

# Cloud Catalyst

## D.4.2. Development of “Go-to-the-Cloud” Service

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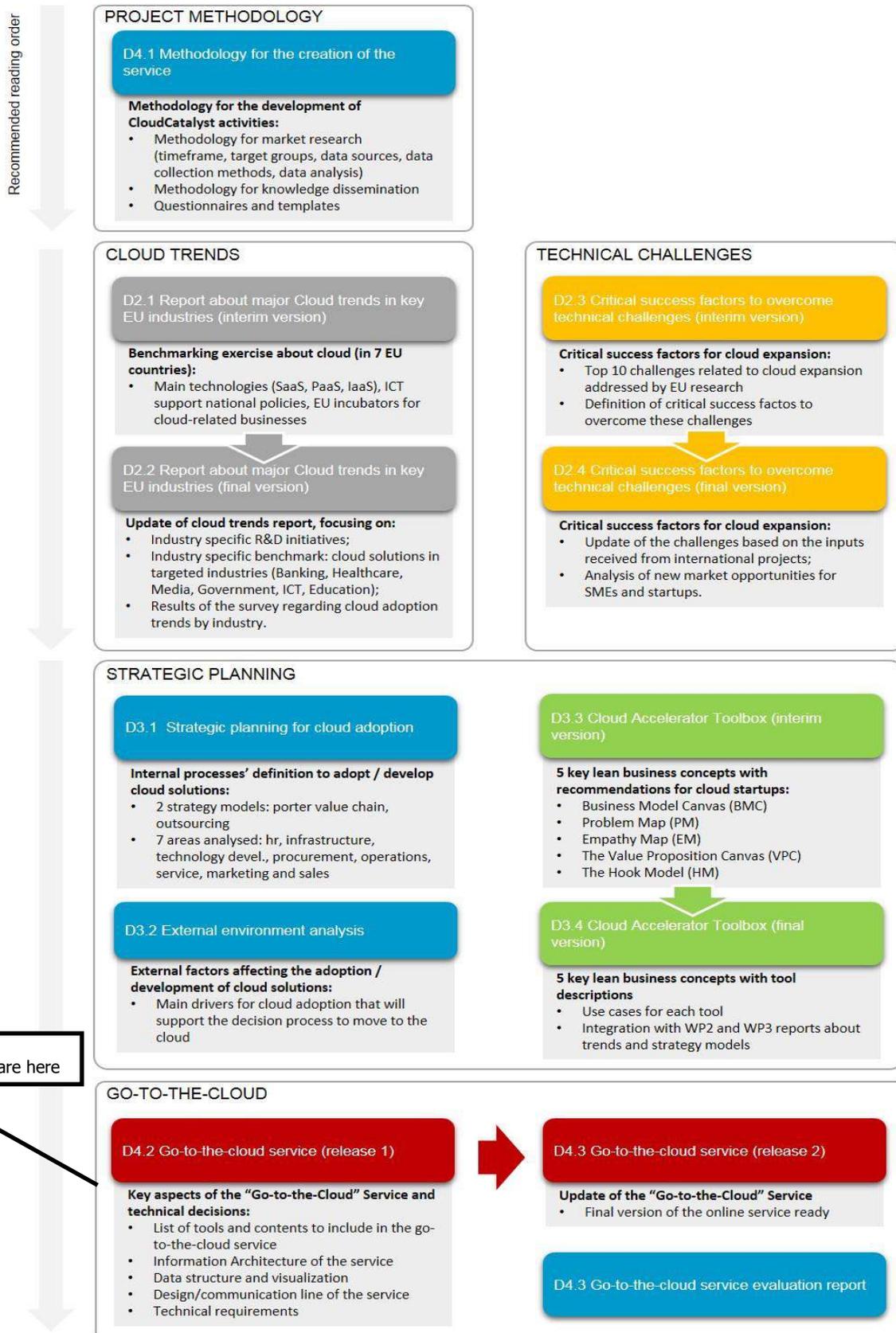
#### Statement of Originality

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## Executive Summary

The key objective of this document is to present the "Go-to-the-Cloud" Service – an online support service for information sharing and dissemination, coaching and consulting to EU startups, SMEs and other key stakeholders interested in the development and implementation of Cloud solutions.

This document will cover the key aspects of the "Go-to-the-Cloud" Service and all the technical decisions and requirement decisions related to the development of it, namely:

- The list of tools and contents to include in the go-to-the-cloud service
- The Information Architecture of the service
  - The data structure
  - The visualization of the data
- The design/communication line of the service
- The technical requirements for the Go-to-the-cloud service

# 1 Introduction to the deliverable and scope

## 1.1 Objectives and scope

WP4 – "Go-to-the-Cloud" service development and implementation – aims to implement a support service for information sharing and dissemination, coaching and consulting to EU startups, SMEs and other key stakeholders interested in the development and implementation of cloud solutions.

Therefore, with a very practical and concrete approach WP4 aims to:

- Provide appropriate techno-economic tools and methodologies for planning, designing and evaluating different Cloud solutions.
- Make available a support service for Cloud deployment.

That said, selected techno-economic tools for planning, designing and evaluating Cloud technologies will be adapted and made available in CloudCatalyst website for on-line or off-line utilization, as considered more appropriate.

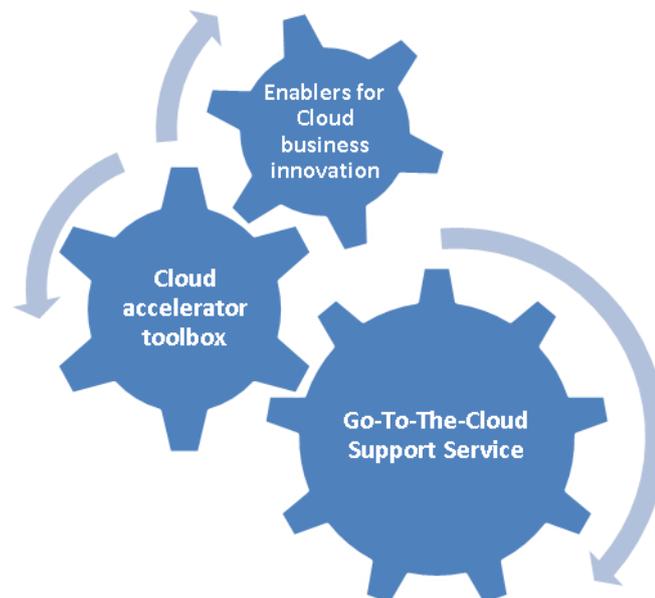


Figure 1- CloudCatalyst key instruments

It will be made available to all the stakeholders that, through several filters can analyze and cross the projects, funding, operators, existing solutions, best practices etc. to find relevant information that will serve as a base for the development of their own Cloud initiatives.

In addition to making available in CloudCatalyst website a suite of techno-economic tools for planning, designing and evaluating Cloud solutions, the project will also implement a support service targeting software developers, scientific community,

entrepreneurs and Cloud start-ups, among others.

This support service will be an information and consulting service to relevant EU and national (EU-27) key players involved in the formulation of future strategies and initiatives for ICTs as well as in the design and management of Cloud systems.

"Go-to-the-Cloud" service will target the needs of key European and national actors by providing to them the necessary input on the most adequate technologies, best practices and use cases according to their specific situation. The service will be deployed and executed from an "end-user centric" and "problem-solving" approach.

The purpose of this service is multifold:

- Stimulating the local stakeholders to set out their intentions that will lead onto successful (e.g. value for money, in budget, on time, sustainable) cloud deployments.
- Contribute for the dissemination of best practices in terms of Cloud Computing implementation and operation.

Also, a level of quality control process will be implemented within this support service, based on ENISA's cloud certification metaframework<sup>1</sup>, which will:

- Deliver a framework, assessments and a possible certification through are meaningful selection tools for providers/customers, who want to provide/use trustworthy cloud services.
- Reduce the necessity to perform costly individual audits.
- Provide a valuable instrument with a high level of transparency and guidance for customers and providers alike.

In reference to the ENISA CCSM metaframework, EuroCloud as a certification scheme provider and consortia member, has established:

- A free usage of self-assessment tool (<https://eurocloud-staraudit.eu/assessment.html>) to be used by IaaS, PaaS, SaaS providers on the "Go-to-the-Cloud" for quality assessment
- Provide sustainability of quality control process for longer term, also after finish of the project within the EuroCloud Star Audit programme
- Build a community of stakeholders, consultant, certification and training organizations to educate the provider and user community of cloud services

## 1.2 Target Users Characteristics

The Go-to-the-Cloud Service is directed to every major stakeholder in the CloudCatalyst project, namely entrepreneurs from cloud start-ups, SMEs, incubation centers, start-up accelerators, venture capitalists, business consultants, scientific community, research institutes, policy makers, the European Commission, among others.

That said, our primary and most important target group is startups who are building

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• <sup>1</sup> <https://resilience.enisa.europa.eu/cloud-computing-certification>

(or could be building) cloud services and/or cloud-based services, then SMEs and then every support organizations in the entrepreneurial world, which could directly or indirectly benefit from the tools, data and know-how developed with in the CloudCatalyst project and available at the Go-to-the-Cloud Service.

Naturally, each stakeholder will have different motivations to use the service, so a short description of each stakeholder characteristics and a list of the benefices to use the service are listed below:

### **1.2.1 Entrepreneurs and Cloud Start-ups**

An entrepreneur is "someone who exercises initiative by organizing a venture to take benefit of an opportunity and, as the decision maker, decides what, how, and how much of a good or service will be produced." [Def\_Entrepreneur] and a startup is a new venture, lead by an entrepreneur, which has, at an early stage, plenty of uncertainty regarding its product(s), market(s), business model(s), etc.

That said, the entrepreneurs and startups are the primary group of the Go-to-the-Cloud service, and they should be able to find within the portal, the necessary know-how and tools to make conscious decisions about building a Cloud Product or a Cloud-based Product.

They should be able to learn about cloud computing advantages, benefits, opportunities and challenges, and follow best practices regarding cloud adoption (to reduce uncertainty in their projects).

### **1.2.2 SMEs**

Similarly to start-ups, the Small and Medium Enterprises (SMEs) that are willing to start an innovative product, or improve a previous one, will be able to find the Go-to-the-Cloud service the necessary know-how and tools to make this transition.

SMEs could also use the comparable knowledge about the European Markets covered in the CloudCatalyst project to make important business decisions related to market expansion.

### **1.2.3 Incubation Centers, Start-up Accelerators, Venture Capitalists and Business Consultants**

Incubation centers, start-up accelerators, venture capitalists and business consultant, as support organizations in the entrepreneurial world, could use the information and tools available at the Go-to-the-Cloud service to (i) teach/mentor entrepreneurs and startups regarding cloud computing advantages, benefits, opportunities and challenges, (ii) build specific programs to Cloud startups and (iii) evaluate the best and/or the most prepared cloud startups to succeed in the Cloud Computing market.

### **1.2.4 Research Institutes and the Scientific Community**

The research institutes and the scientific community will be able to use the Go-to-the-Cloud service to find opportunities for further research in the cloud computing field

(namely, by reading about the challenges faced nowadays by the Cloud Computing industry) and also as an opportunities to interact with the entrepreneurs and the startups using the portal.

Researchers that were able to develop innovative technologies in the Cloud Computing field can explore the business opportunities of it, using the service with a new perspective, namely with the eyes of an entrepreneur.

### **1.2.5 Policy Makers and the European Commission**

Policy makers and the European commission will benefit from the Go-to-the-Cloud service by having a website to get state-of-art know-how about cloud computing and by having the opportunity to interact with entrepreneurs and the startups using the portal.

## **1.3 Key Concept**

The main concept of the Go-to-the-Cloud service is to be a one-stop-shop for business information about the cloud computing European market.

The users should be able to get every know-how they need to make important business decisions about cloud computing and business development.



**Figure 2 - Go-to-the-Cloud Key Concept**

## **1.4 Restrictions, Dependencies and Assumptions**

The Go-to-the-Cloud Service has no previously known technical or non-technical restrictions, dependencies or assumptions.

However, there is a natural ambition to maintain the communication line of the CloudCatalyst project, so the design of the portal should follow the look and feel of CloudCatalyst website and project newsletters:



Figure 3- CloudCatalyst Website

## 2 Tools and contents to include in the Go-to-the-Cloud Service

The focus of this chapter is to describe and explain each tool and content that will be included in the Go-to-the-Cloud Service, defining its scope and objectives. In general terms, a "tips and tricks" approach will be privileged as a starting point.

### 2.1 The Cloud Accelerator Toolbox (CAT) tools

The Cloud Accelerator Toolbox (CAT) will be composed by the following 5 tools in this order:

1. The Business Model Canvas (BMC),
2. Problem Map (PM),
3. Empathy Map (EM),
4. Value Proposition Canvas (VPC)
5. The Hook Model (HM)

The full description of CAT features are available in Deliverable D3.3.

Each tool included in the CAT Toolbox will be firstly presented in the following dimensions:

- Description with basic information about the tool;
- Downloadable PDF of a tool (toll can be printed up to A2 paper size)
  - Trackable number of downloads
- Tool manual, which includes information about the required process for successful tool utilization and implementation;
- Tool examples with actual cases of results obtained by tool usage and company references;
- Recommendations for Cloud startups, including a description about most common actions taken by Cloud startups with specific recommendations for toolbox.
- Frequent Asked Questions about the tool;
- "Leave a comment" box with each tool (feedback loop) where visitors/startups can ask questions or raise issues for service improvement and improving the FAQ

Moreover the tool box will also include the following features:

- Reference tools will be available for online fulfillment (enter data, source data from available resources (reports, trends), etc.
- Fulfilled tools can be uploaded, shared or published for peer/ incubator review
- Additional calculators / supporting mechanics for specifics of every tool
  - Example: Calculate potential costs of cloud infrastructure in designated country (you can choose country), or Display relevant EU policies for selected tool.

## 2.2 Business and Industry Data on Cloud trends in Europe

The Go-to-the-Cloud Service will contain data collected by the Cloud Catalyst project to provide a snapshot of the current cloud landscape.

### 2.2.1 Providers and Supporters' Benchmarking

A summary of the benchmarking exercise developed within the Cloud Catalyst project will be included, listing the following categories for each studied organized by country.

- a) ICT Policies
- b) Available technologies providers (IaaS, PaaS, SaaS)
- c) Funding available
- d) Startup incubators

The table below presents an example of the information provided.

<b>Benchmark - Incubators &amp; Accelerators</b>	
<b>National</b>	
<b>Portugal</b>	
<b>Name</b>	<b>Area of expertise</b>
UPTEC - Science and Technology Park of University of Porto	Technology, Creative Industries, Biotechnology, Sea
IPN - Institute Pedro Nunes	Technology
SANJOTEC	Robotics, Automation, Biotechnology, Chemistry, Design and IT
Startup Lisboa	Technology, commerce and tourism
TECMAIA - Science and Technology Park of Maia	Technology
Startup Braga	Technology
AVEPARK - Science and Technology Park, SA	Technology
Lisbon Challenge	Technology
Programa de Aceleração do UPTEC	Technology, Creative Industries, Biotechnology, Sea
<b>SPAIN</b>	
<b>Name</b>	<b>Area of expertise</b>
Madrid Science Park (Parque Científico de Madrid)	Molecular Biology, Proteomics, Industrial Biotransformations, Dermopharmacy and Molecular Interactions
Parque Tecnológico de Andalucía	Technology, Business
La Salle Technova	Technology, Business
Business Booster	ICT eCommerce, Cloud computing
Lanzadera	Business
<b>UNITED KINGDOM</b>	
<b>Name</b>	<b>Area of expertise</b>
North East Business and Innovation Centre Ltd.	Business & Marketing, Technology
Coventry University Enterprises Ltd	Technology, Business
University of Warwick Science Park	Business & Marketing
St John's Innovation Centre	Technology, Business
Knowledge Dock Business Centre - University of East London	Technology

**Figure 4: Benchmark Incubators and Accelerators**

### 2.2.2 SaaS, PaaS and IaaS Providers Directory

A curated directory will help to discover the current SaaS, PaaS and IaaS providers in Europe, and the key characteristics that can be used to compare their offerings. The table below shows an example of the information compiled in the directory.

	International	National	SPAIN	UNITED KINGDOM
	<Player>	PORTUGAL	Telefonica	G-Cloud
Marketplace name		Portugal Telecom	Aplicateca	G-Cloud
Link		Soluções Cloud <a href="https://cloud.ptempresas.pt">https://cloud.ptempresas.pt</a>	<a href="https://www.aplicateca.es/">https://www.aplicateca.es/</a>	<a href="http://govstore.service.gov.uk/cloudsto">http://govstore.service.gov.uk/cloudsto</a>
<b>Service categories</b>				
Categories		Computing; Storage; Collaboration; Web presence; Security	Web and eCommerce; Office; Security; Marketing and Communication; Mobility	SaaS - Application Deployment, Components, C/SaaS -Accessibility, Agile Tools, Analytics, Antispam / CAPTCHA , Asset Management, Conter Management Systems (CMS), Custome Relationship Management (CRM), Dat Visualisation, EDRM/ Collaboration, Email, End User Device (EUD), Enterpris Resource Planning, Forms.
Integration of applications developed by third-parties		√	√	√
<b>Customer profile targeted</b>				
ICT support service		x	√	√
Business in general		√	√	√
Government		x	x	√
<b>Segment</b>				
Corporate		√	√	x
SME		√	x	√
<b>Geography and language support</b>				
Global		x	x	x
Local		√	√	√

Figure 5 : IaaS, PaaS and SaaS Directory

### 2.2.3 Key EU Industries Indicators, Survey Results and Interviews

Use cases, recommendations and results of the surveys regarding cloud adoption trends by industry, comparison global vs. startups and video interviews.

## 2.3 Technical Challenges

In their path to cloud computing adoption, startups will face many technical challenges. The service will include a set of guidelines with fine-grained information about the main adoption barriers. These guidelines will:

- Guide entrepreneurs, researchers, and software developers to create value-added Cloud solutions and services
- Guide any start-up interested in using cloud services to identify potential problems ahead of time, and transform this problems/barriers in innovation opportunities.

## 3 The Solution Requirements Analysis

This chapter aims to describe the functional and non-functional requirements for the Go-to-the-Cloud Service.

### 3.1 The Functional Requirements

#### 3.1.1 User Roles

The portal will have two user roles: users and administrators.

**Users** are every individual or group of individuals that potentially fit in the target audience described in Chapter 1, which can access the application using a web browser.

Users are only allowed to visualize the content and **administrators**, by the other side, will have the power to adapt and update the content of the website and moderate the content added by users.

#### 3.1.2 Use Cases and Graphic Layout

Reference examples of use cases are described below. The search functionality will be used in all the tools and therefore it's presented in a separated section.

As presented in the previous sections the Go-to-The-Cloud service will be organized in three main sections (Tools; Trends; Challenges) and one addition support section providing the search functionality. The webpage supporting the service will have this three sections organized as a menu, as presented in the image below.



Figure 6 - Go-To-The-Cloud service website main menu

The Go-to-The-Cloud service will have in its landing page a description of all functionalities and will have global organization as presented in the image below.



Figure 7 - Go-to-The-Cloud landing page

### 3.1.2.1 THE CLOUD ACCELERATOR TOOLBOX (CAT) MODULE

The landing page of CAT will have all the 4 selected tools organized in a very graphical as presented in the image below.

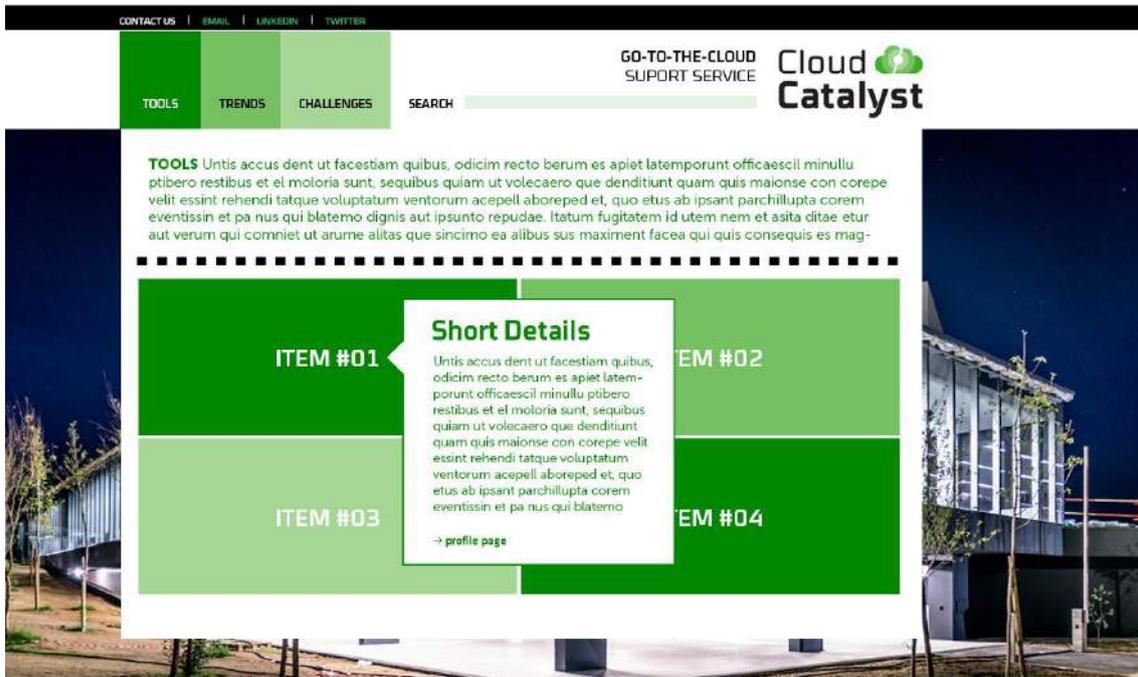


Figure 8 - CAT landing page

For every tool there will be a profile page where user can have access to all details as presented below.

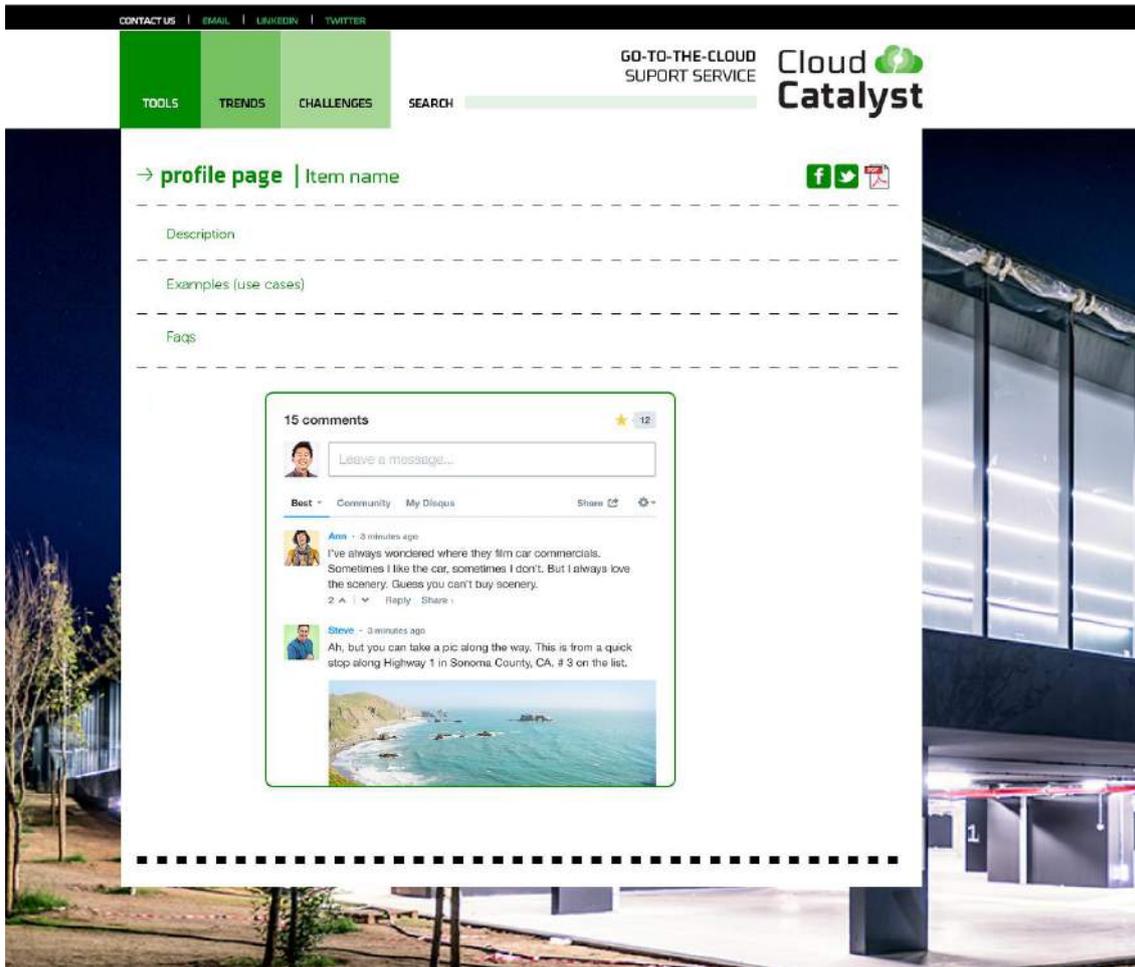


Figure 9 - Profile page

In order to foster the activity on the website (comments, shares and FAQ) the tool will be integrated with open discussion platforms such as Disqus (www.disqus.com)

### 3.1.2.2 BUSINESS AND INDUSTRY DATA ON CLOUD TRENDS IN EUROPE MODULE

The Business and Industry Data on Cloud trends in Europe Module should allow users to:

- Visualize the Providers and Supporters' Benchmarking;
- Visualize recommendations for startups and SMEs;
- Leave comments in comment box with option to contribute for the benchmarking, register in the providers' benchmark, correct the information available, etc.;
- Share the benchmarking on the social networks.
- Visualize video of the interviews with a short summary about the content

### 3.1.2.3 TECHNICAL CHALLENGES MODULE

The Technical Challenges Module will allow users to:

- Visualize each technical challenge
- Visualize the critical success factors
- Visualize the market opportunities for SMEs and startups
- Download the top 10 challenges related to cloud expansion

### 3.1.2.4 SEARCH MODULE

The module Search will allow the user to easily and intuitively find a tool, a provider and any other searchable entity/item.

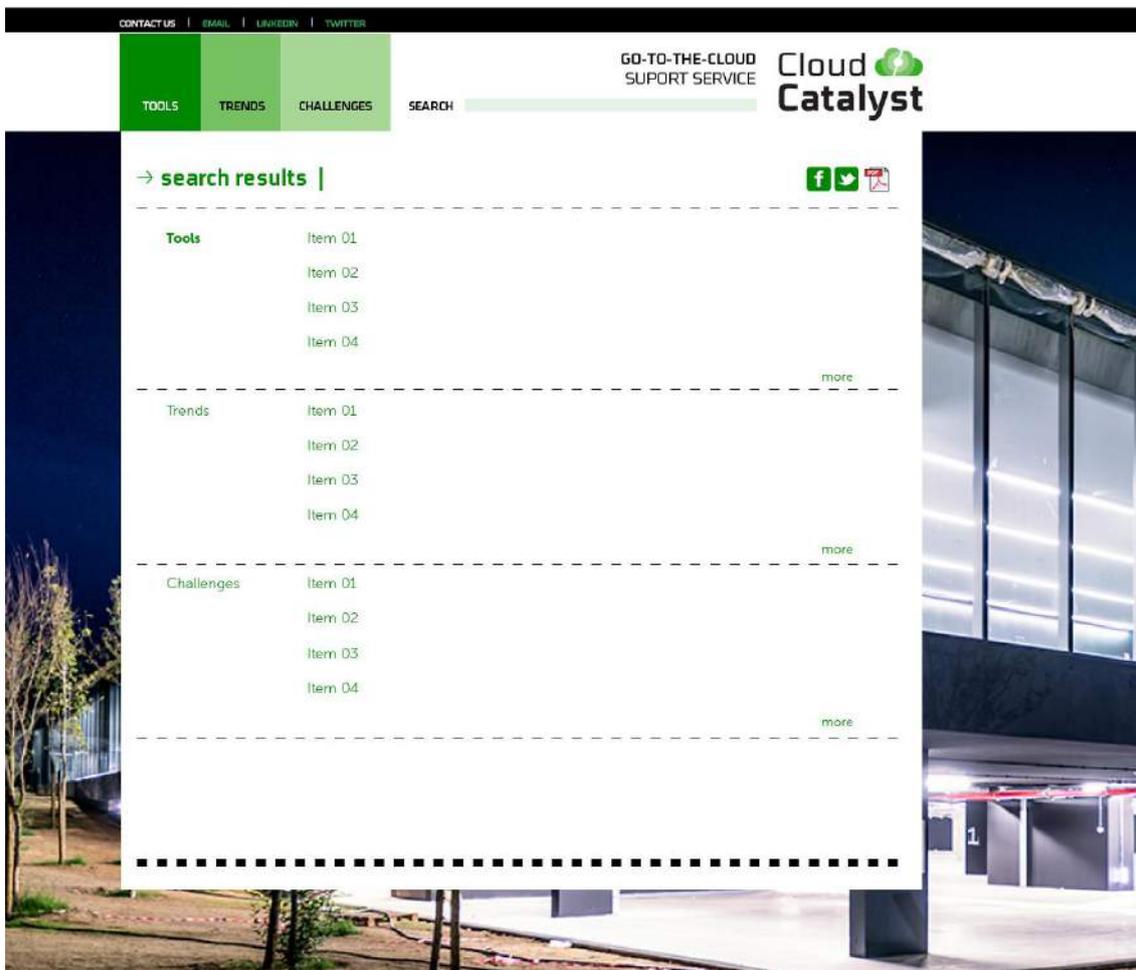


Figure 10 - Search tool

### 3.2 The Non-Functional Requirements

Non-functional requirements are requirements that specify criteria that can be used to judge the operation of a system, rather than specific behaviours. The number of non-functional requirements associated with a software application is extremely large, some of the most important for the Go-to-the-Cloud Service are described below:

- Compatibility – The web application should be compatible with all major browsers (Chrome, Internet Explorer, Firefox and Safari);
- Efficiency – The web application should have good results based on the relationship between the level of performance and the amount of resources used, under stated conditions;
- Extensibility – Application should be able to grow through the development of new features and modules;
- Fault-tolerance – System should be able to continue performing in the case of a component failure or individual user problem;
- Maintainability – Should be accessible for any member of the development team mainly to keep the application working. Maintenance processes should be developed to facilitate those activities;
- Marketability – The application should constantly be seen as a product that aims to please users as customers. Features should aim to solve users necessities and wills;
- Modularity – Application should be divided in independent modules willing to facilitate updates and maintenance;
- Robustness – System should be able to withstand stress, pressure, or changes in procedure or circumstance as abnormalities in input, calculations, etc.;
- Security – Information should only be accessed by owners or authorized people. Authentication mechanisms should be developed to secure that component.

## 4 The Information and Technical Architecture

This chapter aims to describe how the information will be structured, kept and presented to users in the Go-to-the-Cloud service.

### 4.1 The data structure

The proposal structure for the information on the Go-to-the-Cloud service is presented in the following figure.

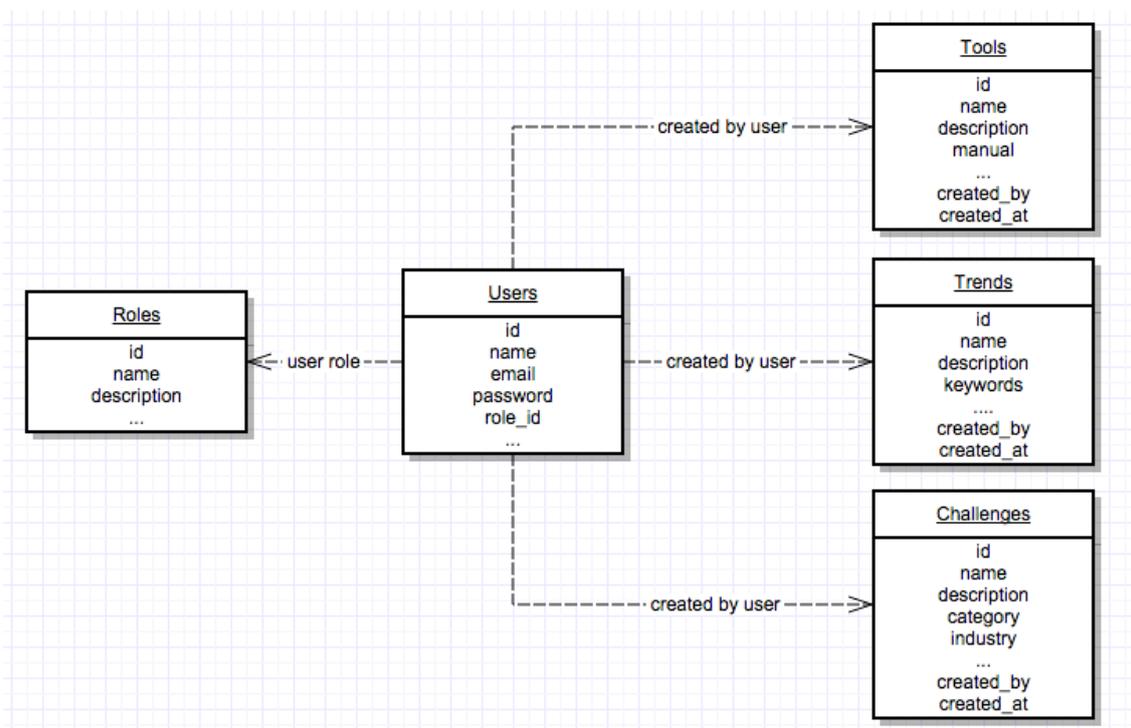


Figure 11 - Data Structure

### 4.2 Backend Technologies

The system should be based in a solid and reliable logic infrastructure with a modern user interface, but it is also important to use state of the art tools, not just because they are more productive (require less time and/or less resources to develop the toolbox) but also to be seen by our stakeholders as an informed and technology savvy consortium.

In this manner, the system will be built using the programming language Javascript with the web framework Meteor, creating a modern user interface with radically less code. Principles of Meteor [Meteor]:

1. "Data on the Wire. Meteor doesn't send HTML over the network. The server sends data and lets the client render it".
2. "One Language. Meteor lets you write both the client and the server parts of your application in JavaScript".

3. "Database Everywhere. You can use the same methods to access your database from the client or the server".
4. "Latency Compensation. On the client, Meteor prefetches data and simulates models to make it look like server method calls return instantly".
5. "Full Stack Reactivity. In Meteor, realtime is the default. All layers, from database to template, update themselves automatically when necessary".
6. "Embrace the Ecosystem. Meteor is open source and integrates with existing open source tools and frameworks".
7. "Simplicity Equals Productivity. The best way to make something seem simple is to have it actually be simple. Meteor's main functionality has clean, classically beautiful APIs".

The database of choice will be the MongoDB, one of the leading NoSQL databases and the database of choice to be used with Meteor.

MongoDB allows storing rich documents (including arrays and sub-documents), better mapping our real-world understanding of our data.

MongoDB has also a very versatile query language and advanced tools to aggregate data.

### 4.3 Frontend Technologies

Since the web application will be developed using Meteor framework, the client-side stack will be: HTML, CSS, Javascript and MiniMongo.

Also the Bootstrap front-end framework will be used. It is the most popular HTML, CSS and Javascript framework for developing responsive projects on the web.

HTML, HyperText Markup Language, is the predominant markup language for Web pages. It provides a means to describe the structure of text-based information in a document — by denoting certain text as links, headings, paragraphs, lists, and so on — and to supplement that text with interactive forms, embedded images, and other objects. HTML is written in the form of tags, surrounded by angle brackets. [wikiHTML]

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation (that is, the look and formatting) of a document written in a markup language. Its most common application is to style web pages written in HTML and XHTML, but the language can be applied to any kind of XML document, including SVG and XUL. CSS is designed primarily to enable the separation of document content (written in HTML or a similar markup language) from document presentation, including elements such as the colours, fonts, and layout. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple pages to share formatting, and reduce complexity and repetition in the structural content. [wikiCSS]

JavaScript is a scripting language widely used for client-side web development. It was the originating dialect of the ECMAScript standard. It is a dynamic, weakly typed, prototype based language with first-class functions. JavaScript was influenced by many languages and was designed to look like Java, but be easier for non-programmers to work with. [wikiJavaScript]

MiniMongo is a reimplement of (almost) the entire MongoDB API, against an in-

memory Javascript database. It is like a MongoDB emulator that runs inside the web browser. This greatly reduces development costs because you're using the same MongoDB API (which is already used on the backend).

Bootstrap is an open-source Javascript framework developed by the team at Twitter. It is a combination of HTML, CSS, and Javascript code designed to help build user interface components. Bootstrap was also programmed to support both HTML5 and CSS3.

#### **4.4 Support Technologies**

To support the software development process, a version control system such as git, svn or cvs should be used.

Version control systems (VCS) are a program that records changes to a file or set of files over time so that you can recall specific versions later. It allows you to revert files back to a previous state, revert the entire project back to a previous state, compare changes over time, see who last modified something that might be causing a problem, who introduced an issue and when, and more. Using a VCS also generally means that if someone screw things up or lose files, you can easily recover. [VCS]

No other technologies are planned to be used to support the project development.

## 5 Solution Development Plan

Go-to-the-cloud service development will be done in the following phases:

### 5.1 Implementation

The first prototype will be made available in January, and the first production version will start be developed in the beginning of February.

After the first review of the design, we will develop all the functionalities, namely the Use Cases defined in section 3.1.2.

The implementation of the production version is expected to last 3 months and 3 weeks (from February 2 until May 20).

### 5.2 Testing

Testing will be done after the development is finished, testing all the implemented use cases and will last for 4 weeks (from May 21 until June 12).

### 5.3 Deployment

Deployment will be done after testing, by setting up the server with the tools needed, creating the code package and deploying it to the server. It will last for 1 week (from June 15 until June 19).

### 5.4 User Support

Will be done after the deployment, managing the feedback from the site users and the consortium will last for 7 weeks (from June 22 until July 31).

### 5.5 Maintenance Plan

Maintenance is normally divided in 4 different qualities:

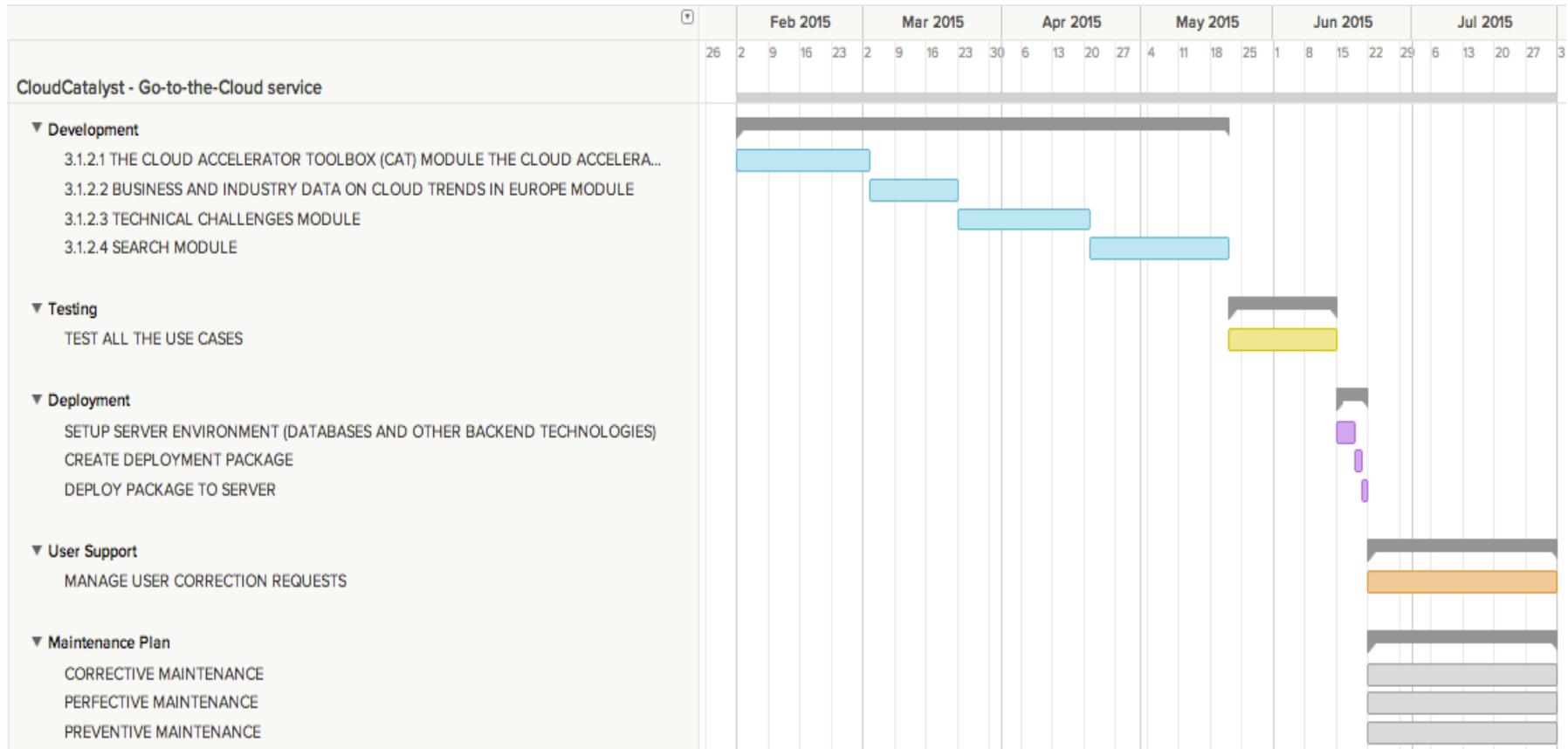
- Corrective maintenance - Reactive modification of a software product performed after delivery to correct discovered problems;
- Adaptive maintenance - Modification of a software product performed after delivery to keep a software product usable in a changed or changing environment;
- Perfective maintenance - Modification of a software product after delivery to improve performance or maintainability;
- Preventive maintenance - Modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults.

All kind of maintenances should be necessary after the release of the service.

Requests of correction will be collected from users (directly on user support) and from the Go-to-the-Cloud partner and developers team itself through tests.

Maintenance activities will last for 7 weeks (from June 22 until July 31).

## 5.6 Project Schedule



## 6 Intellectual Property

The main goal of this chapter is to describe how the intellectual property will be handed under the Go-to-the-Cloud Service, namely the general policies in place and how third party intellectual property will be used.

As stated in the DoW, IPR Management has to follow the legal requirements which can be found in the participation rules and grant agreements.

1. Background covered: all the partners will define the background needed for the purposes of the project in a written agreement joined to the Consortium Agreement; it may also exclude specific background in order, for instance to permit adequate protection prior to providing access.
2. Principles: the principles will be detailed in the Consortium Agreement. General rules were already defined and it was decided that all requests for access rights shall be made in writing; information to each other will be done as soon as possible; in case of conflict, exclusive license shall not take place until agreement has been reached between the beneficiaries concerned and with the Commission Agreement.
3. Access rights for implementation: Access rights to background shall be granted to the other beneficiaries, if it is needed to enable those beneficiaries to carry out their own work under the project provided that the beneficiary concerned is entitled to grant them. Such access rights shall be granted on a royalty-free basis, unless otherwise agreed by all beneficiaries before their accession to this agreement.
4. Access rights for use: Beneficiaries (so as affiliated entity established in a Member State or Associated country) shall enjoy access rights to background, if it is needed to use their own foreground provided that the beneficiary concerned is entitled to grant them. Subject to agreement, such access rights shall be granted either under fair and reasonable conditions or be royalty-free.

The owner of the background concerned may make up a request for access rights to one year after the end of the project; or the termination of participation.

There are two specific cases that should be highlighted in this section:

- The EuroCloud self-assessment tool EuroCloud Star Audit is free of charge (currently the only payable service is printout of the report) and is to be used according to intellectual property rules published under <https://eurocloud-staraudit.eu> (see more information about certification schemes<sup>2</sup>). The copyright of this tool is owned by EuroCloud Europe and has not been developed within CloudCatalyst project.
- Problem map tool has been developed in Hekovnik, startup School, (Slovenia).

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<sup>2</sup> <https://resilience.enisa.europa.eu/cloud-computing-certification/list-of-cloud-certification-schemes/eurocloud-star-audit>

Hekovnik use it in start:Cloud program with Si.mobil. This tool wasn't published until now and copyright of this tool is owned by Hekovnik and has not been developed within Cloudcatalyst project.

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