are the most important **click action** because it provides the ranking of ideas, proposals and projects to be implemented.

Votes can be configured according to predefined types and be expanded with new modalities:

- plurality voting
- positive/negative
- tokens

BiPart can also cast “offline” votes thus increasing the participation and facing the digital divide. Voting can therefore be managed “offline” for those who have difficulties or online restrictions or issues (no email address, no mobile phone, etc.). It can be managed by:

- mobile polling stations
- ballot papers

Mobile Polling system is a simplified digital vote managed by authorized people (operator) entitled to cast the votes of those who prefer to vote in a public polling station rather than home and/or need assistance. It gives the operator the power to check and enable the participants to vote. The participants can therefore vote without inserting the required data (email, VAT number, mobile phone).

ACTIVITIES

- Update of online and offline voting management;
- Implementation of a budgeting system to add the opportunity of crowdfunding winner projects in collaboration with European Crowdfunding network

Empaville Game sessions

Empaville is a role-playing game based on e-democracy platform www.bipart.it that simulates a gamified Participatory Budgeting process for an imaginary park in the city of Empaville, integrating in-person deliberation with digital voting.

The game involves offline and online phases, allowing participants to also use Information and Communication Technologies (ICT) adaptations to implement democratic processes.

All the online phases of the game take place within the BIPART UX (User Experience) digital platform that technologically supports the process.

The players are divided into competing teams, to simulate a call for ideas and budget management of public funding for urban regeneration.

They should define a general strategy for Ravenna's Darsena and propose interventions and actions to restore squares, roads, paths, abandoned buildings and public spaces in general, rethinking the use of green elements, the presence of water, mineral materials for soils, smart object, sustainable mobility and so on. The main facilitator has access to an administration panel to configure the game options, using a wizard. He can select the type of process, defining the number of phases, duration and the player engagement systems (follower, supporter, vote)

The wizard allows to choose different modules with different functionalities:

- Module IDEA / CHALLENGE
- Module PROPOSAL / DELIBERATIVE WORKSHOP
- PROJECT / VOTE module

After this configuration the main facilitator can choose the reference scenario in which the players will play, whether it is clear or masked:

- the real cases push players to measure themselves against a known reality by attributing meaning to the tools and rules of the context (urban plans, regulations, ...), all the more if they know it directly;
- the real masked cases push the players to focus on the roles assigned to them, facing the game with more spontaneity than the game tools and the rules given

Based on the diversity of expectations and uncertainties about how things will develop, the participants can live in different places, imaging alternative future.

These scenarios offer a starting point for discussing the positive and negative implications of ideas and changes proposed in the decision making process..

The scenarios are interactive game environments, made on 2D illustrated maps, divided into zone where it is possible to view environmental data, divided by theme and represented by objects (cameras, sensors, cycle paths, etc.) and quantitative surveys.

Each environment is built on specific drivers of change and can be integrated with recognizable parameters of the Government Plan of the Territory of the city of Ravenna and a selection of data from VIR of the DARE project.

ACTIVITIES

- Update the management of game environment;
- Update the management of participatory processes
- Update the management of game characters
- Create target groups
- Integration with Data Management system of VIR

4. INFRASTRUCTURE OVERVIEW

A Content Delivery Network (CDN) will be used to deliver multimedia content to visitors as fast as possible by having data stored as close as possible to the users' geolocation.

The CDN is equipped with security systems that shield the undergoing system from Dos and DDoS attacks. They also provide a first level of Firewall rules for security application.

The Application Tier for the delivery of business logic services. The Application Tier is composed by different highly reliable apparatus thanks to scalable mechanisms equipped with balancing algorithms for web connections.

The apparatus can horizontally scale based on the traffic volume so that they can provide the visitors an impressive and constant response time. They are also implemented with special probes that detect faults and automatically repair them.

The Application Tier is distributed across multiple server & data nodes, which are located in separate availability zones, to prevent a complete system outage in case of catastrophic events located in a specific availability zone. The object relational persistence layer or database can archive data and it can provide an efficient interrogation system of them all.

The system stores data in different Availability Zones (AZs) and it takes advantage of the active-passive replication mode of data. In case of failure of the primary active node, the traffic will be directed to the passive node that will take the active role.

The persistence layer makes the most of the storage encryption for sensitive data. Every tier is constantly under consistent backup policies; all data are archived based on the temporal storage policy of highly durable, available and safe objects. Both the architecture and the application layer use the most up to date and efficient systems of release management.

ACTIVITIES

- AWS Server configuration
- Testing & debugging
- Assistance and maintenance of the software infrastructure and management of cloud server provider for the entire project period