FIRST DISSEMINATION, COMMERCIAL EXPLOITATION AND SUSTAINABILITY

D7.2

Consisting of

No	Name	Short Name	Country
1	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V	Fraunhofer	Germany
2	THE UNIVERSITY OF WESTMINSTER LBG	UOW	United Kingdom
3	CLESGO GMBH	clesgo	Germany
4	CLOUDSME UG	CLOUDSME	Germany
5	CLOUDBROKER GMBH	CLOUDBROKER	Switzerland
6	CLOUDSIGMA AG	CLOUDSIGMA	Switzerland
7	SCALETOOLS AG	SCALETOOLS	Switzerland
8	LUNDS UNIVERSITET	ULUND	Sweden
9	STIFTELSEN SINTEF	SINTEF	Norway
10	SCUOLA UNIVERSITARIA PROFESSIONALEDELLA SVIZZERA ITALIANA	SUPSI	Switzerland
11	MAGYAR TUDOMANYOS AKADEMIA SZAMITASTECHNIKAI ES AUTOMATIZALASI KUTATOINTEZET	SZTAKI	Hungary
12	THE UNIVERSITY OF NOTTINGHAM	UNOTT	United Kingdom
13	INNOMINE GROUP KFT	INNOMINE	Hungary
14	ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA	UNIBO	Italy
15	VYSOKA SKOLA BANSKA - TECHNICKA UNIVERZITA OSTRAVA	IT4I	Czech Republic
16	INSOMNIA CONSULTING SOCIEDAD LIMITADA	Insomnia	Spain
17	STAM SRL	STAM	Italy
18	DEUTSCHES FORSCHUNGSZENTRUM FUR KUNSTLICHE INTELLIGENZ GMBH	DFKI	Germany
19	LINZ CENTER OF MECHATRONICS GMBH	LCM	Austria
20	HANNING ELEKTRO-WERKE GMBH & CO.KG	HANNING	Germany
21	CATMARINE SRL	CATMARINE	Italy
22	CENTRO DI RICERCHE EUROPEO DI TECNOLOGIE DESIGN E MATERIALI	CETMA	Italy
23	SKA POLSKA SP (ZOO)	SKA	Poland
24	PRIVREDNO DRUSTVO ZA PRUZANJE USLUGA ISTRAZIVANJE I RAZVOJ NISSATECH INNOVATION CENTRE DOO	NISSA	Serbia
25	ZANNINI-SPA	ZAN	Italy
26	FERRAM STROJIRNA SRO	FERRAM	Czech Republic
27	HYDAL ALUMINIUM PROFILER AS	Hydal	Norway
28	NABLADOT SL	Nabladot	Nabladot
29	ENDEF ENGINEERING SL	ENDEF	Spain
30	DSS CONSULTING INFORMATIKAI ES TANACSADO KFT	DSS	Hungary
31	BAKONY ELEKTRONIKA VILLAMOSIPARI GYARTO,	BE	Hungary

	SZOLGALTATO KORLATOLT FELELOSSEGU TARSASAG		
32	COOPERLAT SOCIETA COOPERATIVA AGRICOLA	Trevalli	Italy
33	MACHINEERING GMBH & CO KG	machineering	Germany

This document may change without notice.

DOCUMENT HISTORY

Version[1]	Issue Date	Stage	Content and Changes
V0.1	22/02/2019	Deliverable Structure	Structure defined
V1.0	08/03/2019	Preliminary version - to be completed	Inclusion of content
V1.1	11/03/2019	Preliminary version - to be completed	Inclusion of content (STAM and Fraunhofer)
V1.2	18/03/2019	Preliminary version - to be completed	Inclusion of content (SUPSI and clesgo)
V1.3	27/03/2019	Preliminary version - to be completed	Inclusion of content (Andreas Ocklenburg)
V1.4	05/04/2019	Final Version	Inclusion of content (Tamas Kiss)

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[1] Integers correspond to submitted versions

LIST OF FIGURES AND TABLES

1   EXECUTIVE SUMMARY

This Deliverable reports all updated activities CloudiFacturing has done for the last five months. Dissemination activities are the corner stone for allowing the general public to get to know the project and helping us to spreading the word for the next two Open Calls we have ahead of us.

During this time, there have not been any major changes or updates in the webpage. All about the creation and development of the Webpage, Social Media and Media Coverage are stated in Deliverable 7.1.

Our partners and DIHs have participated in events spreading the CloudiFacturing project all over Europe. These events are described in Section 3.5.

However, there is a major update in the section 4.2 regarding the Commercial Exploitation at Digital Marketplace level.

2   INTRODUCTION

This deliverable reports on updates regarding the dissemination strategies, activities and results; commercial exploitation, sustainability, impact, training activities, work plan assessment and IPR Management Plans planned and carried out during the last five months.

Deliverable D7.1 already fully reported about the following themes:

- Objectives of Work Package WP7
- Tasks of Work Package WP7
- Milestones
- Approach
- Dissemination Strategy (and all the subchapters)
- Logo and Claim Creation (and subchapters)
- Webpage and its structure
- Press Releases
- Media Coverage
- CloudiFacturing brochures and advertising material
- First Open Call Dissemination

Since these activities were already described and stated in the Deliverable D7.1, they are not mentioned here. Major updates have not taken place.

The deliverable will describe updates from all the dissemination activities conducted, dissemination and training events organised and attended, as well as community feedback collected.

Also, D7.2 will report on all the Commercial Exploitation activities, especially on the Commercial Exploitation at the level of the Digital Marketplace with significant amount of new data.

The report includes a detailed analysis of the Impacts planned and achieved for the project as a whole, and will describe the sustainability, impact, training activities and work plan assessment updates.

3   I4MS

The goal of I4MS is to enable and foster the collaboration of manufacturing SMEs, start-ups and mid-caps across their value chains through the help of European DIHs, where companies can run small scale experiments to test digital innovations. This creates a win-win situation for all actors.
The I4MS Going to Market Alliance (I4MS-Go) has started in September 2017 and its main goal is to attract and connect the largest ¨community of communities¨ of stakeholders, users, and service providers, for the digital transformation of manufacturing SMEs and Mid-Caps.

Within the I4MS initiative CloudiFacturing cooperates in a joint communication campaign, a platform community, an I4MS Accelerate Programme and an I4MS Skills Observatory

The main communication channels between I4MS-Go and the Innovation Actions (IAs) have been the exchange of emails, monthly calls, events with joint participation where Innovation Actions and the CSA took the opportunity to discuss future activities and being members of the ecosystem. This last point has allowed an organic collaboration, as well as the interaction with the European Commission and the opportunity to collaborate in organising the participation of the I4MS initiative in European events facilitating the interaction among IAs and the CSA.

Cooperation activities in this period have been:

- Delivering input to the plan for collaboration with other I4MS projects
- Collecting and preparing input for the brochure about DIH success stories
- Publication about the successful results of the conduction of the first Open Call
- Contribution to the Digital Innovation Hubs Annual event 27-28 November 2018 in Warsaw
- Contribution to the planning of the I4MS and SAE booth at the ICT 2018 conference in Vienna that took place 4, 5 and 6 December
- Creating input for the success story brochure for the Mobile World Congress in Barcelona in February 2019.
- Continuing with the support of collaboration actions between IAs
- Creating a summary of successful results of first wave experiments and their publication on the I4MS webpage
- Identifying events where IAs are going to participate or could be interested in participating jointly and where manufacturing SMEs can be reached

4 DISSEMINATION ACTIVITIES AND RESULTS

The dissemination activities to report for this last quarter are only updates, since most of the relevant activities were previously mentioned and described in the Deliverable D7.1.

4.1 Webpage analysis

As we stated on the D7.1, the main tool for showing the information about the project and fundamental to have is a website which continuously be updated regarding project results, application experiments, events, news and Open Calls.

One of the main lessons learned from the first part of this project Is that the project website is a fundamental tool for sharing a variety of contents and at the same time, it keeps the DIHs and Partners involved actively in the project by sharing their information and their activities with us through this website.

IMPORTANT: All mentioned data refers to the timeframe from the 1st. of October 2018, to the 28th of February 2019.
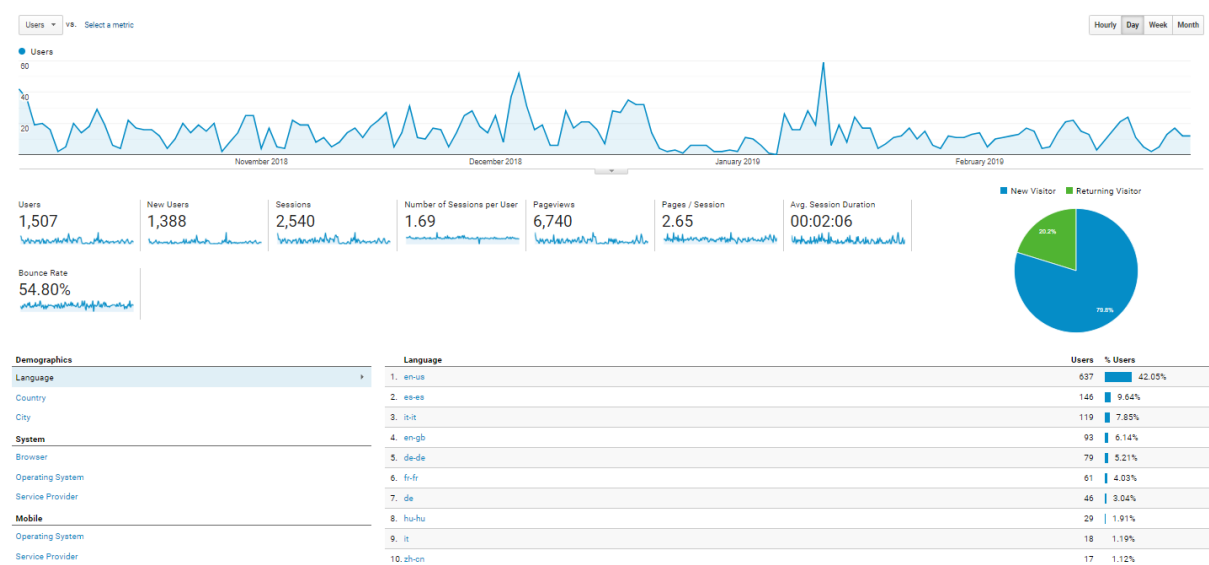
FIGURE 1 - OVERVIEW OF CLOUDIFACTURING'S WEBPAGE 2018-19

In only five months, the project's webpage generated 1,507 users and 1,388 new users with a total of 2,540 sessions. (Users are split between new users and their total number. New users are the proportion of the total number that access the website for the first time in a given time frame.) The total number of users (1507) visited the website on average 1.69 times. From a total of 6,740 pageviews in this period, we can deduce that an average of 2.65 pages were accessed per session started (Figure 1). A session is defined as the period between the first loading of a web page and the visitor's exit. The pageview metric shows the number of pages of a website that have been accessed overall in a defined period. Over the entire project period (October 2017 to the end of February 2019),

most pageviews were generated in September 2018 (4,894). This is probably due to the 1st OpenCall, which ran from July 1st to September 30th.

The preferred language for the users is used in English (North America) followed by Spanish, Italian, English (Great Britain), German, French, Hungarian and Swiss.
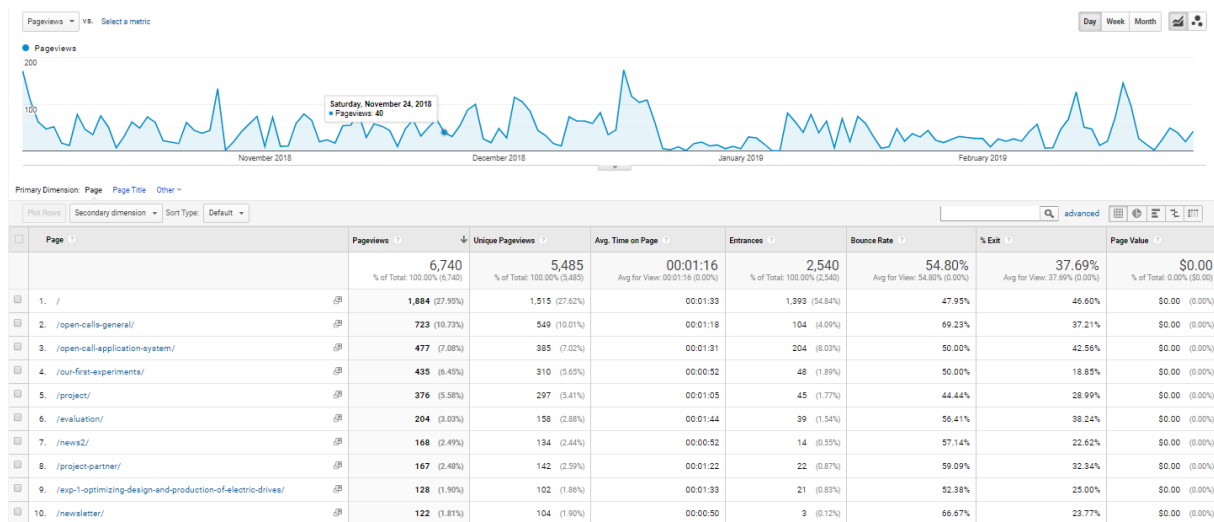
FIGURE 2 - DISTRIBUTION OF PAGEVIEWS

With a total of 5,485 pageviews, visitors were most interested in the general information about Open Calls (723 pageviews) in the mentioned period (Figure 2). The application system generated about 477 pageviews in total.
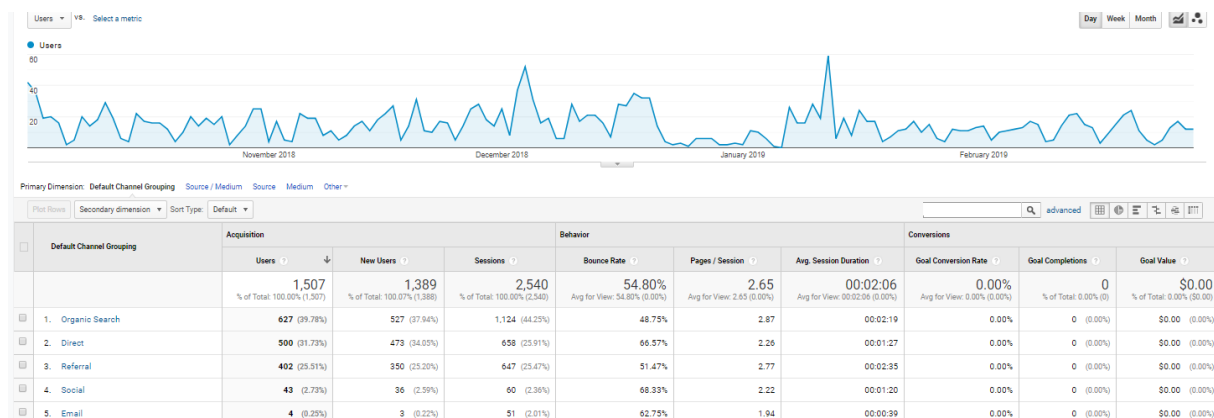
FIGURE 3 - DISTRIBUTION OF THE PAGE ACCESS ORIGINS

In Figure 3, there is a change regarding the last D7.1 results. This time, most users visited the site following the Google search results. Referral links were also increased.
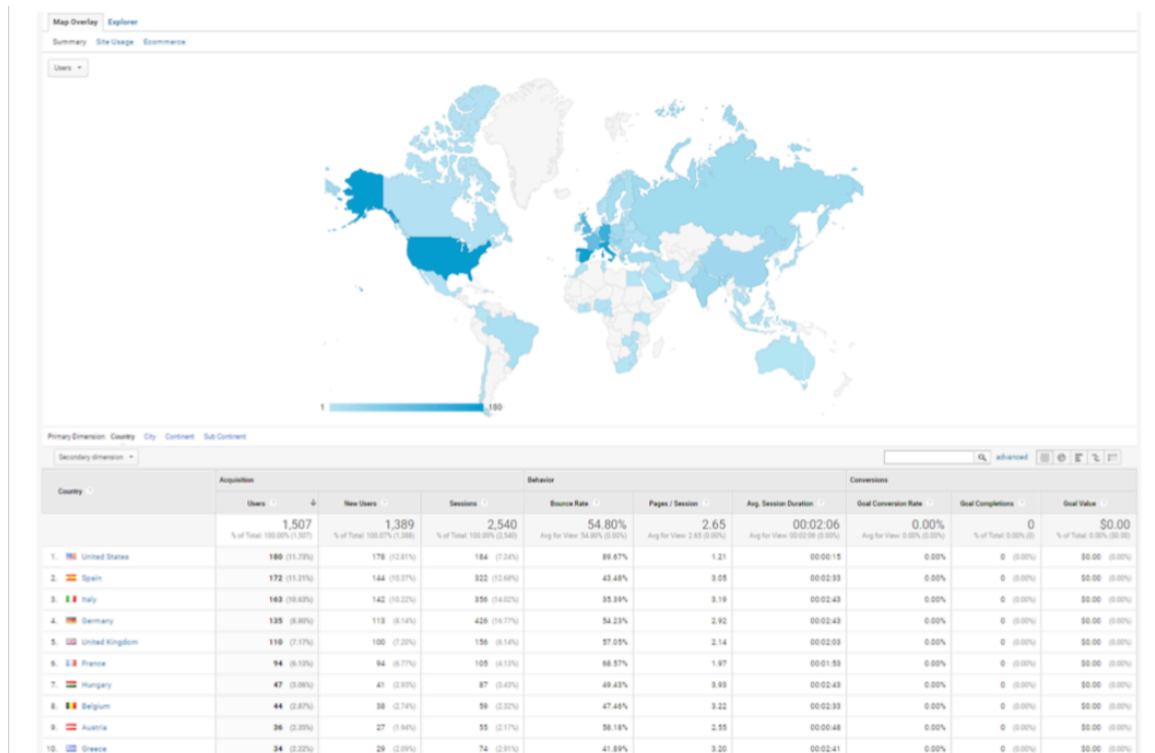
FIGURE 4 - ORIGIN OF THE SESSIONS

Most sessions were started in the United States of America (180 sessions) followed by Spain (172 sessions) and Italy on the third place (163 sessions) (Figure 4). United States of America went up eight position from the last report (D7.1).

4.2 Newsletter

As it was previously stated in Deliverable D7.1, the newsletter is used to spread news and information from CloudiFacturing.

It is sent on a three-month-basis to the people who have subscribed via webpage.

4.2.1 Cloudcomputing Newsletter #4

The fourth newsletter (Figure 5) was sent out to 562 recipients, including 12 bounces; the opening rate was 25,50% (140 unique openings / 323 total openings) and the click rate was 7,86% (11 unique clicks / 21 total clicks); CloudiFacturing's web page link generated 40,00% click amount (6 clicks) in total.
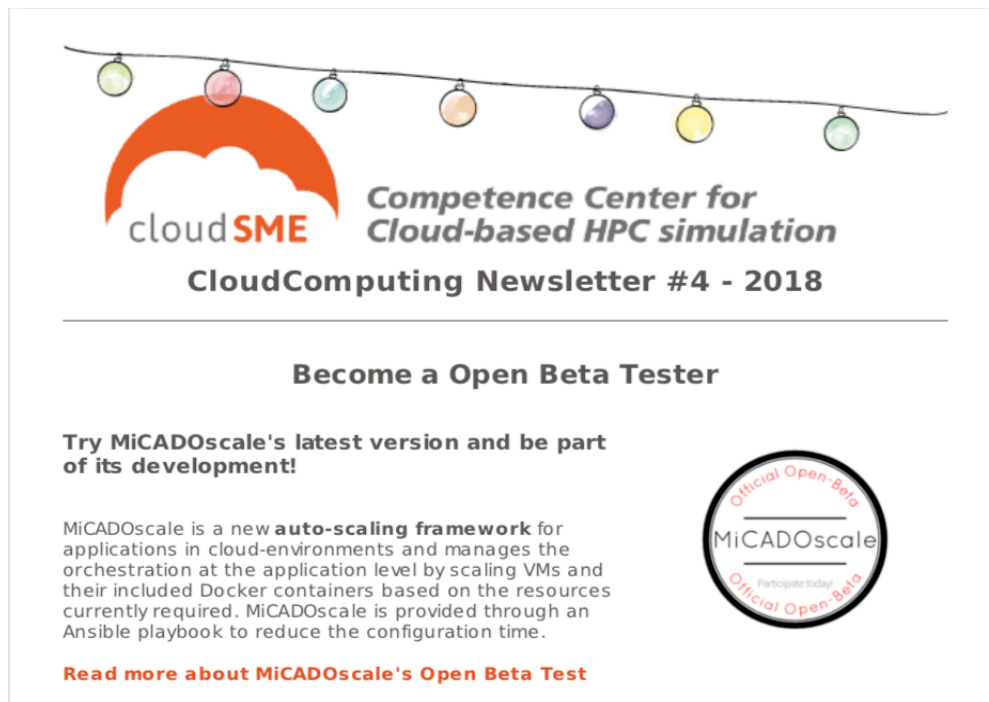
FIGURE 5 - CLOUDCOMPUTING NEWSLETTER #4

4.3 Social Media

Social Media is an important tool for the project, as it allows a quick delivery of messages and news.

CloudiFacturing is using Twitter, Facebook, YouTube and LinkedIn. We will not report anything on YouTube this period given that we did not use it. There were no Webinars in this period of time.

On the following sections 4.3.1 to 4.3.3 it will be an overview and report analysis of the channels and their result activities.

4.3.1 Twitter

CloudiFacturing's Twitter account has grown over the months and here are the results for the period between October 2018 and February 2019 (Figure 6).

	2018			**2019**		
CloudiFacturing Account	October	November	December	January	February	March (until 8th march)
New Followers	5	7	6	7	1	3
Tweets	3	0	1	9	4	0
Tweet Impressions	8528	6074	6325	5984	4850	1270
Profile visits	15	52	37	26	50	0
Mentions	2	12	1	7	10	0

FIGURE 6 - CLOUDIFACTURING'S OVERALL TWITTER PERFORMANCE

4.3.2 Facebook

With Facebook, we continued to post news and events about CloudiFacturing. Social Media has helped us to spread the word about the CloudiFacturing project, as well as everything that happens around it.

FIGURE 7: SCREENSHOT OF THE CLOUDIFACTURING FACEBOOK PAGE

IMPORTANT: All mentioned data of the Facebook analysis refers to the period between October 2018 to Februrary 2019.

As we stated in the D7.1, we were expecting the Facebook page to be a trigger for clicking the link to our website. According to the analytics, there have been only a few clicks to it since the creation of the Facebook page. On the other hand, the number of people who engaged with the CloudiFacturing Facebook page increased. Meaning, the news and events posted reached more people than expected.

Insights of October 2018:

- Page Views: 98 views
- Page Likes: 1 like
- Page Impressions: 166 Impressions
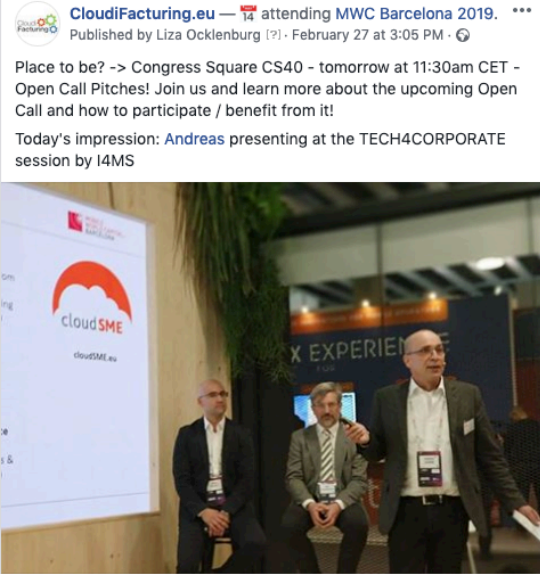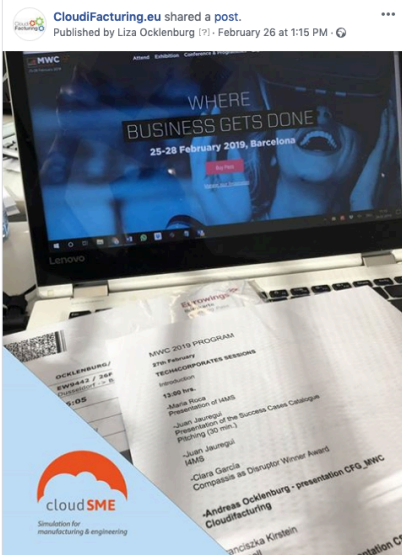
Insights of February 2019
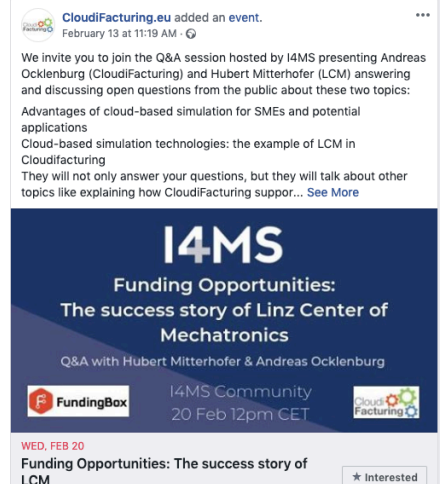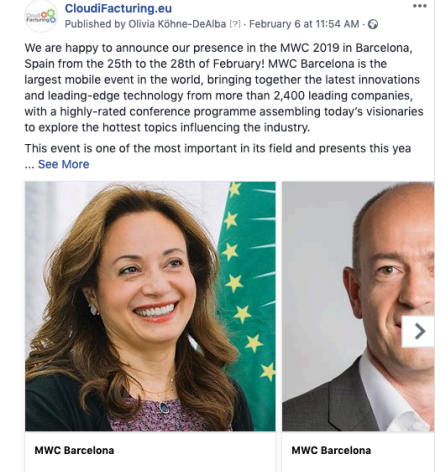
- Page Views: 34 views
- Page Likes: 1 like
- Page Impressions: 134 Impressions

What it is clear with the results is that the closer to the Open Call results, the more people visited the CloudiFacturing's Facebook page. When the results came out, the Facebook audience went up.

Facebook Posts

Below, all the Facebook posts since October will be listed. They will contain the posts topic, as well as a screenshot of the posts. In addition, a screenshot of the post will be showed along with the post type, e.g. if it is a link-post, image-post, event-post; the post range, engagement and reaction.

Publish date & Topic	Post	Post type	Reach	Engagement
27.02.2019 Andreas Ocklenburg participation in the MWC 19 Barcelona		Image	2	0
26.02.2019 Andreas Ocklenburg paticipation in the MWC 19 Barcelona		Image	18	0

26.02.2019 Invitation to the MWC 2019 Barcelona	**CloudiFacturing.eu** Published by Olivia Köhne-DeAlba [?] · February 26 at 10:52 AM · ⊙ On the largest mobile in the world, where innovations and leading-edge technology meet, the EU Projects Department will organize I4MS open call presentation of the current four active IAs. Also will propose one-to-one meetings to disseminate information on the overall project. The individual calls on topic as HPC cloud-based simulations, robotics, Cyber Physical Systems, IoT and additive manufacturing will take place each day of the Congress at 11:15 in the EU Projects booth at CS40. We invite you to attend Andreas Ocklenburg presentation in the frame of the MWC Barcelona on Wednesday 27th at 13:00hrs. and on Thursday at 11:15am. All of them will take place at the EU Projects booth CS40. Don't miss this opportunity and come! **MWC19™ Barcelona** **25-28 February 2019**	Invitation Image	19	0
13.02.2019 Invitation to the I4MS, CloudiFacturing and LCM Q&A session	**CloudiFacturing.eu** added an event. February 13 at 11:19 AM · ⊙ We invite you to join the Q&A session hosted by I4MS presenting Andreas Ocklenburg (CloudiFacturing) and Hubert Mitterhofer (LCM) answering and discussing open questions from the public about these two topics: Advantages of cloud-based simulation for SMEs and potential applications Cloud-based simulation technologies: the example of LCM in Cloudifacturing They will not only answer your questions, but they will talk about other topics like explaining how CloudiFacturing suppor... See More **I4MS** **Funding Opportunities:** **The success story of Linz Center of Mechatronics** Q&A with Hubert Mitterhofer & Andreas Ocklenburg **FundingBox** I4MS Community CloudiFacturing 20 Feb 12pm CET WED, FEB 20 Funding Opportunities: The success story of LCM ★ Interested	Invitation Image	8	0
06.02.2019 Announcement of participation in MWC 2019	**CloudiFacturing.eu** Published by Olivia Köhne-DeAlba [?] · February 6 at 11:54 AM · ⊙ We are happy to announce our presence in the MWC 2019 in Barcelona, Spain from the 25th to the 28th of February! MWC Barcelona is the largest mobile event in the world, bringing together the latest innovations and leading-edge technology from more than 2,400 leading companies, with a highly-rated conference programme assembling today's visionaries to explore the hottest topics influencing the industry. This event is one of the most important in its field and presents this yea ... See More MWC Barcelona MWC Barcelona	Image and text	20	0

Date / Title	Post	Type		
25.01.2019 Video from SyMSpace		Link	22	2
05.12.2018 Article about CloudiFacturing participation in the ICT Conference		Article to webpage	22	3
30.11.2018 CloudiFacturing Review Meeting in Brussels		Article to webpage	23	9
17.10.2018 Digital Innovation Hubs Annual Event		Invitation and link to registration	33	3

FIGURE 8 - POSTS OF CLOUDIFACTURING ON FACEBOOK

4.3.3 LinkedIn

As stated on the D7.1, we use LinkedIn to support to support the community establishment and to provide a platform for stakeholder and members of the project for direct exchange, as well to share the latest news regarding the project (these are shared individually by members of the project in groups dealing with ICT, manufacturing and engineering).

The CloudiFacturing group has grown to 21 members in the last five months (Figure 9).
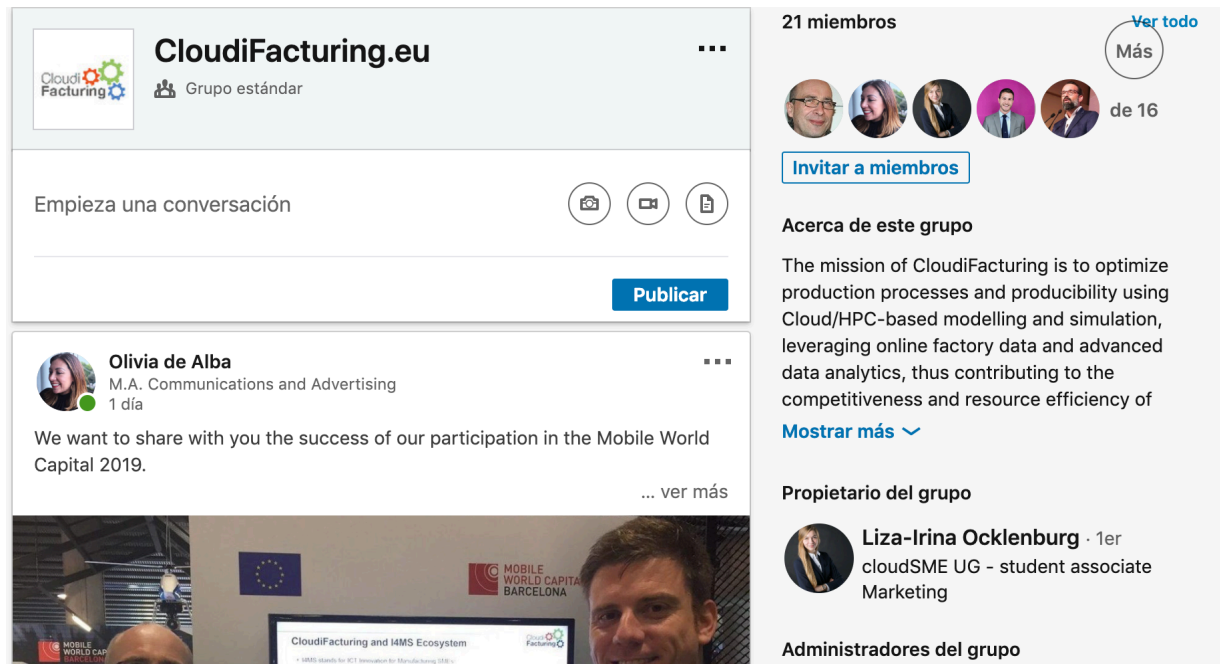
FIGURE 9 - SCREENSHOT OF THE CLOUDIFACTURING GROUP AND LAST POST

4.4 Dissemination Activities executed by the Consortium Partners

The Consortium Partners have done their own dissemination activities by attending conferences, fair trades and workshops. Some of the partners did not manage to attend any events due to the period of time and the season. Normally, the big events are taken place in spring-autumn as they were already reported in the D7.1 document.

In the next table, the events that are shown refer to the period between **October 2018-February 2019.**

Date of the event	Name of the partner(s) who attended	Place of the Event (Country, City)	Name of the Event	Audience/Dissemination Level (policy makers, scientific, academic, researchers, etc.)	Website/Additional Information
27-29.11.2 018	DFKI	Nuremberg, Germany	International Fair - SPS IPC Drives 2018	Booth of SmartFactory / DFKI (1630 Exhibitors)	65700 Visitors of the fair

Date	Partner	Location	Event	Audience	Link
08-11.10.18	Fraunhofer IGD	Hong Kong, China	Pacific Graphics 2018	Scientists and researchers	http://sweb.cityu.edu.hk/pg2018/, http://sweb.cityu.edu.hk/pg2018/PG2018_program_main.pdf, GPU-based Polynomial Finite Element Matrix Assembly for Simplex Meshes (Full) Johannes Sebastian Mueller-Roemer, and André Stork
04-06.12.18	Fraunhofer IGD	Wien, Austria	ICT 2018	Scientists, researchers, industry	https://ec.europa.eu/digital-single-market/events/cf/ict2018/item-display.cfm?id=21611
04.12.2018 - 05.12.2018	LCM & Hanning	Schweinfurt, Germany	EDPC (Electrical drives production conference)	Approximately 10-20% academic, 80-90% industrial R&D	https://www.edpc.eu/
04.12.2018 - 06.12.2018	LCM	Vienna, Austria	ICT 2018	Mixed: Industrial/academic/policy makers within ICT community	https://ec.europa.eu/digital-single-market/en/events/ict-2018-imagine-digital-connect-europe
01.02.19	clesgo	Stuttgart, Germany	Start-up BW Summit	Scientific community, Industry, General Public, Policy makers, Medias, Investors, Customers	https://summit.startupbw.de/
11.03.19	clesgo	Stuttgart, Germany	Open Innovation Kongress Baden-Württemberg 2019	Scientific community, Industry, General Public, Policy makers, Medias, Investors, Customers	https://www.steinbeis-europa.de/news-und-events/veranstaltungen/detail.html?rx_event=2107&fromBackend=1
22-23 October 2018	University of Westminster - Tamas Kiss	Ukraine, Kiev	HPC Ukraine Conference	Academic reserachers, HPC operators and users	http://hpc-ua.org/hpc-ua-18/
27-28/11/2018	nablaDot	Warsaw	DIHs Annual Event	Policy makers	https://ec.europa.eu/digital-single-market/en/news/digital-innovation-hubs-annual-event-2018
11. Okt 18	innomine	Brussels	European Week of regions / DIH event	Policy makers, DIHs	https://europa.eu/regions-and-cities/ https://ec.europa.eu/digital-single-market/en/news/european-week-regions-and-cities-co-design-digital-innovation-hubs-new-member-states
27/28 Nov 2018	innomine	Warsaw	Annual DIH event	Policy makers, DIHs	https://ec.europa.eu/digital-single-market/en/news/digital-innovation-hubs-annual-event-2018

4/5/6 Dec 2018	innomine	Vienna	ICT Proposers Day / Imagine Digital	Policy makers, DIHs, end-users, ISVs	https://ec.europa.eu/digital-single-market/en/events/ict-2018-imagine-digital-connect-europe
27.11.18	Event organized by INSOMNIA (in cooperation with Caixa Popular Ontinyent)	VALENCIA, SPAIN	Public financing for SMEs	SMEs and companies	
20.11.18	INSOMNIA (in cooperation with FEMEVAL, Valencian Federation of Metallurgy)	VALENCIA, SPAIN	Public Financing for Industry in the Region of Valencia	SMEs and companies of the metallurgy sector	https://www.femeval.es/Jornadas/detalle_jornada.html?id=000617
20.11.18	INSOMNIA (in cooperation with Chamber of Commerce and Industry of Barcelona (Spain), Council of Chambers of Commerce and Industry of Valencia Region (Spain), Chamber of Commerce and Industry of Oviedo (Spain), Chambre de Commerce de Nouvelle-Aquitaine (France), San Jorge University (Spain), Regional Government of Castilla León (Spain), Associação Nacional de Jovens Empresários (Portugal), Agência Nacional de Inovação (Portugal).	BARCELONA, SPAIN	2018 EU SME WEEK: Square Table: smart financing for SMEs	Public and Private institutions, academic, investors	http://ec.europa.eu/growth/tools-databases/sme-week/index.cfm?fuseaction=sme.viewEvent&id=9749&uuid=E355F2C7-0B9A-E5E9-DC9BC5E8D9EF52D5
30.10.18	INSOMNIA (in cooperation with Alaquas Caixa Popular)	VALENCIA, SPAIN	Public financing for SMEs	SMEs and companies	NA
3-5/10/2018	INSOMNIA	MADRID, SPAIN	South Summit	SMEs, Startups, companies	https://events.bizzabo.com/208184/
25.09.18	INSOMNIA	VALENCIA, SPAIN	Business breakfast for industry	Industrial SMEs and companies	NA

FIGURE 10 - CLOUDIFACTURING PARTNERS DISSEMINATION EVENTS

5 COMMERCIAL EXPLOITATION

The commercial exploitation plan for each experiment is described in detail in Deliverable D1.2.

Additionally the project website (www.cloudifacturing.eu) summarizes the outcomes of each experiment in a separate "outcome section" of the website. Each outcome page is clearly structured as follows:

- Experiment description
- Technical impact
- Economic impact
- Outcome summary
- Testimonial by an experiment partner (typical: end user)
- Involved partners

The experiment partners, to avoid publishing of business secrets approved all the outcome pages. The content will be used also to create printed outcome magazines/leaflets or success stories for other publications later on.

FIGURE 11 - FIRST WAVE OUTCOMES

5.1 Commercial Exploitation at the level of the individual experiments

Significant part of the impact of the CloudiFacturing project is expected to generate by the application experiments. The project will run at least 21 application experiments in three waves. The partners for the first wave have already been included in the project consortium, while additional experiments will

be recruited via open calls. In Deliverable D7.1 we have already reported on the expected impact from the first wave of experiments. Here we provide an update of these expected impact figures and present the expected impact of the second wave of experiments.

5.1.1 Expected impact of wave 1 experiments

Expected impact KPI metrics have been collected individually from wave 1 experiment partners during the time of writing the CloudiFacturing project proposal and these figures have been included in the DoA. During the implementation of the experiments these figures have been updated twice and were reported in Deliverables D1.1 and D1.2. Detailed analysis of these KPIs at the level of individual experiments can be found in Section 2 of D1.1 and D1.2, respectively. In D7.1 we have also provided a summary of the revised figures. Here in D7.2 we present the updated impact summary table. This table represents the final estimation of wave 1 experiments after completing their implementation. The numbers that changed are represented in red. As it is shown by the table, there are no major differences in the predictions and most numbers remain the same. This illustrates that implementing the experiment did not significantly change the original expectations and the participating companies are still expecting the same benefits. The only minor change is the reduction of Ferram's expected turnover increase one year after the experiment that went down from 750K to a more modest 500K. However, their 5 year forecast still remains the same. Additionally, IT4I as HPC provider has also supplied potential impact numbers this time.

The conclusions that were stated in D7.1 still remain largely the same. Although most involved companies expect impact almost immediately (one year) after the experiment, much more significant impact is anticipated within a five year period. Cumulatively, the 16 Wave 1 experiment partners predict 19 enhanced/new products or services to be created as the direct outcome of the CloudiFacturing project within one year after the experiment, and 82 products and services within 5 years. The predicted turnover increase is over 1.6 million Euros within a year, and over 8.5 million Euros within 5 years. Most companies predict significant increase in employment (13 within a year, 60 within 5 years), in the number of business partners (at least 52 within a year and 190 within 5 years), and in making business partners in countries that are new to them (at least 17 in a year and 69 within 5 years). Additionally, 85% of the companies anticipate more efficient business processes and 80% of them expect better increased business practices in both short and longer term. Finally, 85% of the partners expect improvement in customer satisfaction (at a rate between 5% to 100% better customer satisfaction), and 73% of them anticipate reduction in time to product/market (at a rate between 10% to 80% time reduction).

	KPI Metrics									
Partner name	year after experiment	enhanced/new products/services	increase in turnover [K€]	increase in employment	new contacts/partners	more efficient business processes	reduction in time to product/market	improvement in customer satisfaction	increase in business practice	partners in new countries
LCM	1	1	50K	1	4	Yes	0	10%	Yes	1
	5	7	400K	5	15	Yes	0	50%	Yes	5
Hanning	1	1	0	1	0	Yes	80%	0%	Yes	0
	5	15	300K	5	15	Yes	80%	10%	Yes	10
CAT-MARINE	1	2	250	2	5	Yes	50%	10%	Yes	3
	5	10	1000	6	20	Yes	70%	50%	Yes	6
CETMA	1	1	25	1	5	Yes	10%	5%	Yes	1
	5	5	450	2	20	Yes	35%	70%	Yes	4

Partner name	KPI Metrics									
	year after experi- ment	enhanced/ new products/ services	increase in turnove r [K€]	increase in employ- ment	new contact s/ partner s	more efficient business processe s	reductio n in time to product / market	improvem ent in customer satisfactio n	increase in business practice	partners in new countrie s
SKA	1	1	100	1	2	Yes	N/A	15%	Yes	1-2
	5	4	350	4	10	Yes	N/A	35%	Yes	3-5
Nissa	1	1	80	2	2	10	Yes	N/A	15%	Yes
	5	5	500	10	10	50	Yes	N/A	50%	Yes
Zannini	1	1	No	No	0	2-4	Yes	Yes	Yes	Yes
	5	5	No	No	0	4-7	Yes	Yes	Yes	Yes
Ferram	1	1	500	0	5	Yes	Yes	Yes	Yes	3
	5	1	3500	10	10	Yes	Yes	Yes	Yes	7
Hydal	1	5	200	0	2	Yes	Yes	Yes	Yes	1
	5	10	500	2	4	Yes	Yes	Yes	Yes	2
IT4I	1	1	10	0	1	N/A	N/A	N/A	N/A	N/A
	5	2	50	0	2	N/A	N/A	N/A	N/A	N/A
EndeF	1	yes	200	1	yes	N/A	20%	100%	N/A	LatinA
	5	yes	600	3	yes	N/A	30-50%	100%	N/A	Medit.
nablaDot	1	1	20	1	5	N/A	N/A	N/A	N/A	1
	5	5	120	4	15	N/A	N/A	N/A	N/A	3
DSS	1	1	80	1	6-8	1	15%	Yes	1	1
	5	3	200	3	20-25	2	20%	Yes	2	3
BE	1	1	25-30	1	8-10	1	15%	Yes	3	1
	5	5	65-75	3	25-30	2	20%	Yes	6	3
machineering	1	1	100	1	3	10 %	N/A	5 %	Yes	1
	5	3-5	500	3	20	100 %	N/A	20 %	100 %	20
Trevalli	1	No	No	0	3-5	Yes	Yes	Yes	N/A	N/A
	5	No	No	0	3-5	Yes	Yes	Yes	N/A	N/A
Overall	1	19	1,645	13	>52	for 81%	10-80%	5-100%	for 75%	>17
	5	82	8,545	60	>190	for 81%	20-80%	10-100%	for 75%	>69

FIGURE 12: KPI METRICS – WAVE 1 EXPERIMENTS

5.1.2 Expected impact of wave 2 experiments

Wave 2 experiments were selected as a result of an open call. The conduct and outcomes of this call are described in detail in deliverable D1.2. During the process, each experiment had to provide expected impact figures, similarly to wave 1 experiments. This expected impact was one aspect of the selection criteria. A summary of expected wave 2 experiment impacts is provided below. During the implementation process these impact figures will be iteratively refined and modified if necessary.

It is interesting to observe that most predicted impact figures are higher for wave 2 experiments than it was for wave 1. This can be explained by both, the competitive process, and the selection of the best candidates from a larger pool, and also by the growing confidence in the CloudiFacturing platform and results.

partner name	KPI Metrics									
	year after experi-ment	enhanced/ new products/ services	increase in turnove r [K€]	increase in employ-ment	new contact s/ partner s	more efficient business processe s	reductio n in time to product / market	improveme nt in customer satisfaction	increase in business practice	partner s in new countri es
DENN	1	1	1000	1	4	10%	20%	30%	30%	3
	5	3	10,000	10	12	30%	40%	50%	80%	10
Quantech	1	1	100	1	4	30%	35%	30%	30%	2
	5	2	400	3	12	75%	50%	60%	75%	5
i-Deal	1	1	350	8	3	25%	Yes	50%	Yes	1
	5	1	3,900	37	30	100%	Yes	85%	Yes	10
TroTusTex	1	1	1,000	90	2	10%	Yes	60%	Yes	1
	5	1	2,500	215	5	15%	Yes	80%	Yes	3
Thermolym pic	1	1	50	2	8	Yes	No	Yes	N/A	1
	5	1	250	2	10	Yes	Yes	Yes	N/A	2
Belgian Monitoring	1	1	100	1	3	Yes	Yes	Yes	N//A	1
	5	1	500	2	5	Yes	Yes	Yes	N/A	3
ITAINNOVA	1	1	125	2	5	Yes	Yes	Yes	Yes	1
	5	1	350	4	15	Yes	Yes	Yes	Yes	5
DURIT	1	5%	450	4	3	Yes	Yes	Yes	Yes	2
	5	15%	5,000	12	5	Yes	Yes	Yes	Yes	7
Brascontrol	1	3	50	2	2	Yes	N/A	Yes	Yes	1
	5	3	300	8	3	Yes	N/A	Yes	Yes	3
RBF Morph	1	1	500	2	2	10%	5%	10%	10%	1
	5	5	4,000	5	6	20%	5%	15%	15%	3
CMS	1	1	15	1	5	20%	50%	20%	20%	2
	5	2	60	2	15	20%	50%	20%	30%	4
RINA-C	1	1	40	1	3	10%	20%	20%	10%	2
	5	3	150	2	10	15%	20%	30%	20%	5
Ansys	1	2	50	1	1	1%	N/A	1%	1%	N/A
	5	2	500	5	10	2%	N/A	2%	2%	N/A
MV Engineering	1	3	1,600	1	1	3%	2%	5%	5%	1
	5	20	7,800	10	5	10%	10%	10%	10%	3
Vodena doo	1	2	480	3	8	N/A	N/A	10%	10%	3
	5	2	2,400	5	25	N/A	N/A	30%	30%	10
Netico	1	1	20	1	5	Yes	15%	5%	Yes	2
	5	3	400	5	50	Yes	20%	20%	Yes	10
EMDIP	1	1	15	0	1	No	5%	5%	Yes	1
	5	3	150	2	5	Yes	15%	10%	Yes	2
Nissatech	1	1	5	1	3	Yes	15%	5%	Yes	1
	5	2	100	2	20	Yes	20%	20%	Yes	10
Overall	**1**	**23**	**5,950**	**122**	**>63**	**for 94%**	**for 83%**	**For all**	**for 89%**	**26**
	5	**55**	**44,710**	**331**	**>188**	**for 94%**	**for 83%**	**For all**	**for 89%**	**95**

FIGURE 13: KPI METRICS - WAVE 2 EXPERIMENTS

5.2 Commercial Exploitation an Business Sustainability of the Digital Marketplace

The Digital Marketplace will be the central channel to commercialise the CloudiFacturing results; in other words, the Digital Marketplace is the default entry point to the CloudiFacturing solution. This means that the Digital Marketplace will directly interact with the CloudiFacturing platform

components and it will therefore enable the execution of artefacts available within the execution engines (as a result of the three waves of experiments and the services from WP4 and WP5).

The Digital Marketplace aims to become the single point of access in Europe and beyond to manufacturing SMEs for ICT-enabled solutions, including cloudified Computer-aided tools (CAx), simulation and visual analytics software for big factory data running on flexible Cloud and HPC resources, as well as training and consultancy services to facilitate the adoption of the advanced technology.

The Digital Marketplace is inspired by the concept of *agora*, aiming to gather assemblies and markets within the same space; in our case, the community and the marketplace of ICT-enabled solutions for manufacturing SMEs. The Digital Marketplace aims to foster and support the cultivation of a community around ICT technologies for the manufacturing industry. The purpose of the Digital Marketplace is to be recognized as an online space, where manufacturing SMEs can learn and experience technology trends and solutions for their own businesses. However, and from the point of view of the manufacturing SMEs, it is not only about gathering information, but also about having the opportunity to interact and communicate with other members of the community, who could look for similar information or who could already have solved similar challenges.

By building and cultivating this community, we want to facilitate the engagement with the technology offered by the Digital Marketplace. Manufacturing SMEs should in the first line perceive the Digital Marketplace as a neutral source of know-how for them, regardless of their intention to use or purchase any of the executable artefacts being offered. Notwithstanding, we believe that a positive engagement with the community and a positive endorsement of other members will lead to an increment in the number of adopters and users of the technology offered by the Digital Marketplace and its partners.

For a successful joint commercial exploitation of the CloudiFacturing results, we would need to define the commercial model and the legal framework that facilitate a feasible commercialisation, accounting for the granting of rights and the provision of support. For a long-term sustainability of the CloudiFacturing results, we would need to establish a suitable commercial operation that ensures the professional development of the customers, considering the availability of the solution and the provision of services.

5.2.1 Study of the context and trends

The aim of this study is to set the foundations for a scalable and sustainable business model for emGORA (the brand behind the CloudiFacturing solution), so that the project will effectively be in operation and grow beyond the duration of the EC- funded period. This section provides a first study of the context along with the trends and market that will allow us to formulate a proper vision and mission statements for the CloudiFacturing solution in view of the target segments (not from a technical perspective). The initial study will also deal with the analysis of the competition and the business models already in place by similar 3rd parties on the market.

With the aim of improving production processes and optimising producibility of manufacturing SME in Europe, the CloudiFacturing project brings advanced ICT in the field of ICT/HPC-based modelling and simulation.

emGORA is composed by different elements: the Digital Market place, the central user management, the central billing system, the repository for executable artefacts, the artefact execution system, data

transfer and browsing system, the workflow executor, the application executor, and the executable artefacts (for more details, please refer to deliverable D2.2)

The Digital Marketplace in turn is composed by different elements such as:

- Information: home, presentations, regional info, webinars, press releases, newsletter;

- Community: blog, matchmaking, collaboration, professional networking, forum;

- Cloud/HPC services: user support, artefact management, artefact execution, artefact creation, resource management;

- Financial services: accounting, billing, payment, statistics;

- User account management;

- Security services: authentication, authorisation, data protection, privacy management, trust management.

Manufacturing-focused marketplaces help ICT solution providers to market their services to a global audience. These marketplaces cover different needs in a single online platform for peculiar areas and allow them to execute a particular service, to collaborate and discuss in real time and/or to exchange information and ask for a quotation for example. Often, locating a new supplier and follow the traditional RFQ (request for quotation) processes could lead to long and expensive discussion while buyers are looking to save time and money instead.

Even though on a manufacturing marketplace it would be more natural to attract prospects interested in those kinds of services in contrast to a standard social network, the marketing efforts behind the marketplace should anyhow be consistent, including for instance consultancy services, the creation of quotes, communication and so on. Marketplaces should offer more than RFQs, they should intersect different information, both quantitative and qualitative, in order to present the best matching option for the buyer.

Creating a complete customer profile in the marketplace is very important to educate prospects searching for a specific service; within emGORA, this is probably related to ISVs and VARs that need to have a consistent profile, in order to be found and chosen. Other than the usage of the standard services, being part of a marketplace could also optimise the search engine optimisation of the company, and it will be important to propose this benefit to the emGORA prospects.

An important feature of online manufacturing marketplaces is the rating system that allows to rank the different suppliers and buyers as it is done on major e-commerce website (e.g. Amazon, eBay, etc.). As it is the case for e-commerce, it should be taken into account the possibility that the prospects will consult the marketplace to then explore a traditional partnership with the stakeholders scouted on the platform (take away: there should be a contract that allows emGORA to benefit from the value generated between a buyer and a supplier or ICT solution providers thanks to the touch point they created on the marketplace for a certain period of time).

The business models of these marketplaces are very different; they can be free, time-based subscriptions and other charge a percentage of each awarded RFQ. Some factors that can portrait the

match of a certain marketplace with a customer could be: number of buyers / suppliers / stakeholders, the number and quality of services, the industrial focus to check whether it is in line with the company profile, and the specific business goal of the company.

5.2.2 Flexible business models for emGORA

The shift to cloud-based computing allowed for moving from traditional business models such as for example upfront licensing towards pay-per-use model, subscription model or again a combination of both. Indeed, nowadays most of the Software as a Service (SaaS) solutions are offered in such kind of business models. These new business models allow companies to avoid incurring into high startup fees and to have a usage period of about typically six months, where the company can experience the solution. The new models empower companies to gradually increase their use of the solutions based on the actual need, giving also more feedback about the product usage such as pricing policies and how to consolidate offers into packages to drive higher margins.

Moreover, the shift to the cloud and thus to the pay-per-use model from an accounting point of view enabled companies to move from capital expenditure (CapEx) to operational expenditure (OpEx). In fact, the argument behind this switch on the balance sheet refers to the transition from a traditional technology investment towards recurring fluctuating costs. Entrepreneurs prefer OpEx to CapEx given the ability to deduct more expenses minimising the income tax that are charged on the company's gross income.

The Internet of things and Big data trends are envisioned to unleash in the future the creation and adoption of internet connected devices, facilitating the better monitoring of the usage of a product, in order to easily adapt pay-per-use business models also for physical objects.

In the pay-per-use and subscription model, billing is much more complex due to the variety of resources and services a customer could use at different times with multiple users, and with diverse prorated accounts. In this topic, a little error can tangibly and negatively affect the customer churn. Invoices should be accurate, transparent and simple to understand, in order to build long-lasting customer relationships. Often pay-per-use is a convenient business model, when the usage of the solution happens in a discrete manner (e.g. few times a month).

Although these new business models permit allow customers to be more flexible, as a drawback such flexibility might hinder the capability to forecast revenues for a company providing this service in the medium and long-term. Indeed, revenue and profits generated from the solutions are less predictable from a pay-per-use or subscription model. In order to have a continuing adoption /usage, solutions deployed via these business models need to have billing amounts controllable and really well predictable, as a customer needs to know in advance whether exceeding a certain threshold means an extra charge in the pricing.

A subscription model fosters the increase of the lifetime value of a customer against a traditional one-time-sale model. With subscription, businesses can easily forecast revenue flows as they can usually build on a loyal customer base. Cancelling a subscription is also usually seen as a hassle because the transaction cost of moving from a service to another is perceived as to be big. Indeed, a lost customer from a service depends usually more on the service quality than other issues. The automatic billing feature translates into reduction of inconveniences for the users.

The following table highlights some pros and cons of a pay-per-use business model.

Pros	Cons
Transparent pricing to the customers	Unpredictable revenue for the company providing this service
Business model mainly driven by customers' needs	Leaving customers after the trial period is expired
Lower barriers to new customers' adoption due to reduced setup costs	High number of order transactions, difficult to report financial statements
Lower prices to new customers	
Greater customers' feedback (i.e. for refining pricing)	
Moving from CapEx to OpEx	

FIGURE 14: PROS / CONS OF THE PAY-PER-USE MODEL

The pay-per-use model influences the business strategy of a company through several factors.

flexible packaging
scalable delivery
consumption-based billing
rapid service innovation
continuous customer engagement

FIGURE 15: THE PAY-PER-USE MODEL'S IMPACT ON BUSINESS MODELS

Moreover, there are different types of pricing methodologies. Usually, a company should start with two or three basic surprising pricing tiers and should adjust them over time while learning from users. Some of the pricing methods used are represented in the following table:

Unlimited subscription: unlimited quantity, features, devices.
Pre-defined subscription: access to a specify quantity of product or of its features for a pre-defined period.
Consumption-based: pay-per-use generally with minimum purchase or commitment.
Outcome-based: monetisation based on value delivered to the customer, measured on quantifiable outcomes;
Overage charges: all pre-defined but with any overage billed based on actual use.
Free trials
Virtual coupons: one-time discount.
Early bird offers: discounts if joining in a certain period.
Freemium: basic services for free while charging a premium for advanced or special features.
Bring in your license: using companies existing licenses.

FIGURE 16: EMGORA PRICING METHODS

When designing a manufacturing-focused digital marketplace, different questions should be taken into account from a market and customer adoption point of view such as for example:

- Is there a large addressable market or the solution is too focused on a niche?

- Does the value proposition meet the real customer pain point?

- Can the product/service be engineered to scale with highly variable cost (vs. fixed)?

In order to do so, it will be important to focus a lot on the customers relationships and:

- Define clear buyer personas and deep understanding of how the customer use emGORA;

- Develop deeper customer relationships for maximising feedback from the users;

- Understand when to offer different combinations of pricing methods and at what point in time;

5.2.3 Lean startup applied to CloudiFacturing

The Lean Startup is a method that looks at the development of innovative new products/services/solutions highlighting fast iteration and customer insights. Products change constantly through the process of optimisation (tuning the engine), less frequently the strategy might have to change (a pivot). However, the overarching vision rarely changes. Such paradigm is described in the image below.

FIGURE 17: LEAN STARTUP PARADIGM

This process shall be adopted within the CloudiFacturing project as well. During the project, development partners (teams) should try to think big but start small, avoiding adding many unvalidated features to the platform initially but should try to observe real customers' behaviours, interact with real customers and learn about their needs.

One of the main errors of high-tech startups is to spend tons of hours over-optimising software and in the end, they realizing that their value proposition is far from the customers' desire. Learning is the essential unit of progress for any innovative project and validated learning is backed up by empirical data collected from real customers; this improves the startup's core metrics. To do so, the product should not be over-optimised as the project is postponing getting any data until are certain of success.

While developing the CloudiFacturing project, all the development teams should always think about the build-measure-learn loop, which is at the foundation of the lean startup movement. For any upgrade / optimisation made by the teams, the customer should be involved for feedback, resulting in the monitoring of relevant KPIs. In case such KPIs are improving then the teams can persevere on the optimisation; in the opposite case, it will be important to decide what kind of pivot it is needed.

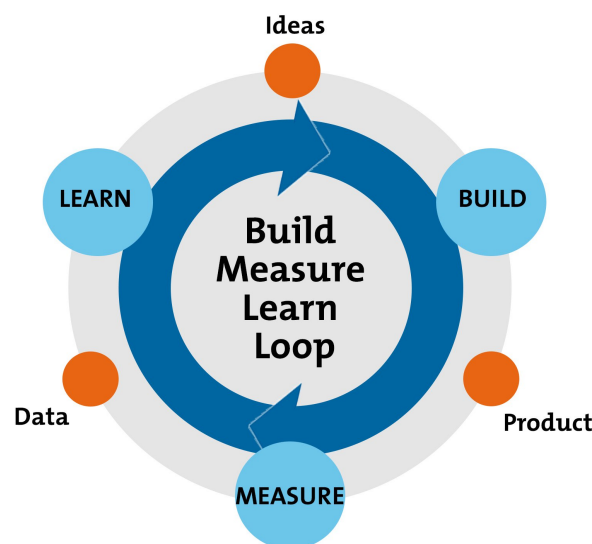Different types of possible pivots are described in the following table.

FIGURE 18: BUILD, MEASURE, LEARN LOOP

Pivot type	Description
Zoom-in pivot	what previously was considered a single feature in a product becomes the whole product
Zoom-out pivot	what was considered the whole product becomes a single feature of a much larger product
Customer-segment pivot	the product solves the real problem, but for another customer segment from the original it was planned to be served
Customer-need pivot	the problem we are trying to solve is not really important for our customers. Because of our customer intimacy, we though discover what the real problem is, so we fix our existing product towards the ideal

Platform pivot	refers to a change from an application towards a platform or vice-versa. Usually these startups start creating a killer app and their platform is meant for that app, which is then extended to third parties
Business-architecture pivot	from high margin low volume (usually associated with B2B) towards low margin high volume and vice-versa (usually associated with consumer goods)
Value-capture pivot	a new revenue or monetisation models (e.g. from fixed license towards subscription or pay as you go)
Engine for growth pivot	there are three of them: viral, sticky, and paid growth models. A company here changes though its growth strategy to seek faster and more profitable growth
Channel pivot	the way the company delivers its product to the customer (e.g. online vs. physical distribution)
Technology pivot	achieving the same solution with a different technology. Maybe a new tech can provide a better price tag and /or performance compared to existing technology

FIGURE 19: TYPES OF POSSIBLE PIVOTS

5.2.3.1 KPIs to be monitored in the CloudiFacturing project - innovation accounting

Every time an upgrade / improvement is pursued in CloudiFacturing, the different users should be involved in a testing session for getting feedback and understand, whether such optimisation was beneficial. Here are some examples of potential KPIs to be adopted, according to the types of features to be monitored.

Marketing & sales	acquisition
	activation
	retention
	referral
	revenue
User experience	simplicity
	intuitiveness
	feedback
	guidance
Service	innovation
	quality
	performance
	added-value

FIGURE 20: KPIS TO BE MONITORED IN THE CLOUDIFACTURING PROJECT

The KPI that are identified for the different aspects of emGORA should be understood by the customers and written down. Such KPIs should be actionable (demonstrating cause and effect) and accessible (simple to be understood).

The tables below are just an example of how the metrics should be monitored by the different teams in CloudiFacturing. For each new improvement of the features from the different teams, the metrics should be quantified and reported to understand, whether to persevere with the optimisation or to make a pivot. (The numbers in the table are just random numbers.)

Marketing and sales KPIs

KPI	V1	V2	Vn
Acquisition	5%	17%	
Activation	17%	90%	
Retention		4%	
Referral		5%	
Revenue			

FIGURE 21: EMPHASIZED MONITORING OF MARKETING AND SALES KPIS

User experience KPIs

KPI	V1	V2	Vn
Simplicity			
Intuitiveness			
Feedback			
Guidance			

FIGURE 22: EMPHASIZED MONITORING OF USER EXPERIENCE KPIS

Service KPIs

KPI	V1	V2	Vn
Innovation			
Quality			
Performance			
Added-value			

FIGURE 23: EMPHASIZED MONITORING OF SERVICE KPIS

Overall lean startup method applied to CloudiFacturing

The following scheme shows how the lean startup method could be applied to CloudiFacturing. Starting from the left side, the CloudiFacturing team is developing and optimising a feature and it believes (the value hypothesis) that this feature will increase the value of the solution for whatever reason (user experience, efficiency, etc.). Indeed, this feature will be used by its users; to test whether the value hypothesis is true, the new/improved feature is presented to the users, who are asked to

test and provide feedback through a specific set of questions. These questions allow us to define quantifiable, accessible and actionable KPIs. Eventually, such KPIs give some indications, regarding if it should go ahead with such development or whether a change is needed. In the end, the development team take action on what has been decided.
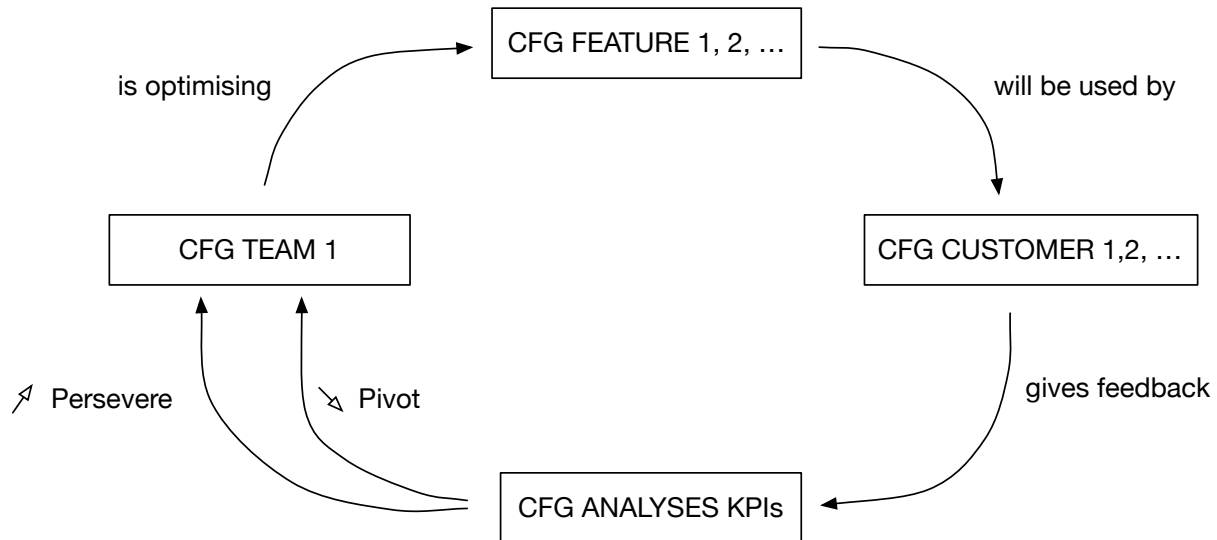
FIGURE 24: LEAN STARTUP METHOD APPLIED TO CLOUDIFACTURING

5.2.4 Customer archetypes

emGORA will serve different customer archtypes; some of them will be consumers of the offerings and some of them will contribute to the provision of the offerings. The following classification considers the 13 customer archetypes defined in deliverable D6.1 (including the customer stories) and it groups these into primary and secondary consumers and primary and secondary providers:

- Primary consumers:
   - End users
- Secondary consumers:
   - Advertisers
   - Communities
- Primary providers:
   - ISV (own web portal, dedicated desktop GIU, without dedicated GUI)
   - VAR
   - Platform providers
   - Platform component providers
   - Execution engine providers
   - Marketplace operators
- Secondary providers
   - Resource providers
   - Consultants
   - Trainers

5.2.5 Competitor analysis

Preliminary selections of competitors have been conducted. The competitors are categorized into a) IaaS provider with SaaS offering for manufacturing and b) marketplaces for manufacturing SaaS.

5.2.5.1 IaaS provider with SaaS offerings fo manufacturing

This category is composed of established IaaS providers or a group of established IaaS provider, which started offering SaaS solutions for the manufacturing industry.

5.2.5.1.1 GOMPUTE

Gompute delivers solutions for HPC, in-house or in cloud. It includes remote desktop functionality, Gompute scheduler (to implement corporate resource usage policies), Phyton API for job submission, and third-party integration (to let third-party application benefit from the cluster's capabilities).

Gompute provide the possibility to license two different packages:

- *Gompute HPC Cloud Platform* with all its proprieties (Gompute analytics, on demand connector, HPC data stager, distributed resource manager, license management, gsub, remote desktop and remote desktop wan accelerator);

- *Gompute on demand* with Gompute HPC cloud platform integrated.

Gompute's features include software, remote desktop and data Stager (file transfer system that include big data analytics system providing useful insights into the health and utilization of corporate WANs, security during the transfers is guaranteed).

Engineering applications available in Gompute:

Comsol
Siemens
Ansys
Paraview
Matlab
Ensight
Code Aster
Scilab
LS-Dyna
Ansa
OpenFOAM
XFlow
Abaqus
Smokeview
Netbeans
GNU Octave
CAESES
Abinit
FDS

Gompute's partners:

Partner	Type
Nvidia	Hardware
Comsol	ISV
Siemens	ISV
Lenovo	Hardware
Ansys	ISV
Friendship	ISV
Code Aster	ISV
BetaCAE	ISV
IBM	Hardware
Next Limit Technologies	ISV
Sourceflux	ISV
Intel	Hardware
Numascale	Hardware
Mathworks	ISV
WIKKI	ISV
DHCAE Tools	ISV
CoolSim	ISV
LSTC	ISV
ABAQUS	ISV

Gompute pricing policies

Gompute delivers solutions for High Performance Computing, both **in-house and as a service**. Solutions:

- *Gompute HPC on demand for data intensive applications*: **0,03 €/hour**.
  Service created for these sectors: aeronautics, civil engineering, digital, electrical engineering, energy, health, manufacturing, maritime.
  Company account subscription: **150€/month** (includes 1 user account, application repository and 100 GB of storage);
  Computing price: Starting from **0.027 €/Core Hour** (price for 3 years commitment).
  Other cost: application license.

- *HPC on demand*: **0.02 €/hour.**
  Company account subscription: **150€/month** (includes 1 user account, application repository and 100 GB of storage);
  Computing price: Starting from **0.019 €/Core Hour** for 1-year commitment.
  Other cost: application license.

Success story: characterization of wind flow over urban areas.

Solution: tool that integrates all the necessary factors required to calculate the optimal placement of turbines.

Organizations involved: KLiUX Energies (end user), University of Zaragoza (HPC expert), nablaDot (host center) and Gompute (HPC provider).

5.2.5.1.2 CPU 24/7

First solution: CAE As a Service

Computer Aided Engineering (CAE) as a Service. The process of designing, configuring, tuning and operating HPC systems requires highly specialized expert knowledge and years of experience, which is rarely found at a standard IT service organization. In addition, investing into building up a comprehensive HPC system and to operate it is expensive. CPU 24/7 provides its customers with a flexible, pre-configured and "ready-to-use" CAEaaS infrastructure hosted in the CPU 24/7 Cloud.
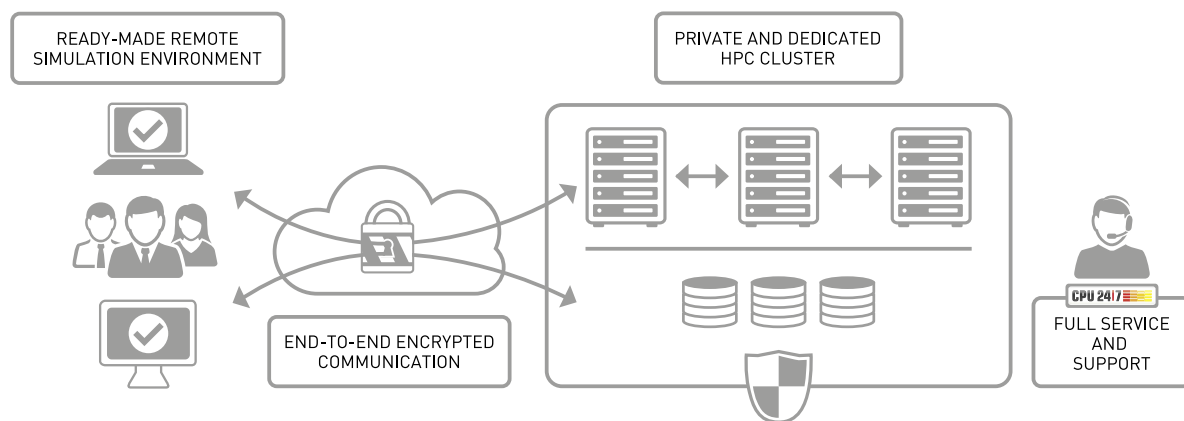
FIGURE 25 - FUNCTIONING OF CAE AS A SERVICE

Second solution: CAE Express

CPU 24/7 offers CAE Express for specific processing power. It can be deployed to the customer via a remote desktop or SSH. It works according to the following process (Figure 26):

- Start phase (the project starts): selection of pre-configured application;
- Phase of hosting: operations on data center and monitoring;
- Phase of operations and support: updating and upgrading;
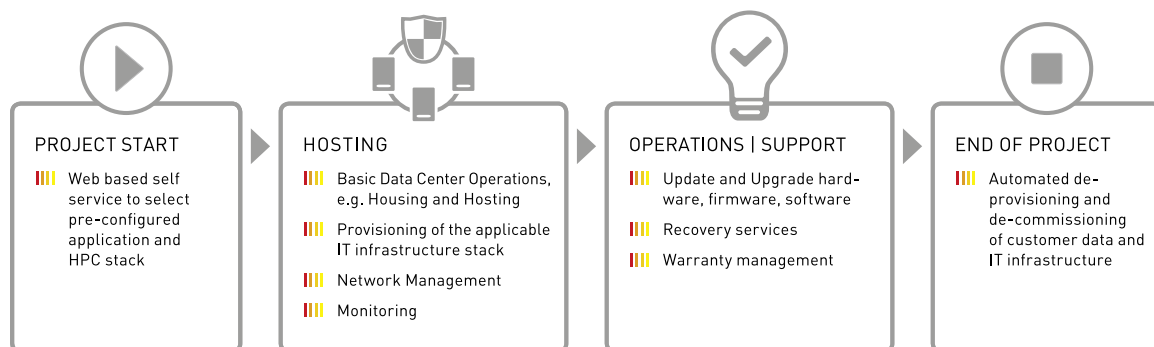- End phase (the project ends).

FIGURE 26 - FUNCTIONING OF CAE EXPRESS

You only pay for the capacity and duration of the computing services that have been used.

Third solution: CAE Enterprise

It provides highly customised HPC cluster solutions built exclusively for the customer. CAE Enterprise works cyclically and includes the following macro phases (Figure 27):

- Consulting and customising: HPC cluster design;
- Purchasing: purchase of data center, installation, configuration and testing;
- Hosting: operations on data center and monitoring;
- Operations and support: updating and upgrading;
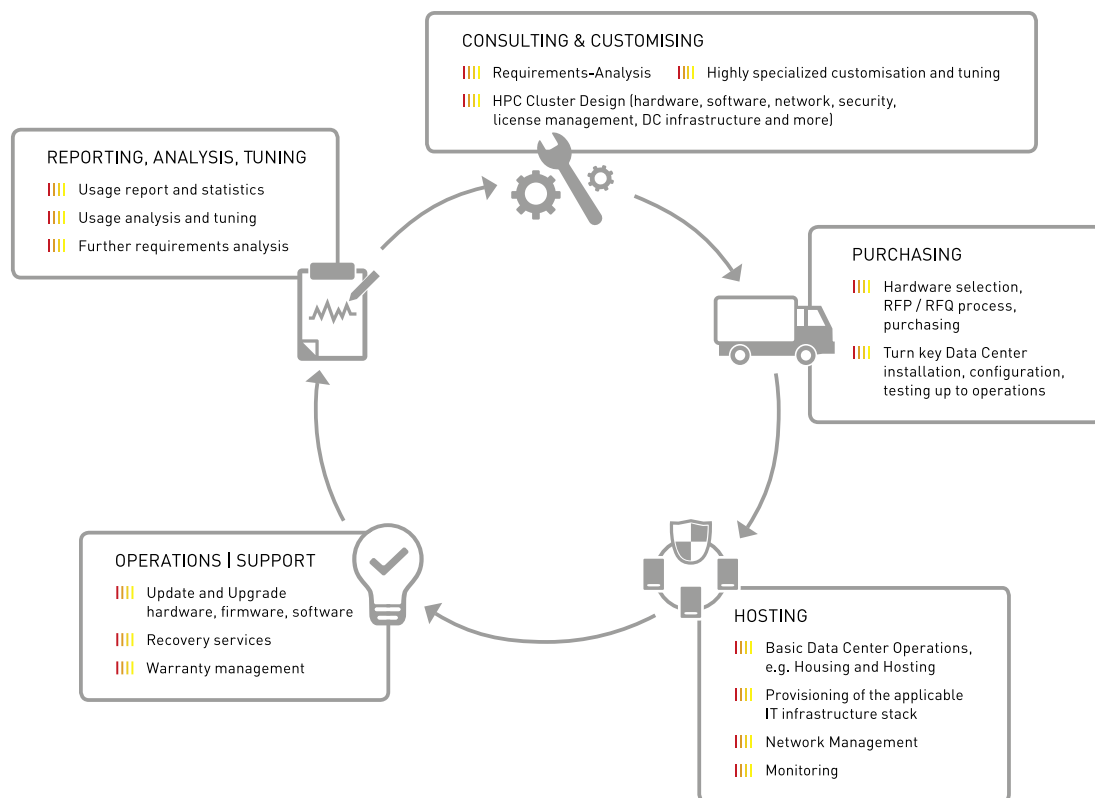- Reporting, analysis and tuning.

FIGURE 27 - FUNCTIONING OF CAE ENTERPRISE

CPU 24/7 partners:

Ansys
AVL
CD-adapco
Comsol
LS-Dyna

Friendship system
MSC Software
Nice
Numeca
Univa
Mellanox Technologies
E-shelter
SIBB (association)
Asc(c (non-profit association)

CPU24/7 pricing policies

Pricing includes support from highly skilled HPC experts, and there are no hidden costs for data traffic and storage, based on hardware configuration different type of servers are used.

Pricing:
- Price per core-hour starts from **0,049 €**;
- Price per TFlops-hour starts from **1,199** €;
- Discount pricing options based on volume or contract period are available.

5.2.5.1.3 FORTISSIMO

It provides hardware, software, and expertise required for computationally intensive simulations. Fortissimo gives the opportunity to do this via on-demand, pay-per use or one-stop shop model.

Fortissimo has different feature:

- On demand access to advanced simulation and modelling resources;
- Access to state of the art HPC facilities;
- Matchmaking services;
- Accesso to Capability register advertising and promotion services;
- Run simulations in hours rather than days;
- Access to best-practice guides.

Fortissimo's partners

Epcc
Arctur
Intel
Gompute
Genci
Sicos
AVL
Compass
Datapixel
DCU
aAmbiente

Pricing policies

The Fortissimo Marketplace offers a large amount of solutions, including HPC resources, software applications and expertise and tools.

Examples[2]:

- CP2K (ARCTUR): **1,80 €/hour**. The software CP2K is released as a service.
- ARCTUR HPC Consulting: **65,00 €/hour**. Fortissimo delivery HPC consulting services. Software: ANSYS, OpenFOAM, Paraview, Numeca CFD.

- Cloud Computing Services: **0,04 €/hour**. Infrastructure as a service, big data PaaS and cloud consultancy. Software: OpenStack.
- And many others.

5.2.5.2 Marketplaces for manufacturing SaaS

Competitors, which have no attachments to a resource provider neither to a software provider, but that bring the two groups together to create a combined added value, represent this category.

5.2.5.2.1 RESCALE

Rescale is a global player for enterprise big compute. By leveraging HPC in the cloud, Rescale is a platform that helps solve challenging problems:

- Transformed it agility
- On-demand turnkey platform (immediate access to applications)
- Accelerated time to market (no queues)
- Reduce capital expenditures (using pay-as-you-go for hardware and software)

Rescale provide different solutions for different industry (aerospace, automotive, Oil & Gas, life science, electronics), by role (engineering, CxOs, HPC management, academia) or by focus (machine learning, digital twin, IoT and Big Data, etc).

Rescale has a long list of **partners**. Some are mentioned below.

Amazon Web Services
Ansys
Autodesk
AVL
CADFEM
CAE Solutions
Comsol
Convergent Science

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[2] https://www.fortissimo-project.eu/buy-services

Cradle North America
Cybernet
Dassault Systemes
Dynamic Computing Technology
EDEM
ESI Group
ESSS
Flowtech
Fraunhofer-Gesellschaft
Function Bay, Inc.
Future facilities Ltd.
Siemens

Pricing policies
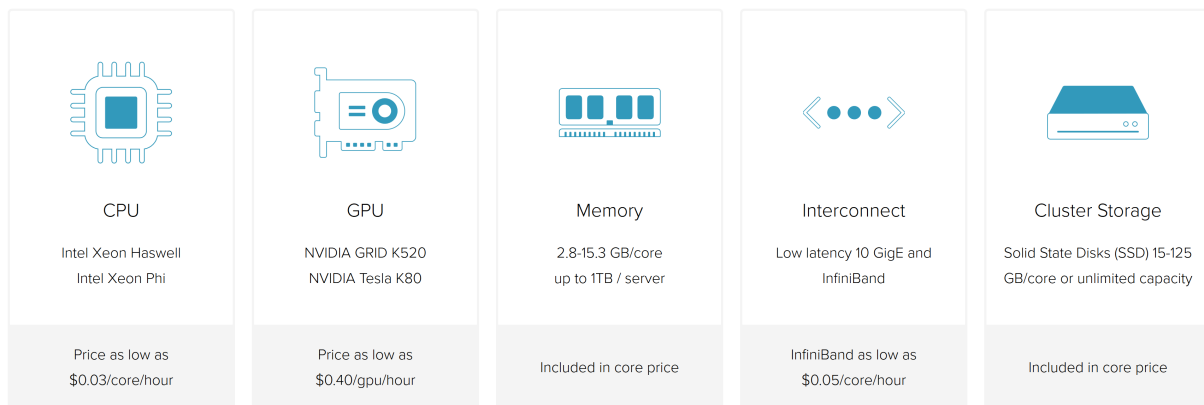
Rescale sold in pay as you go model.

- Hardware:

CPU	GPU	Memory	Interconnect	Cluster Storage
Intel Xeon Haswell Intel Xeon Phi	NVIDIA GRID K520 NVIDIA Tesla K80	2.8-15.3 GB/core up to 1TB / server	Low latency 10 GigE and InfiniBand	Solid State Disks (SSD) 15-125 GB/core or unlimited capacity
Price as low as $0.03/core/hour	Price as low as $0.40/gpu/hour	Included in core price	InfiniBand as low as $0.05/core/hour	Included in core price

FIGURE 28: RESCALE PRICING POLICIES

Rescale offers different core types, different in memory (GB/Core), network IO, Storage (GB/Core) and processor.

- Storage (per user):
  - First 100 GB: free
  - 100 GB – 1 TB: 99 $/month
  - 1 TB +: 99 $/TB/ month
- Transfer (per user):
  - First 100 GB: free
  - 100 GB – 1 TB: 99 $/month
  - 1 TB +: 99 $/TB/ month

Rescale provides more usage models: instant, on Demand, low Priority and prepaid.

Rescale offers free trial, with 300 simulation and deep learning packages, instant HPC clusters on demand, 100GB free storage & data transfer per month, up to 240GB of RAM per node & SSD storage, secure SSL data transfer & encryption at rest and share & clone simulation jobs (Figure 28).

5.2.5.2.2 AWESIM

It provides businesses with competitive solutions for simulation-driven design. It provides modeling & simulation (M&S) on HPC via online modeling & simulation apps, training courses and experts and consultants.

Simulation-driven design with M&S on HPC allows for less expensive computer simulations, which reduces the time to take products to market, improves quality, and cuts costs.

AweSim provide different solutions for different experience level (inquisitive, engage or fully engaged). Costs are also estimated for each solution.

For AweSim, the three different customers are described as follow:

- **Inquisitive**: the company knows M&S, but it does not use it. It is required by customers to use M&S; competitors are using M&S; company is using CAD, CAM, PLM or ERP software.
- **Engage**: the company makes some use of M&S; it is looking to offer additional services; it is expanding beyond spec manufacturing; and it are seeking custom workflows/apps.
- **Fully engaged**: the company makes significant use of M&S; it is interested in the latest M&S tools; it is looking for better M&S services; it wants to engage suppliers in M&S.

For the **first type** (Inquisitive), the offered solution is:

Discovery Engagement Program
Learn how Modeling & Simulation can help your business.
Example client engagement:
They provide a pilot feasibility study for a startup company's product concept.
Example cost estimates:
5,000 $ (expert consultants) + 1,000 $ (HPC resources).

For the **second type** (Engage) the offered solution is:

Project Consultants
Get help on the M&S project from the community of M&S experts.
Example client engagement:
They provide ongoing access for multi-physics analysis of device design iterations.
Example cost estimates:
400 $/month (HPC resources) + 100 $/hour (Software).

For the **third type** (Fully engage) the offered solution is:

Product Apps and Software
Get started right away using commercial apps and software.
Example client engagement:
They provide resources to run a sophisticated 4-month aerodynamic analysis project.

Example cost estimates:
85,000 $ (HPC resources).

5.2.5.2.3 UBERCLOUD

They run simulations on a cloud infrastructure. It works in a simple way: bower-based access (instant access anytime/anywhere from a laptop or tablet); fully interactive GUI.

UberCloud is an ANSYS Advanced Solution Partner.

UberCloud's features:

- Fast;
- Easy (simple browser-based access);
- Secure;
- Flexible (environments are provisioned on-demand);
- Predictable (platform validated by Intel, Microsoft, ANSYS, and more);
- Economical (UberCloud offers low costs).

Pricing policies

UberCloud offers different type of pricing models.

Examples:

- OpenFoam Advania data centres: $179 / 1,000 anytime core hours starting at 16 CPU cores;
- OpenFoam Amzon Web Services: $199 / 16 cores X 24h;
- OpenFoam NephoScale cloud computing: $199 / 32 cores X 24h;
- OpenFoam CPU 24/7: $1,880 for 10,000 core-hours with CPU 24/7 HPC resources;
- OpenFoam Ohio Supercomputer Center: $500 for 4 hours block;
- OpenFoam support from CFD support (starter): $200 up to 2 hours of support;
- OpenFoam support from CFD support (advanced): $10,000 for big conceptual project of hundreds of hours.

5.2.5.3 Competitors summary

This is a categorized summary of the preliminary selected competitors. Their business models have been evaluated in regard of features and their monetisation model and compared to the targeted emGORA business model.

	FEATURES	MONETISATION MODEL
	IaaS provider with SaaS offerings for manufacturing	
GOMPUTE	✓ Remote desktop ✓ Compute scheduler ✓ Phyton API for job Submission ✓ Third part integration	✓ HPC on demand: 0.03 €/hour ✓ Firm account subscription: 150 €/month (1 user account, app repository and 100 GB of storage ✓ Computing: 0.027 € / core-hour (with 3 years commitment) ✓ If it's not data intensive than 0.03 -> 0.02 and 0.027 -> 0.019

CPU 24/7	✓ CAE as a service ✓ CAE express ✓ CAE enterprise (highly custom)	✓ Computing: 0.049 €/core-hour ✓ 1.199 €/TFlops-hour
FORTISSIMO	✓ On-demand access to advance simulation and modelling resources ✓ Access to SOA HPC facilities ✓ Matchmaking services ✓ Access to a capability register advertising and promoting services ✓ Run simulation in hours rather than days ✓ Access to best practice guides	Different pricing models ✓ … $ fixed per service ✓ … $/item ✓ … $/hour ✓ …$ core/hour
Market places for manufacturing SaaS		
RESCALE	✓ Simulation platform ✓ Workflow ✓ Visualisation ✓ File management ✓ API ✓ IT administration portal ✓ On-Premise HPC & scheduler integration ✓ Comprehensive license management ✓ Support	Storage and transfer (per user) ✓ First 100GB free ✓ 100GB - 1TB 99 $/m ✓ 1TB + 99 $/TB per month More usage models: instant, on demand, low priority, prepaid.
AweSim	✓ Online Modelling & Simulation apps and tools ✓ Educational materials and training courses ✓ Industry specific expertise and consultants	Experience level (inquisitive) ✓ Expert consultant: 5,000 $ ✓ HPC resources: 1,000 $ Experience level (engaged) ✓ SW: 100$/hour ✓ HPC resources: 400 $/month Experience level (power user) ✓ HPC resources: 85,000 $

UberCloud	✓ Cloud simulation platform ✓ Cloud CAE and cloud HPC	✓ Different pricing models per service used ✓ $179 / 1,000 anytime core hours starting at 16 CPU cores ✓ $199 / 16 cores X 24h ✓ $199 / 32 cores X 24h ✓ $1,880 for 10,000 core-hours with CPU 24/7 HPC resources ✓ $500 for 4 hours block ✓ $200 up to 2 hours of support ✓ $10,000 for big conceptual project of hundreds of hours

FIGURE 29: COMPETITORS SUMMARY

5.2.6 Commercial Exploitation at the level of the Digital Marketplace

We foresee that all the services offered in the CloudiFacturing Digital Marketplace will be based on a pay-per-use business model with a unified billing process, in order to streamline the adoption of the orchestrated technology without jeopardizing the liquidity of the manufacturing SMEs. The Digital Marketplace will be open, empowering different stakeholders to become members of the community to offer their technology or consultancy services through an additional distribution channel, or to access advanced cloud-based services and expert knowledge to boost the competitiveness.

The community members will be able to influence and accompany the evolution of the CloudiFacturing Digital Marketplace, suggesting additional features and participating as stakeholders in agile-driven iterative development cycles. The openness of the Digital Marketplace will allow any end user in the context of the product development or production processes, any technology provider (ISVs, VARs, RTOs, computing resources providers), and any consultancy company to join the Digital Marketplace and to exploit the large network of purpose-affined members; thus, building and generating sophisticated added value.

The Section 2 of Deliverable D6.1 outlines the current understanding within the consortium about the Digital Marketplace. These conceptual analyses focus on the comparison of related solutions available in the market, including the collection of the requirements from the experiment partners of wave 1 toward the Digital Marketplace. Furthermore, the expected customer types, the derived customer stories, and the needed user roles are described in detail, providing a clear idea of how the stakeholders will interact within the Digital Marketplace.

The Digital Marketplace, the CloudiFacturing platform, as well as the experiments and the services of WP4 and WP5 are under development and many technology choices will influence the definition of the commercial model for the commercial exploitation from the level of the Digital Marketplace. Nevertheless, we already studied different commercial models and the corresponding interactions with the stakeholders, in order create a basis for further analyses according to the progress of the development.

Figure 30 shows the flow and the role of the partners involved in the provision of executable artefacts to end users (manufacturing SMEs) in the context of a reseller commercial model. The ISVs, VARs and RTOs would be responsible for the deployment and maintenance of the service. A cloud provider hosts the CloudiFacturing platform and other cloud and HPC providers offer compute and storage resources.

The operators of the Digital Marketplace act as the face to the customer and they are responsible for the marketing and the customer support, as well as the billing and payment management. Furthermore, the Digital Marketplace operators also need to make sure that the operation of the whole system is proper by monitoring all the technical systems.
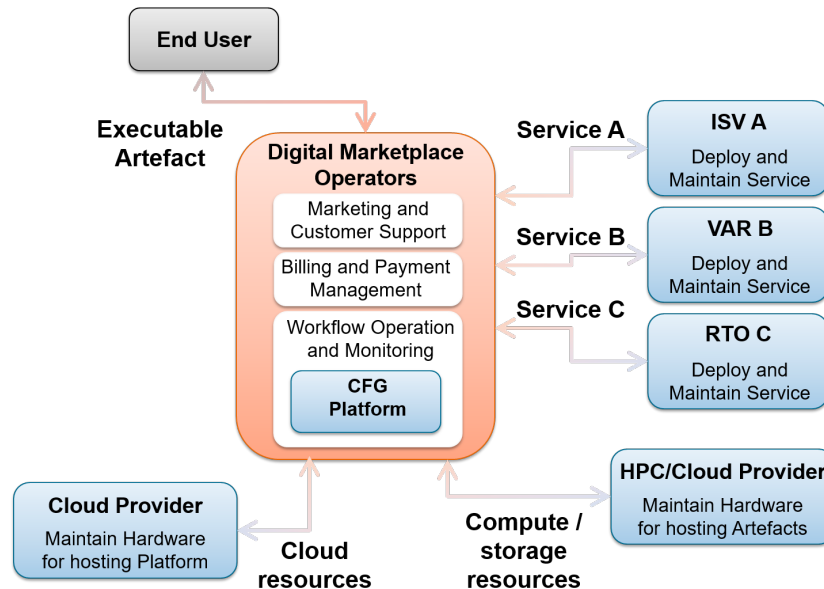

FIGURE 30 - RELATIONSHIPS AMONG THE STAKEHOLDERS UNDER A RESELLER COMMERCIAL MODEL

The outlined relationships aim to minimize the risk for every involved stakeholder, while having the opportunity to explore the cloud market and assess how their own customers react to it.

Furthermore, it enables all stakeholders to continue cooperating with each other, while still keeping the ownership of the IPRs and the possibility to perform individual exploitations.

In order to build such relationships from a legal point of view, we would need to consider some general aspects. In this context, there are three main actors: a) the end user (the payer of the services), b) the IPR owners (the provider of the technology), and c) the operator of the technology (through the Digital Marketplace). Ideally, the end user would be able to use and pay for any offering under the same legal conditions, facilitating the adoption of the technology. However, to achieve this, the IPR owners would need to grant similar rights and provide similar services, otherwise it would not be possible to homogenise the terms of use for the end user.

From this perspective and in order to implement a reseller commercial model, the IPR owners would be required to license their technology with the following considerations: "proprietary license" (retained copyright) with the right to distribute, demonstrate, disseminate, duplicate, and sublicense the software product.

In other words:

- Software distribution: make the software accessible via the cloud platform.
- Software demonstration: showcase the functionality of the software product.
- Software dissemination: promote and market the software product.
- Software duplication: deploy the software product on different VMs.

- Software sublicensing: grant time-limited license of the software product to end users.

It is also important to note that the IPR owner would also need to provide additional services in terms of: adaptation, installation, integration, and/or maintenance.

In other words:

- Adaptation services: make the software interoperable with the cloud platform.
- Installation services: deploy and configure the adapted software product.
- Integration services: register the software product on the cloud platform.
- Maintenance services: ensure the proper and secure operation of the software product

Although the relationships and licensing considerations outlined above seem to be very suitable for the type of technology that the Digital Marketplace will offer, we studied different alternatives for offering cloud-based software that will also be considered and evaluated along with the evolution of the technology development.

The first case considers and ISV that sells its software tools via an owned PaaS (see Figure 31). In this case, the ISV owns the IPR over the software tools and the PaaS. Thus, the ISV defines the terms and conditions, it has the customer ownership, it is liable for IPR and defects, it offers customer support, and it is responsible for branding and pricing.
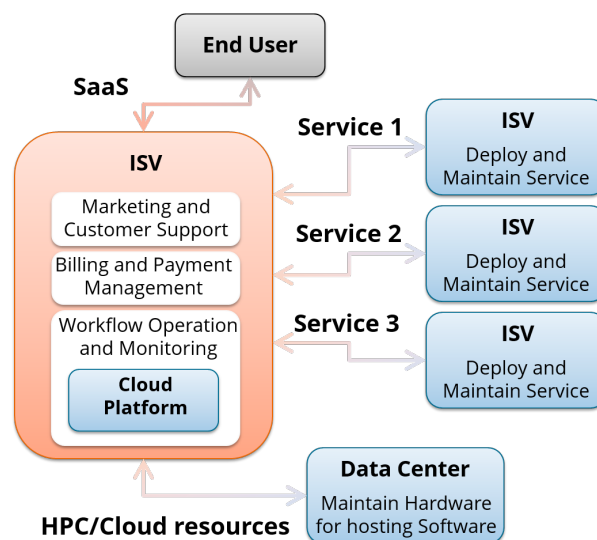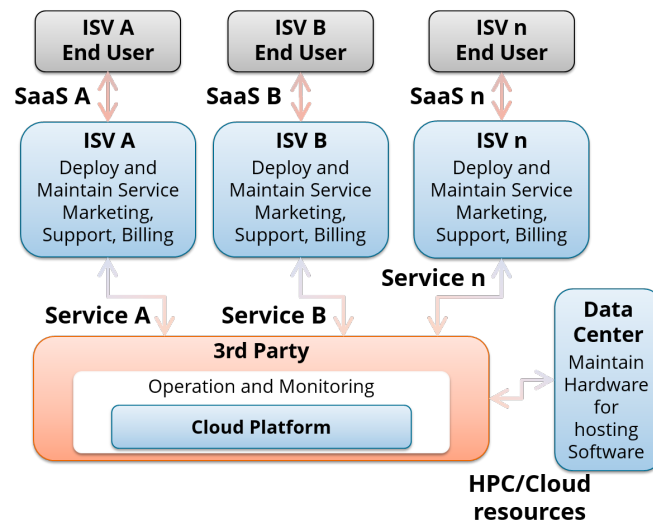

FIGURE 31 - ISV DIRECT SALES OF ITS SOFTWARE TOOLS VIA ITS OWNED PAAS

In the second case, the ISV sells its software tools over a third-party PaaS (refer to Figure 32). The ISV only owns the IPR of the software tools and it has access to HPC / cloud resources over the third-party PaaS. Base on this scenario, the ISV would have a similar behaviour as before, it defines the terms and conditions, it has the customer ownership, it is liable for IPR and defects, it offers customer support, and it is responsible for branding and pricing.

FIGURE 32 - ISV DIRECT SALES OF ITS SOTWARE TOOLS VIA A THIRD-PARTY PAAS

For the sake of completeness, the third case is similar to the first case (as showed in Figure 33) however, the owner of the software tool is a System Integrator (SI) and not an ISV; in other words, the software tool is based on granted rights from a licensor.
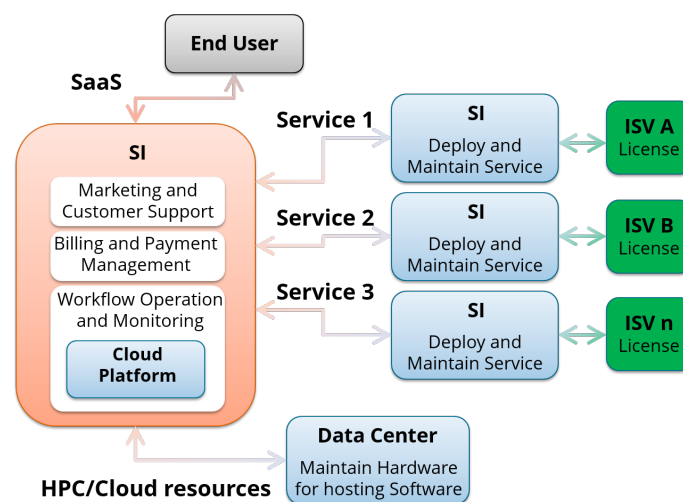

FIGURE 33 - SI INTEGRATES THIRD PARTY SOFTWARE OF A LICENSOR AND SALES THIS VIA ITS OWNED PAAS

There is an additional characteristic, which is relevant according to the technical solution that CloudiFacturing is pursuing: the possibility to build workflows. CloudiFacturing will provide the technical capability to chain different executable artefacts into a workflow. Nevertheless, we also need to establish a suitable legal framework that supports the combination of executable artefacts from different vendors.

In the three cases, it would not be possible to combine executable artefacts from different vendors into workflows. If the ISV or the SI sells its own software tools (regardless of how is was yield, by developing or integrating it), only software of the same ISV / SI will be available, so the combination of executable artefacts is only possible for "in-house" software tools. In the second case, if the ISV is selling software tools via a third-party PaaS, even if there is more software from other vendors

deployed on the same PaaS, it would be difficult to combine the software tools (given that the technical support is available), because each ISV will have its own terms of use and a homogenisation of the terms of use for the end user would legally be very challenging.

The current reseller commercial model (Figure 30) that for the time being seems to be promising, will allow us to build and offers chains of executable artefacts from different vendors. Many established ISV, VARs, and SIs will have no difficulties to adopt such a model, because they have a product that they support and want to resell. Notwithstanding, RTOs might have difficulties with such a reseller commercial model, because some RTOs are not allowed to create products and be liable for a product; hence, they would not be able to resell their technology. In this case, the current option would be to find a partner (internal or external to the project) that license their technology and build a product based on it.

5.2.7 Business Sustainability of the Digital Marketplace

The main objective of the long-term sustainability of the Digital Marketplace is to create a scalable business starting from the value proposition. The main stages in the process are (refer to Figure 34) Customer-Problem-Fit: learn as much as possible about the customers, their problems, their wishes, and their expectations toward a solution.

- Problem-Solution-Fit: learn as much as possible about how the solution can actually generate added value for the customers.
- Solution-Product-Fit: learn as much as possible about the pricing, the functions, and the scalability of the product.
- Product-Market-Fit: learn as much as possible about the distribution, the dynamics, and the scalability of the business models.

Although this process will be executed several times to improve the results, we can currently assume that we have reached the problem-solution-fit stage; we has a preliminary value proposition, we know the customer (by means of interacting with the end user of the wave 1 application experiments – and from previous projects), and we have an initial idea about the solution (by means of testing concrete use cases with the wave 1 application experiments). Nevertheless, the solution-product-fit and the product-market-fit stages still need to be addressed, in order to establish a scalable business.

To reach the next two stages, an iteration process is needed, where different Minimum Viable Products (MVPs) will be defined and will be tested and validated with early adopters. After different MVPs has been tested and validated, the next step will be to start generating traction, for which we will validate the commercialisation funnel for the product (see Figure 36).
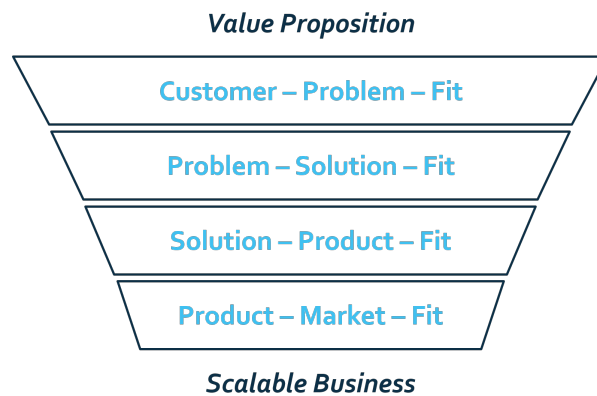
FIGURE 34 - PROCESS TO REACH A SCALABLE BUSINESS FOR THE DIGITAL MARKETPLACE

The process to reach a scalable business will help us to identify the key aspects that we need to optimise in each stage. However, every iteration will result into a better understanding of the business and therefore into an improved description of the business model canvas.

The business sustainability of the Digital Marketplace has different perspectives. A preliminary description of the business models canvas summarises our current understanding of the commercialisation of the Digital Marketplace and its underlying technology (see Figure 35).
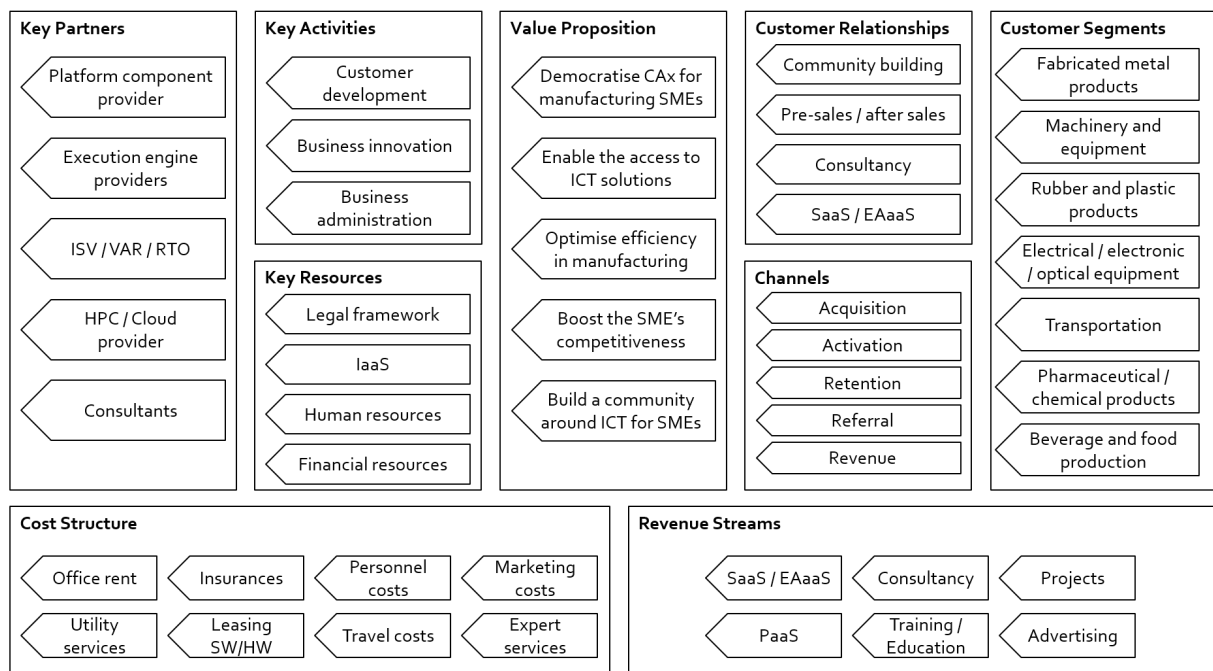

FIGURE 35 - PRELIMINARY BUSINESS MODEL CANVAS FOR THE DIGITAL MARKETPLACE

Although the preliminary business model canvas provides an overview of the different perspectives behind the commercialisation of the Digital Marketplace, given the current state of the project and of the technical development, we still have many aspects to analyse and process in more detail that we cannot formulate at this point in time.

Key Activities:

The strategic decision from the conception of the project was that the two commercial start-ups (clesgo GmbH and cloudSME UG) will take over the operation and the long-term sustainability of the Digital Marketplace and the underlying technology. The first step in this direction aimed to define the scope of the operation and key activities of the Digital Marketplace. The current understanding within the consortium in this regard covers three different activities: a) customer development, b) business innovation, and c) business administration. In more detail, these three perspectives are described below:

Customer Development (aka marketing operation):

- Assess the market, understand the customers' reasoning and needs, and determine strategies to: i) satisfy their desires, ii) attract their interests, and iii) boost the customer's benefits from the provided services.
- Characterize the customers and analyse the competitors from the point of view of the cloud market, in order to design marketing messages, material, and campaigns, by combining multiple channels and strategies such as: try-before-you-buy, social advertising, SEM / SEO, calls-to-action campaigns, contest-driven awareness, etc.
- Develop the market and optimize the marketing funnel (acquisition, activation, retention, referral, and revenue) and the customer journey (familiarize, evaluate, acquire, consume, advocate), by means of iteratively validating the assumptions and improving the customer experience (CX).
- Initiate and cultivate a community around the technology, connecting people, promoting its advantages, guiding prospects in applying it, and providing access to: best practices, how to(s), educational information, specialized links, technology news, etc.
- Design an appealing and scalable commercialization strategy to generate awareness, drive sales, and acquire new customers that enables the commercial integration of the technology providers and that supplies a single point of contact and a first level support to the customers.

Business Innovation (aka technical operation):

- Analyse and comprehend the underlying technology in view of determining strengths and weaknesses, of clarifying dependencies and potential synergies, and of ratifying the individual value propositions.
- Collect and process customer feedback, in order to identify new application fields and to improve, expand, and develop new services in view of co-creating and co-designing new innovative applications.
- Monitor the technological trends and the evolution of the industry, identifying promising endeavours to create innovation roadmaps and to support the future development of the underlying technology and its technological sustainability.
- Validate new services and its corresponding business models from a customer perspective, by means of facilitating the creation of short iteration processes based on minimum viable products (MVPs) and with the direct involvement of external stakeholders.
- Build and maintain an ecosystem with the needed features and support to enable the democratization of the technology and the scalability of the customer base.

Business Administration:

- Identify and manage the technological IPRs of the different technology providers, in order to prepare and set up a viable legal framework toward the commercialization of the integrated solution without affecting any individual exploitation plans.

- Develop a proper commercial model that integrates the different technology providers and that facilitates the sustainability of the technology, while generating added-value to the customers.
- Account for the administrative and financial aspects of the commercial offer, including invoicing, collecting the customer payments, transferring the retained VAT to the corresponding tax offices, and distributing the revenues among the technology providers.
- Inform the technology providers about the customer behaviour with their individual services, in order to develop further strategies and to improve the customer acceptance.
- Determine and monitor metrics and KPIs to streamline the strategic development and execution of the business, while harmonizing these with external business indicators.

Although the legal construct to facilitate the operations of the Digital Marketplace by the two commercial start-ups has not been concretised yet, the agreement between the start-ups is that the operation of the Digital Marketplace will be performed with an equal commitment from both sides and therefore, the revenue generated by the operation of the Digital Marketplace will also be divided in equal parts ("50-50"). Furthermore, given the backgrounds of the two commercial start-ups, it has already been agreed that cloudSME UG will have a focus on the customer development aspects, while clesgo GmbH will have a focus on the business innovation aspects. The business administration aspects are a remaining topic to be discussed in the following months (among many other topics).

Value Proposition:

Our preliminary value proposition is formulated in the following way:

We boost the efficiency of manufacturers, who are challenged by the uncertainty of the resource-intensive Trial & Error process, when manufacturing industrial products. The typical Trial & Error process is caused by the lack of understanding of the interplay between the design of the product, the constraints of the manufacturability, and the efficiency of the manufacturing process itself. We offer you ICT-based solutions to transform your design requirements into an optimal decision-making process that can directly be applied in the production. You will gain a higher confidence in planning and calculating your work, leading to a better innovation and competitiveness for both: you and your customers.

Channels:

When we reached the product-market-fit stage (see Figure 36), a traction framework will be stablished, in order to reach as much customer as possible and scale the business. The different phases in the traction funnel are:

- Acquisition: how can we reach and attract customers? E.g. LinkedIn - Xing - Twitter - Google Ads - SEO - Fairs - Webinars - Video – CTA
- Activation: do the prospects actually use our offer? E.g. Landing Page - Try-before-your-buy - free CPU hours
- Retention: are customers reusing the offer? E.g. Email (lifecycle / status) - Success Stories - Examples - News - Events
- Revenue: do we generate turnover? is the pricing proper? E.g. Email invitation - Like / Share on Social Media - Reviews - Contest-driven awareness
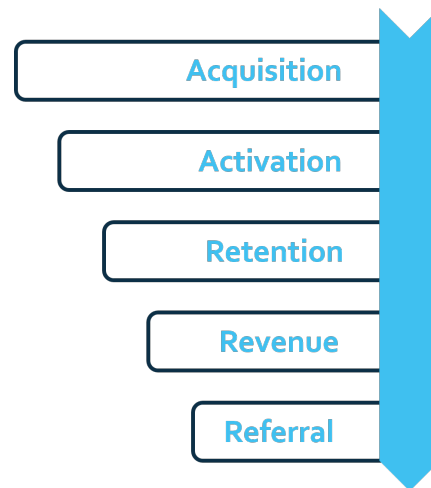- Referral: do the customers recommend our offer? E.g. Pay-per-use / Pay-as-you-go

FIGURE 36 - COMMERCIALIZATION FUNNEL FOR THE DIGITAL MARKETPLACE

Customer Segments:

The target market for the Digital Marketplace is the manufacturing sector at large and the potential customers are engineering or manufacturing companies that already apply or can apply digital technologies for engineering and production, by means of CAx technologies.

The market for engineering software (CAD, CAM, CAE, AEC, & EDA) is expected to reach USD 50.34 billion in 2022. This fast market growth (from USD 19.98 billion in 2014) is also caused by the increasing use of cloud engineering software, especially by SMEs. North America accounts for about 38% of the global market and Asia Pacific will be one of the fastest growing regions, boosted by the automotive and construction industries. The market share in Europe is 27%, Asia-Pacific 20%, Middle East and Africa 10%, and Latin America (5%). (Transparency Market Research, Nov. 2015: http://www.transparencymarketresearch.com/pressrelease/global-engineering-software-market.htm)

As an example of the increasing use of CAx software, the CAE software CD-adapco provided 2.5 million and 7.3 million computing hours in 2012 and 2013 respectively, i.e. a factor of 3 within one-year time. (Kenneth Wong, Jun. 2014: http://www.deskeng.com/de/map-simulation-cloud/)

The manufacturing sector worldwide accounted for about 16% (USD 12.6 trillion) of the global gross domestic product (GDP) in 2013, being led by China (23.9%), EU (20.9%), USA (16.3%), and Japan (7.6%). (The World Bank, Manufacturing, value added, Oct. 2013: http://data.worldbank.org/indicator/NV.IND.MANF.CD).

In 2012, the European Union (EU) had about 2.1 million companies in the manufacturing sector, employing 30 million people (22.4% of the employment in the EU) and generating about EUR 1.62 trillion of value added (22.6% of the value added in the EU). From the previous figures, 2.08 million companies were manufacturing SMEs, employing 17.7 million people (59%) and generating about EUR 720 billion of value added (44,4%). (eurostat, Manufacturing statistics – NACE Rev. 2, Nov. 2015 http://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacturing_statistics_-_NACE_Rev._2)

The potential customers of the Digital Marketplace will mainly be SMEs (and mid-caps) in the manufacturing sector, since these have limited resources and might have difficulties to afford the

expensive software licenses or the hardware to perform high-end computations. Similarly, SMEs might not have the engineering expertise to prepare and execute such computations.

Nonetheless, the customers are not restricted to the above-mentioned ones; we will also aim to serve engineering companies or big manufacturing companies with high engineering expertise, which are also willing to explore new technologies and alternative business models.

The target industries within the manufacturing sector are too large to design go-to-market activities; thus, the 3 major target industries are also segmented into smaller chunks (see Figure 37). Nevertheless, the initial marketing activities will focus on one segment, in order to optimize the resources and to increase the possibility to dominate one segment. The gained experienced will support the expansion to other segments and industries with proven results.

Segments in Europe	Enterprises
Professional, scientific and technical activities (Oct. 2015)	
Architectural and engineering activities	906500
Technical testing and analysis	62900
Manufacture of fabricated metal products (Apr. 2013)	
Treatment and coating of metal; machining	142100
Structural metal products	122600
Cutlery, tools and general hardware	49600
Manufacture of machinery and equipment (Apr. 2013)	
General-purpose machinery	12000
Metal forming machinery and machine tools	9300
Agricultural and forestry machinery	7500

FIGURE 37 - TARGET SEGMENTS IN EUROPE FOR THE DIGITAL MARKETPLACE

(eurostat - Manufacturing statistics - NACE Rev. 2 https://ec.europa.eu/eurostat/statistics-explained/index.php/Manufacturing_statistics_-_NACE_Rev._2)

It is estimated that about 567.000 manufacturing companies (2014) utilize engineering software in Europe and it is expected that about 120.000 manufacturing companies in Europe will adopt cloud engineering software by 2022.

Revenue Streams:

Although we have not quantified nor prioritised the possible revenue streams, we have identified the most promising services:

- Services based computation units
  - Software as a Service / Engineering Apps as a Service: consumed by manufacturing SMEs
  - Platform as a Service: consumed by ISVs with external web portals

- Services based on time units
  - Consultancy
  - Training / Education
  - Projects
- Services based on clicks / impressions
  - Advertising

6   DIH'S IMPACT

DIHs are contributing to CloudiFacturing impact closing the gap between experiment partners and impact and commercialisation of their experiment results. Specifically, DIHs contribute to experiment management and interface with consortium, networking and business acceleration, training (as discussed in Section and dissemination activities. Figure 38 below, shows a sketch of the activities.
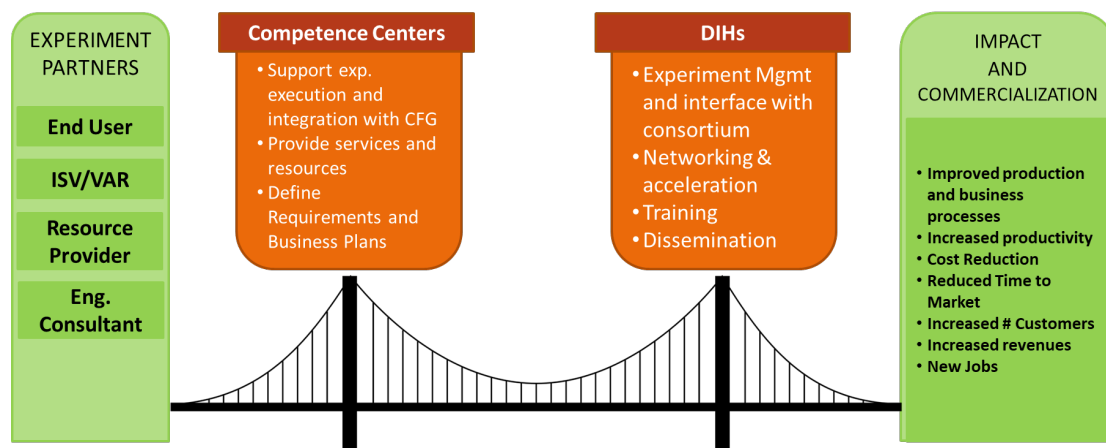

FIGURE 38 - ROLES OF DIHS AND COMPETENCE CENTERS IN IMPACT AND COMMERCIALIZATION

The main impacts that are sought by experiment partners (end-users, ISVs/VARs, resource providers and engineering consultants) are: improved production and business processes, increased productivity, cost reduction, reduced time to market, increased number of customers, increased revenues and new jobs.

After the experiment, experiment partners, DIHs, and involved parties will work to ensure maximum industrial impacts. DIHs will do so by disseminating within their network the experiment results and supporting experiment partners with the definition of a road to market to engage corporates and industrial clients.

The following main activities will lead to customers' acquisition and business scaling:

- Networking and commercial meetings

- Corporate procurement (support end-user SMEs to collaborate or become suppliers of large enterprises to enlarge their market)

- Pilot projects (projects through which this facilitation is made)

- Potential additional investments.

7   DIH'S TRAINING ACTIVITIES

Training is one of the main activities of DIHs within CloudiFacturing. DIHs are mainly supposed to train and inform SMEs and mid-caps about the CloudiFacturing offerings, from open calls to services. This will ultimately contribute to reach the overall project objectives, as depicted in the scheme of Figure 39 below.
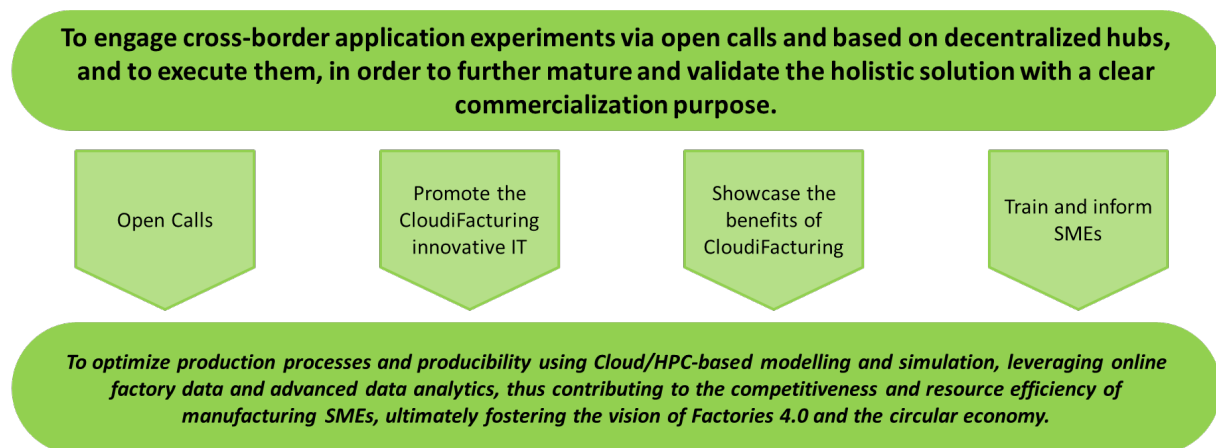

FIGURE 39 - ROLE OF DIHS

In particular, training activities of DIHs can be grouped into two categories: tasks to be performed at the beginning of each experiment wave and before and during open calls. In the first case, DIHs are supposed to train experiment partners about EC & CloudiFacturing rules and best practices, tools and opportunities for maximization of results, and exploitation. This happened at the beginning of the project, together with the kick-off of first wave of experiments, and will happen in the first months of 2019, when the 2nd wave of experiments will start the activities.

Before and during the organisation of open calls, DIHs are supposed to train external stakeholders and potential experiment partners about CloudiFacturing concept and main goals, proposal preparation (including provision of comments and suggestions), and collaboration to establishment of impact figures and preliminary exploitation plans.

The following Figure 40 summarises the training activities of DIHs and Competence Centres.

Trainers / Trainees	Experiment Partners	External Stakeholders
Competence Centers	Code Camp Requirements & Business Modelling Services integration	Platform information Marketplace details Technical & Integration framework
DIHs	EC & CloudiFacturing rules & Best Practices Results Maximization Exploitation	CloudiFacturing concept and main goals Proposal Preparation Impact figures and exploitation
	BEGINNING OF EACH EXPERIMENT WAVE	**BEFORE AND DURING OPEN CALLS**

FIGURE 40 - TRAINING ACTIVITIES OF DIHS AND COMPETENCE CENTERS

Training events will take place at the beginning of each experiment wave targeting third parties participating in experiments with both technical and also business impact related content. External focused training events will also be organised during the second half of the project to raise further awareness and train potential new customers about utilising the marketplace and its technology platform.

8   CONCLUSIONS

This second period between October 2018 and February 2019 has been quite satisfying. The number of followers in Social Media has increased but mainly, CloudiFacturing's webpage numbers have shown a significant increase in this period.

With the help of the DIHs, Competence Centers and Partners, the project is getting stronger and recognized. Although there is more to do, especially in the communication field, improvements are palpable.