CO3
Digital Disruptive Technologies to Co-create, Co-produce and Co-manage Open Public Services along with Citizens

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D4.2
Site-specific evaluation methods and preliminary reports

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History

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0.1	15/03/2021	Table of contents	LINKS
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Acronyms

ACA	Augmented Commoning Area
PA	Public Administration

CdQ	Case del Quartiere – Neighbourhood's Houses
AR	Augmented Reality
FL	First Life
LF	LiquidFeedback
TAM	Technology Acceptance Model
SUS	System Usability Scale
PMI	Protection Maternelle et Infantile (Georges Semard, Saint-Denis)
BMI	Building information management
FCPE	Association de Parents d'élèves Adhérents (national, departemental and municipal levels)

Table of Contents

1 Introduction

Deliverable D4.2 is built on the CO3 evaluation framework presented in D4.1. Through a co-design approach the evaluation metrics and activities to be carried out in each pilot have been defined considering characteristics, constraints and needs of each case.
Participatory methods are used along all the project lifetime, from the services concept to their impact evaluation. The co-design methodology has been used since the beginning of the project for the definition of the local services to be piloted, through an active engagement of local stakeholders. In the initial phase of the project, in fact, CO3 analysts have been able to understand local stakeholders' needs and to collaboratively define the services that will be implemented in the pilots (D1.1 and D1.2).
Then, grounding on a participative approach, the CO3 evaluation framework has been conceptualised during the second year of project execution (Y2), 2020, when the project had to face the issues related to the COVID-19 pandemic emergency. As a consequence of several lockdowns and restrictions imposed by the sanitary emergence in all the CO3 partners' countries the development of the pilots has been delayed and the scenarios initially described in D1.2 have been reviewed in alignment with the contextual conditions and constraints imposed in each country from march 2020 (scenarios updates are documented in D3.3 and recapped here). In this background, the evaluation framework has been designed and then adapted to each pilot context mainly through remote meetings between WP4 task leaders (OLA + LINKS), the pilots managers, and involving, when necessary, other Consortium partners for gaining relevant information related to their specific roles in the project (e.g. legal, technical, etc.).
Specifically, the main objectives of this deliverable are:

- To propose the overall co-design methodology used for the definition of the CO3 context-specific evaluations;
- To make an update of each pilot and, where relevant, of the engagement plan presented in D3.1;
- To provide for each pilot:
    - A description of how the evaluation process can be adapted to its specific case
    - The evaluation plan in terms of:
        - main hypothesis to be tested
        - evaluation actions to be implemented in order to test the hypothesis
        - types of data to be collected
        - main stages for data collection
        - templates and materials for data collection

This deliverable is structured as follows: after this introductory chapter, Section 2 recaps the CO3 evaluation framework defined in D4.1 while Section 3 focuses on each pilot, Athens, Turin and Paris, proposing the context specific evaluation activities foreseen. Specifically, for each pilot the following topics are considered:

- Update of the pilot - describes any relevant changes or delays that the pilot had to manage, considering the difficulties arisen after the COVID-19 emergency.
- Evaluation framework adapted to the specific case - details how the pilot intends to adapt the CO3 evaluation process proposed in D4.1 considering its features.
- Main hypothesis to be tested - presents the main hypothesis that are going to be verified through the evaluation actions.
- Evaluation actions – lists the evaluation actions foreseen for each use case / scenario, in light of the main hypothesis to be tested. For each evaluation action the reference to the type of data to be collected and the evaluation dimension (e.g., technological, social, economic, legal, cultural, etc.) are proposed.

- Evaluation stages – details the main stages for data collection.
- Evaluation material – proposes the templates for data collection to be used in the different evaluation stages and, where available, preliminary results.

Finally, conclusions and next steps are presented in Section 4.

2 The CO3 evaluation framework

During the first half of the CO3 project, local services to be piloted have been designed following a participatory methodology, based on co-design. This approach has been followed also in the evaluation of each pilots' service (Pautasso et al. 2021[1]). As anticipated in D4.1, within the plethora of qualitative and quantitative evaluation methodologies (European Commission, 2013[2]), theory-based evaluation (Chen, H.T., 1990[3]), and in particular the realist evaluation (Pawson & Tilley, 2004[4]), has been identified as the most suitable tools to accomplish such objectives.
Co-design logic has been adapted to an evaluation framework (Figure 1). The framework covers the two main axes of the project: the use of disruptive technologies and the co-production of public services. These axes are combined to different evaluation aspects that are related with legal, socio-cultural, economical and sustainability factors.

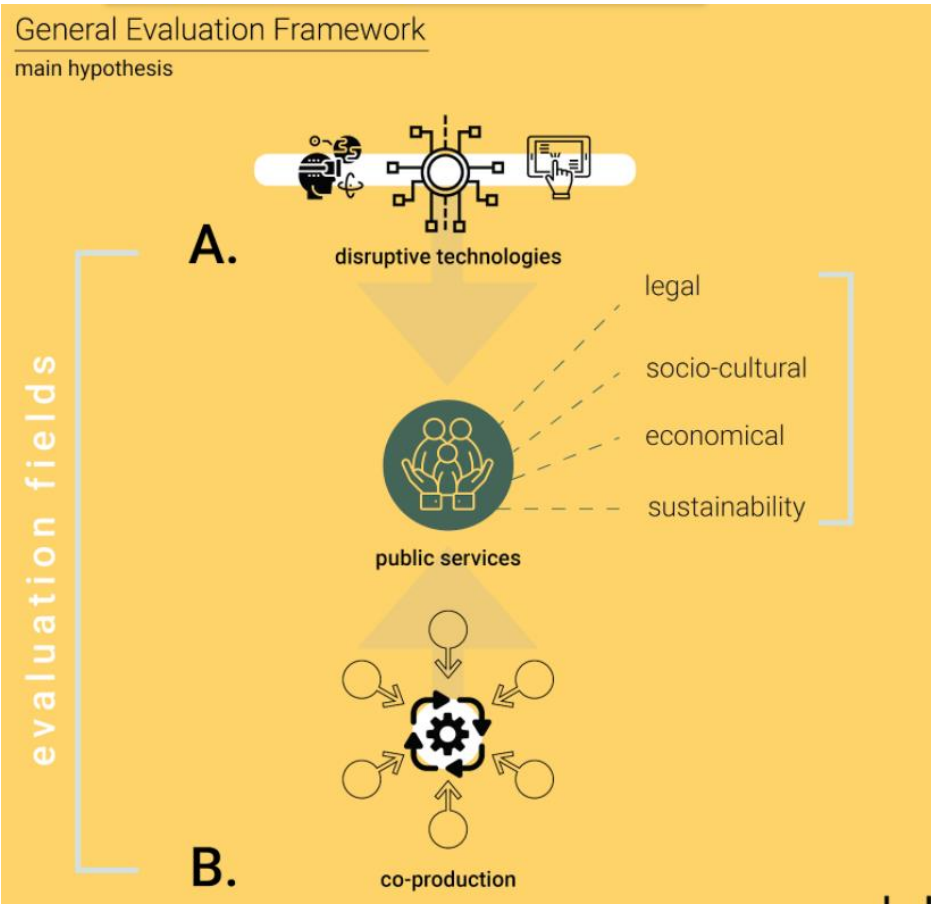

Figure 1 - General evaluation framework - SOURCE: CO3 project D4.1

[1] Pautasso, E., et al., (2021). The Outreach of Participatory Methods in Smart Cities, From the Co-Design of Public Services to the Evaluation: Insights From the Athens Case Study. International Journal of Urban Planning and Smart Cities (IJUPSC), 2(1), 59-83
[2] European Commission. (2013). EVALSED Sourcebook: method and techniques.
[3] Chen, H. T. (1990). Theory-driven evaluations. Sage Publications Inc
[4] Pawson, R., & Tilley, N. (2004). Realist Evaluation. Sage Publications Inc

The evaluation framework has been, then, contextualised to cover the needs of the individual pilot sites (Figure 2). Each pilot's evaluation plan contains services' metrics that incorporate stakeholders' interests and views. The contextualised evaluation plan is based on what each stakeholder needs to evaluate. In short, the evaluation framework aims to establish a "common ground" through which the results of the activities of the three pilot sites of the CO3 project are going to be evaluated. For this reason, **the CO3 evaluation plan is strictly connected to the stakeholders' engagement plan (D3.1)**.

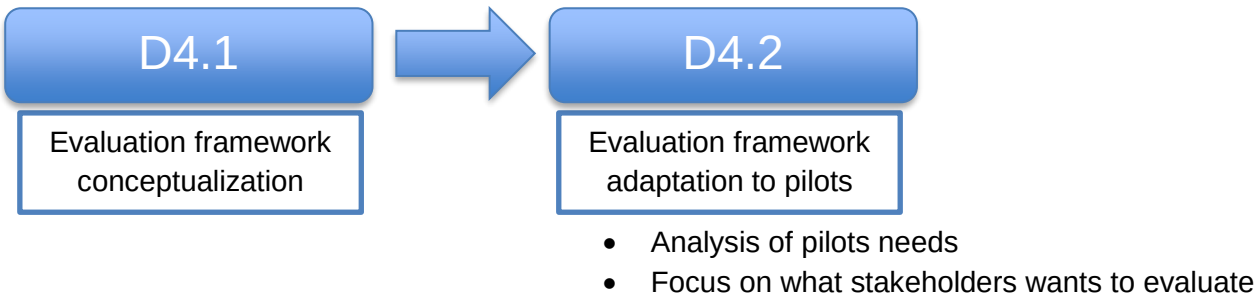

Figure 2 - From the evaluation framework (D4.1) to contextualised evaluation plan (D4.2)

2.1 Pilots evaluation plan design

2.1.1 Evaluation plan steps

Following the realist evaluation approach, the design of the pilot's specific evaluation plans has been framed around three steps (Figure 3):

1. **Identification of the main hypothesis** to be tested through the evaluation (together with pilots representatives, taking into account stakeholders expectations);
2. **Definition of the evaluation actions** to be carried out in order to test the main hypothesis, defined in step 1;
3. **Definition of the evaluation roadmap**, in order to collect data for the evaluation actions defined in step 2.

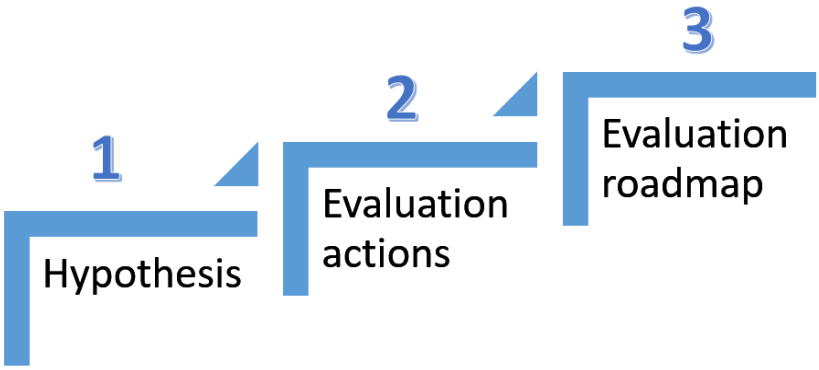

Figure 3 - CO3 pilots evaluation plan design in three steps

Hypothesis and sub hypothesis

At first, we worked with the pilot partners to create a main hypothesis for each pilot case. This hypothesis represents the pilot case as a whole.

To better enrich our approach we went on to define specific sub-hypothesis for each service's main hypothesis. These sub-hypothesis aimed to enlighten specific aspects of the pilot service, important to the pilot organization or local stakeholders.

Even though most hypotheses have an element of disruptiveness we aimed to develop specific *disruptive hypotheses* that aim to map existing services, similar to pilot ones, and spot the

disruptiveness. This way we are able to better understand the context in which the pilot service will operate and what existing provisions will disturb.

Main hypothesis and sub-hypothesis have been formally defined through a common tabular template that considers the following variables:

- Code: Each hypothesis is identified by a code. The code label contains the reference to the pilot (T=Turin, P=Paris, A=Athens); the use case / scenario number (1,...,n) and the hypothesis or sub-hypothesis number.
  Examples: T1.H1 indicates the hypothesis num 1 associated to use case 1 of Turin pilot; T1.SH1 indicates the sub hypothesis num 1 associated to the use case 1 of Turin pilot; T1.D1 indicates the disruptive hypothesis number 1 associated to use case 1 of Turin pilot.
- Content: Full text description of the hypothesis to be tested.
- Focus: Indicates the main stakeholders to which the hypothesis refers to.
  Examples: citizens, students, professors, volunteers, etc.
- Service: Reference to specific use case.
  Example: Turin 1 = use case num 1 of Turin pilot.
- Technology: Indicates the technology/ies that is / are taken in consideration by the hypothesis.
  Possible options: wallet, FirstLife, AR app, LiquidFeedback, Gamification.

See as an example for Athens pilot: Table 3.

Disruptive hypothesis have been formally defined through a common tabular template that considers the following variables:

- Code: Each disruptive hypothesis is identified by a code. The code label contains the reference to the pilot (T=Turin, P=Paris, A=Athens); the use case / scenario number (1,...,n) and the disruptive hypothesis number.
  Example: T1.D1 indicates the disruptive hypothesis number 1 associated to use case 1 of Turin pilot.
- Content: Full text description of the disruptive hypothesis.
- Current: describes how the existing services are carried out by the organization without CO3.
- Focus: Indicates the main stakeholders to which the disruptive hypothesis refers to.
  Examples: citizens, students, professors, volunteers, etc.
- Service: Reference to specific use case.
  Example: Turin 1 = use case num 1 of Turin pilot.

See as an example for Athens pilot: Table 4

Evaluation actions

On a subsequent stage of the discussion with the pilots we went on to map the evaluation actions that will be carried out in every pilot.
The goal here was to map these evaluation actions in order to:

- Design actions able to collect data in order to test the hypotheses developed;
- Attempt to link evaluation actions with engagement actions to achieve a more coherent pilot development course of action;
- Use them as feedback to create the overarching framework and decide on the general action types and phases.

The definition of the evaluation actions helps us to identify which are the data to be collected during the pilots. Specifically, two main types of data are going to be collected:

- Usage data: are the data that will be collected from the CO3 platform during the whole pilot execution, considering all the CO3 systems: LiquidFeedback, wallet, AR app, FirstLife, Gamification (Ontomap).
- Qualitative data: are the qualitative data about stakeholders' expectations that will be collected in specific moments of the pilots' lifetime. They could be collected through questionnaires, workshops, focus groups, interviews with experts, etc.

Evaluation actions have been formally defined through a common tabular template that considers the following variables:

- Code: Each evaluation action is identified by a code. The code label contains the reference to the pilot (T=Turin, P=Paris, A=Athens); the use case / scenario number (1,...,n) and the evaluation action number (1,...,n)).
  Example: T1.1 indicates the evaluation action num 1 associated to use case 1 of Turin pilot.
- Content: Full text description of the evaluation action .
- Type: Indicates the type of data to be collected.
  Possible options: a) usage data, b)data collected during the qualitative evaluation stages (e.g. through questionnaires, workshops, focus groups, interview with experts, …).
- Factor: Reference to the evaluation factor.
  Possible options: technological, social, cultural, economic, legal.
- Hypothesis: Reference to the specific hypothesis (code) that the evaluation action intends to test (see step 1).
- Engagement action: Reference to specific engagement actions (code) presented in the engagement plan presented in D3.1.
- Service: Reference to specific use cases.
  Example: Turin 1 = use case num 1 of Turin pilot.

See as an example for Turin pilot: Table 25.

Evaluation roadmap

The general CO3 evaluation roadmap has been presented in D4.1 and recapped here (Figure 4). This roadmap aims to provide local pilots and partners in Task 4.2 a clear way to organize the contextualised evaluation actions and is going to be adapted to specific pilots' needs and characteristics. Not all phases must be implemented in each pilot in the same way and with the same order. It depends on the local environment. The roadmap incorporated the following phases that are linked with evaluation methods, and particularly with data collection methods.

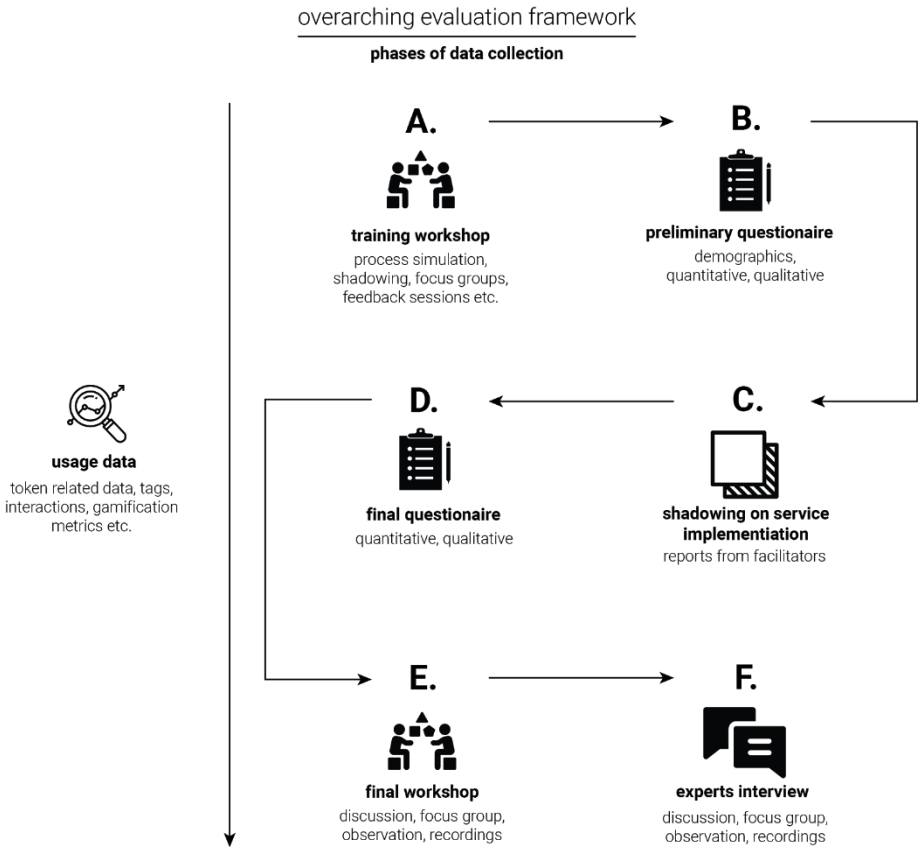

Figure 4 - CO3 evaluation roadmap - SOURCE: CO3 project D4.1

The main outputs for this step are the following:

- **For usage data:** a unique table (one for all the pilots) that makes reference to the main data to be used. Each data is defined according to the following variables:
  - Code: Each usage data is identified by a code. The code label contains the reference to the specific CO3 system it refers to (W=wallet, FL=FirstLife; AR=AR app; LF=LiquidFeedback; G = Gamification) and a sequential number.
    Example: W.1 usage data number 1 referred to the CO3 wallet.
  - Title: Name of the usage data.
  - Description: Detailed description of the usage data.
  - Pilot reference (ev. action): Reference to the pilot evaluation action [evaluation action code defined in step 1].
  - System(s): Indicates the CO3 system(s) that is / are considered.
    Possible options: wallet, FirstLife, AR app, LiquidFeedback; Gamification.

A first version of the usage data table was included in D4.1. An updated version of it, aligned with the pilot specific metrics proposed in the next chapters is reported in the Appendix (Table 52). D4.3 will contain (and evaluate) the final list of usage data that will be collected by the CO3 platform in the three pilots. It could slightly differ from the present one considering eventual refinements in the evaluation framework.

- **For qualitative data:** for each pilot the evaluation stages for collecting the requested data are defined through a common tabular template that considers the following variables:
  - Evaluation stage: Reference to a specific evaluation stage, defined in the evaluation roadmap (Figure 4) (A=training workshops; B=preliminary questionnaire; C=shadowing on service implementation; D=final questionnaire; E=final workshop; F=experts interview)

- Main action - code: for each evaluation stage one or more actions are identified by a code. The label code contains the reference to the pilot (T=Turin, P=Paris, A=Athens) and a sequential number. Example: A1.M.1 = Main action number 1 for Athens pilot scenario 1
- Eval. stage main action - title: Title of the main action
- Eval. stage main action - description: Full text description of the main action
- Evaluation action: Reference to the evaluation action(s) (code as defined in step 1) to which this main action refers to
- Engagement action: Reference to specific engagement actions (code) presented in the engagement plan (D3.1)
- Data collection: Description of the data collection method.
  Possible options: report from workshop facilitators, feedback from stakeholders, surveys, etc.
- Data analysis: Description of data analysis method. It could be: thematic analysis, quantitative analysis, etc.
- Supporting material: Link to supporting material and templates prepared for facilitating data collection (if available).
- Time table: Indicates when the main action is going to be carried out.

See as an example for Paris pilot: Table 45.

Pilot evaluation as a whole: from hypothesis to evaluation actions and stages

In order to provide a comprehensive vision of each pilot's evaluation framework built on the methodology presented in D4.1 (theory based - realist), a summary table is proposed at the end of each pilot chapter. The table lists all the hypothesis, evaluation actions and stages that are going to be carried out for each pilot.
This table (schematised in Figure 5) is conceived in order to facilitate the overall pilot evaluation process:

- following the table from the left (hypothesis) to the right (stages), it supports the evaluation analysis that will be carried out in D4.3, once all the qualitative and quantitative data will be collected. The pilot evaluator, in fact, will be able to understand which actions and related data can be used for evaluating each hypothesis and in which stage they have been collected;
- following the table from the right (stages) to the left (hypothesis), it supports the design and the preparation of the material for each of the evaluation stages (e.g. questionnaires, interviews / reports structure, etc): the evaluator can easily verify if in each evaluation stage all the information and data needed to test the pilot evaluation hypothesis are collected.

Support for the design of the material for each of the evaluation stages

Reading the table from stages to hypothesis

EXAMPLE		Evaluation stages						
Evaluation hypothesis	Evaluation action	usage data	A - training	B - preliminary questionnaire	C - shadowing	D - final questionnaire	E - final workshop	F - experts interviews
Hyp 1	Action 1	✓	✓					
…			✓					
Hyp n	Action n						✓	✓

Support for final pilot evaluation (D4.3)

Reading the table from hypothesis to stages

Figure 5 - Pilot evaluation as a whole (framework)

2.1.2 Evaluation plan: definition process

The evaluation plan has been defined following an iterative approach that involved both pilots' partners and other Consortium partners that contributed according to their competences / role in the project. Starting from the beginning of CO3 year 2, four main rounds of meetings have been carried out in order to make an initial draft of the evaluation plan and, then, to review and improve it (Figure 6).

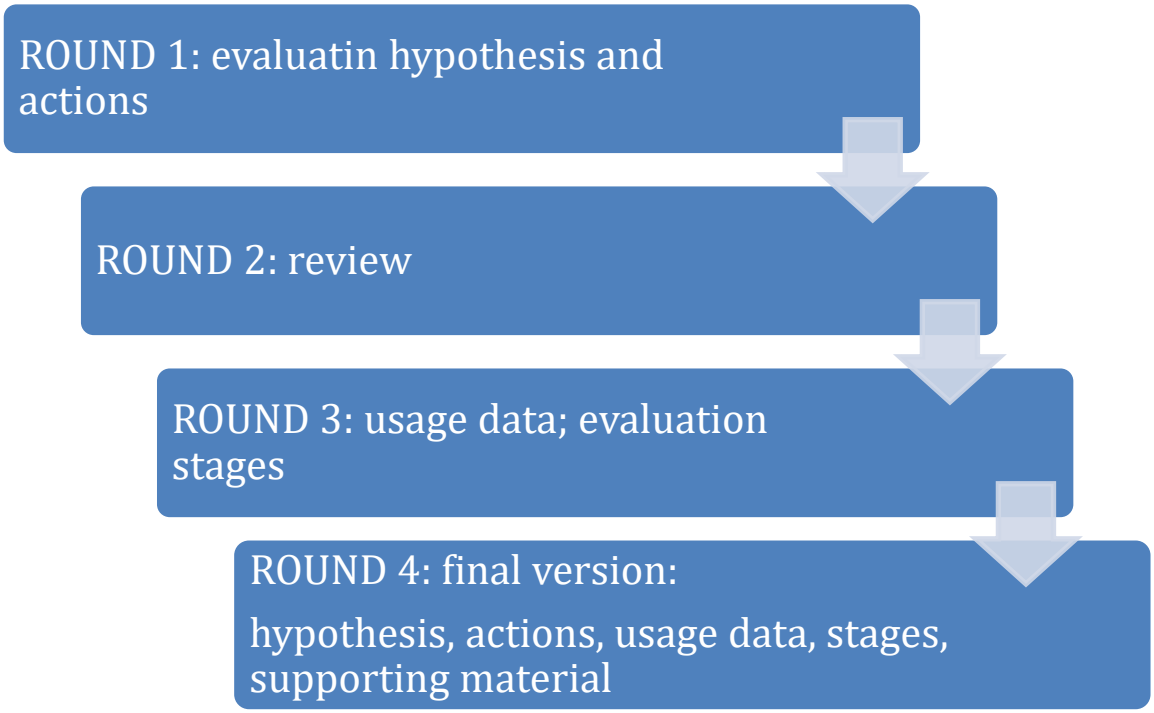

Figure 6 - Co-design of context specific evaluations - main phases

These rounds of meetings are detailed below (Table 1).

Table 1 - Co-design of context specific evaluations - main phases description

Round	Objectives	Involved Partners	Involved Partners role	Main outputs
1	Evaluation hypothesis and actions identification	OLA + LINKS	Support for discussion and documentation management	Context specific evaluation spreadsheet v0.1, containing: • Hypothesis • Evaluation actions
		Pilot partners*	Knowledge on the context	
2	Evaluation hypothesis and actions review	OLA + LINKS	Support for discussion and documentation management	• Context specific evaluation spreadsheet updated, v0.2 • Usage data spreadsheet v0.1 (to be reviewed by technical partners)
		Pilot partners*	Knowledge on the context	
		Other Consortium partners	Contributions with reference to their specific roles in the project, e.g. legal, technical, etc	
3	Evaluation process: - Evaluation stages - Usage data	OLA + LINKS	Support for discussion and documentation management	• Context specific evaluation spreadsheet updated, v0.3, containing: • Hypothesis • Evaluation actions • Evaluation stages
		Pilot partners*	Knowledge on the context	

				• Usage data spreadsheet v0.2 (reviewed by technical partners)
4	Final version of evaluation hypothesis, actions and stages Supporting material	OLA + LINKS	Support for discussion and documentation management	Context specific evaluation spreadsheet v0.4, containing • Hypothesis • Evaluation actions • Evaluation stages • Usage data spreadsheet v0.3 • Supporting material for each stage
		Pilot partners*	Knowledge on the context	

* the discussion with the pilots incorporated the feedbacks from local stakeholders with which the pilot partners are deeply engaged

3 Pilot specific evaluation methods

INTRODUCTORY REMARK

As previously said D4.2 has been postponed due to the delay in the launch of all the pilots and to the contextual uncertain conditions that impact on the implementation of them.
In order to provide an incremental view on how the evaluation process has been defined and organised in the three cities considering the advent of the COVID-19 emergency during the execution of CO3 project, we decided to **propose in D4.2 the provisional and wider list of evaluation hypotheses and actions defined until now (June 2021), while, D4.3 will contain the final and definitive evaluation results.**
Hereafter, the initial list of evaluation hypotheses and actions that have been defined by CO3 Consortium during Y2 within T4.2 is presented, however considering the evolution of the pandemic in the next months they could be further reduced or reviewed in D4.3.

3.1 Athens

3.1.1 Pilot recap and updates considering COVID-19

The main updates about the Athens pilot are presented in D3.3. In this chapter they are recapped with the aim to clarify the main changes with respect to the original ideas presented in the first half of the project in terms of scenarios definitions and engagement plans (D1.2 and D3.1), as they can have an impact on the pilots evaluations.

Context: Like any other European country, Greece has been affected by the COVID-19 pandemic since February 2020 and a series of restrictive measures aimed to contrast and limit the diffusion of the virus have been taken. However, the restriction measures in Greece started to be mitigated in May 2021.

Scenarios and engagement plans: in D1.2 two scenarios for Athens pilot have been proposed:

1. “Grocery on Hold”, referring to the social distribution of quality food excess. It takes place at flea markets located in 2 Athenian neighbourhoods - in Patisia and Kolonaki - with the

involvement of customers, producers of the products that own benches in the market, and the services beneficiaries (namely, citizens with social and financial needs).

2. “Empty Buildings”, referring to the open debate on the potential re-usability of empty buildings, through the mapping of empty buildings of the city by citizens, and the proposition of potential uses with the active involvement of municipal employees of the urban planning agency

The COVID emergency affected to a minimum extent the operation of the flea markets: less producers with benches per flea market, each flea market was actually divided in two sub-markets in the same locality to tackle social distancing of producers and customers. In general, though since the flea market continued to operate we were able to start the pilot in April 2021.

Most importantly, the COVID emergency induced obstacles in the continuation of the activities based on group meetings, namely the preparatory activities and the engagement plans for Athens Pilot 2 which was based on a board game session.

Nonetheless, the main strategy and activities for the implementation of the two scenarios have not changed, but the timeline of execution is extended. Consequently, the preparatory phase was prolonged and the actual pilot execution started with a time-shift, mainly for the second scenario in May 2021.

3.1.2 Evaluation hypothesis

For the Athens pilot the following evaluation hypotheses for the two scenarios have been defined (Table 2).

Table 2 - Summary of Athens pilot evaluation hypothesis

Paris scenarios	# main hypothesis	# sub hypothesis	# disruptive hypothesis
1 - Grocery on holds	1	7	4
2 - Empty Buildings	1	9	2

Table 3, Table 4, Table 5 and Table 6 propose the evaluation hypothesis for the two scenarios.

Scenario 1 - Grocery on holds

Table 3 - Athens scenario 1 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
A1.H1	The capabilities afforded by CO3 Wallet Application and Coopbox can help create and maintain a service where citizens contribute to groceries provision to citizens in need.	Main	Athens 1	blockchain
A1.SH1	Citizens will be eager to contribute economically to the on-hold food provision service (Hesitation, Purpose, Trust to the service)	Citizen	Athens 1	blockchain
A1.SH2	Producer will be positive on selling products through the on-hold food provision service	Producer	Athens 1	blockchain
A1.SH3	Citizen in need are willing to shop with tokens through the on-hold food provision service	Beneficiary	Athens 1	blockchain
A1.SH4	Users will accept to use the CO3 Wallet Application	Technology	Athens 1	blockchain
A1.SH5	The service will be feasible to sustain within the greek legal and accounting framework	Conditions	Athens 1	blockchain
A1.SH6	The service will be adopted by municipality	Public Authorities	Athens 1	blockchain
A1.SH7	The service will be adopted by commoners	Commoners	Athens 1	blockchain

Table 4 - Athens scenario 1 disruptive hypothesis

Code	Content	Current	Focus	Service
A1.D1	Citizens/donors will more be eager to contribute economically to the on-hold food provision service	Contribute with material to foodbanks from social initiatives (e.g. Allos Anthropos, Mirmigi, Steps)	Citizen	Athens 1
A1.D2	Citizens in need prefer to be able to shop with tokens than get groceries from foodbank	They get groceries from KYADA and Social Initiatives (e.g. theCupboard, Mimigi)	Beneficiary	Athens 1
A1.D3	Producers are more eager to conceptate the digital tokens from the wallet than the paper food stamps	The Prefecture of Attica and the Union of Sellers provided paper stamps to buy groceries in flea market	Producers	Athens 1
A1.D4	The city prefers to support the co-produced food provision by citizens than run services supported by private company donors	KYADA food provision is mostly funded by private company donations	Public Authorities	Athens 1

Scenario 2 - Empty Buildings

Table 5 - Athens scenario 2 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
A2.H1	The capabilities afforded by CO3 AR app and FL could engage citizens to participate in collaboratory urban planning	Main	Athens 2	AR & First Life
A2.SH1	Serious gaming, gamification and AR can make it challenging/interesting for citizens to participate in the service	Citizen	Athens 2	gamification
A2.SH2	Educate citizens about the management of urban space and processes about it	Citizen	Athens 2	
A2.SH3	AR and LF are inclusive for broad population	Technology	Athens 2	AR & LF
A2.SH4	The service could create a discourse about the city between citizens and public authorities	All	Athens 2	LF
A2.SH5	Discourse created from the service is fruitful for the public authorities (added value, realistic)	Public Authorities	Athens 2	LF
A2.SH6	Proposals from the service are adopted by the municipality	Public Authorities	Athens 2	
A2.SH7	Both citizen and PA through service they get a better understanding of the urban environment	All	Athens 2	
A2.SH8	AR will help map items in the urban environment / FL help visualization	Technology	Athens 2	AR
A2.SH9	The asynchrony of discussion in LiquidFeedback will help citizens and public authorities to express ideas and make decisions	Technology	Athens 2	LF

Table 6 - Athens scenario 2 disruptive hypothesis

Code	Content	Current	Focus	Service
A2.D1	Citizen will map their needs in the city through AR + FL	Technical agency of the city does research on what is needed	All	Athens 2
A2.D2	Participatory workshop with FL and LF are used to deliberate upon proposals by citizens	The city makes a network and invites groups for discussions or there is an online form for citizens' feedback	All	Athens 2

3.1.3 Evaluation actions

Scenario 1 - Grocery on holds

Twelve evaluation actions have been defined for the Grocery on holds scenario (Table 7). Three of them can be evaluated through the analysis of CO3 platform / pilot specific data (A.1.1, A.1.3, A.1.4). The others are the results of data collected through the interaction with relevant stakeholders in workshops, interviews/questionnaires and focus groups. Usage data can mainly contribute to the evaluation of economic factors. Workshops, focus groups and interviews can be used to collect additional qualitative feedbacks from end-users about the usefulness of the CO3 application. Two actions are addressed to gain relevant information about the legal implications (A.1.6 and A.1.9), while the others are focused on the socio-cultural sphere in addition to the economic one.

Table 7 - Athens scenario 1 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
A.1.1	Volume of tokens raised	Usage Data [W1]	Economic	A1.SH1		Athens 1
A.1.2	Ask citizens why they donated (or why not)	Short Interviews & Questionnaire	Sociocultural	A1.SH1, A1.D1	B4	Athens 1
A.1.3	Volume of tokens consumed	Usage Data [W2]	Economic	A1.SH2 , A1.SH3		Athens 1
A.1.4	Number of Producers	Pilot specific data[5]	Economic	A1.SH2		Athens 1
A.1.5	Ask producer why they participated (or why not)	Short Interviews & Questionnaire	Sociocultural	A1.SH2	A1, A2	Athens 1
A.1.6	Legal barriers to producer participation	Legal Report	Legal	A1.SH2, A1.SH5		Athens 1
A.1.7	Ask beneficiaries if they are positive on using tokens	Short Interviews > Questionnaire	Sociocultural	A1.SH3, A1.D2	D	Athens 1
A.1.8	Technology Acceptance of Wallet	UTAUT Survey	All	A1.SH4	E	Athens 1
A.1.9	Is the service feasible with Legal/Accounting framework	Legal Report	Legal	A1.SH5		Athens 1
A.1.10	Opinion of municipality officials	Experts Interview	All	A1.SH5, A1.SH6, A1.D4		Athens 1
A.1.11	Opinion of commoners	Focus Group/Workshop	All	A1.SH7		Athens 1
A.1.12	Producers asked to compare with food stamps	Short Interviews > Questionnaire	Economic, Sociocultural	A1.D3	E	Athens 1

Scenario 2 - Empty Buildings

Thirteen evaluation actions have been defined for the Empty Buildings scenario (Table 8). The majority of the actions addresses sociocultural aspects (10 out of 13) and three of them can be

[5] it is a pilot specific data not collected by the app, but known by the pilot manager

evaluated through the quantitative analysis of usage data (A.2.1, A.2.2, A.2.3). The specificity of this case is related to the fact that two evaluation actions (A.2.4 and A.2.5) refer to the board game that has been conceived in order to make an “off-line” test of the scenario. Moreover, while usage data can be used to evaluate mainly socio-cultural factors, data collected through workshops, focus groups and interviews can be used to collect additional qualitative feedback from end-users about the usefulness of the CO3 application. In this case one evaluation action (A.2.12) is going to be used to evaluate the solution from a legal perspective.

Table 8 - Athens scenario 2 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
A.2.1	Items mapped (How many? Which type?)	Usage Data [FL.2, FL.3, FL4]	Sociocultural	A2.SH1 , A2.SH3, A2.SH8		Athens 2
A.2.2	Badges earned by participants	Usage Data [G1]	Sociocultural	A2.SH1, A2.SH3, A2.SH8, A2.SH9		Athens 2
A.2.3	How many proposals and comments on LF	Usage Data [LF.1, LF.2]	Sociocultural	A2.SH9, A2.SH3		Athens 2
A.2.4	How citizen play the board game	Observation , Discourse analysis	Sociocultural	A2.SH1	A2	Athens 2
A.2.5	Items mapped in the game (How many? Which type?)	Board Game Data	Sociocultural	A2.SH1	A2	Athens 2
A.2.6	Technology Awareness Assessment of Users	Questionnaire	All	A2.SH1, A2.SH3, A2.SH8, A2.SH9	A1, B	Athens 2
A.2.7	How citizens react on data collected	Observation , Discourse analysis	Sociocultural	A2.SH1, A2.SH7, A2.SH8	C	Athens 2
A.2.8	Technology Acceptance of LF	UTAUT Survey	All	A2.SH3	D1 or D2	Athens 2
A.2.9	How PA and citizens discuss online	Discourse analysis / usage data [LF.2]	Sociocultural	A2.SH2, A2.SH3, A2.SH4, A2.SH9	D2	Athens 2
A.2.9b	How PA and citizens discuss together	Observation , Discourse analysis	Sociocultural	A2.SH1 A2.SH2 A2.SH4 A2.SH5 A2.SH6, A2.D1		Athens 2
A.2.10	AR/LF/FL feedback	Questionnaire + UTAUT	Sociocultural	A2.SH1, A2.SH3, A2.SH8, A2.SH9, A2.D2		Athens 2
A.2.11	PA feedback	Experts Interview	Sociocultural	A2.SH5, A2.SH6		Athens 2
A.2.12	How proposals are legally feasible	Legal Report	Legal	A2.SH5, A2.SH6		Athens 2

3.1.4 CO3 evaluation roadmap for the Athens pilot

The CO3 evaluation roadmap as presented in Figure 4 (see Chapter 2) has been adapted for the two Athens scenarios. The following image (Figure 7) resumes the main stages that are going to be carried out in each scenario. Firstly, usage data is going to be monitored during the pilot execution and at the end of it. Moreover, in both scenarios that envisage interactions with relevant stakeholders, qualitative evaluation is going to be carried out in three main phases: preliminary (training workshops + preliminary questionnaire), ongoing (shadowing on service implementation) and final (final questionnaire, workshop and experts interview). They are detailed in the next paragraphs.

	Evaluation stages						
	usage data	A - training	B - preliminary questionnaire	C - shadowing	D - final questionnaire	E - final workshop	F - experts interviews
Scenario 1 – Grocery on holds	A1.M.12	A1.M.1, A1.M.3, A1.M.4	A1.M.2	A1.M.5, A1.M.6	A1.M.7, A1.M.8	A1.M.9	A1.M.10, A1.M.11
Scenario 2 – Empty Buildings	A2.M.10	A2.M.2, A2.M.5	A2.M.1	A2.M.4	A2.M.7	A2.M.3, A2.M.6	A2.M.8, A2.M.9

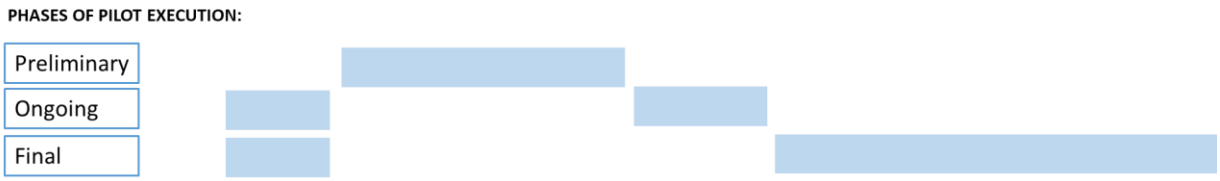

Figure 7 - Athens pilot evaluation stages

Scenario 1 - Grocery on holds

Athens scenario 1 evaluation stages have been framed around four main phases:

1. Preliminary evaluation
2. Ongoing evaluation (during pilot implementation)
3. Final evaluation
4. Usage data analysis

Preliminary evaluation

TRAINING WORKSHOPS

A1.M.1 - Collect Opinions on the service from producers while engaging with them to join: Pilot partner members make field visits to flea markets, present the service to the producers and ask for their opinion. They take notes in a diary. This aims to get the first perception of the service from producers and check afterward if it changes overtime.

A1.M.3 - Report on Usability & Acceptance issues while training producers to use the system: During training with producers that want to join pilot partner members track down what they think about the service & the system in terms of Usability and TAM in general. The training may take place in the flea market and not as a separate workshop. This aims to cover early usability problems and get a primarily perceptual feedback on the service.

A1.M.4 - Report on Usability & Acceptance issues while training beneficiaries to use the system: During training with beneficiaries that were selected to join pilot partner members track down what they think about the service & the system in terms of Usability and TAM in general. The training may take place in the flea market and not as a separate workshop. This aims to cover early usability problems and get a primarily perceptual feedback on the service.

PRELIMINARY QUESTIONNAIRE

A1.M.2 - Collect Opinions on the service from selected beneficiaries: Engaging with a large population of beneficiaries seems unlikely and unethical. Beneficiaires will be proposed by partners

on the ground (social services and social centers). Pilot partner members will take a survey from the ones selected to collect their initial view on the service and see how this changes overtime.

During pilot implementation (shadowing on pilot implementation)

A1.M.5 - Collect opinions on the service from citizens in the flea market: While in the flea market promoting the service, pilot partner members use a small scorecard to ask citizens why they donated or not
A1.M.6 - Collect pilot member partners' views on the implementation of the service: Pilot partner members will be every week at the flea market. As such it is useful to write down their own views and what they encounter during service implementation. Problems with stakeholders (producers, beneficiaries, consumers) or other problems or reactions encountered should be logged in a weekly diary

Final evaluation

FINAL QUESTIONNAIRE
A1.M.7 - Get feedback from producers that participated in the project: Close to the end of the pilot implementation pilot partners will engage with producers for an extended interview in which they will seek for feedback for the service and the technology used
A1.M.8 - Get feedback from beneficiaries that participated in the project: Close to the end of the pilot implementation pilot partners will engage with beneficiaries for an extended interview in which they will seek for feedback for the service and the technology used

FINAL WORKSHOP
A1.M.9 - Collect opinion from commoners on the sustainability of the service: After pilot implementation is concluded preliminary results will be presented to commoners in the pilot area to discuss in a workshop how can this service be implemented as commons in a sustainable way. The goal here is to understand how the service can evolve outside the scope of the research project

EXPERTS INTERVIEWS
A1.M.10 - Collect opinion from PA about the service: After pilot implementation is concluded preliminary results will be presented to PA officers not directly involved in the project but engaged in similar social service (such as KYADA). We aim to collect their opinion on whether this service is sustainable, how it interacts with PA culture and whether it can have a longtime positive social impact.
A1.M.11 - Collect opinion from legal experts on the legal feasibility of the service: After pilot implementation is concluded preliminary results will be presented to legal experts to assess potential legal barriers for the actual implementation of such a service.

Usage data analysis

A1.M.12 - Quantitative evaluation on data collected: during the pilot execution a periodic evaluation of data collected will be carried out by pilot managers

In conclusion, Table 9 attempts to summarize the main evaluation stages by typology of action.

Table 9 - Athens scenario 1 evaluation stages by typology

Typology	Number	Evaluation stage
questionnaires	3	A1.M.2, A1.M.7, A1.M.8
workshops / meetings	4	A1.M.1, A1.M.3, A1.M.4, A1.M.9
interviews	2	A1.M.10, A1.M.11
periodic monitoring	2	A1.M.5, A1.M.6

Table 10 details each of the evaluation stages and related actions.

Table 10 - Athens scenario 1 evaluation stages description

Evaluation stage	Eval stage main action	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
A - Training Workshop	A1.M.1 - Collect Opinions on the service from producers while engaging with them to join	A.1.5, A.1.6, A.1.9, A.1.8, A.1.12	A1, A2	Small interviews	Thematic	Canvas, Interview Guide, Leaflet for producers Available in appendix	First two months of pilot implementation
B - Preliminary Questionnaire	A1.M.2 - Collect Opinions on the service from selected beneficiaries	A.1.7, A.1.8	C1,C2,C3 will not take place. Instead we will engage directly with selected beneficiaries.	Structured interview with open and closed questions	Thematic & Quantitative	Answers template, Interview Guide Available in appendix	First month of pilot implementation. Before M.1.5
A - Training Workshop	A1.M.3 - Report on Usability & Acceptance issues while training producers to use the system	A.1.5, A.1.8, A.1.12	A3 Train producers to use the system (new)	Cognitive Walkthrough/Think aloud	Thematic	Canvas, Facilitator Guide Available in appendix	First month of pilot implementation
A - Training Workshop	A1.M.4 - Report on Usability & Acceptance issues while training beneficiaries to use the system	A.1.7, A.1.8	D	Cognitive Walkthrough/Think aloud	Thematic	Canvas, Facilitator Guide Available in appendix	First month of pilot implementation
C - Shadowing	A1.M.5 - Collect opinions on the service from citizens in the flea market	A.1.2	B4	Small Structured Survey	Quantitative	Questionnaire	During the whole 9 months of pilot implementation
C - Shadowing	A1.M.6 - Collect pilot member partners' views on the implementation of the service	A.1.2, A.1.5, A.1.6, A.1.7, A.1.8, A.1.9, A.1.12	B4, D, E	Diary Log	Thematic	Diary Log Template	During the whole 9 months of pilot implementation

D - Final Questionnaire	A1.M.7 - Get feedback from producers that participated in the project	A.1.5, A.1.6, A.1.9, A.1.8, A.1.12	-	Structured interview with open and closed questions	Thematic & Quantitative	Answers template, Interview Guide	Last month of pilot implementation
D - Final Questionnaire	A1.M.8 - Get feedback from beneficiaries that participated in the project	A.1.7, A.1.8	-	Structured interview with open and closed questions	Thematic & Quantitative	Answers template, Interview Guide	Last month of pilot implementation
E- Final Workshop	A1.M.9 - Collect opinion from commoners on the sustainability of the service	A.1.8, A.1.11	-	Recordings, Facilitator Report	Thematic	Canvas, Facilitator Guide, Preliminary results presentation	A month after the pilot implementation
F - Experts Interviews	A1.M.10 - Collect opinion from PA about the service	A.1.8, A.1.10	-	Unstructured interview	Thematic	Preliminary results presentation, Interview Guide	A month after the pilot implementation
F - Experts Interviews	A1.M.11 - Collect opinion from legal experts on the legal feasibility of the service	A.1.6, A.1.9	-	Unstructured interview	Thematic	Preliminary results presentation, Interview Guide	A month after the pilot implementation
Usage data	A1.M.12 - Quantitative evaluation on data collected	A.1.1, A.1.3		CO3 platform	Quantitative		During pilot execution

Scenario 2 - Empty Buildings

Athens scenario 2 evaluation stages have been framed around four main phases:

1. Preliminary evaluation
2. Ongoing evaluation (during pilot implementation)
3. Final evaluation
4. Usage data analysis

Preliminary evaluation

TRAINING WORKSHOPS

A2.M.2 - Simulation of service through serious gaming: This is merely an engagement action that will help participants understand the service. Nonetheless it can provide some evaluation data. Participants will play a board game designed to engage them and simulate the service process. We will collect data from the gameplay to see how they think regarding the urban development process. After that they will go out to map with the AR app.

A2.M.5 - Train participants how to use LF: In a separate event participants that have gone through previous engagement action will be trained on LF. A tool presentation will take place by pilot partner members and hands on experience on LiquidFeedback will be provided. On the evaluation part we will track down what they think about this part of the service in terms of Usability and generally. After that online discussion starts.

PRELIMINARY QUESTIONNAIRE

A2.M.1 - Collect technology awareness data from citizens that will participate in the pilot implementation: Pilot members will collect data on technology awareness of participants with a limited survey. The goal here is to get to know our users and see how capable they are to use technologies such as AR and LF. Demographic data can also be collected here. Citizens' digital competences are going to be measured through the “Digital Literacy Measurement Tool” reported in the Appendix. This tool has been defined in alignment with the European Digital Competence framework DigComp[6] and is going to be used also within A1.M.1 and A1.M.2 and for the Turin pilot evaluation stages T.M.3 and T.M.6.

During pilot implementation (shadowing on pilot implementation)

A2.M.4 - Collect opinions from participants about the AR mapping process: Collect data from participants on a scoresheet focused on the technology component of the service but with some questions on other aspects too.

Final evaluation

FINAL QUESTIONNAIRE

A2.M.7 - Collect opinions from participants after the conclusion of the pilot implementation: Collect data from participants after the implementation of the pilot with an unsupervised written questionnaire focused on the technology component of the service but with some questions on other aspects too.

FINAL WORKSHOP

A2.M.3 - Discuss mapping results with participants: When participants return from the mapping process with the AR app all data will be presented in FL life. Pilot members will discuss with participants regarding the mapping service focusing on the buildings the chose and their ideas for the service as a whole

A2.M.6 - Observe interaction between PA and participants after the online discussion: After online discussion is concluded PA and participants come together for a final workshop in which

[6] https://publications.jrc.ec.europa.eu/repository/bitstream/JRC110624/dc_guide_may18.pdf

they discuss the most prominent proposals. Through the workshop process we try to collect data about the impact of the service in all stakeholders

EXPERTS INTERVIEWS
A2.M.8 - Collect feedback from PA for the service as a whole: Interview with PA in order to collect opinions about the overall process, outcomes, failures and potential next steps
A2.M.9 - Legal assessment: We need to know whether the proposals created are legally feasible. For this purpose we will ask for a legal assessment from PA legal department in collaboration with the urban planning department

Usage data analysis

A2.M.10 - Quantitative and qualitative evaluation on data collected: During the pilot execution a periodic evaluation of data collected will be carried out by pilot managers

In conclusion, Table 11 attempts to summarize the main evaluation stages by typology of action.

Table 11 - Athens scenario 2 evaluation stages by typology

Typology	Number	Evaluation stage
questionnaires	2	A2.M1, A2.M.7
workshops / meetings	4	A2.M.2, A2.M.5, A2.M.3, A2.M6
interviews	2	A2.M.8, A2.M.9
periodic monitoring	1	A2.M.4

Table 12 details each of the evaluation stages and related actions.

Table 12 - Athens scenario 2 evaluation stages description

Evaluation stage	Eval stage main action	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
B - Preliminary Questionnaire	A2.M.1 - Collect technology awareness data from citizens that will participate in the pilot implementation	A.2.6	A2	Small Structured Survey	Quantitative & Qualitative	Questionnaire **Available in appendix**	First action in every ACA initiation
A - Training Workshop	A2.M.2 - Simulation of service through serious gaming	A.2.4, A.2.5	A2	Facilitator report, Recordings	Thematic analysis and Quantitative on some gameplay data	Board game, Facilitator Guide, Report templates **Available in appendix**	Second action in every ACA initiation
E- Final Workshop	A2.M.3 - Discuss mapping results with participants	A.2.7	C	Facilitator report, Recordings	Thematic Analysis	Facilitator Guide, FL map with data	Right after the 3D mapping take place
C - Shadowing	A2.M.4 - Collect opinions from participant about the AR mapping process	A.2.7, A.2.8	-	Unsupervised Structured Survey	Quantitative & Qualitative	Questionnaire	This action concludes the ACA initiation process
A - Training Workshop	A2.M.5 - Train participants how to use LF	A.2.8	D1	Facilitator Report & Small Interviews	Thematic	Canvas & Interview Guide	A few days after ACA initiation
E- Final Workshop	A2.M.6 - Observe interaction between PA and participants after the online discussion	A.2.9b	E1	Facilitator report, Recordings	Thematic Analysis	Canvas, Facilitator Guide, Report templates	2-3 months after ACA initiation
D - Final Questionnaire	A2.M.7 - Collect opinions from participants after the conclusion of the pilot implementation	A.2.10	E1	Unsupervised Structured Survey	Quantitative & Qualitative	Questionnaire	In the same event as M.2.6
F - Experts Interviews	A2.M.8 - Collect feedback from PA for the service as a whole:	A.2.11	E2	Unstructured interview	Thematic	Interview Guide	After M.2.6
F - Experts Interviews	A2.M.9 - Legal assessment	A.2.12	-	Legal Report	It will be used in cross-examination with other evaluation data	Report on the proposals created	After M.2.6

Usage data	A2.M10 - Quantitative and qualitative evaluation on data collected	A.2.1, A.2.2, A.2.3, A2.9	-	CO3 platform	Quantitative		During pilot execution

3.1.5 Athens evaluation as a whole: from hypothesis to evaluation actions and stages

In order to provide a comprehensive vision of the Athens evaluation framework built on the methodology presented in D4.1 (theory based - realist), the following tables (Table 13 and Table 14) resume the main hypothesis, evaluation actions and stages that are going to be carried out for this pilot.

Table 13 - Athens scenario 1 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
A1.H1	A1.SH1	A.1.1	A1.M.12			
		A.1.2			A1.M.5 A1.M.6	
	A1.SH2	A.1.4	A1.M.12			
		A.1.5		A1.M.1 A1.M.3	A1.M.6	A1.M.7
		A.1.6		A1.M.1	A1.M.6	A1.M.7 A1.M.11
		A.1.3	A1.M.12			
	A1.SH3	A.1.7		A1.M.2 A1.M.4		A1.M.8
	A1.SH4	A.1.8		A1.M.1 A1.M.2 A1.M.3 A1.M.4		A1.M.7 A1.M.8 A1.M.9 A1.M.10
	A1.SH5	A.1.9		A1.M.1		A1.M.7 A1.M.11
		A.1.6			A1.M.6	A1.M.7 A1.M.11
		A.1.10				A1.M.10
	A1.SH6					
	A1.SH7	A.1.11				A1.M.9
A1.D1		A.1.2			A1.M.5 A1.M.6	
A1.D2		A.1.7				A1.M.8
A1.D3		A.1.12		A1.M.1 A1.M.3		A1.M.7
A1.D4		A.1.10				A1.M.10

Table 14 - Athens scenario 2 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
A2.H1	A2.SH1	A.2.1	A2.M10			
		A.2.2				
		A.2.4		A2.M.2		
		A.2.5				
		A.2.6		A2.M.1		
		A.2.7			A2.M.4	A2.M.3
		A.2.9b				A2.M.6
		A.2.10				A2.M.7
	A2.SH2	A.2.9	A2.M10			
		A.2.9b				A2.M.6
	A2.SH3	A.2.1	A2.M10			
		A.2.2				
		A.2.3				

		A.2.6		A2.M.1		
		A.2.8		A2.M.5	A2.M.4	
		A.2.9	A2.M10			
		A.2.10				A2.M.7
	A2.SH4	A.2.9b				A2.M.6
	A2.SH5					
		A.2.11				A2.M.8
		A.2.12				A2.M.9
	A2.SH6	A.2.9b				A2.M.6
		A.2.11				A2.M.8
		A.2.12				A2.M.9
	A2.SH7	A.2.7			A2.M.4	A2.M.3
	A2.SH8	A.2.1	A2.M10			
		A.2.2	A2.M10			
		A.2.6		A2.M.1		
		A.2.7			A2.M.4	A2.M.3
		A.2.9	A2.M10			
		A.2.10				A2.M.7
	A2.SH9	A.2.2	A2.M10			
		A.2.3	A2.M10			
		A.2.6		A2.M.1		
		A.2.9	A2.M10			
		A.2.10				A2.M.7
A2.D1		A.2.9b				A2.M.6
A2.D2		A.2.10				A2.M.7

3.1.6 Evaluation materials

The evaluation materials (templates) for the Athens scenario already defined are reported in the Appendix:

- A1.M.1 - Collect Opinions on the service from producers while engaging with them to join
- A1.M.2 - Collect Opinions on the service from selected beneficiaries[7]
- A1.M.3 - Report on Usability & Acceptance issues while training producers to use the system
- A1.M.4 - Report on Usability & Acceptance issues while training beneficiaries to use the system
- A2.M1 - Collect technology awareness data from citizens that will participate in the pilot implementation
- A2.M2 - Simulation of service through serious gaming

3.2 Turin

3.2.1 Pilot recap and updates considering COVID-19

The main updates about the Turin pilot are presented in D3.3. In this chapter they are recapped with the aim to clarify the main changes with respect to the original ideas presented in the first half of the project in terms of scenarios definitions and engagement plans (D1.3 and D3.1), as they can have an impact on the pilots evaluations.

Context: The three Case del Quartiere involved in CO3 (Casa del Quartiere di San Salvario, Cecchi Point and PiùSpazioQuattro) have experienced, as any other cultural centre in Italy, several disruptions of service during the COVID emergency in the last fifteen months. Cultural centres have been among the first services to be shut down in March 2020 and among the last to be

[7] A1.M.1 and A1.M.2 contain the digital literacy section, aligned with A2.M.1.
A similar section is contained in the preliminary and final questionnaires of Turin pilot T.M.3 and T.M.6

opened again, with limitations, in the second half of June 2020. They have been shut down again in October 2020 and currently the re-opening is scheduled for the 1st of July 2021. During lockdowns the only service that was operating in the Case del Quartiere was the collection and distribution of food to people in need. Educational activities for children were allowed in some periods, when schools were open. However, gatherings, cultural activities, courses and citizens participation in general could not take place during most of this period and implementation of CO3 services had to be postponed.

Scenario and engagement plans: As described in D1.2 Turin pilot foresees one main scenario and four use cases. Table 15 proposes a short recap and an update of them considering the pandemic emergency occurred since February 2020.

Table 15 - Turin pilot use cases update

	Short description from D1.2 (before pandemic)	Update (June 2021)
Augmented content	Creation of augmented spaces where CdQ managers, associations and citizens can create and visualize different types of content (artistic content, information about activities and events, information about CdQ spaces and services, blockchain objects).	This use case requires the physical presence of users, therefore could not start during the lockdown, where the CdQs suspended their activities. **Original use case postponed to the reopening of the CdQ (July 2021).**
Prepaid card with the CdQ's coin	Creation of a virtual blockchain currency for each CdQ, and of prepaid cards, managed via a wallet app (wallet) that allows associations and private users to make transactions for crowdfunding campaigns, group buying, coupon generation for enhancing the services and inviting people to participate more.	An alternative for this use case was hypothesised as a form of crowdfunding. However, this would require a payment system, which is not planned in the CO3 wallet. Moreover, the building of a user base for CO3 would have been difficult during the lockdown. **Original use case has been postponed to the reopening of the CdQ (July 2021).**
Management of volunteering activities	Augmented Reality, First Life and the blockchain wallet will be used to advertise, manage and reward volunteering activities.	The CdQ staff made the hypothesis to use this case for helping in recruiting the volunteers for food distribution, but this would have required to have an already existing users community in place, which was not the case at that time due to the Engagement plan schedule. **Original use case has been postponed to the reopening of the CdQ (July 2021) - focus on the volunteering activities in execution in the period.**
Use of coins for pre-registration in the planning of the yearly programme	Citizens will participate in some of the decisions regarding the programme of the events and activities taking place in CdQs, through coins for pre-registering, or decision tokens.	This use case requires the physical presence of users, therefore could not start during the lockdown, where the CdQs suspended their activities. **Original use case has been postponed to the reopening of the CdQ (July 2021).**

The launch of the pilot has been postponed to July 2021 with the reopening of the CdQs. The main impact of COVID on pilot implementation is therefore a strong delay; further changes and adaptations take into account the limitations to the capacity of the CdQs' halls and rooms: the original design of the Scenario was strongly focused on physical presence; currently the CO3 apps

are being revised in order to facilitate the remote interaction in addition to the interactions in presence.

3.2.2 Evaluation hypothesis

For the Turin pilot the following evaluation hypotheses have been defined (Table 16).

Table 16 - Summary of Turin pilot evaluation hypothesis

Scenario: Augmented Commoning	# main hypothesis	# sub hypothesis	# disruptive hypothesis
use case 1	1	1	2
use case 2	1	9	1
use case 3	1	4	3
use case 4	1	3	1

Table 17, Table 18, Table 19, Table 20, Table 21, Table 22, Table 23 and Table 24 propose the evaluation hypothesis for the four use cases[8].

Use case 1 - Augmented content

Table 17 - Turin use case 1 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
T1.H1	The capabilities afforded by CO3 use of AR Technology can help to create and maintain a service where managers, organizers and citizens actively participate in CdQ activities	Main	Turin 1	AR
T1.SH1	CdQ managers, organisers and citizens alike will be engaged in producing/dropping AR content	All	Turin 1	AR/ Gamification

Table 18 - Turin use case 1 disruptive hypothesis

Code	Content	Current	Focus	Service
T1.D1	Citizens will contribute/participate to the CdQ activities through the use of AR in ACA	There's no spaces in which Managers, Organizers and Citizens can share contents in an immediate and interactive way, just physical message boards	Citizens	Turin 1
T1.D2	Communication through AR will provide more feedback on spaces and facilities, improving maintenance	They need to go to the manager to report their feedback	Citizens	Turin 1

Use case 2 - Prepaid card with the CdQ's coin

Table 19 - Turin use case 2 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
T2.H1	The capabilities afforded by CO3 Token System can help create and maintain a service where citizen participating in CdQ activities pre-pay services to provide working capital in advance	Main	Turin 2	blockchain
T2.SH1	Citizens will be eager to contribute in advance to CdQ activities (Hesitation, Usefulness, Trust in the Commons)	Citizens	Turin 2	blockchain

[8] The tables contain the initial list of evaluation hypotheses that have been defined by CO3 Consortium during Y2 within T4.2, however they could be further reduced or reviewed in D4.3 as the official launch of the pilot in the Turin case is foreseen for the beginning of September.

T2.SH2	Organizations that propose activities are willing to promote the system and provide incentives to the citizens to use the system	Organizations	Turin 2	blockchain
T2.SH3	The system improves daily work and does not create bigger administrative workload	All	Turin 2	blockchain
T2.SH4	The use of prepaid tokens and of an exchange system creates economic links between different activities and organisations	All	Turin 2	blockchain
T2.SH7	The use of this system changes the characteristics of the participants (age, type etc.)	Citizens	Turin 2	blockchain
T2.SH8	Organizers will be eager to redeem token in CdQ (instead of exchanging them)	Organizations	Turin 2	blockchain
T2.SH9	Users will accept to use the CO3 Wallet Application (UTAUT, Usefulness, Ease-of-use / Feel confident)	Technology, Citizens	Turin 2	blockchain
T2.SH10	The service will be feasible to sustain within the Italian legal and accounting framework	Legal	Turin 2	blockchain
T2.SH11	The service will be adopted by the municipality or other similar entities (e.g association / third sector organizations)	P.A.	Turin 2	blockchain

Table 20 - Turin use case 2 disruptive hypothesis

Code	Content	Current	Focus	Service
T2.D1	Blockchain will provide CdQ and organisations with working capital in advance	Payments are made mainly in cash, usually at the time of use of the service (max 1 month in advance)	Associations	Turin 2

Use case 3 - Management of volunteering activities

Table 21- Turin use case 3 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
T3.H1	The capabilities afforded by CO3 Token System can help create and maintain a service which improves the management of voluntary activities and engagement of volunteers	Main	Turin 3	AR/ Blockchain / Gamification
T3.SH1	Managers and organizers will be using the service	CdQ management, Organizations	Turin 3	AR/ Blockchain
T3.SH2	Number of volunteers will increase when service is installed	Citizens	Turin 3	AR/ Blockchain / Gamification
T3.SH3	Volunteer will complete the tasks at hand	Citizens	Turin 3	AR/ Blockchain
T3.SH4	Less time spent by managers to manage voluntary work	CdQ management, Organizations	Turin 3	AR/ Blockchain

Table 22- Turin use case 3 disruptive hypothesis

Code	Content	Current	Focus	Service
T3.D1	ACA provides a way to show volunteering activities available and every user/organiser will be able to check activity completed. Improvement of Houses' Governance.	Manager asks the mailing list/whatsapp group. If it is a group activity a specific session is organised and volunteers invited through the mailing list/whatsapp group. Benefits/acknowledgements are given inconsistently by organizations in paper/xls sheet or in a time management tool.	All	Turin 3
T3.D2	AR provides incentive to citizen to participate in voluntary activities linked	Activities are communicated through mailing list/xls	Citizens	Turin 3

	with the surrounding environment			
T3.D3	Blockchain tokens will allow volunteers to easily redeem their discounts	Communication with managers is required to confirm redemption through paper/xls.	Users	Turin 3

Use case 4 - Use of coins for pre-registration in the planning of the yearly programme

Table 23 - Turin use case 4 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
T4.H1	The capabilities afforded by CO3 Token System can help produce a yearly program targeted on real users/public interest	Main	Turin 4	AR/ Blockchain
T4.SH1	Users will be interested in expressing their preferences	Citizens	Turin 4	AR/ Blockchain
T4.SH2	The voting system will act as well as a promotional activity (citizens participating in voting will be more willing to participate in the activities)	Organizers	Turin 4	AR/ Blockchain
T4.SH3	Efficiency will increase by reducing activities that fail because do not meet public's favor	Organizers	Turin 4	AR/ Blockchain

Table 24 - Turin use case 4 disruptive hypothesis

Code	Content	Current	Focus	Service
T4.D1	Citizens will be directly involved in the choice of services address to them	The programme of courses is presented by managers and organizers	Citizens	Turin 4

3.2.3 Evaluation actions

Use case 1 - Augmented content

Three evaluation actions have been defined for the Turin use case 1 (Table 25). Two of them can be evaluated through the analysis of usage data about AR contents. The other one is the result of data collected through the interaction with relevant stakeholders in workshops and questionnaires. All these data can contribute mainly to the evaluation of socio-cultural factors.

Table 25 - Turin use case 1 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
T.1.1.	Number of people that create AR contents	Usage data [AR.3]	Sociocultural	T1.SH1, T1.D1		Turin 1
T.1.2.	Number of AR items created	Usage data [FL.1]	Technological/ Sociocultural	T1.SH1		Turin 1
T.1.3.	Number of people participating in events promoted through AR; effectiveness of AR in promoting activities	Usage data [AR.6]; Questionnaire	Economic; Sociocultural	T1.D2	G8, G9, G10	Turin 1

Use case 2 - Prepaid card with the CdQ's coin

Eleven evaluation actions have been defined for the Turin use case 2 (Table 26). More than half of them (7/11) can be evaluated through the analysis of usage data in a quantitative way. The other four are the results of data collected through the interaction with relevant stakeholders in workshops and questionnaires. Usage data can mainly contribute to the evaluation of economic

factors. Some of them also address socio-cultural aspects. Workshops and questionnaires can be used to collect additional qualitative feedback from end-users about the usefulness of the CO3 application, considering socio-cultural, legal and economic factors.

Table 26 - Turin use case 2 evaluation actions

Code*	Content	Type	Factor	Hypothesis	Engagement Action	Service
T.2.1.	Volume of tokens created	Usage data [W.1]	Economic	T2.SH1, T2.SH2		Turin 2
T.2.2.	Volume of tokens spent, average purchase of tokens, average balance (customer), average balance (issuer), average time to spend (customer),	Usage data [W.2, W.4, W.5, W.6]	Economic	T2.SH1		Turin 2
T.2.3.	Citizens willingness to support CdQ/organisation by prepaid system	Focus Group/Workshop; Short Interviews UTAUT based Questionnaires	All	T2.SH1	G2, G3, B1	Turin 2
T.2.4.	Impact of the wallet on the work of CdQ managers and organisers	Focus Group / Workshop; Questionnaire	All	T2.SH3	G2, G8, G9, G10	Turin 2
T.2.5.	Opinion of an external expert about CO3 wallet (about: legal feasibility, impact on PA, administrative / bureaucratic constraints)	Experts Interview/ Questionnaire	All	T2.D1, T2. SH10		Turin 2
T.2.6.	Number of users that use tokens for services offered by different organisations in the same CdQ (percentage of the total)	Usage data [W.7]	Sociocultural, Economic	T2.SH4		Turin 2
T.2.8.	Technology acceptance of Wallet	Survey / UTAUT based Questionnaires	All	T2.SH9	G8, G9, G10	Turin 2
T.2.10	Demographics of users	Usage data [D.1, D3, D4]	Sociocultural	T2.SH7		Turin 2
T.2.11	Usage of tokens by organisations (redemption / exchange)	Usage data [W.9]	Economic	T2.SH8		Turin 2
T.2.12	Adoption of the wallet by P.A./organisations outside the CdQ	Usage data [W.7]	Economic	T2.SH11		Turin 2
T.2.14	Number of issuers that accept third party tokens	Usage data [W13]	Economic	T2.SH4		Turin 2

*NOTE: missing codes T2.7, T2.9, T2.13 are attributable to the refinements of the list of evaluation hypotheses and actions made in the last months.

Use case 3 - Management of volunteering activities

Three evaluation actions have been defined for the Turin use case 3 (Table 27). Two of them can be evaluated through the analysis of usage data about the involvement of volunteers. The other one is the result of data collected through the interaction with relevant stakeholders in workshops and questionnaires. These data can contribute mainly to the evaluation of economic and socio-cultural factors.

Table 27 - Turin use case 3 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
T.3.1.	Number of CdQ users that will be involved in the volunteer activities published in the platform	Usage data [W.14]	Sociocultural	T3.SH3, T3.SH2, T3.D2		Turin 3
T.3.2.	Effectiveness of the app in the management of volunteering activities	Questionnaire/ focus group	Sociocultural, Economic	T3.SH4, T3.SH1, T3.D1, T3.D3	G2, G8, G9, G10	Turin 3
T.3.3.	N. of volunteers activities	Usage data [FL.3]	Economic	T3.SH1, T3.SH2		Turin 3

Use case 4 - Use of coins for pre-registration in the planning of the yearly programme

Four evaluation actions have been defined for the Turin use case 4 (Table 28). Three of them can be evaluated through the analysis of usage data about the involvement of participants to the CdQ activities. The other one is the result of data collected through the interaction with relevant stakeholders in workshops and questionnaires. These data can contribute mainly to the evaluation of economic and socio-cultural factors.

Table 28 - Turin use case 4 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
T.4.1.	N. of participants in annual courses, engaged by the platform (percentage on offline data)	Usage data [W.11]	Economic	T4.SH1		Turin 4
T.4.2.	Number of people participating in courses that have reached the maximum of voting tokens	Usage data [W.11,W12]	Economic	T4.SH3		Turin 4
T.4.3.	Percentage of people participating in the voting process that participate also in the activities	Usage data [W.11,W.12]	Sociocultural	T4.SH2		Turin 4
T.4.4	Effectiveness of the Token System in producing a yearly program targeted on real users/public interest	Focus Group / Workshop; Short Interviews > Questionnaire	Sociocultural	T4.SH3, T4.D1	G2, G8, G9, G10	Turin 4

3.2.4 CO3 evaluation roadmap for the Turin pilot

The CO3 evaluation roadmap as presented in Figure 4 (see Chapter 2) has been adapted for the Turin pilot. Figure 8 resumes the main stages that are going to be carried out in this scenario. Please note that for the Turin pilot, the evaluation hypothesis and actions have been defined considering the four use cases that have conceived in order to detail the single Turin scenario. The evaluation stages, instead, aim to specify how the evaluation actions can be evaluated for each pilots' scenario. For this reason they refer to the overall scenario and not to the single use cases. Firstly, usage data are going to be monitored during the pilot execution and at the end of it. Moreover, for the actions that envisage interactions with relevant stakeholders, qualitative evaluation is going to be carried out in three main phases: preliminary (training workshops + preliminary questionnaire), ongoing (shadowing on service implementation) and final (final questionnaire, workshop and experts interview). They are detailed in the next paragraphs.

	Evaluation stages						
	usage data	A - training	B - preliminary questionnaire	C - shadowing	D - final questionnaire	E - final workshop	F - experts interviews
Turin	T.M.8	T.M.1, T.M.2	T.M.3	T.M.4	T.M.6	T.M.5	T.M.7

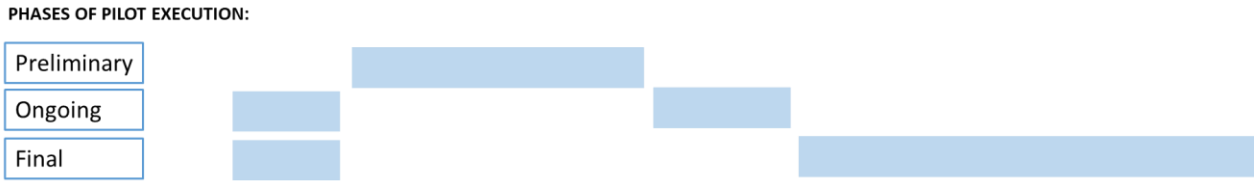

Figure 8 - Turin pilot evaluation stages

Turin pilot evaluation stages have been framed around four main phases:

1. Preliminary evaluation
2. Ongoing evaluation (during pilot implementation)
3. Final evaluation
4. Usage data analysis

Preliminary evaluation

T.M.1 - Training Workshops with CdQ organizers and managers: A comprehensive report from workshops that have taken place (or will take place) in CdQ.
T.M.2 - Launch event: During the launch event end-users (CdQ organizers, managers, citizens) will be asked to test the app and start buying coins.
T.M.3 - Collect stakeholders' preliminary views on the system and their needs: members of all stakeholder organizers, Managers, and visitors will have to complete a questionnaire covering: views on CdQ needs, a perception towards the system imposed, especially on Use Case 2. System Usability Scale (SUM) and Technology Acceptance Model (TAM) are used as reference for the evaluation of CO3 application acceptance by end-users.

During pilot implementation (shadowing on pilot implementation)

T.M.4 - Collect feedback during implementation: During the pilot implementation CdQ Managers and Organizes will provide feedbacks about the pilot implementation.

Final evaluation

T.M.5 - Final meeting with CdQ organizers / managers: During the final workshop the main results of the CO3 pilot in Turin will be presented in order to stimulate a discussion about opportunities and barriers leveraged by the CO3 system.
T.M.6 - Collect stakeholders views on the system: Members of all stakeholder Organizers, Managers, and visitors will have to complete a questionnaire about the usefulness of the CO3 system.
T.M.7 - Collect opinion from experts about the service: Interview with an expert in order to discuss socio, economic, cultural and legal implications of the proposed action in Turin (minimum: one expert).

Usage data analysis

T.M.8 - Quantitative evaluation on data collected : During the pilot execution a periodic evaluation of data collected will be carried out by pilot managers.

In conclusion, Table 29 attempts to summarize the main evaluation stages by typology of action.

Table 29 - Turin evaluation stages by typology

Typology	Number	Evaluation stage
questionnaires	2	T.M.3, T.M.6
workshops / meetings	3	T.M.1, T.M.2, T.M.5
interviews	1	T.M.7
periodic monitoring	1	T.M.4

Table 30 details each of the evaluation stages and related actions.

Table 30 - Turin pilot evaluation stages description

Evaluation Stage	Eval stage main action	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
A - training workshop	T.M.1 - Training Workshops with CdQ organizers and managers	T.1.3, T2.3, T.2.4, T.2.8, T.3.2, T.4.4	T.G.8, T.G.9, T.G.10	Report from workshop facilitator	Thematic Analysis	Guide on where to focus on the report **Available in appendix**	During the first month of the pilot - July 2021
A - training workshop	T.M.2 - Launch event	T.1.3, T2.3, T.2.4, T.2.8, T.3.2, T.4.4	T.G.7 (launch event)	Report from launch event organizers. During the launch event preliminary questionnaires (T.M.3) will be proposed (live). It will be possible to see and comment the first results	Thematic Analysis	Guide on where to focus on the report **Available in appendix**	one month after TM1 September 2021
B - preliminary questionnaires	T.M.3 - Collect stakeholders preliminary views on the system and their needs	T.1.3, T2.3, T.2.4, T.2.8, T.3.2, T.4.4	T.G.7 (launch event); T.G.5	Online survey. For organizers and managers the data collection can take place online. For visitors pilot members should collect data in CdQ. The questionnaire will be launched during the launch event (TM2). preliminary results will be presented during the launch event (live)	Quantitative analysis for Likert-Scale questions. Thematic analysis for open questions	Questionnaire with alterations for each stakeholder type. The visitors questionnaire should be as small as possible **Available in appendix**	one month after TM1 September 2021 the questionnaire can be launched during the launch event and promoted through social networks / CdQ website
C - shadowing on service implementation	T.M.4 - Collect feedback during implementation	T.1.3, T2.3, T.2.8, T.3.2, T.4.4	T.G.4	The pilot manager will continuously take notes about the requests and feedback from CdQ managers and organizers, and citizens. Emails and social networks will be monitored as well	Thematic Analysis	notes	from September 2021
E - final workshop	T.M.5 - Final meeting with CdQ organizers / managers	T.1.3, T2.3, T.2.4, T.2.8, T.3.2, T.4.4	T.G.7. (final event)	Report from ws organizers	Thematic Analysis	Guide on where to focus on the report **Available in appendix**	last month of pilot execution

D - final questionnaire	T.M.6 - Collect stakeholders views on the system	T.1.3, T2.3, T2.1, T.2.4, T.2.8, T.3.2, T.4.4	T.G.7. (final event); T.G.5	Online survey. For organizers and managers the data collection can take place online. For visitors pilot members should collect data in CdQ. The questionnaire will be launched during the final ws(TM5). preliminary results will be presented during the final event (live) In addition, the questionnaire will be sent by e-mail to all the app users and will be published on the CdQ website and social networks in order to collect data by all end-users	Quantitative analysis for Likert-Scale questions. Thematic analysis for open questions	Questionnaire with alterations for each stakeholder type. The visitors questionnaire should be as small as possible **Available in appendix**	Within the last month of the pilot, the questionnaire can be launched during the final meeting and promoted through social networks
F - Experts interview	T.M.7 - Collect opinion from experts about the service	T.2.5		report from the interview	Qualitative. Thematic analysis	a template for the interview will be provided.	October-November 2021
usage data	T.M.8	T.1.1,T.1.2, T.1.3,T.2.1, T.2.2,T.2.6, T.2.10,T.2.11, T.2.12, T.2.14, T.3.1, T.3.3, T.4.1, T.4.2, T.4.3		CO3 platform	Quantitative		During pilot execution

3.2.5 Turin evaluation as a whole: from hypothesis to evaluation actions and stages

In order to provide a comprehensive vision of the Turin evaluation framework built on the methodology presented in D4.1 (theory based - realist), the following tables (Table 31, Table 32, Table 33, Table 34) resume the main hypothesis, evaluation actions and stages that are going to be carried out for this pilot.

Table 31 - Turin use case 1 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	usage data	Evaluation stage		
				preliminary	shadowing	final
T1.H1	T1.SH1	T.1.1.	T.M.8			
		T.1.2.	T.M.8			
T1.D1		T.1.1.	T.M.8			
T1.D2		T.1.3	T.M.8	T.M.1	T.M.4	T.M.5
				T.M.2		T.M.6
				T.M.3		

Table 32 - Turin use case 2 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
T2.H1	T2.SH1	T.2.2.	T.M.8			
		T.2.3.		T.M.1	T.M.4	T.M.5
				T.M.2		T.M.6
				T.M.3		
		T.2.1.	T.M.8			
	T2.SH2					
	T2.SH3	T.2.4.		T.M.1		T.M.5
				T.M.2		T.M.6
				T.M.3		
	T2.SH4	T.2.6.	T.M.8			
		T.2.14				
	T2.SH7	T.2.10				
	T2.SH8	T.2.11				
	T2.SH9	T.2.8.		T.M.1	T.M.4	T.M.5
				T.M.2		T.M.6
				T.M.3		
	T2.SH11	T.2.12	T.M.8			
	T2.SH10	T.2.5.				T.M.7
T2.D1						

Table 33 - Turin use case 3 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
T3.H1	T3.SH1	T.3.2.		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6
		T.3.3.	T.M.8			
	T3.SH2					
		T.3.1.	T.M.8			
	T3.SH3					
	T3.SH4	T.3.2.		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6
T3.D1		T.3.2.		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6
T3.D2		T.3.1.	T.M.8			
T3.D3		T.3.2.		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6

Table 34 - Turin use case 4 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
T4.H1	T4.SH1	T.4.1.	T.M.8			
	T4.SH2	T.4.3.				
	T4.SH3	T.4.2.				
		T.4.4		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6
T4.D1		T.4.4		T.M.1 T.M.2 T.M.3	T.M.4	T.M.5 T.M.6

3.2.6 Evaluation materials

The evaluation materials for the Turin scenario (provisional templates) already defined are reported in the Appendix:

- T.M.3 - Collect stakeholders preliminary views on the system and their needs and T.M.6 Collect stakeholders views on the system[9]
- T.M.1 - Training Workshops with CdQ organizers and managers and T.M.2 Launch event
- T.M.5 - Final meeting with CdQ organizers / managers

3.3 Paris

3.3.1 Pilot recap and updates considering COVID-19

The main updates about the Paris pilot are presented in D3.3. In this chapter they are recapped with the aim to clarify the main changes with respect to the original ideas presented in the first half

[9] T.M.3 and T.M.6 contain the digital literacy measurement tool defined in the Athens pilot (evaluation stage: A2.M1)

of the project in terms of scenarios definitions and engagement plans (D1.2 and D3.1), as they can have an impact on the pilots evaluations.

Context: The pandemic has profoundly impacted the geographical context and the services targeted by the pilots. A gradual re-opening of social activities and public services that have been stopped or reduced in Paris started in May 2021.

Scenarios and engagement plans: The pandemic has profoundly disrupted the way in which the first two main scenarios of the French pilot – Contributory Clinic, Urban Modelling, both thought as in-presence scenarios – were conceived.

- **The Contributory Clinic scenario** (Paris 1) is hosted by the PMI (Protection Maternelle et Infantile Pierre-Saint-Sémard, Saint-Denis). Giving the exacerbation of the use of screens during the pandemic, sessions related to the CO3 digital tools as an example of virtuous practices have been confirmed as very relevant. Some in-presence events were organised, but due to the emergent priorities of the service in the Department (e.g. domestic violence), **the testing of the main thesis and hypothesis of the project,** and of the CO3 application, **have been postponed to May 2021 (partial opening), and the qualitative analyses of the tools to June**, even with still subject to uncertainties on the sanitary conditions. All the actions implying an in-presence activity within the PMI has been slowed down but will be re-established if the sanitary conditions will permit it. The number of beneficiaries is going to be drastically reduced since the number of parents involved in the Contributory Clinic is decreased because of the economical and social problems raised by the pandemic – especially in the Seine-Saint Denis Department.
- **Urban Modelling scenario** (Paris 2). The pilot confirmed its original structure as regards most of the activities planned with the five schools, even with some rescheduling. Monthly Seminar with teachers has taken place between September and December 2020 as planned. **The official launch has been postponed to May.** Many activities with the schools took place intermittently when schools were open, and with fewer number of students and classes, with a stabilization of the situation from May 2021 on. Rescheduling of the activities has been done in order to keep into account the distance learning mode and the consequent organizational issues that teacher were facing. On the contrary, **new activities have been planned, such as the Hackathons at the Jacques Brel highschool and Poincaré middle-school.** This has emerged as a special activity that professors wanted to include in the project, beside the “showcase” of the constructions made within Minetest in their respective buildings.
- The third scenario **Blockchain-Registry Scenario** (Paris 3) did not envisage to implement in presence activities. Hence, IRI continued working on these matters in order to present all the results of the blockchain modeling study at the end of the pilot experimentations. Instead of analysing real-world cases of the French pilot, **this scenario will be targeted to a modelling scenario with more qualitative instead of quantitative issues for the use of this particular type of Blockchain**.

3.3.2 Evaluation hypothesis

For the Paris pilot the following evaluation hypotheses for the three scenarios have been defined (Table 35).

Table 35 - Summary of Paris pilot evaluation hypothesis

Paris scenarios	# main hypothesis	# sub hypothesis	# disruptive hypothesis
1 - Contributory Clinic	2	3	/
2 - Urban Modelling	1	4	3
3 - Blockchain Registry	1	1	1

Table 36, Table 37, Table 38, Table 39 and Table 40 propose the evaluation hypothesis for the three scenarios.

Scenario 1 - Contributory Clinic

Table 36 - Paris scenario 1 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
P1.H1	We want to assess if the use of screens via AR could be less toxic and improve the off-line, desautomatised and deliberative relations, as well as capability creation fostering the creation of knowledge (that is intrinsically negentropic/anti-antropic).	Parents and PMI Staff	Paris 1	AR/ First Life
P1.H2	We want to create a social network allowing parents of the Plaine Commune to exchange and develop good digital practices, parenting-knowledge as well as display the negentropic/anti-entropic activities present on the territory.	Parents of Plaine Commune	Paris 1	AR/ First Life
P1.SH1	The use of AR can foster deep-attention activities	Parents and PMI Staff	Paris 1	AR/ First Life
P1.SH2	The use of AR can diminish the amount of time spent online, hence it fosters the time spent in active dialogue and off-line activities	Parents and PMI Staff	Paris 1	AR/ First Life
P1.SH3	The use of the Co3 app and its articulation with this scenario will lead to the development of links between the health institutions, parents and parents' association on the territory	Parents, PMI Staff, health institutions, parents' associations	Paris 1	CO3 app

Scenario 2 - Urban Modelling

Table 37 - Paris scenario 2 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
P2.H1	The enhancing of the capabilities of the students, professors and professionals via CO3 AR App and FirstLife along with the use of Minetest can contribute to the understanding of the new ways in which inhabitants can be put inside the loop of deciding for territorial urban planning.	Schools (students, professors, parents), privates / businesses (professionals)	Paris 2	AR/ First Life
P2.SH1	Building information management (BIM) technologies articulated with Minetest and CO3 platform will help students to understand the problems and the potentials and threats opened up by digital platforms contributing in the urban environment	Students	Paris 2	Minetest

P2.SH2	The use of AR will give a better grasp of the urban development for students and all the inhabitants	Citizens	Paris 2	AR
P2.SH3	The use of the system will lead to the development of links between the educational institutions and professional paths in the territory	Schools, businesses	Paris 2	AR
P2.SH4	The use of the system will create an environment for dialog between middle schools and high-schools.	Schools	Paris 2	AR

Table 38 - Paris scenario 2 disruptive hypothesis

Code	Content	Current	Focus	Service
P.D2.1	The students, professors and professionals will directly propose with AR a modification of the urban environment	They see a 2D model on the door of the building site	Schools (students, professors, parents), privates / businesses (professionals)	Paris 2
P.D2.2	The 3D projections of Minetest Models in classroom will lead to engagement of students	They see projects on screens and physical models	Students	Paris 2
P.D2.3	The use of tagging with the AR app during on-site visits will lead to engagement of students	They go to the site and might take photos or notes	Students	Paris 2

Scenario 3 - Blockchain registry

Table 39 - Paris scenario 3 main hypothesis and sub hypothesis

Code	Content	Focus	Service	Technology
P3.H1	Blockchain could be used as a territorial knowledge-registry for certifying the skills and knowledges developed by inhabitants in order to create human-recommendation for PA over the developing of new activities and workshops on the territory	citizens, PA	Paris 3	Blockchain
P3.SH1	Recommendation made will be of use for territory (PA/businesses/associations)	PA	Paris 3	Blockchain

Table 40 - Paris scenario 3 disruptive hypothesis

Code	Content	Current	Focus	Service
P.D3.1	Registry will operate as a Dashboard that provides an overview of knowledges	Know the territorial activities led on the territory but do not know the knowledged developed by inhabitants (better traceability, quantitative and qualitative data)	PA	Paris 3

3.3.3 Evaluation actions

Scenario 1 - Contributory Clinic

Eight evaluation actions have been defined for the Contributory Clinic scenario (Table 41). Four of them can be evaluated through the analysis of usage data in a quantitative (amount of time, number of objects, …) and qualitative way (thematic analysis of content created). Specifically, usage data can contribute to the evaluation of the technological factors but also the socio-cultural ones, considering the possibility to make the analysis of the content created. Workshops and

interviews can be used to collect additional qualitative feedback from end-users about the usefulness of the CO3 application and perceived needs and obstacles.

Table 41 - Paris scenario 1 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
P.1.1	Amount of time spent with AR	Usage Data [AR1]	Social	P1.SH2		Paris 1
P.1.2	Objects placed in ACA	Usage Data [FL1]	Technological	P1.SH3		Paris 1
P.1.3	perception of the usability of the AR app (easy of use, etc)	Workshop	Technological	P1.H2	A3, C2, D, E	Paris 1
P.1.4	Assessment of the toxicity/usefulness of the digital activities: the AR app can foster deep-attention activities? Reduces the time spent on line?	Workshop	Technological	P1.SH1, P1.SH2	A3, C2, D, E	Paris 1
P.1.5	Entities created, Comments created	Usage Data [FL2]	Technological	P1.SH3		Paris 1
P.1.6	Content Analysis Data	Usage Data [FL2]	Social, cultural	P1.SH1		Paris 1
P.1.7	Assessment of the needs, actual digital practices and stakeholders communication	Interviews and workshops	Social, cultural	to be used as baseline for P1.H1, P1.H2(P1.SH3)	A3, C2, D, E	Paris 1
P1.8	Usefulness of the CO3 services after the execution of the pilot	Interviews and workshops	Technological	P1.H1, P1.H2(P1.SH3)	A3, C2, D, E	Paris 1

Scenario 2 - Urban Modelling

The Urban modelling scenario can be evaluated through ten evaluation actions (Table 42): four of them make reference to usage data, while the other six can be collected through the interactions with relevant stakeholders. In particular, some workshops and interviews with professors and students are foreseen and a qualitative questionnaire is going to be proposed. Students are going to be involved in in-class activities and on-site visits in order to test and provide feedback about the application. Usage data can contribute to the evaluation of the technological factors but also the socio-cultural ones (thematic analysis of the content). Workshops and interviews with professors and students are linked with the social, cultural and political factors of the evaluation framework.

Table 42 - Paris scenario 2 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
P.2.1	Number of interaction, content creation and badge awarded within CO3 platform	Usage Data [FL1, AR4, AR5, LF1, G1]	Social, cultural	P.2.H1		Paris 2
P.2.2	Quality of tags	Usage Data [FL2, LF1]	Social, cultural	P.2.H1		Paris 2

P.2.3	Ratio between time in the platform and quality of contributions	Usage Data [AR1]	Technological	P.2.H1		Paris 2
P.2.4	Number of ACA created	Usage Data [AR2, AR4]	Technological	P.2.H1		Paris 2
P.2.5	Quality of media and content created through the CO3 application	In-class activities (workshops)	technological, Social, cultural	P.2.SH1	B1, B2	Paris 2
P.2.6	Feedback about the App from professors and students (about the form of collective participation)	Questionnaire	Political/Sociocultural	P2.SH1, P2.SH2, P2.SH3, P.D2.1		Paris 2
P.2.7	platform functionality and easiness (easy of use, etc)	Interviews	Technological	P2.H1		Paris 2
P.2.8	Professors feedbacks about the project	Workshops	Political/ Sociocultural / Technological	P2.SH3, P2.SH4	E7, E9, E10	Paris 2
P.2.9	Discussions with students focused on the on-site visits/use of CO3 and MineTest	Workshops	Social, cultural	P2.SH1, P2,SH2, P2.D2.2, P2.D2.3	E7, E9, E10	Paris 2
P2.10	Number of intervention of IRI staff in schools and feedbacks	Workshops	Social, cultural	P2.SH1. P2.D2.2		Paris 2

Scenario 3 - Blockchain registry

The third Paris scenario makes reference to a research activity that does not involve specific stakeholders. One main evaluation action has been defined: an interview with the researchers involved in this activity (Table 43).

Table 43 - Paris scenario 3 evaluation actions

Code	Content	Type	Factor	Hypothesis	Engagement Action	Service
P3.1	research evaluation of blockchain as knowledge registry	Expert interview	Technological, social, cultural	P3.H1, P3.SH1,P.D3.1		Paris 3

3.3.4 CO3 evaluation roadmap for the Paris pilot

The CO3 evaluation roadmap as presented in Figure 4 (see Chapter 2) has been adapted for the three Paris scenarios. The following image (Figure 9) resumes the main stages that are going to be carried out in each scenario.

Firstly, usage data are going to be monitored during the pilot execution and at the end of it. Moreover, in the first two scenarios, that envisage interactions with relevant stakeholders, qualitative evaluation is going to be carried out in three main phases: preliminary (training

workshops), ongoing (shadowing on service implementation) and final (questionnaire, workshop and experts interview). They are detailed in the next paragraphs.

	Evaluation stages						
	usage data	A - training	B - preliminary questionnaire	C - shadowing	D - final questionnaire	E - final workshop	F - experts interviews
Scenario 1 – Contributory Clinic	P1.M.5	P1.M.1, P1.M2a, P1.M2b		P1.M.3		P1.M4	
Scenario 2 – Urban Modelling	P2.M.8	P2.M.1.a, P2.M.1.b, P2.M.2		P2.M.3.a, P2.M.3.b, P2.M.4, P2.M.5, P2.M.6	P2.M.7		
Scenario 3 – Blockchain Registry							P3.M1

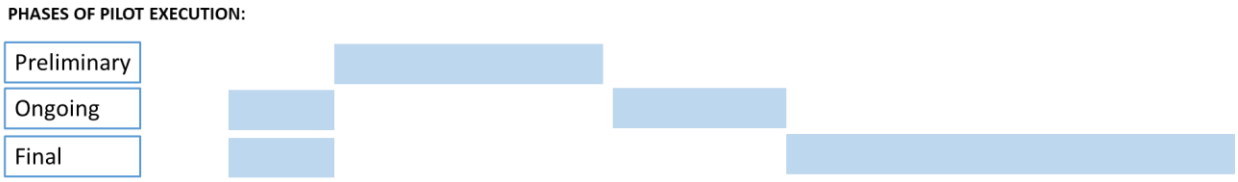

Figure 9 – Paris pilot evaluation stages

Scenario 1 - Contributory Clinic

Paris scenario 1 evaluation stages have been framed around four main phases:

1. Preliminary evaluation
2. Ongoing evaluation (during pilot implementation)
3. Final evaluation
4. Usage data analysis

Preliminary evaluation

P1.M.1- Interviews and workshops with key stakeholders: ad hoc meetings with key stakeholders (PMI staff, FCPE) in order to assess the needs, actual digital practices and stakeholders communication.
P1.M.2.a - Workshop with PMI (app test): workshop aimed to evaluate the reactions of CO3 app users, after their first test of the application
P1.M.2.b- Workshop with PMI (qualitative feedback): during the workshop with PMI + IRI staff a qualitative feedback about the usefulness of the CO3 solution will be investigated

During pilot implementation (shadowing on pilot implementation)

P1.M.3 - Collect pilot member partners views on the implementation on the services: Pilot managers will periodically take note about the evolution of the pilots identifying main issues or success factors

Final evaluation

P1.M.4 - Final questionnaire / interviews with key personnel of PMI: the objective of this stage is to make a final evaluation of the pilot, possibly making a comparison with the baseline (without CO3 app)

Usage data analysis

P1.M.5 - Quantitative evaluation on data collected: During the pilot execution a periodic evaluation of data collected will be carried out by pilot managers

In conclusion, Table 44 attempts to summarize the main evaluation stages by typology of action.

Table 44 - Paris scenario 1 evaluation stages by typology

Typology	Number	Evaluation stage
workshops / meetings	4	P1.M.1,P1.M.2.a, P1.M.2.a, P1.M.4
periodic monitoring	1	P1.M.3

Table 45 details each of the evaluation stages and related actions.

Table 45 - Paris scenario 1 evaluation stages description

Evaluation stage	Eval stage main action	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
A. Preliminary	P1.M.1 - Interviews and workshops with key stakeholders	P1.7	A1, A2, B1,B2	Facilitators report	Thematic	interviews report's template	Autumn-winter 2020/21
A. Preliminary	P1.M.2.a - Workshop with PMI (app test)	P1.3	A2, B2	Facilitators report	Thematic	workshop report's template	beginning of june
A. Preliminary	P1.M.2.b - Workshop with PMI (qualitative feedback)	P1.4	A2, B2	Facilitators report	Thematic	questions to collect feedbacks (to be included in the workshop report's template)	beginning of june 2021
C. shadowing on service implementation	P1.M.3 - Collect pilot member partners views on the implementation on the service s	P1.3.	A3, C2, D, E	Pilot managers notes collection	Thematic	report template	at least 2 times during pilot execution
D. Final evaluation	P1.M.4 - Final questionnaire / interviews with key personnel of PMI	P1.3, P1.7, P1.8	A3, C2, D, E	Facilitators report	Thematic	report template	November 2021
Usage data	P1.M.5 - Quantitative evaluation on data collected	P1.1, P1.2, P1.5, P1.6		CO3 platform	Quantitative	//	November 2021

Scenario 2 - Urban Modelling

Paris scenario 2 evaluation stages have been framed around four main phases:

1. Preliminary evaluation
2. Ongoing evaluation (during pilot implementation)
3. Final evaluation
4. Usage data analysis

Training Workshop / Preliminary evaluation

P2.M.1.a - Onboarding Rectorate of Créteil: Ask to the Rectorate to sponsorize the project and help IRI with the organization of the capacitatory workshops with professors
P2.M.1.b - Capacitatory workshops with professors: A series of workshops (5) on urbanism, architecture, new digital technologies and their possible use for the reinvention of the territory through the use of MineTest and CO3 Technologies
P2.M.2 - Preliminary workshops with students: Preliminary in-class-workshops with students about MineTest and CO3 applications

Shadowing on service implementation

P2.M.3.a - Shadowing the execution of the pilots in the schools online: IRI will assist online all the classes involved in the project. IRI staff can help via Mattermost/Discord the professors and the students that are connected to the MineTest server.
P2.M.3.b - Shadowing the execution of the pilots in the schools presentially: IRI will assist physically some classes involved in the project: physically means that IRI staff will directly help professors inside the classrooms,
P2.M.4- Following up schools (middle and high schools): Follow up of the school activities in MineTest and CO3 platform
P2.M.5- On-site visits with classes (workshops): On-site outdoor visits with classes / workshops on CO3 application
P2.M.6 - Hackaton feedbacks: During the hackathon it will be possible to test platform functionality and easiness (easy of use, etc). Qualitative feedbacks about usefulness of the platform will be collected by the pilot managers

Final evaluation

P2.M.7 - Evaluation questionnaire for professors and students: Feedback about the App from professors and students

Usage data analysis

P2.M.8 - Final quali - quantitative evaluation on data collected : During the pilot execution a periodic evaluation of data collected will be carried out by pilot managers

In conclusion, Table 46 attempts to summarize the main evaluation stages by typology of action.

Table 46 - Paris scenario 2 evaluation stages by typology

Typology	Number	Evaluation stage
questionnaires	1	P2.M.7
workshops / meetings	6	P2.M.1.a, P2.M.1.b, P2.M.2, P2.M.4, P2.M.5, P2.M.6

periodic monitoring	2	P2.M.3.a, P2.M.3.b

Table 47 details each of the evaluation stages and related actions.

Table 47 - Paris scenario 2 evaluation stages description

Evaluation stage	Eval stage main action	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
A. Training Workshop / Preliminary evaluation	P2.M.1.a - Onboarding Rectorate of Créteil	P2.8	Interviews and rdvs with the Rectorate - A1	report from facilitators	Qualitative analyses	Report template	September - December 2020
A. Training Workshop / Preliminary evaluation	P2.M.1.b - Capacitatory workshops with professors	P2.8	A1	Videos + report	Qualitative analyses	Report template	September - December 2020
A. Training Workshop / Preliminary evaluation	P2.M.2 - Preliminary workshops with students	P2.5	A2. meetings with classes during hours dedicated to the project	Videos, pictures, report	Qualitative analyses	Report template	In-class activities have taken place intermittently and only in 4 schools because of the disruption brought by the pandemic
C. Shadowing	P2.M.3.a - Shadowing the execution of the pilots in the schools online	P2.1, P2.2, P2,3, P2.4	Invite professors during P2.M2	Mattermost/Discord data	Quantitative and qualitative analysis of platform data	—	from June 2021
C. Shadowing	P2.M.3.b - Shadowing the execution of the pilots in the schools presentially	P2.10	meetings with professors, dialogue with them and ask if they need help in the classes E2, E9, E10	report from facilitators	Qualitative analyses	Slides/MOOC videos for explaining CO3 services and app	from June 2021
C. Shadowing	P2.M.4 - Following up schools (middle and high schools)	P2.9		report from facilitators	Qualitative analyses	—	October 2021
C. Shadowing	P2.M.5 - On-site visits with classes (workshops)	P2.9	Invite professors during P2.M2. B1	report from facilitators	Qualitative analyses	AR Markers	June /July 2021

C. Shadowing	P2.M.6 - Hackathon feedbacks	P2.7		report from facilitators	Qualitative analyses		June 2021
D. Final evaluation	P2.M.7 - Evaluation questionnaire for professors and students	P2.6, P2.9		Interviews	Qualitative	questionnaire template - aligned with WP5	November 2021
usage data - FINAL	P2.M.8 - Final quali - quantitative evaluation on data collected	P2.1, P2.2, P2,3, P2.4		CO3 platform	Quantitative and qualitative analysis of platform data		November 2021

Scenario 3 - Blockchain Registry

Paris scenario 3 foresees one evaluation action (Table 48). In order to test this hypothesis pilot's managers propose to make a final evaluation through an in-depth interview with one or more researchers involved in the research activity.

Table 48 - Paris scenario 3 evaluation stages description

Evaluation stage	Eval stage main action	Description	Evaluation Action	Engagement Action	Data Collection	Data Analysis	Supporting Material	Timetable
F. Experts interview	P3.M1 research evaluation	research evaluation blockchain as knowledge registry	P3.1	//	Report from researchers	Qualitative	//	November 2021

3.3.5 Paris evaluation as a whole: from hypothesis to evaluation actions and stages

In order to provide a comprehensive vision of the Paris evaluation framework built on the methodology presented in D4.1 (theory based - realist), the following tables (Table 49, Table 50, Table 51) resume the main hypothesis, evaluation actions and stages that are going to be carried out for this pilot.

Table 49 - Paris scenario 1 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
P1.H1		P.1.7		P1.M.1		P1.M.4.
		P1.8				
	P1.SH1	P.1.6	P1.M.5			
		P.1.4		P1.M.2.b		
	P1.SH2	P.1.1	P1.M.5			
		P.1.3		P1.M.2.a	P1.M.3	P1.M.4.
P1.H2	P1.SH3	P.1.2	P1.M.5			
		P.1.5				
		P.1.7		P1.M.1		P1.M.4.
		P1.8				

Table 50 - Paris scenario 2 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Usage data	Evaluation stage		
				preliminary	shadowing	final
P2.H1		P.2.1	P2.M.8		P2.M.3.a	
		P.2.2	P2.M.8			
		P.2.3	P2.M.8			
		P.2.4	P2.M.8			
		P.2.7	P2.M.8		P2.M.6	
	P2.SH1	P.2.5		P2.M.2		
		P.2.6				P2.M.7
		P2.10			P2.M.3.b	
		P.2.9			P2.M.4	P2.M.7
	P2.SH2				P2.M.5	
		P.2.6				
	P2.SH3					
		P.2.8		P2.M.1.a		
	P2.SH4			P2.M.1.b		
P.D2.1		P.2.6				P2.M.7
P.D2.2		P.2.9			P2.M.4	
P.D2.3					P2.M.5	
					P2.M.3.b	

Table 51 - Paris scenario 3 evaluation as a whole

Main Hypothesis	Sub Hypothesis	Evaluation action	Evaluation stage		
			preliminary	shadowing	final
P3.H1	P3.SH1	P3.1			P3.M1
P.D3.1		P3.1			P3.M1

3.3.6 Evaluation materials and preliminary results

In the Appendix the main insights from the evaluation stages already implemented for the Paris pilot are summarised.

- P1.M1 - Interviews and workshops with key stakeholders
- P2.M.1.a - Onboarding Rectorate of Créteil
- P2.M.1.b - Capacitatory workshops with professors
- P2.M.2 - Preliminary workshops with students

For each stage a short description of its execution, the number of people involved, the modality (on line or in presence) and the main feedbacks received are proposed.

4 Conclusions and next steps

This deliverable presents the CO3 evaluation framework for the three pilots: Athens, Turin and Paris, as result of T4.2 activities. It has been conceived starting from the approach proposed in deliverable D4.1 and adapted to the specific cities considering the contextual background. The COVID-19 emergency has strongly impacted on the development and implementation of the pilots and, as a consequence, also on the definition of the evaluation metrics.
Specifically, D4.2 describes how the evaluation framework has been adapted in the three cities and lists the main types of evaluations actions and related data needed.
In order to provide a big-picture of the results of the activities carried out within T4.2 the following two graphs (Figure 10 and Figure 11) summarize the main evaluation hypothesis, actions and typologies of data to be collected, identified for each pilot.
In total 68 evaluation hypotheses have been defined and 65 evaluation actions have been proposed to test the hypothesis: 45% of the evaluation actions can be measured through data collected by the CO3 platform. Usage data indicators are going to be used mostly to evaluate the Turin pilot (50% of them refer to this specific case).
The main tools that are going to be used for collecting qualitative data are: questionnaires (8), meetings in workshops or events (21), experts interviews (6) and periodic monitoring activities (7).

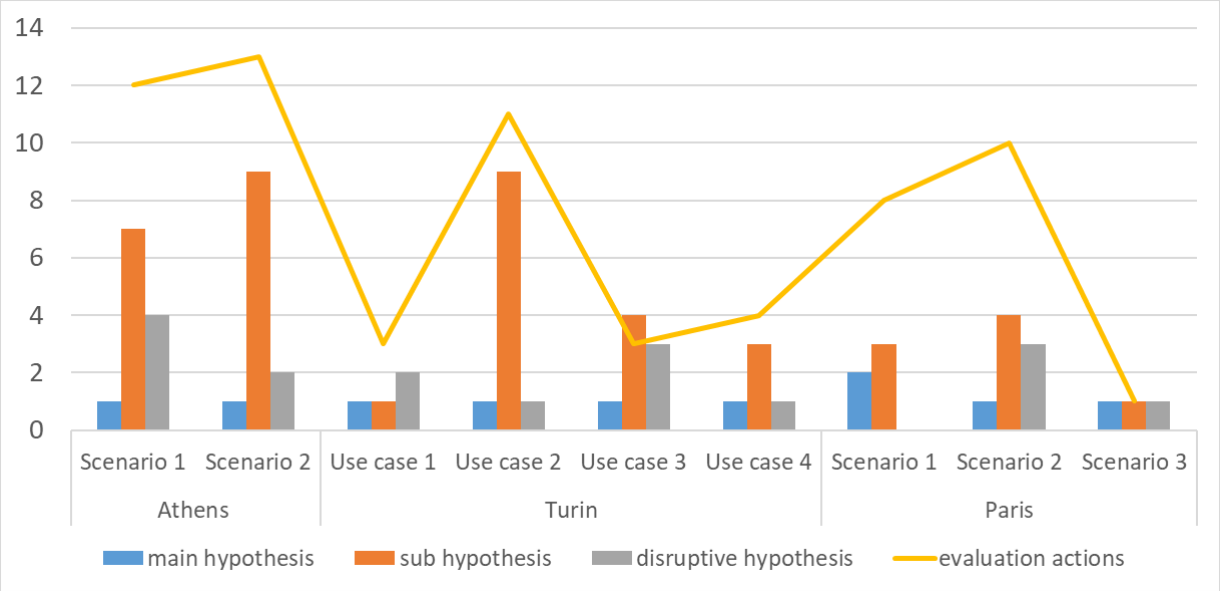

Figure 10 - Number of evaluation hypothesis and actions defined for the three pilots[10]

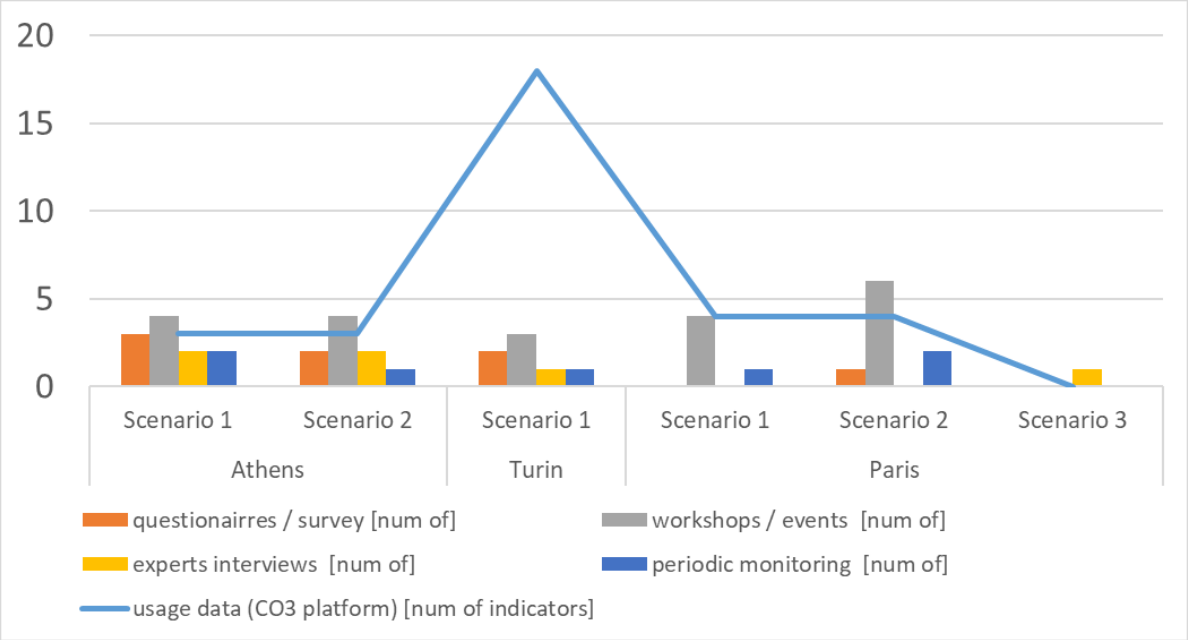

Figure 11 - Qualitative and quantitative data analysis evaluation tools for the three pilots[11]

D4.2 represents a mid-term evaluation report. The results of the final evaluation activities will be documented in D4.3 due at the end of the project.
The following next steps can be envisaged:

- review and update of the evaluation hypothesis, actions and data, aligned with the evolution of the pilots implementation;
- preparation of evaluation supporting materials (especially for last evaluation stages) where missing;
- collection and measurement of qualitative and quantitative data during and at the end of each pilot;
- analysis of the data that will be collected.

[10] For the Turin pilot the evaluation hypothesis and actions have been defined considering the four use cases related to the single scenario.
[11] Evaluation actions are defined considering the scenarios.

Appendix

A1. Usage data table

Table 52 - Updated usage data table

Code	Title	Description	Pilot Reference (evaluation action)	System(s)
D.1	Age Group	under 18 / 19-29 / 30-39 / 40-49 / 50 +	T.2.10	LiquidFeedback
D.3	Gender	Male / Female / Other / Rather not say	T.2.10	LiquidFeedback
D.4	Area	postal code (CAP in Italy) / rather not say	T.2.10	LiquidFeedback
W.1	Volume of tokens raised	Volume of tokens raised in the pilot or in specific Wallets/User Group	A.1.1, T.2.1	Wallet
W.2	Volume of tokens consumed	Volume of tokens consumed in the pilot or by specific Wallets/User Group	A.1.3, T.2.2	Wallet
W.4	Average purchase of tokens	The average purchase of tokens by User Groups	T.2.2	Wallet
W.5	Average balance	The average balance of wallets in the pilot or in specific Wallets/User Group	T.2.2	Wallet
W.6	Average time to spend	The average time in which the tokens are spent in the pilot or by specific Wallets/User Group	T.2.2	Wallet
W.7	Number of users that use tokens	Number of users that use tokens and distinction by user group	T.2.6 , T2.12	Wallet
W.9	Tokens consumed or exchanged for money	Usage of tokens by wallets (redemption or exchange)	T2.11	Wallet
W.11	Users of specific token type	Number of users of specific token type or combination of types	T.4.1, T.4.3.	Wallet
W.12	Volume height of specific token type	How many tokens have been created for a specific token type	T.4.3	Wallet
W.13	Issuers that accept 3rd party tokens	Number of Issuers that accept tokens other than their own	T.2.14	Wallet
W.14	users of tokens to participate to activities	Number of users that use tokens in order to participate to activities	T3.1	Wallet
FL.1	Number of AR objects placed	Number of items mapped through the AR App in FL	P.2.1, P.1.2, T.1.2	AR App , FirstLife
FL.2	Items mapped	The content of the items mapped through the AR App in FL	A.2.1 , P.1.5, P.1.6, P.2.2	FirstLife
FL.3	Items mapped by type	The type of items mapped/placed in AR	A.2.1, T.3.3	AR App , FirstLife
FL.4	User views by item	Views of single users per item	A.2.1, T.1.3, T.3.2.	FirstLife
AR.1	Logged Time	Time in the platform linked with items placed during that time	P.1.1, P.2.3	AR App , FirstLife
AR.2	Number of ACA created	Number of ACA created	P.2.4	AR App
AR.3	AR Content Creation	Number of people that create AR contents	T.1.1	AR App
AR.4	Number of POI (point of interest)	Number of points in the map where AR objects have been placed	P.2.1, P2.4	AR App , FirstLife

AR.5	Number of 3D models created for ACA	Number of different 3D models loaded in the app per ACA	P.2.1	AR App , FirstLife
AR.6	People participating in events	Number of people participating in events promoted through AR	T1.3	AR app
LF.1	Number of Proposal and comment	Numerical analytics on the discussions made in LF for the items in FL	A.2.3, P.2.1, P2.2	LiquidFeedback
G.1	Badges earned	Number of badges earned	T.2, T.3, T.4, P.2.1, A.2.2	Gamification (Ontomap)

A2. Supporting material

A2.1 Athens pilot scenario 1

Evaluation Main Stage: A1.M3 - Report on Usability & Acceptance issues while training producers to use the system

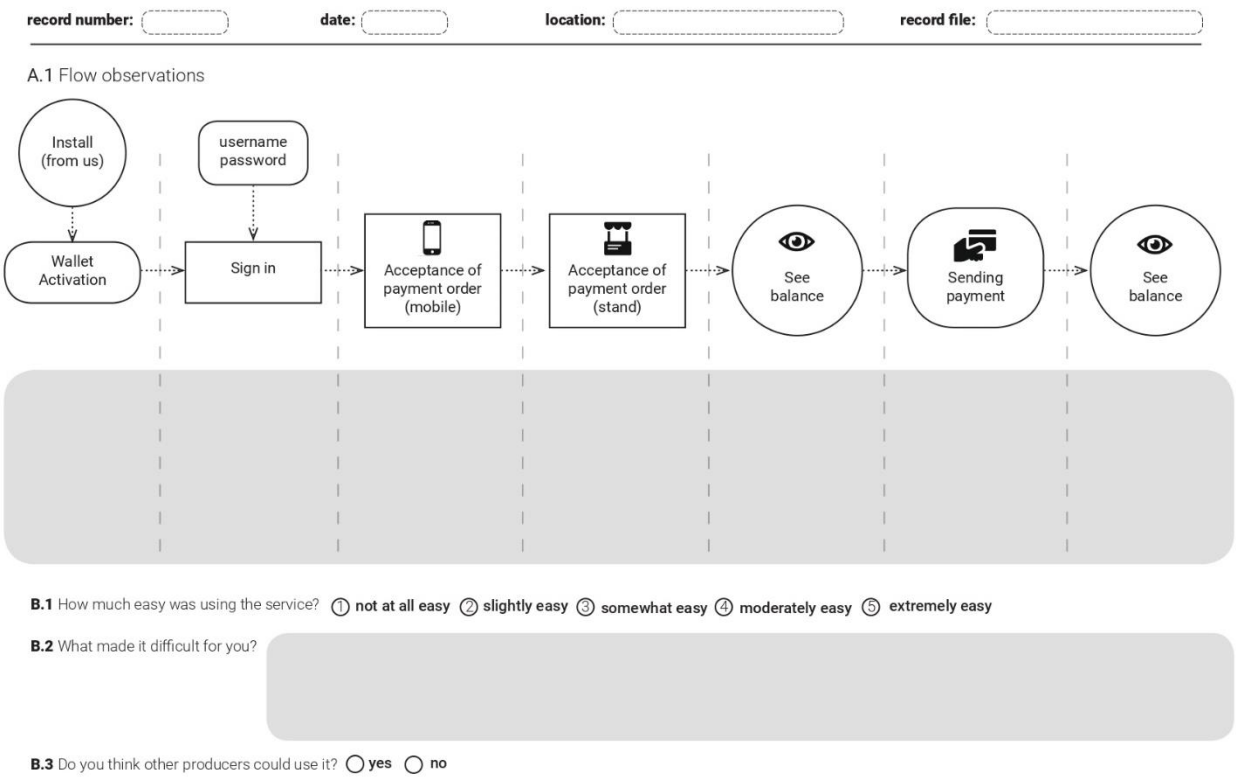

Figure 12 – A1.M3 template

Evaluation Main Stage: A1.M4 - Report on Usability & Acceptance issues while training beneficiaries to use the system

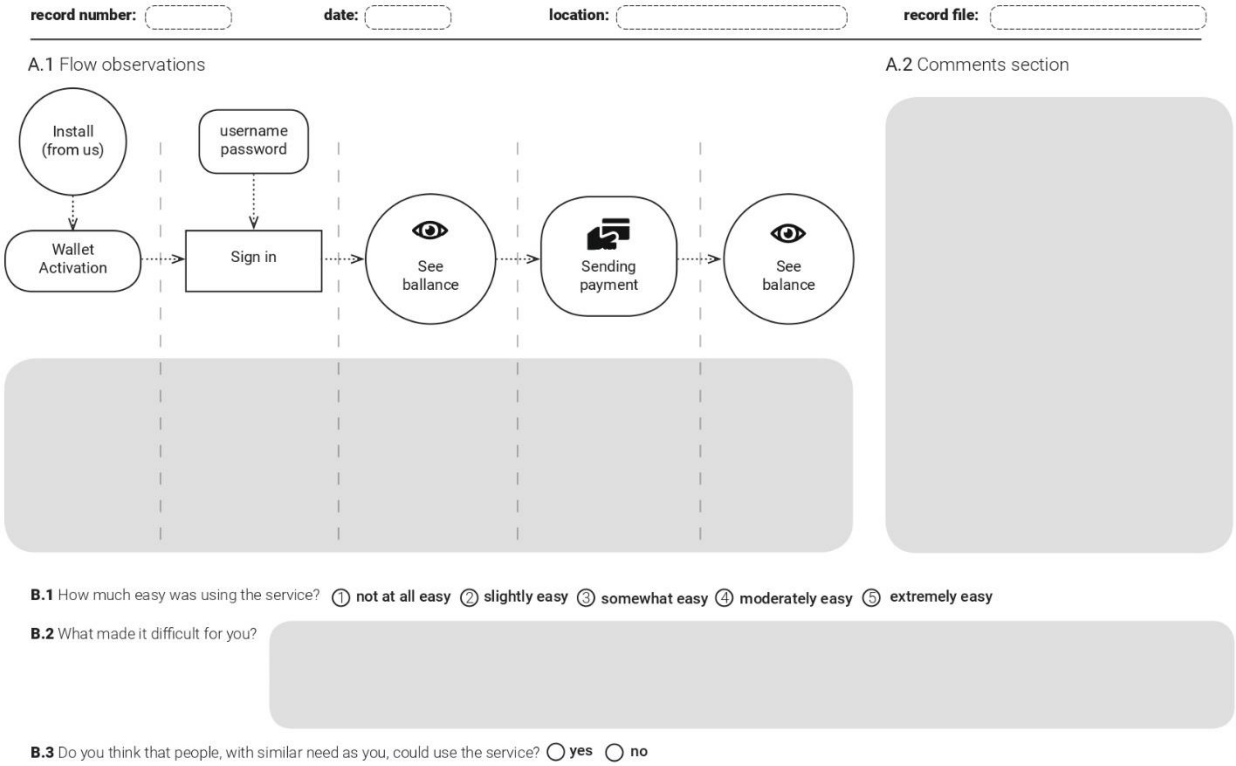

Figure 13 – A1.M4 template

Evaluation Main Stage: A1.M1 - Collect Opinions on the service from producers while engaging with them to join

record number: **date:** **location:**

record file:

1.1.A. Which are the main problems that you face?

1.1.B. Digital literacy **/ 35**

- What kind of devices do you use in your daily life?

mobile phone ① **smartphone** ② **tablet** ③ **desktop/laptop** ④ **more than one** ⑤

- How often do you use your device(s) for something other than communication (news, wikipedia search, etc.)

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you use the Internet to search for information about the daily needs?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you use more than one sources to cross-reference information or news on the Internet?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- In what way do you communicate with your family, friends and colleagues? (multiple choice)

① **Calls and sms**

① **Chat via applications (messenger)**

① **In group chat - content exchange**

② **Use of asynchronous communication platforms**

- At what level are you familiar with creating digital content?

① **Take photos and videos that remain in the memory cart of my device**

② **Post or share photos and videos on social media**

③ **Edit videos or photos via smartphone before posting or sharing**

⑤ **Specialized knowledge of using image or video editing programs**

level 01	level 02	level 03	level 04	level 05
■	□	■	□	■

1.1.C. Are you interested in the service? ◯ **yes** ◯ **no**

WHY NOT: ◯ **not useful for me** (PU) ◯ **difficulties of use** (PE) ◯ **legal barriers** (Legal, A.1.6)
◯ **I will not get any help for this** (FC) ◯ **it will damage the image of the market (SI)**
◯ **accounting barriers** (Legal, A.1.6) ◯ **it will change the way the market works** (Disruptive)
◯ **overlaps with the existing stamps system** (A.1.14) ◯ **other**

WHY YES: ◯ **useful for me** (PU) ◯ **easy to use** (PE) ◯ **good impression** (SI)
◯ **I will participate and will get help from you** (FC) ◯ **better than the stamps** (A.1.14)
◯ **it will revitalise the way the market works** (Disruptive) ◯ **other**

1.1.D. Overall impression from the service?

NEGATIVE ① ② ③ ④ ⑤ **POSITIVE**

- What would you change?

1.1.E. How realistic do you consider the possibility of generalizing the service? (Sustainablity)

NOT AT ALL ① ② ③ ④ ⑤ **EXTREMELY**

1.1.F. How much comprehensive was the presentation of the service?

NOT AT ALL ① ② ③ ④ ⑤ **EXTREMELY**

- What made it difficult for you?

comments section

Figure 14 – A1.M1 template

Evaluation Main Stage: A1.M2 - Collect Opinions on the service from selected beneficiaries

record number: **date:** **location:**

record file:

1.1.A. Which are the main problems that you face?

1.1.B. Digital literacy **/ 35**

- What kind of devices do you use in your daily life?

mobile phone ① **smartphone** ② **tablet** ③ **desktop/laptop** ④ **more than one** ⑤

- How often do you use your device(s) for something other than communication (news, wikipedia search, etc.)

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you use the Internet to search for information about the daily needs?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you use more than one sources to cross-reference information or news on the Internet?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- In what way do you communicate with your family, friends and colleagues? (multiple choice)

① **Calls and sms**

① **Chat via applications (messenger)**

① **In group chat - content exchange**

② **Use of asynchronous communication platforms**

- At what level are you familiar with creating digital content?

① **Take photos and videos that remain in the memory cart of my device**

② **Post or share photos and videos on social media**

③ **Edit videos or photos via smartphone before posting or sharing**

⑤ **Specialized knowledge of using image or video editing programs**

level 01	level 02	level 03	level 04	level 05
6 – 12	12 – 18	18 – 24	24 – 30	30 – 35

1.1.C. Have you been previously benefited from a similar service? ◯ **yes** ◯ **no**

- If so, what was your experience?

NEGATIVE ① ② ③ ④ ⑤ **POSITIVE**

- If negative, what were the disadvantages?

① **product availability** ② **quality** ③ **frequency** ④ **variety**

⑤ **other:**

1.1.D. Overall impression from the service?

NEGATIVE ① ② ③ ④ ⑤ POSITIVE

- What do you think of the blockchain and tokens technology?

- Compared to the previous situation?

- What would you change?

1.1.E. How realistic do you consider the possibility of generalizing the service?

NOT AT ALL ① ② ③ ④ ⑤ EXTREMELY

1.1.F. How much useful do you consider the service?

NOT AT ALL ① ② ③ ④ ⑤ EXTREMELY

If NOT AT ALL, why?

- How much easy was using the service?

NOT AT ALL ① ② ③ ④ ⑤ EXTREMELY

- Do you think there are the appropriate infrustructures that support the service?

NOT AT ALL ① ② ③ ④ ⑤ EXTREMELY

- Do your friends and family support you in order to participate at the service?

NOT AT ALL ① ② ③ ④ ⑤ EXTREMELY

comment section

Figure 15 – A1.M2 template

A2.2 Athens pilot scenario 2

Evaluation Main Stage: A2.M1 - Collect technology awareness data from citizens that will participate in the pilot implementation

openlab athens | **M.2.1** Digital Literacy Measurement Tool

record number: **date:** **location:**

record file:

1.1.A. Digital literacy **/ 35**

- What type of devices do you use in your daily life?

mobile phone ① **smartphone** ② **tablet** ③ **desktop/laptop** ④ **more than one** ⑤

- How often do you use your device(s) for something other than communication (news, wikipedia search, etc.)

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you search on the internet about information or data in your routine?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How often do you use more than one sources to cross-reference information or news on the Internet?

never ① **every 3 month** ② **every month** ③ **weekly** ④ **daily** ⑤

- How do you interact with your personal and working environment? (multiple choice)

① **Calls and sms**

① **Chat via applications (messenger)**

① **In group chat - content exchange**

② **Use of asynchronous communication platforms**

- At what level are you familiar with creating digital content?

① **Take photos and videos that remain in the memory cart of my device**

② **Post or share photos and videos on social media**

③ **Edit videos or photos via smartphone before posting or sharing**

⑤ **Specialized knowledge of using image or video editing programs**

level 01	level 02	level 03	level 04	level 05
6 – 12	12 – 18	18 – 24	24 – 30	30 – 35

1.1.B. Do you know what Augmented Reality is? ◯ **yes** ◯ **no**

Figure 16 – A2.M1 template

Evaluation Main Stage: A2.M2 - Simulation of service through serious gaming

Figure 17 – A2.M2 template

A2.3 Turin pilot

Evaluation Main Stages: T.M.3 - Collect stakeholders preliminary views on the system and their needs and T.M.6 Collect stakeholders views on the system

QUESTIONNAIRES TEMPLATES

SECTION 1 - PERSONAL DETAILS [T.M.3 and T.M.6]

1. age: ……..
2. gender
3. employment
4. To which of the following CdQ do you usually go? (multiple answer)
    - CdQ San Salvario
    - Cecchi Point
    - PiùSpazioQuattro
    - Other CdQ
    - none CdQ

5. Role in the CdQ
    - visitor,
    - volunteer,
    - manager,
    - coordinator,
    - other, …

6. are you going to use the CO3 app? **[T.M.3]**
   - yes,
   - not, → why not? …….
   - don't know

7. Have you used the CO3 app? **[T.M.6]**

   - Yes, already used;
   - not yet used but I'm going to use it;

SECTION 2 - CDQ evaluation – without CO3 [T.M.3 and T.M.6]

8. Consider the following activities related to the CdQ management and evaluate them according to the scale:
   1. To be improved
   2. Sufficient
   3. Good
   4. Excellent

	1	2	3	4
Ways in which the CdQ activities are proposed to visitors				
Volunteers' activities management				
Producing a yearly program targeted on real users/public interest				
Management of the citizens' participation to CdQ activities				

Additional comments: …….

SECTION 3 - CO3 EVALUATION

9. **[T.M.3]** are you interested in using the CO3 app for the following scopes?
   - content creation through AR
   - Payment of CdQ activities using the CO3 wallet
   - management of volunteers activities
   - annual planning of CdQ activities

10. **[T.M.6]** Did you use the CO3 app for the following scopes?
    - content creation through AR
    - Payment of CdQ activities using the CO3 wallet
    - management of volunteers activities
    - annual planning of CdQ activities

3.A - AUGMENTED CONTENT [[T.M.3 and T.M.6]

11. Express your agreement with the following sentences: AR can be used for increasing

	not at all	Just a little	quite a lot	a lot
the promotion of CdQ activities				
the participation to the CdQ activities				

12. What do you think about the use of AR in the CO3 app

1 = not at all agree; 5= completely agree

	1	2	3	4	5
it is useful					

it is easy to use					
it is very intuitive					
I will need the help of someone for using it					
I would imagine that most people would learn to use this system very quickly.					

3.B - PRE-PAID SYSTEM - CO3 wallet [T.M.3 and T.M.6]

13. How much are you interested in the possibility of using a pre-paid system for the participation to the activities of CdQ?
    - not at all interested
    - slightly interested
    - interested
    - very interested

14. What do you think about the CO3 wallet?

1 = not at all agree; 5= completely agree

	1	2	3	4	5
it is useful					
it is easy to use					
it is very intuitive					
I will need the help of someone for using it					
I would imagine that most people would learn to use this system very quickly.					

15. according to your opinion which are the main benefits for the usage of the CO3 wallet?

If question 5 = CdQ managers	If question 5 = visitors
• improvement of daily work • It is possible to carry out the work in faster way • It is possible to carry out the work in a more easy way • Bureaucracy is reduced • possibility to reach additional target users • other	• improvement of the organization • faster • increased transparency • other: …….

16. which are the main obstacles in the use of the CO3 wallet
    - difficult to use
    - I need too much time for learning to use it
    - I do not know who could help me in case of needed assistance
    - it does not seems to me a reliable system
    - other: ……...

3.C - VOLUNTEERS' ACTIVITIES MANAGEMENT AND ANNUAL PLANNING [T.M.3 and T.M.6]

17. Express your agreement with the following sentences: CO3 app can be used for improving

	not at all	just a little	quite a lot	a lot
the management of volunteers' activities				
the production of a yearly program targeted on real users/public interest				

the production of a yearly program targeted on real users/public interest				

3.D - FINAL EVALUATION ON CO3 APP [T.M.3 and T.M.6]

18. which functionality or characteristic of the CO3 app did you like most? …….
19. which functionality or characteristic of the CO3 app do you think is more difficult to use or not useful? …….

SECTION 4 - DIGITAL COMPETENCES [T.M.3 and T.M.6]

Reference to digital literacy questions in A2.M1 (ATHENS)

SECTION 5 - CONTACTS

20. **[T.M.3]** are you available for filling a follow-up questionnaire at the end of the pilot? please, provide your email: …….

Online version (preliminary questionnaire T.M.3) - ITALIAN LANGUAGE is available here: https://forms.office.com/r/ZBR8f4V5JS

Evaluation Main Stages: T.M.1 - Training Workshops with CdQ organizers and managers and T.M.2 Launch event

TEMPLATE FOR FACILITATORS DATA COLLECTION	
Date of the meeting	
place	online / physical, specify where
number of participants	#
(possibly include attendants list)	
role of the workshop participants in the CdQ	coordinators, managers, ...
CdQ represented	specify the name of the CdQ represented in the workshop
CO3 app presentation and training	Report perception and difficulties of the participants in using the app take note of the main questions from participants are there some functionalities that seem to be more interesting / useful than others?
Discussion	conclusive discussion can focus on what CdQ managers / organizers expect from the use of the CO3 app, especially in terms of improvement of some CdQ activities, promotion of CdQ activities volunteers management Management of the citizens' participation to CdQ activities planning of the yearly programme

Evaluation Main Stage: T.M.5 - Final meeting with CdQ organizers / managers

TEMPLATE FOR FACILITATORS DATA COLLECTION	
Date of the meeting	
place	online / physical, specify where
number of participants	#

(possibly include attendants list)	
role of the workshop participants in the CdQ	coordinators, managers, ...
CdQ represented	specify the name of the CdQ represented in the workshop
shadowing on service implementation	brief roundtable about the complete pilot execution, make reference to: • results achieved • blocking issues (if any) • CO3 app users engagement evaluation about CO3 app AR: • usefulness and easy of use • does it work well? • if not, what aspect does not work? • how can be improved token system: • usefulness and easy of use • does it work well? • if not, what aspects do not work? • how can be improved
Discussion	conclusive discussion can focus on how CdQ managers / organizers think that the use of the CO3 app can impact on CdQ activities, promotion of CdQ activities volunteers management Management of the citizens' participation to CdQ activities planning of the yearly programme

A2.4 Paris pilot scenario 1

Evaluation Main Stage: P1.M.1 - Interviews and workshops with key stakeholders

a) Series of interviews conducted with various FCPE groups of parents (Jan-Jun 2021) for understanding the needs and digital practices

N° of people: ≈ 50
Iri staff involved: 7
N° rdvs: 18
Mostly online

RESULTS: High interest from the stakeholders and citizens relating to the Co3 app and the co-design methodology. The idea of a geolocated social network open up a space for a real discussion about the future development of websites and platforms (e.g. collective purchase for school's materials) within the FCPE

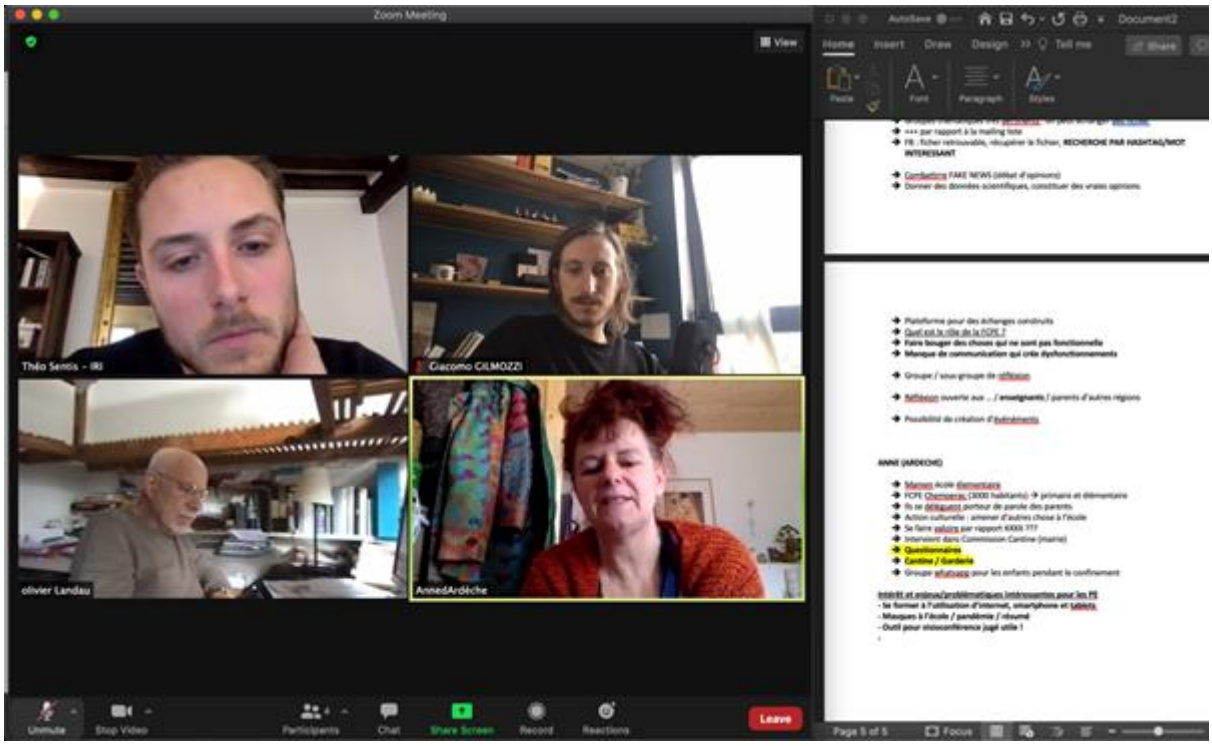

Figure 18 - One example of the pilot interviews we made with one parent from the FCPE. Interviews were made two-to-two or one-to-one. Workshops gathered around 30 parents and 5 IRI staff each.

b) workshops with PMI staff and single-mothers on the toxicity and potentialities of the digital technologies have continued during the pandemic

c) first interviews with “hands on the CO3 app” with PMI staff is planned for July 2021

N° of people: ≈ 15
IRI staff involved: 5
N° rdvs: 26
Mostly (80%) online

RESULTS: High interest from the stakeholders and citizens about the themes and the contributory-research methodology. For sanitarian reason related to COVID-19 and the legal status of the PMI, users have only seen the app via the presentations and live-use during conference calls of the app and the desktop technologies

A2.5 Paris pilot scenario 2

Evaluation Main Stage: P2.M.1.a - Onboarding Rectorate of Créteil

The rectorate endorsed the project and help us in connecting with the schools of the Seine-Saint-Denis Department

N° of people: ≈ 80
Iri staff involved: 12

N° rdvs: 5 (from 9 am – to 5 pm)

• a first step dedicated to the transmission of theoretical elements making it possible to place the project in the perspective of the major anthropological, industrial, economic and political issues posed by the new urban revolution;
• a second phase dedicated to playing the Minetest video game and CO3 technologies;
• a third step aimed at supporting teachers in preparing for sessions with students and planning in-class interventions.

Mostly (90%) in presence
RESULTS: High interest in the Co3 technologies and the articulation with the Minetest game from professors – pedagogically and technologically speaking

Figure 19 - Meeting with Rectorate of Créteil

Evaluation Main Stage: P2.M.1.b - Capacitatory workshops with professors

The capacitatory workshop session for professors have been done (almost entirely in presence) at the Rectorate between September 2020 and February 2021. Another session is planned for Fall 2021 (Sept-Dec 2021).

Figure 20 - An example of meeting with professors

Evaluation Main Stage: P2.M.2 - Preliminary workshops with students

IRI has held various workshops in the schools of the Seine-Saint-Denis:

<u>Lycée Jacques Brel</u>

3 in-class interventions (Nov 2020-May 2021), 1 Minetest-Co3 hackathon on 3 full days (9-11 June 2021) plus one day event with a jury evaluating the projects developed by the students through the use of Co3 app AR and FirstLife desktop.
N° of people: ≈ 30
IRI staff involved: 7

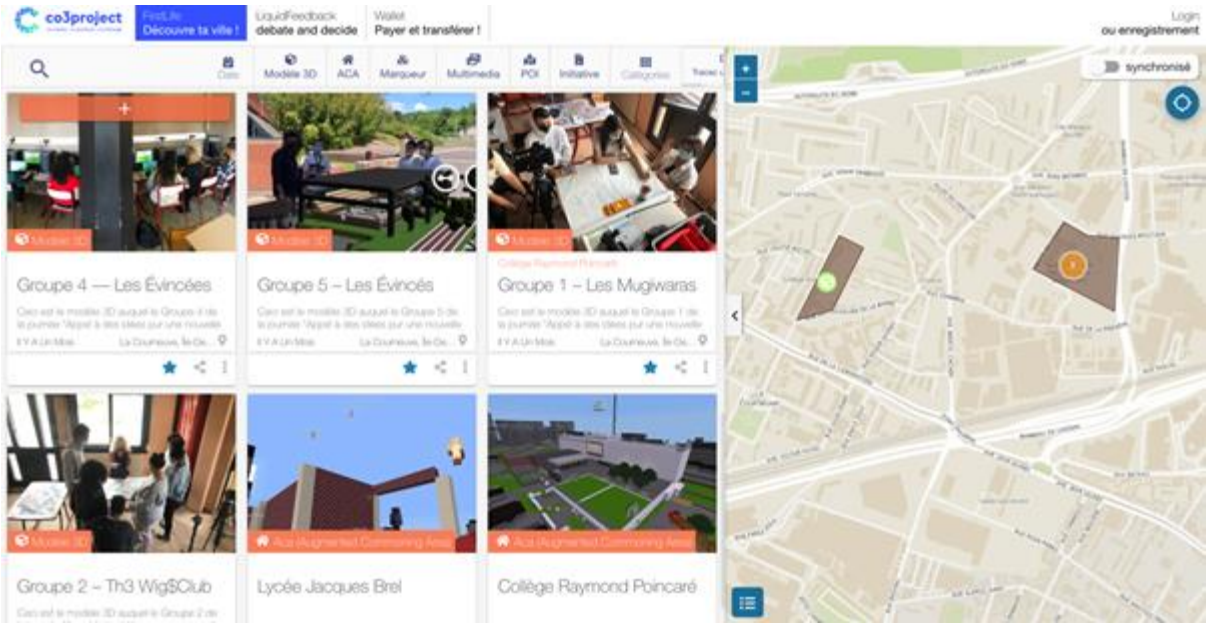

Figure 21 - Example of the in-class activities with Lycée Jacques Brel students

Figure 22 - Example of the in-class activities with Lycée Jacques Brel students

Figure 23 - Workshop with Lycée Jacques Brel students

<u>Lycée Denis Papin</u>

3 in-class interventions
N° of people: ≈ 20
Iri staff involved: 3

<u>Collège Raymond Poincaré</u>

4 in-class interventions (Nov 2020-June 2021)
1 Co3-Minetest hackathons during 2 full days (7-8 July)

Figure 24 - Workshop with Collège Raymond Poincaré students

Showing the 3D model created by the students and exported from Minetest through a gltf viewer, then imported in the CO3 app before going to the court and superposed it onto reality (Collège Poincaré, July 8th 2021).

N° of people: ≈ 30
Iri staff involved: 4
RESULTS: High interest and appreciation from both students and professors for the Co3 technologies and the articulation with the Minetest.