Cloud-based **R**apid **E**lastic **MA**nufacturing

WP9 – Impact

D9.14: Project Collaboration and Standardisation Engagement Reports I

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This first annual report includes two plans where collaborative and standardisation activities for the remaining two years of the CREMA project are established. It also provides a detailed overview of main actions conducted during the first year of the project as well as a selection of main Projects, Technology Platforms, Associations and Standardisation Bodies to be contacted.

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Executive Summary

This deliverable is the first of the three documents where collaboration and standardisation activities carried out in the project will be described and planned. In particular, this report describes the set of collaboration and standardisation activities performed by CREMA partners during 2015 (first year of the project) and provide a Collaboration Plan and a Standardisation Plan for the next two years of the project.

For the preparation of both plans, some basic premises have been followed. First, identifying the main objectives to be achieved with the different activities to be performed within the CREMA and, second, defining an operational strategy based on three stages (Stage 1: Identify and Contact, Stage 2: Involve and Collaborate and Stage 3: Share and Promote) to manage all collaboration and standardisation activities to be conducted in the project.

Regarding collaboration activities and starting with Stage 1 (Identify), this report includes the analysis and identification of main EU projects (FP7 and H2020 Research projects and Coordinating Support Actions - CSAs), European Technology Platforms (ETPs), European, National and Local Associations, Clusters and Initiatives whose fields of action are in close liaison with the challenges and work to be done in CREMA. Related information has served as the main input for defining and planning all future collaboration activities showed in the report by the Collaboration Plan.

Additionally, and by means of the current contacts of CREMA partners and the possibility to attend several events during 2015, some collaboration activities with EU projects, ETPs and Clusters have progressed to Stage 2 (Involve and Collaborate). As a result of this, this report provides a summary with the description of contacts made including the most relevant scientific aspects and main benefits for CREMA project. Some of these activities will have a continuation in the future and, for this reason, are also included in the collaboration plans for 2016 and 2017.

As regards standardisation activities, only Stage 1 (Identify) has been started. In this way, the report includes some references for the best standardisation practices and relevant standardisation bodies which have been identified. Moreover, a preliminary Standardisation Plan covering the main future standardisation activities, have been set up.

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1 Introduction

CREMA – Cloud-based Rapid Elastic MAnufacturing – is a project funded by the Horizon 2020 Programme of the European Commission under Grant Agreement No. 637066.

This deliverable is the first of the three documents where collaboration and standardisation activities carried out in the project will be described. Additionally, each report includes a "Collaboration Plan" and a "Standardisation Plan" with information about foreseen activities to be done until the end of the project. Both plans will be updated for the next period depending on the inputs received and decisions taken during the project execution.

1.1 CREMA Project Overview

CREMA aims at simplifying the establishment, management, adaptation, and monitoring of dynamic, cross-organisational manufacturing processes following cloud manufacturing principles. CREMA will also provide the means to integrate data from distributed locations as if the complete manufacturing was carried out on the same shop floor, by integrating extra- and inter-plant manufacturing assets and making them "mobile".

CREMA will be built upon concepts and methods from the fields of Virtual Factories, Service-oriented Computing, Ubiquitous Computing, Cyber-Physical Systems, the Internet of Things and the Internet of Services, and naturally and most importantly Cloud Computing. To achieve its goals, the project will define tools and approaches in these areas:

- Manufacturing Virtualisation & Interoperability.
- Cloud Manufacturing Process and Optimisation Framework.
- Cloud Manufacturing Collaboration, Knowledge and Stakeholder Interaction Framework.

Thus, to achieve its goals, CREMA conducts original research and applies technologies from the fields of full end-to-end integration of Cloud manufacturing, integration of manufacturing assets and corresponding data sources, the design and execution of manufacturing processes, to the end user support via collaboration and interaction tools. For more information, please refer to the project Website[1].

1.2 Deliverable Purpose, Scope and Context

The main purpose of this deliverable is to describe the set of collaboration and standardisation activities performed by CREMA partners during 2015 (first year of the project) and provide a Collaboration Plan and a Standardisation Plan for the next two years of the project which will be updated in the deliverable Project Collaboration and Standardisation Engagement Reports II (T9.4, D9.15) at the end of 2016.

Regarding collaboration activities, this report includes planned and carried out actions with EU projects (FP7 and H2020 Research projects and CSAs), ETPs (e.g., MANUFUTURE[2]

[1] http://www.crema-project.eu/
[2] www.manufuture.org/

or the alliance for Logistics Innovation through Collaboration in Europe - ALICE ETP[3]), European, National and Local Associations (e.g., the European Factories of the Future Research Association - EFFRA[4] or the Spanish Technological Platform for Advanced Manufacturing - MANU-KET)[5]), clusters (e.g., the Future Internet Enterprise Systems Cluster - FinES[6]) and Initiatives (e.g., ICT Innovation for Manufacturing SMEs - I4MS[7]) in order to achieve the following objectives in accordance with the European Commission:

- Exploitation of synergies and technical "concertation" by means of promotion and participation in workshops, contribution to working groups and task forces and participation / promotion of clusters as a valuable input to scientific and strategic activities.
- Empowerment of knowledge exchange, dissemination and training issues.
- Contribution to repositories of reference implementations and dissemination portals.

With respect to standardisation activities, this report mainly includes planned actions to engage CREMA with the European standardisation process (specifically CEN[8]) as well as actively communicating with other relevant standardisation bodies. Additionally, activities with other EU projects to increase the coordination of standardisation efforts are considered and planned. Naturally, standardisation efforts can only be fully covered once more tangible results are available. Hence, the report sections on standardisation engagement will grow from year to year.

Also, this deliverable has some complementarities with the Scientific Dissemination Reports I (T9.3, D9.9) where other dissemination actions (e.g. publications) are described in detail.

1.3 Document Status and Target Audience

This document is listed in the Description of Action (DoA) as "public", since it provides information about the past, current and future collaboration and standardisation activities done during the project execution. It may be used by external parties to have a vision of relevant activities made and planned in the project and get ideas for defining their own activities.

This document has primary audience the project partners as a reference point to know the collaboration and standardisation activities that have been made in the project so far and particularly those which are scheduled to perform in the next period. Nevertheless, some collaboration activities and, above all, standardisation ones may be of interest to the scientific and industrial communities, other public or private funded projects as well as related associations.

[3] www.etp-logistics.eu/
[4] www.effra.eu/
[5] www.manufacturing-ket.com/manu-ket/
[6] http://cordis.europa.eu/fp7/ict/enet/ei_en.html
[7] http://i4ms.eu/
[8] http://www.cen.eu/

1.4 Abbreviations and Glossary

A glossary of common terms and roles related to the realisation of CREMA as well as a list of abbreviations is provided as an online glossary[9] / abbreviations list[10].

1.5 Document Structure

This deliverable is broken down into the following sections:

- **Section 1 (Introduction)** provides an introduction for this deliverable, including a general overview of the project, and outlines the purpose, scope, context, status, and target audience of this deliverable.
- **Section 2 (Collaboration and Standardisation Premises)** states objectives and the strategy for conducting collaboration and standardisation activities.
- **Section 3 (CREMA Collaboration Plan)** includes the identification of relevant EU projects, ETPs, European, National and Local Associations, Clusters and Initiatives, the Collaboration Plan for the next two years of the project as well as a description of the collaboration activities performed during 2015.
- **Section 4 (CREMA Standardisation Plan)** includes the identification of relevant Standardisation Bodies and the Standardisation Plan for the next two years of the project.
- **Section 5 (Conclusion)** concludes the document.
- **Annexes:**
  - **Annex A**: List of EU Projects analysed
  - **Annex B**: List of Standardisation Bodies analysed
- References: Provides the details of the references mentioned in the document

[9] http://crema-project.eu/glossary
[10] http://crema-project.eu/abbreviations

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2 Collaboration and Standardisation Premises

As basic premises for the preparation of the Collaboration and Standardisation Plans, main objectives to be achieved with the different actions to be performed within the CREMA project have been identified. Thus, each action included in a plan will be conveniently characterized facilitating its posterior analysis and quantification. Also, an operational strategy based on three stages has been defined addressing the process to follow for managing all collaboration and standardisation actions to be conducted in the project.

2.1 Objectives

This section is intended to provide a general overview of the main objectives to be achieved in CREMA by conducting collaborative actions with different types of entities such as EU projects, ETPs, Associations, Clusters, Standardisation Bodies and other Initiatives. These objectives may be different depending on the type of entity with which will be established a collaboration. For example, to increase the visibility of CREMA is generic regardless the type of entity to be contacted. However, collaboration with a technology platform will be more focused on information sharing or participation in Working Groups.

Below is a list of these objectives is described:

- **Increasing visibility** - Introduce the CREMA project to the scientific and industrial communities is a general objective applicable to any entity to be contacted. To increase the visibility of CREMA, actions such as the distribution of the official presentation of the project to all entities contacted, regular communication of newsletters and event calendars for publication on respective websites or live presentations at events organized in these entities (e.g., EFFRA General Assembly or EU projects workshops) will be planned.
- **Sharing information** - Sharing ideas, approaches and available information is a general aim of the collaboration. Particularly interesting is the case of collaboration with other EU projects (e.g., C2NET[11] project for research activities or the CSA FoF-Impact[12]) for exploitation activities, enabling the possibility to share information about projects results including deliverables generated. This will be a valuable input to improve the efficiency of tasks to be carried out both within CREMA and the project to work with.
- **Using projects' results** - Maximum reuse by CREMA of results generated by other projects (e.g., frameworks, methodologies, or software) is one of the objectives of the European Commission and, therefore, one of the collaboration objectives to agree with the contacted entity. Considering aspects related to IPRs and exploitation of the results of each project, the possibility of their use in CREMA will be analysed. Particularly important is the contribution that CREMA partners can make as partners of contacted projects such as ICE in ARUM[13], TUV, DFKI, ICE,

[11] http://c2net-project.eu/
[12] http://www.effra.eu/impact/
[13] http://arum-project.eu/

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TANet and ASC in FinES Cluster. They can contribute providing knowledge and results generated in these projects.

- **Increasing knowledge about results exploitation strategies** - Enhancing the exploitation of CREMA project results is another key objective to get. A better knowledge of different strategies employed by other projects to increase the impact is another relevant issue to be considered as potential collaboration actions. Particularly interesting will be the collaboration with CSA projects such as FoF-Impact or FOCUS[14] on which guidelines and operating procedures to maximise impact of the results of EU projects will be defined.
- **Enhancing business models knowledge** - Identifying the most appropriate business model to bring CREMA results to the market is another crucial objective to be achieved. The creation of new companies or the generation of new activities by CREMA partners requires a thorough knowledge of alternative business models to be used for their materialisation. In this regard, collaboration with projects will be a valuable input to provide additional information to define the most adequate business model for exploiting CREMA results. Special relevance will have the collaboration with CSAs (e.g., Road4Fame[15]) who is working in this field.
- **Contributing to Work Groups or Tasks Forces** - Another way of cooperation is provided for participation in different working groups or tasks forces existing in different ETPs, Joint Undertakings (JU) or Associations to contribute to the preparation of strategic agendas and technology roadmaps. The ECSEL Multi-annual Strategic Plan[16], the EFFRA Multi-annual roadmap[17] or the ALICE WG4 Global supply network coordination and collaboration roadmap[18] are some examples. Membership of some CREMA partners to these entities will facilitate this type of action, e.g. IKER can participate in the EFFRA Multi-annual roadmap as member represented by IK4 Research Alliance[19].
- **Contributing to current standards** - To establish collaborations with standardisation bodies related to tasks performed in CREMA is another objective to achieve. The use of existing standards in the developments to be made in the project and propose ideas to contribute to the process of definition and consolidation of new standards will be the main result of collaboration actions in this field. Engaging these organisations not being a member is not an easy task. Contacts with membership companies will be mobilized to explore possibilities to channelling CREMA contributions.

2.2 Strategy

For the preparation of the Collaboration and Standardisation Plans a three-stage strategy has been designed temporarily distributed throughout the project. These stages have some overlap (see Figure 1) because it is difficult to predict unplanned actions that may arise at any time, for example, a new contact that is necessary to analyse and plan.

[14] http://www.focusonfof.eu/
[15] http://road4fame.eu/
[16] http://www.ecsel-ju.eu/web/downloads/Documents_GB/ecsel-gb-2014-22_masp_2015.pd
[17] http://www.effra.eu/attachments/article/72/FoF%20Roadmap_FP7.pdf
[18] http://www.etp-logistics.eu/?page_id=94
[19] http://www.ik4.es/es/default.asp

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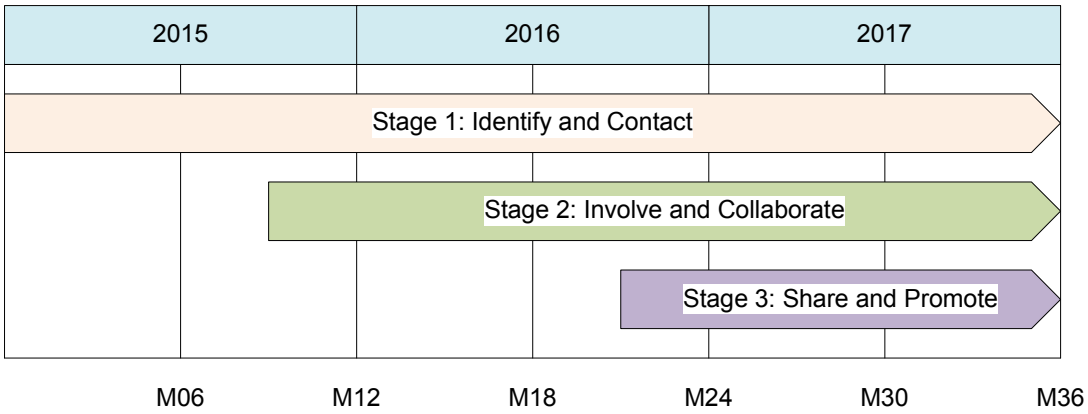

Figure 1: Collaboration and Standardisation strategy

2.2.1 Stage 1: Identify and Contact

The first stage starts with the identification of relevant entities such as EU projects, ETPs, European, National and Local Associations, Clusters, Standardisation Bodies and other initiatives aligned with CREMA objectives. To do this activity, references include in CREMA DoA as well as current "official" clusters, e.g. the cluster Domain 4: Collaborative and Mobile Enterprises defined for the event Factories of the Future (FoF) Impact Workshop[20] organised by the EC in cooperation with EFFRA last April 2015, have been considered.

After identification, prioritisation and selection, the process continues making contacts with selected entities. The standard procedure to follow is to conduct a mailing to all selected entities with information about the CREMA project including the official project presentation and suggesting the kind of collaboration that could be established in the future. This mailing is customised depending on the type of entity and target collaboration objectives. For example, in order to increase the visibility of CREMA, a contact with another EU project would include mentions to collaborate publishing bidirectional newsletters in respective websites or making live presentations at events organised by both projects could be included.

As mentioned above, interesting new contacts can come up throughout the project's development being necessary to properly handle them. This is the reason why this stage finishes at the end of the project stressing the importance of having live collaboration and standardisation plans.

This report focuses on actions taken in this first stage. The identification and selection process has been completed and contacts with selected entities have been done partially. It is expected that contacts with selected standardisation bodies will be done before ending the first quarter of 2016. However, and without the mailing procedure, a relevant number of contacts with some EU projects such as C2NET, iMAIN[21], FOCUS or ARUM, ETPs such as ALICE[22] or MANU-KET have been done during 2015. This has been possible taking

[20] https://ec.europa.eu/research/industrial_technologies/meetings-and-workshops_en.html
[21] http://www.imain-project.eu/
[22] www.etp-logistics.eu/

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advantage of contacts and participation in events carried out by some CREMA partners (for more details see Section 3.3).

2.2.2 Stage 2: Involve and Collaborate

On the basis of the mailing replies and their posterior analysis, a detailed set of actions will be defined to involve related entities and agree the kind of concrete collaboration to have with each one. Actions resulting from this agreement will be planned and included in their respective Collaboration and Standardisation Plans to monitor their implementation.

Special interest will have actions with entities involving regular collaboration in which sharing irrelevant information and practices will be especially useful for development tasks, business models and exploitation of results. In this case, planning activities will have to take into account the specific objectives to be achieved and the effort required by the CREMA partners. For example, the creation of mini-clusters consist of two or three EU projects that hold regular meetings must be properly planned and sized to efficiently manage available resources.

Stage 2 will start in the second year of the project and finish at the end of the project. Collaboration and standardisation actions derived from agreements with entities will follow the time schedule showed in their respective plans and may continue until the completion of the project. To remark that there is an overlapping with stage 1 until the end of the project. The chance to identify a new contact from stage 1 at any time demands to start stage 2 activities to manage it adequately.

It should be noted that the first mini-cluster formed with C2NET project is already operational having had the first Technical Workshop meeting in early November. Clear synergies and interests among projects, both were funded in the H2020 FoF Topic-01-2014[23] under the theme of Collaborative and mobile manufacturing, and direct involvement of IKER as beneficiary of the two, have allowed CREMA to bring forward this stage for implementing this action.

Related to this stage, this report shows the collaboration and standardisation actions planned for the second and third year of the project. Their level of detail will be increased after receiving entities' replies, analysing them and defining specific actions. In any case, planned actions already started as well as specific events to attend have been included.

2.2.3 Stage 3: Share and Promote

The third stage will be focused on the sharing of achieved CREMA results with contacted entities. This is a critical stage in which quality and suitability of project outputs will be validated both for the scientific, standardisation and industrial communities.

This stage will be carried out mainly during the last year. Active participation in industrial and scientific workshops as well as in other events with high level of audience will be critical not only to validate technical results of the project but to have direct information about the exploitability of the project results. In this way, events organised either by CREMA or other entities will be relevant actions to be considered and planned in this stage.

[23] https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/430-fof-01-2014.html

Promotion actions have special relevance to convince industrial end users to use CREMA results. In this sense, specific actions are required to know as soon as possible the opinion of industrial end users. This is why and industrial workshop has been planned in last half of the second year of the project. Feedback of the industrial community will provide valuable information to fit and, if necessary, correct the technical direction of the project.

This report includes a rough collaboration and standardisation plans for this stage. It will be refined and updated during the second year of the project and presented in the next version of this report to be provided at the end of that year.

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3 CREMA Collaboration Plan

The main aim of the Collaboration Plan is to define the list of collaboration activities to be done during the three years of the CREMA project. This Collaboration Plan will serve as a guideline for significant contacts and clustering actions for CREMA research and dissemination tasks. Promoting collaboration among different projects, associations, clusters and other kind of initiatives is a strategic approach to maximise project results impact and to optimise resources involved in it.

CREMA Collaboration Plan will have a strong interaction with T9.2 Promotion and Promotional Material and T9.3 Dissemination and Workshops in two ways: First, the Collaboration Plan will use results from both tasks as well as all project deliverables and resource expertise to increase the efficiency of planned actions and, secondly, new planned actions will act as input for guiding future activities to be done in both tasks. At this point, it is important to highlight the dynamic character of this plan which implies its continuous evolution over time. CREMA addresses different application domains related to collaborative manufacturing technologies which are rapidly evolving and feature a wide range of initiatives and projects. Therefore, the Collaboration Plan will be continuously monitored and updated.

In line with the stage 1 of the strategy proposed in Section 2.2, the preparation of the Collaboration Plan has been done starting with the identification of relevant entities for the CREMA project (Section 3.1). Then, the Collaboration Plan scheduled for the second and third year of the project is presented (Section 3.2). As concrete actions will be defined in the second year of the project, the Collaboration Plan for the third year will be updated and presented in the next version of this report (end of 2016). Finally, in Section 3.3, a description of collaborative actions undertaken during 2015 is included.

3.1 Identification of EU projects, ETPs and Associations

To prepare the first release of the Collaboration Plan, a previous process of identification of relevant EU projects, ETPs, European, National and Local Associations, Clusters and Initiatives has been conducted. Sections 3.1.1 and 3.1.2 describe this process and the results of it, namely, the selection of projects and organisations to be contacted in order to define concrete collaboration activities. IKER and TANet have clear links and associations with organisations such as EFFRA and will use all channels available for collaboration opportunities.

3.1.1 EU Projects

For the identification and selection of relevant EU projects the following step has been taken:

- **Preliminary selection of projects**: To set this preliminary list, projects mentioned in the CREMA DoA have been collected. Additionally, a set of projects referenced in the C2NET DoA have been added. C2NET is together with CREMA the other project funded in the Topic H2020 FoF-01-2014 under the theme of Collaborative and mobile manufacturing and IKER is involved in both projects. Finally, projects included in the cluster called Domain 4: Collaborative and Mobile Enterprises have been considered. CREMA along with other 14 projects was allocated in this Domain

during the FoF Impact Workshop organized by the EC in cooperation with EFFRA in April 2015. Annex A includes the table with the 80 selected projects including a brief description and their relationship with CREMA research WPs.

- **Review of projects contents and alignment with CREMA**: From the information available, their potential interest has been established by analysing their fit with the different CREMA research work packages.
- **Final selection**: Besides the project alignment with CREMA objectives and activities, only in progress or just ended projects have been selected.

Tables 1 and 2 show the selected H2020 and FP7 projects respectively. Each table contains the information necessary to establish contact with project coordinators, know the main purposes for collaborating and which CREMA partners participate in each project, if any, or have some kind of contact with them (in brackets). This information will be used to address the analysis of replies received after contacting them by the customised mailing mentioned above.

Table 1: Selected H2020 Projects

Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
ACCEPT	RIA	ASCORA Tim Dellas dellas@ascora.de	ACCEPT has performed an in-depth analysis of augmented reality and smart glasses technologies whose analysis results could benefit CREMA Agile Personal Collaboration Environment which is planned in T6.4. Besides, ACCEPT will use sensors for measuring values such as temperatures, humidity or optical information representing a useful input for T4.4 CREMA Cyber-Physical Systems, Sensor Abstraction and Virtualisation. Also, ACCEPT will deal with the management of marketplace assets and transactions tob be use in T6.1 CREMA Marketplace and Monetisation.	01/01/2018	ASC
C2NET	RIA	ATOS Silvia Castellvi silvia.castellvi@atos.net	C2NET is together with CREMA the other project funded in the Topic H2020 FoF-01-2014 under the theme of Collaborative and mobile manufacturing. Due to existing synergies of both projects, creating a mini-cluster to maintain several technical meetings to share relevant information and will be the main goal of this collaboration.	01/01/2018	IKER

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Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
Co-FACTOR	CSA	Steinbeis-Europa-Zentrum Patricia Wolny wolny@steinbeis-europa.de	To acquire knowledge for managing clusters of projects with common topics and interests to speed-up short-term exploitation of project results in industrial settings.	01/01/2017	
EFFECTIVE	CSA	SYNESIS Franco Cavadini franco.cavadini@synesis-consortium.eu	To be aware of the EFFECTIVE industrial exploitation framework for the promotion and transfer of FoF projects activities and results. How to structure networks & alliances to achieve such objectives will be another collaboration purpose.	31/01/2017	
FOCUS	CSA	NTNU Odd Myklebust odd.myklebusttnu.no	Knowing exploitation methods to be developed in FOCUS and the convenience of being used in CREMA.	01/01/2017	(IKER)
FoF-Impact	CSA	EFFRA Chris Decubber chris.decubber@effra.eu	Access to FoF-Impact results (tools and guidelines) in order to speed up and increase the exploitation of CREMA outcomes.	01/01/2017	(IKER)
MANTIS	ECSEL -RIA	MONDRAGON GOI ESKOLA POLITEKNIKOA Urko Zurutuza uzurutuza@mondragon.edu	Sharing information about services platform architectures to be defined in both projects. Due to MANTIS is focus in providing maintenance services, this will be especially interesting for the Use Case of FARR.	01/06/2019	IKER
Road2CPS	CSA	Steinbeis-Europa-Zentrum Meike Reimann reimann@steinbeis-europa.de	To have a direct link to roadmaps, current research priorities and business opportunities for future CPS (Cyber Physical Systems).	01/02/2017	(IKER)

Table 2: Selected FP7 Projects

Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
amePLM	CP	FhG IAO Joachim Lentes joachim.lentes@iao.fraunhofer.de	amePLM will develop an ontology for an open engineering system. This can have potential use in CREMA T4.1. Exploring possibilities to use open-source software tools and libraries.	31/03/2015	
ALFRED	CP	ASCORA	ALFRED had to deal with the challenge of storing information that is requiring high reliability and security aspects. For CREMA, this had a positive impact to its security and privacy	30/09/2016	ASC

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Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
			approach outlined in T3.4 and to its data management approach of T4.3. In addition, both projects exchanged on how to visualise information in a responsive way while providing personal and easy to understand data visualization. For CREMA this aspect is especially important for its dashboard approach in T6.5.		
APPS4AME	CP-FP	FhG Michael.Lickefett	Apps for advanced Manufacturing Engineering developed in APPS4AME could be applicable in CREMA. Where appropriate, to know possibilities to use them in CREMA WP4, WP5 and WP6 will be an objective.	30/11/2015	
ARUM	CP	Airbus Defence and Space GmbH Arnd Schirrmann coordinator@arum-project.eu	ARUM provides an Enterprise Service-Based platform (i-ESB) that will integrate a service-based architecture with a knowledge-based Multi-Agent System. This platform has special interest for CREMA T3.1, WP5 and WP6 due to it gathers information from sources such as sensors and resource management systems, giving decision makers and planners.	30/09/2015	(ICE)
CAPP-4-SMES	CP-FP	KUNGLIGA TEKNISKA HOEGSKOLAN Vincent Wang wangxi@kth.se	CAPP-4-SMES provides a machine availability monitoring for real-time job routing; and a Cloud-based services platform for cost-effective and easy access over the Internet are interesting topics which may be useful for CREMA WP5 and WP6.	30/11/2015	
CELAR	CP	ATHENA Nectarios Koziris nkoziris@cslab.ece.ntua.gr	CELAR provides an elastic platform for the support of very large, service-based process landscapes. This may be an interesting input for CREMA T4.3 and WP6 in order to develop an elastic Infrastructure for Cloud Manufacturing Processes.	30/09/2015	TUV
CLOUDSME	CP	THE UNIVERSITY OF WESTMINSTER LBG Tamas Kiss T.Kiss@westminster.ac.uk	The CloudSME Simulation Platform provides simulation applications in form of SaaS to support SMEs simulation needs. This could be particularly interesting by CREMA WP4, WP5 and WP6 where services	31/12/2015	

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Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
			will be developed.		
EPES	CP	TECNALIA Ana Arroyo ana@robotiker.es	The EPES system will include features for collaborative work such as Virtual Factory knowledge repository, service configuration, and a simulation and decision-making platform. CREMA T6.3 and T6.4 can receive valuables inputs from it.	28/02/2015	(IKER)
FITMAN	CP	TXT E-SOLUTIONS SPA Sergio Gusmeroli sergio.gusmeroli@txtgroup.com	The FIWARE Generic Enablers (GE's) offer the opportunity to interlink with other services offered by Fitmanufacturing Lab (FML) which will be supported on Sematronix www.smecluster.com portal.	31/03/2015	DFKI TANet
GloNet	CP	CAS SOFTWARE AG Spiros Alexakis Luis M. Camarinha-Matos	GloNet aims at designing, developing, and deploying an agile virtual enterprise environment for promoting networks of SMEs collaborating with customers and local suppliers. Project outcomes may have quite interest for CREMA T6.4 Agile Personal Collaboration Environment.	28/02/2015	(IKER)
MONDO	CP	X/OPEN COMPANY LIMITED Dimitris Kolovos ku.ca.kroy@sovolok.sirtimid	MONDO provides the means to model large scale models based on Cloud technology. It provides some basic modelling technology that can be used within CREMA WP4.	30/04/2016	IKER
OSMOSE	CP	PIKSEL SPA Claudia Guglielmina Claudia.guglielmina@txtgroup.com	OSMOSE will develop a reference architecture, a middleware and applications for interconnecting Real, Digital and Virtual Worlds. In this sense, CREMA T4.4 Cyber-Physical Systems, Sensor Abstraction and Virtualisation could be benefitted from this collaboration.	30/09/2016	(IKER)
PREMANUS	CP	POLITECNICO DI MILANO Laura Catellani laura.catellani@polimi.it	PREMANUS will provide an on demand middleware for product information and product services within one service oriented architecture for exchanging information about products at the end of their lifecycle (KPIs monitoring). This may be useful for CREMA T6.2 and T6.5.	30/06/2015	(ICE)
ProaSense	CP	SINTEF Hans Torvatn Hans.Torvatn@sintef.no	ProaSense provides a distributed architecture for the management and processing of big-data that will eventually enable continuous monitoring	31/10/2016	(IKER)

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Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
			and the need for service adaptation. It includes novel approaches for scalable storage and access to sensed data and development of smart sensing services. Outcomes from this project can have relevance for CREMA WP4 and WP6.		
PROSECO	CP-IP	TECNALIA Ana Arroyo ana@robotiker.es	The objective of PROSECO is to provide a novel methodology and comprehensive ICT solutions for collaborative design of product-services and their production processes. A Cloud Manufacturing approach will be applied for effective collaboration.	30/09/2017	(IKER)
Road4FAME	CSA	Steinbeis-Europa-Zentrum Meike Reimann reimann@steinbeis-europa.de	Road4FAME provides a strategic research and innovation roadmap for future architectures and services for manufacturing and methodologies for new business opportunities identification. Collaboration will be through participating in future workshops promoted by Road4FAME to contrast and enrich CREMA issues related to Business Models (T2.3) and Exploitation plans (T9.1).	31/10/2015	(IKER)
ROBUSTPLANET	CP-FP	MAGYAR TUDOMANYOS AKADEMIA SZAMITASTECHNIKAI ES AUTOMATIZALASI KUTATO INTEZET Botond Kádár info@robustplanet.eu	The RobustPlaNet project aims to provide an innovative technology-based business approach for promoting collaborative and robust production networks able to timely deliver innovative product-services in very dynamic and unpredictable, global environments. Innovative product-services enabled by ICT, methodologies for decision-making and innovative business and assessment models will be an input for CREMA T2.3, T4.5, T5.3, T6.3 and T6.4.	30/09/2016	
SIMPLI-CITY	CP	TECHNISCHE UNIVERSITAET WIEN Stefan Schulte s.schulte@infosys.tuwien.ac.at	Although SIMPLI-CITY working field is in the mobility domain, there are some similarities between smart mobility and smart factories. Insights about the assembling of a unified data model, re-usage of data interoperability and data integration methods, techniques and tools as well as the application of elasticity for	30/09/2015	TUV ASC

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Project	Type	Coordinator	Collaboration purpose	End date	CREMA partners
			processes have been discussed to have a valuable input for CREMA WP4 and WP5.		
USE-IT-WISELY	CP-IP	VTT Göran Granholm Goran.Granholm@vtt.fi	The project will develop a product-service platform providing an interactive and collaborative distributed environment for enhancing product-service agility and extended service life. This may be interesting for CREMA T6.4 Agile Personal Collaboration Environment.	30/11/2016	(IKER)
VENIS	CP-FP	ENGINEERING - INGEGNERIA INFORMATICA SPA	VENIS promotes interoperability between Large and Medium-Small-Micro Enterprises providing a distributed and secure repository to share the information contained in the file systems, databases, ERPs, CRMs, and other legacy applications of the enterprises. Lightweight web services for the smart integration of the information exchanged using a distributed processes engine mechanism to execute business processes is an interesting input for CREMA WP4 and WP5.	31/08/2015	

3.1.2 ETPs, Associations, European Initiatives and Clusters

References included in the DoA and some additional inputs provided by some CREMA partners, e.g., contractual Public-Private Partnerships (cPPP) such as the Sustainable Process Industry through Resource and Energy Efficiency (SPIRE)[24] or the Big Data Value Association (BDVA)[25], have been used as the main source to identify the set of ETPs, Associations, European Initiatives and Clusters relevant for the purposes of CREMA. Table 3 shows the list of selected entities including contacts, the type of collaboration as well as the CREMA partners which have some relationship either directly as a member or indirectly as represented member (in brackets). As for EU projects, this information will be used to address the analysis of replies received from these entities.

[24] http://www.spire2030.eu/
[25] http://www.bdva.eu/

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Table 3: Selected ETPs, Associations, European Initiatives and Clusters

Acronym	Type	Mission	Collaboration purpose	CREMA partners
AFM	Association	AFM, Advanced Manufacturing Technologies, is the Spanish Association of manufacturers of machine tools, accessories, parts and tools. It represents 90% of machine tool and advanced manufacturing technology companies in Spain. Contact: afm@afm.es	Giving visibility to CREMA project at the large community of Machine Tool manufacturers in Spain. As a press manufacturer, special emphasis will be placed on the objectives and results to be achieved in the FARR Use Case.	(IKER) FAGOR GOIZ
ALICE	ETP	To develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe. The platform will support and assist the implementation of the EU Program for research: Horizon 2020. Contact: Fernando Liesa fliesa@etp-alice.eu	Increasing visibility of CREMA project and exploring opportunities for future collaborations (e.g. contributing to ALICE working groups due to close ties with CREMA WP3 and WP4)	(IKER)
BDVA	Association	The Big Data Value Association AISBL is a fully self-financed non–for-profit organisation under Belgian law. The main role of the Big Data Value Association will be providing the Big Data Value strategic research agenda (SRIA) and its regular updates, defining and monitoring the metrics of the cPPP and joining the European Commission in the cPPP partnership board. Contact: lgh@spire2030.eu	Increasing CREMA visibility to the Big Data community especially in those aspects related with the outcomes achieved form the application of the component CREMA Manufacturing Big Data, Knowledge and Analytics.	ICE
CECIMO	Association	CECIMO is the European Association of the Machine Tool Industries, we bring together 15 national associations of machine tool builders, which represent approximately 1500 industrial enterprises in Europe, over 80% of which are SMEs. CECIMO defends the common interests of its members, particularly in relation to authorities and associations, and promotes the European machine tool industries and their development in the fields of economy, technology and science. Contact: information@cecimo.eu	The collaboration purpose is the same as in the case of AFM but at European level. In fact, AFM is member of CECIMO.	(FAGOR) (GOIZ)
EBN Innovation Network	Network	EBN is a network of around 150 quality-certified EU BICs (Business and Innovation Centres) and 100 other organisations that support the development and growth of innovative entrepreneurs, start-ups and SMEs. EBN is also a community of professionals whose day-to-day work helps these businesses to grow in the most effective, efficient and sustainable way. Contact: info@ebn.eu	To enhance CREMA business opportunities by accessing a large community of centres and organisations specialised in supporting the creation of new businesses.	

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Acronym	Type	Mission	Collaboration purpose	CREMA partners
ECSEL JU	Joint Undertaking	ECSEL is a partnership between the private and the public sectors for advancing the state-of-the art in electronic components and systems and contributing to the development of a strong and globally competitive electronics components and systems industry in the European Union. Contact: ecsel-office@ecsel.europa.eu	To give more visibility to CREMA project especially in activities related to T4.4 CREMA Cyber-Physical Systems, Sensor Abstraction and Virtualisation. Contributing to the preparation of the ECSEL Multi Annual Strategic Research and Innovation Agenda (MASRIA).	IKER
Enterprise Europe Network	Network	The Enterprise Europe Network is a key instrument in the EU's strategy to boost growth and jobs. Bringing together around 600 business support organisations from more than 50 countries, we help small companies seize the unparalleled business opportunities in the EU Single Market. Contact: info@eurada.org	Increasing CREMA dissemination and business opportunities to exploit project results.	
EFFRA	Association	The European Factories of the Future Research Association (EFFRA) an industry-driven association promoting the development of new and innovative production technologies. It is the official representative of the private side in the 'Factories of the Future' public-private partnership. Contact: Chris Decubber chris.decubber@effra.eu	Dissemination of CREMA goals, activities and outcomes to EFFRA community formed by industrial enterprises, research organisations, universities, associations and related stakeholders from across Europe. Contributing to the preparation of the EFFRA Strategic Multi-Annual Roadmap 2014-2010.	(IKER)
EURADA	Association	The European Association of Development Agencies (EURADA) has a membership of about 70 regional development agencies from across the European Union. Agencies from almost all the Member States of the EU are EURADA members. EURADA runs conferences and seminars and has an extensive publications programme. It keeps its members up to date with EU policy developments and provides briefing on critical issues such as state aid rules. It alerts members to funding and contract opportunities and helps with forming and running partnerships. Contact: info@eurada.org	Spreading CREMA activities and results inside a big group of European regional development agencies in order to promote new business opportunities.	
FinES Cluster	Cluster	The Future Internet Enterprise Systems (FInES) Cluster aims to catch the realm of Future Enterprises opening up new research perspectives for the domain. It is uniting the previous Enterprise Interoperability and Collaboration (EI) and Digital Ecosystems (DE) clusters in order to encompass the past and current research experts and organisations	To enhance CREMA collaboration and synergies with other research projects in the fields of Enterprise Interoperability and Collaboration and Digital Ecosystems.	ICE TUV DFKI TANet ASC

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Acronym	Type	Mission	Collaboration purpose	CREMA partners
		focusing on benefiting all of us by offering an increased opportunity for synergy and enhanced collaboration among research projects in this unit. Contact: Alexandra de Neuville		
ManuClouds	Network	ManuClouds is a global organisation dedicated to supporting R&D innovation on cloud manufacturing. ManuClouds presents the most comprehensive information about R&D activities on cloud manufacturing. It network researchers from industry, academia, and research institutions under this theme. Contact: support@manuclouds.org	To disseminate CREMA activities related to cloud manufacturing (T4.3 CREMA Cloud-based RAID Infrastructure and WP5 Cloud Manufacturing Process and Optimisation Framework).	ASC
MANUFUTURE-EU	ETP	To propose, develop and implement a strategy based on Research and Innovation, capable of speeding up the rate of industrial transformation to high-added-value products, processes and services, securing high-skills employment and winning a major share of world Manufacturing output in the future knowledge-driven economy. Contact: Chris Decubber chris.decubber@effra.eu	Dissemination of CREMA goals, activities and outcomes to MANUFUTURE community.	(IKER)
MANU-KET	ETP	MANU-KET is established as the Spanish Technological Platform for Advanced Manufacturing. Its aim is to identify technological needs required by future products and services, in which the incorporation of advanced materials, microelectronics, photonics and nanotechnologies (all of them, considered Key Enabling Technologies as defined by the EC) require new processes, equipment and production systems with new levels of productivity, safety, functionality or precision. Contact: secretaria@manufacturing-ket.com	Dissemination of CREMA goals, activities and outcomes to MANU-KET community.	IKER
NESSI	ETP	NESSI, the Networked Software and Services Initiative, is the European Technology Platform, for this new Digital Information Society and Economy powered by software and services and data. NESSI promotes that software, services, and data are key enablers to help resolve European societal and economic challenges across all sectors, both private and public, such as manufacturing, transportation, energy, and healthcare. Contact: office@nessi-europe.eu	Sharing CREMA results with the NESSI community, especially those related to software and services development as well as data collection and analysis (WP3, WP4, WP5 and WP6)	TUV ASC
SMECluster	Cluster	SMECluster is a trustworthy portal providing information, links, useful tools and services for small businesses, communities and individuals. A great source for revenue generation through access to funding streams, tender	SMECluster is an Industry 4.0 Platform for collaboration with Industrial SME's and its membership includes WAF and Aerospace members.	TANet

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Acronym	Type	Mission	Collaboration purpose	CREMA partners
		opportunities or access to business tools that can save you time and money. The original concept was to provide a place where you could get good reliable information about what's available in the local community. Contact: admin@smecluster.com		
SPIRE	Association	A.SPIRE aisbl is an international non-profit association formed to represent the private sector as a partner in the Sustainable Process Industry through Resource and Energy Efficiency. SPIRE contractual Public-Private Partnership (cPPP) was launched as part of the Horizon2020 framework programme. The mission of A.SPIRE is to ensure the development of enabling technologies and best practices along all the stages of large scale existing value chain productions that will contribute to a resource efficient process industry. Contact: Loredana Ghinea lgh@spire2030.eu	As in case of EFFRA, the main purpose of this collaboration is to give visibility of CREMA to the SPIRE community and explore the potential application of project results to specific needs of process industries.	
Welsh Automotive Forum	Forum	The Welsh Automotive Forum (WAF) represents component suppliers in Wales who provide parts for the world's vehicle makers. The Forum has a key role to play here, in disseminating information to companies about the future trends, whether that's from the vehicle manufacturers, or from the large module suppliers. The Forum is supported by the Welsh Assembly Government and industry members. Contact: info@welshautomotiveforum.co.uk	The WAF provides access to at least 200 Tier 1 suppliers and is the main contact point to the automotive industry in Wales in conjunction with Industry Wales www.industrywales.com	TANet

3.2 Collaboration Plan

This section includes the collaboration plan as a roadmap with the set of actions to be done for the upcoming 2 years. Each collaboration action has been defined establishing the objectives to be achieved, where the action will take place, the planned date and the CREMA partner responsible for carrying it out. All planned actions are shown in Table 4 grouped by year.

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Table 4: CREMA Collaboration Plan (2016-2017)

Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
2016							
CA2016-01	Contact selected ETPs (customised mailing)	To increase the visibility of CREMA Project; To participate in working groups or tasks forces contributing to Strategic Research Agendas and multi-annual roadmaps preparation.	NA	Feb/2016		IKER	Pending
CA2016-02	Contact selected Associations, European Initiatives and Clusters (customised mailing)	To increase the visibility of CREMA Project; To participate in working groups or tasks forces.	NA	Feb/2016		IKER	Pending
CA2016-03	Analysis of H2020 and FP7 projects replies	To define and plan specific collaboration actions with EU projects.	NA	Feb/2016		IKER	Pending
CA2016-04	Participation in the Resilient Production Networks Workshop at 8th International Conference on Interoperability for Enterprise Systems and Applications I-ESA 2016	To increase the visibility of CREMA Project; To present some papers and discuss approaches and experiences from CREMA project with scientific community; To participate in other Workshops related to CREMA scope (e.g. Intelligent Systems Configuration Services for Flexible Dynamic Global Production Networks (FLEXINET), Cloud Collaborative Manufacturing Networks (C2NET), Enterprise Interoperability for Portuguese SMEs (UNINOVA), Interoperability as an Infrastructure (TU Zwickau), FITMAN Evolution and FML (TXT)).	Guimaraes (Portugal)	29-30/03/2016		TANet	Pending
CA2016-05	Analysis of ETPs replies	To define and plan specific collaboration actions with ETPs.	NA	Mar/2016		TANet	Pending
CA2016-06	Analysis of Associations, European Initiatives and Clusters replies	To define and plan specific collaboration actions with Associations, European Initiatives and Clusters.	NA	Mar/2016		TANet	Pending
CA2016-07	Participation in the 6th Workshop Impact of the Factories of the Future PPP - 2016	To share success stories and cross-cutting issues of FoF projects; To discuss the impact achieved by projects, as reported by them, in order to discuss how it can be improved and what targets can be fixed for the future; To learn about best practices, outcomes,	Brussels (Belgium)	Apr/2016		TANet	Pending

Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
2016							
		success stories and business expertise; To discuss on how FoF PPP is adding value.					
CA2016-08	Organisation of the 2nd CREMA-C2NET Technical workshop	Contents TBD.	TBD	May/2016		IKER	Pending
CA2016-09	Attending the EFFRA General Assembly 2016	To increase the visibility of CREMA Project.	Brussels (Belgium)	May/2016		TANet	Pending
CA2016-10	CREMA industrial Workshop organisation	To increase the visibility of CREMA project To have a direct feedback of the industrial community on the applicability of the project results; To address results exploitation strategies and business models.	TBD	Sep/2016		TANet	Pending
CA2016-11	Contact new EU funding projects resulting for the next FoF-11-2016 topic in the area of Collaborative manufacturing and logistics	To create a cluster in the field of Collaborative and Mobile Manufacturing.	NA	Nov/2016		IKER	Pending
2017							
CA2017-01	Organisation of the 3rd CREMA-C2NET Technical workshop	Contents TBD	TBD	Feb/2017		IKER	Pending
CA2017-02	Participation in the 7th Workshop Impact of the Factories of the Future PPP - 2017	To share success stories and cross-cutting issues of FoF projects; To discuss the impact achieved by projects, as reported by them, in order to discuss how it can be improved and what targets can be fixed for the future;	Brussels (Belgium)	Apr/2017		TANet	Pending

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Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
2016							
		To learn about best practices, outcomes, success stories and business expertise; To discuss on how FoF PPP is adding value.					
CA2017-03	Attending the EFFRA General Assembly 2017	To increase the visibility of CREMA Project.	Brussels (Belgium)	May/2017		IKER & TANet	Pending
CA2017-04	CREMA Industrial/Scientific Workshop organisation	To increase the visibility of CREMA Project; To have a direct feedback of the scientific community on the quality of the project results To address results exploitation strategies and business models.	TBD	Jun/2017		TUV	Pending
CA2017-05	Launching of the Collaborative Manufacturing and Logistics cluster	To increase the visibility of CREMA Project; To share information; To learn about best practices, outcomes, success stories and business expertise; To enhance the exploitability of project results.	TBD	Jul/2017		TANet	Pending

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As a result of the actions proposed to contact entities (CA2016-01 and CA2016-02) and subsequent analysis (CA2016-03, CA2016-05 and CA2016-06) is more than likely the establishment of new actions to be included in the plan for follow up.

It is also expected that the emergence of new actions in 2016 will generate a domino effect in the 2017 plan when such actions are not specific but are maintained throughout the project with regular meetings and ongoing contact to share common interests. An example of such actions is the mini-cluster CREMA-C2NET with a technical workshop held in 2015, another planned for 2016 (CA2016-08) and one more for CA2017-01 2017). During 2016, and as a result of contacts done with EU projects, there will be the possibility of creating new mini-clusters. If so, corresponding actions will be include in the collaboration plan.

Another interesting action to point out is the contact to make with new EU funding projects resulting for the next FoF-11-2016 topic in the area of Collaborative manufacturing and logistics (CA2016-11). This represents an important opportunity to promote the creation of a cluster of projects in this area whose embryo would be the mini-cluster CREMA-C2NET and its materialisation would take place in 2017 (CA2017-05).

Furthermore, the plan includes some recurring actions which take place every year. This is the case of the attendance to workshops on Impact of the Factories of the Future PPP (CA2016-07 and CA2017-02) organised by EFFRA on behalf of the EC or the presence in the EFFRA General Assemblies (CA2016-09 and CA2017-03).

3.3 Report on CREMA Collaboration activities (2015)

In this section a detailed description of collaboration activities carried out during 2015 is included. A summary of them is presented in Table 5 using the same structure as in the collaboration plan.

Table 5: Summary of Collaboration activities in 2015

Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
CA2015-01	Participation in the Road4FAME – Business Modelling Workshop	Starting collaboration with the FP7 CSA Road4Fame; Contributing with IKER expertise in Business Modelling to establish potential business opportunities for manufacturing and service sector companies; Contrasting and enrichment of CREMA approaches related to Business Models and Exploitation plans Opportunities for future collaborations (e.g. to participate in workshops promoted by Road4Fame).	ATOS SPAIN, Madrid (Spain)	16/04/2015	16/04/2015	IKER	Done
CA2015-02	Participation in the 5th Workshop Impact of the Factories of the Future PPP - 2015	To share success stories and cross-cutting issues of FoF projects; To discuss the impact achieved by projects, as reported by them, in order to discuss how it can be improved and what targets can be fixed for the future; To learn about best practices, outcomes, success stories and business expertise; To discuss on how FoF PPP is adding value.	Brussels (Belgium)	29-30/04/2015	29-30/04/2015	TANet	Done
CA2015-03	Attending the event I4MS 2015: Enhancing digital transformation in manufacturing SMEs	To explore future collaboration possibilities in order to increase CREMA visibility and potential applications in the I4MS manufacturing SMEs community.	Brussels (Belgium)	22/05/2015	22/05/2015	IKER	Done
CA2015-04	Attending the event III Jornadas TICS4LOG	The main objective of participating in this event was to contact Fernando Liesa, Secretary General at ALICE ETP looking for raise CREMA awareness and exploring future opportunities to collaborate in working groups or tasks forces directly related with CREMA research activities.	ITAINNOVA, Zaragoza (Spain)	26/05/2015	26/05/2015	IKER	Done
CA2015-05	Attending the Demonstration Seminar of the FP7 Project iMAIN – A novel Support System for Predictive Maintenance in Forming	To know first-hand the results of the European project iMAIN due to great alignment with CREMA project, especially in aspects related to the FAGOR use case; To contact iMAIN project coordinator to explore opportunities to undertake future collaborations.	Gorenje, Velenje (Slovenia)	30/06/2015	30/06/2015	IKER & FAGOR	Done
CA2015-06	Technical meeting between SIMPLI-CITY and CREMA	Discussion of the usage of software framework components from the SIMPLI-CITY EU FP7 project;	Vienna, Austria	Aug/2015	14/08/2015	TUV	Done

Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
	projects	Discussion of lessons learned from the SIMPLI-CITY data model.					
CA2015-07	Identifying EU projects, ETPs, Associations, Initiatives and Clusters related to CREMA project objectives	To establish a preliminary list of entities to be contacted in CREMA to explore potential collaborations.	NA	Oct/2015	30/10/2015	IKER	Done
CA2015-08	Identifying Standardisation Bodies related to CREMA project objectives	To establish a preliminary list of entities relevant for CREMA in order to analyse collaboration alternatives.	NA	Oct/2015	02/11/2015	IKER	Done
CA2015-09	Contact with the Spanish Technological Platform MANU-KET	To increase CREMA visibility by posting on the MANU-KET website CREMA newsletters and relevant project events; To discuss the possibility to present CREMA project in the next MANU-KET General Assembly.	MCC, Arrasate-Mondragon (Spain)	Sep/2015	06/11/2015	IKER	Done
CA2015-10	Organisation of the 1st CREMA-C2NET Technical workshop	Maintaining a first F2F meeting to start the collaboration between both projects; Showing an overview of both projects: objectives, contents, work plan, etc; Sharing relevant information for both projects, specifically on issues related to high-level architectures and design of components and APIs; Coordination of efforts in order to plan future joint actions.	Calpe (Spain)	Nov/2015	5-6/11/2015	IKER	Done
CA2015-11	Organisation of the event The Connected Business Community 4.0 - Service Based Economy	Introduction of Industry 4.0 and what it means to SME; Presentation of CREMA project objectives and results.	Waterton Technology Centre, Bridgend (UK)	Nov/2015	19/11/2015	TANet	Done
CA2015-12	Technical meeting between ALFRED and CREMA projects	Discussing about similarities of two projects related to service marketplaces, mobile aware web portal technology and information storage and data visualisation infrastructure.	Ganderkesee (Germany)	Nov/2015	19/11/2015	TUV	Done

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Id	Action	Main objective	Location	Planned date	Completion date	Responsible	Status
		Future contacts to explore opportunities to reuse RTD results by both projects.					
CA2015-13	Technical meeting between ACCEPT and CREMA projects	Discussing about similarities of two projects related to information infrastructure, use of mobile devices and location identification technologies on construction sites and smart factories. Future contacts to explore opportunities to reuse RTD results by both projects.	Ganderkesee (Germany)	Dec/2015	09/12/2015	TUV	Done
CA2015-14	Contact H2020 and FP7 selected projects	To increase the visibility of CREMA Project; To know projects results and possibility to use them in CREMA; To have feedback about their results exploitation strategies; In case of CSA projects, to know roadmaps and exploitation strategies issues.	NA	Dec/2015		IKER	In progress

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For reporting activities, a template has been used seeking to register each activity, highlight relevant scientific aspects and main benefits for CREMA as well as monitor some figures about the impact. The template structure is as follows:

- **Id**: Activity code as it is in the collaboration plan.
- **Title and context**: Title of the activity including its type such as event, conference, workshop, meeting with external community, etc.
- **Date / Location** of the activity.
- **CREMA attendees**: Names of people and corresponding CREMA partners who performed the activity.
- **Description**: A short description of the main purposes to do the activity.
- **Website**.
- **CREMA related scientific aspects** to be highlighted.
- **Target audience and collaboration level** indicating the scope of the activity (international, national or local) and the kind of collaboration (networking, workshop participation, particular meeting, etc.)
- **Benefits for CREMA.**
- **Impact** of the collaboration action indicating some figures about the number of participants from research, industry, etc.
- **Other relevant information.**

Then, descriptions of collaborative activities carried out during 2015 are presented. Section 3.3.1 includes activities with other EU projects, Section 3.3.2 with ETPs and Associations and Section 3.3.3 with European Initiatives and Clusters.

3.3.1 Collaboration Activities with EU Projects

Regarding EU projects, seven main activities have been conducted in this period:

- The first activity to point out is the participation a workshop organised by the CSA Road4FAME (FP7 FoF-ICT-2013.7.1) contributing to prepare a strategic research and innovation roadmap for future architectures and services for manufacturing and identify new business opportunities. As a result of this there will be opportunities for future collaborations participating in future workshops promoted by Road4FAME to contrast and enrich CREMA approaches, especially those related to Business Models and Exploitation plans.
- The second was to attend to the periodic workshop organised by EFFRA on behalf the EC and with the participation of representatives of 157 FoF projects. For CREMA, special relevance has the participation in the cluster named Domain 4: Collaborative and Mobile Enterprises with other EU projects to increase visibility and share approaches, results and experiences. Participation in future editions of this event is scheduled.
- The third was the attendance to the iMAIN (FP7 FoF-NMP-2012.2) seminar due to great alignment with CREMA project in sensing and monitoring issues. This will be especially relevant for the FAGOR use case scenario. In addition, Markus Wabner (Fraunhofer IWU) and coordinator of the project accepted to participate in the CREMA Advisory Group. Finally, a first contact with the CSA FOCUS project (H2020 FoF-07-2014) was made. Maintaining regular contacts with FOCUS to know the status of exploitation methods to be developed in the project and the convenience of being used in CREMA will be the primary goal of future collaborations.

- The fourth activity was the technical meeting held with the EU project SIMPLI-CITY (FP7 ICT-2011.6.7) as although its working field is in the mobility domain, there are some similarities between smart mobility and smart factories. Insights about the assembling of a unified data model, re-usage of data interoperability and data integration methods, techniques and tools as well as the application of elasticity for processes have been discussed to have a valuable input for CREMA.
- The fifth activity reported is the technical workshop with C2NET project (H2020 FoF-01-2014.a) to detect interest and joint efforts in order to create a tight collaboration between both projects. Future technical workshops to share information and jointly promotion of events (e.g., industrial or scientific workshops) are some of the collaboration activities to be planned for the future. This constitutes the first step to create a cluster embryo in the field of Collaborative and Mobile Manufacturing. This "mini-cluster" would be extended with new EU funding projects resulting for the next FoF-11-2016 topic in the area of Collaborative manufacturing and logistics.
- The sixth activity was the technical meeting with the EU project ALFRED (FP7 ICT-2013.5.1). While ALFRED is working in the health domain, some similarities related to service marketplaces, mobile aware web portal technology and information storage and data visualisation infrastructure have been discussed. Future contacts to share information about RTD results of each project and explore opportunities to reuse them in both projects will be made.
- The last activity was another technical meeting held with the EU project ACCEPT (H2020 EeB-03-2014). This project is focused in the construction sector but there are clear synergies between information infrastructure, use of mobile devices and location identification technologies on construction sites and smart factories. Just as with ACCEPT, this first meeting was done in order to identify these similarities and discuss possible future reuse of RTD results by both projects.

In the following subsections, these activities are described in more detail.

3.3.1.1 Road4Fame – Business Modelling Workshop

Description of the Collaboration Action	
Id	CA2015-01
Title and context	Road4Fame - Business Modelling Workshop
Date / Location	16-Apr-2015 / ATOS SPAIN, Madrid (Spain)
CREMA attendees	Juan María Goenaga (IKER)
Description	The main objective of this action is to start contacts with the EU project Road4Fame (FP7-2013-NMP-ICT-FOF), a CSA whose main goal is to develop a Strategic Research and Innovation Roadmap for Future Architectures and Services for Manufacturing in Europe and Derivation of Business Opportunities. This first contact was done participating by invitation in a workshop to contribute with our expertise in Business Modelling to establish potential business opportunities for manufacturing and service sector companies. The output of this action will be included in the Road4Fame deliverable D4.1 "Catalogue of Future Business Opportunities, Business Models and Services".

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Website	http://road4fame.eu/
CREMA related scientific aspects	Starting from the future IT architectures, services and megatrends identified in the road mapping process, new potential business models and business services which become possible or even necessary to support them were identify. As a result a strategic document for manufacturing and service sector companies is available (http://road4fame.eu/wp-content/uploads/2015/06/Road4FAME_609167_D4-1_Catalogue_of_Business_Opportunities.pdf). This document will be used as valuable input for the work to be done in three tasks of the CREMA project: • T2.2 Market and Applicability Watch • T2.3 Business Model Analysis and Innovation Management • T9.1 IPR Plan and Exploitation
Target audience and collaboration level	International
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Starting collaboration with the CSA Road4Fame. • Opportunities for future collaborations (e.g. to participate in workshops promoted by Road4Fame. • Contrasting and enrichment of CREMA approaches related to Business Models and Exploitation plans.
Impact	The event was attended by 15 experts who included a mix of backgrounds including manufacturers, service providers and large and small companies.
Other relevant information	

3.3.1.2 5th Workshop Impact of the Factories of the Future PPP

Description of the Collaboration Action	
Id	CA2015-02
Title and context	5th Factories of the Future Impact Workshop
Date / Location	29-30-April-2015 / Brussels (Belgium)
CREMA attendees	Gash Bhullar (TANet)
Description	The objectives of participating in this workshop were: • to share success stories and cross-cutting issues of FoF projects; • to discuss the impact achieved by projects, as reported by them, in order to discuss how it can be improved and what targets can be fixed for the future; • to learn about best practices, outcomes, success stories and business expertise; • to discuss on how FoF PPP is adding value.
Website	http://ec.europa.eu/research/industrial_technologies/index_en.cfm
CREMA related	Main activity was through the WP9 activities of dissemination and innovation opportunities. Many projects are looking to collaborate and consolidate best

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scientific aspects	practice. Many collaboration activities have been performed with the projects listed in the Impact section.
Target audience and collaboration level	International
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Learning what other platforms could be used to offer services • Taking on-board the lessons learnt in joint dissemination activities • New opportunities to look at partners for future workshops
Impact	The Workshop was attended by the European Commission, EFFRA and representatives of 157 FoF projects. Projects were grouped in homogeneous Areas characterized by common topics and goals. CREMA and other 14 projects (VENIS, MEMAN, C2NET, MANSYS, ROBUSTPLANET, FLEXINET, USE-IT-WISELY, EASY-IMP, PROSECO, ROAD4FAME, FOFDATION(F), ADVENTURE(F), BIVEE(F), COMVANTAGE(F), EPES(F), EXTREMEFACTORIES(F), GLONET(F), IMAGINE(F), MSEE(F), PREMANUS(F)), were assigned to the cluster named Domain 4: Collaborative and Mobile Enterprises.
Other relevant information	

3.3.1.3 Demonstration Seminar of the FP7 Project iMAIN

Description of the Collaboration Action	
Id	CA2015-05
Title and context	Demonstration Seminar of the FP7 Project iMAIN – A NOVEL SUPPORT SYSTEM FOR PREDICTIVE MAINTENANCE IN FORMING
Date / Location	30-Jun-2015 / Gorenje Orodjarna, d. o. o., Velenje, Slovenia
CREMA attendees	Eduardo Saiz (IKER) & Aitor Jimenez (FAGOR)
Description	To know first-hand the results of the European project iMAIN due to great alignment with CREMA project, especially in aspects related to the FAGOR use case. To contact iMAIN project coordinator to explore opportunities to undertake future collaborations.
Website	http://www.imain-project.eu/
CREMA related scientific aspects	iMAIN is an European research project aiming to develop a novel decision support system for predictive maintenance. This project provides a multi-layer solution integrating embedded information devices and artificial intelligence techniques for knowledge extraction and novel reliability & maintainability practices. The resulting solution will provide extended maintenance capabilities in the Cloud to increase system lifetime of the production equipment, energy efficiency and availability of whole process while decrease maintenance costs. In this context, iMAIN project activities and results are closely related to several research tasks to be performed within CREMA. Aspects such as networks of assets, sensory, embedded data acquisition, Cloud storage, data analytics, assets

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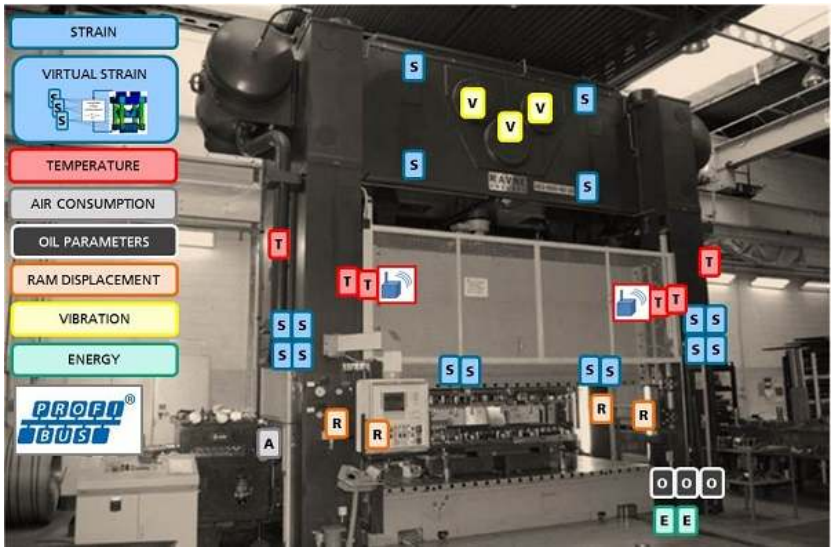
	performance algorithms or Cloud platform GUIs are covered by both projects. As a validation scenario, iMAIN has proven its developments in a similar press that is going to be used in one of the use cases of CREMA. That press incorporates a set of different sensors as you can see in Figure 2. These sensors are used to collect data and monitor different systems and parameters of the press: structural deformations and forces ("S" blue labels in Figure 2), bearing vibration ("V" yellow labels), temperatures ("T" red labels), ram displacement ("R" brown labels), belts vibrations (wireless labels), energy ("E" green labels) and air consumption ("A" grey labels) and oil parameters ("O" grey labels). Data are uploaded to a Cloud platform where they are stored and post-processed to obtain the diagnosis of each component individually and in combination with other components. Post-processed data are compared with load and failure models to detect alarms. The Cloud platform includes services such as a Dashboard Manager or an Alarm Server for both fixed and mobile users which can view the status of a particular parameter of a sub-system of the machine.  Figure 2: Installed sensory in the Gorenje forming press Regarding scientific aspects, iMAIN provides relevant information to the following CREMA R&D work packages and tasks: • WP4 Manufacturing Virtualisation & Interoperability T4.1 CREMA Data Model, Model Library and Profiles T4.2 CREMA Data Harmonisation Services T4.3 CREMA Cloud-based RAID Infrastructure T4.4 CREMA Cyber-Physical Systems, Sensor Abstraction and Virtualisation T4.5 CREMA Service Virtualisation and Abstraction • WP6 Cloud Manufacturing Collaboration, Knowledge and Stakeholder Interaction Framework T6.2 CREMA Monitoring & Alerting T6.3 CREMA Manufacturing Big Data, Knowledge and Analytics T6.5 CREMA Dashboard & Visualisation • WP7 Piloting & Validation: Use Case I: Machinery Maintenance
Target audience and collaboration level	International

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Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Knowing a real example of an asset (forming press) equipped with sensors incorporating a data logger to collect real-time data from the sensors and communicate them to the Cloud. • Having a comprehensive set of examples of how to visualize in real time the behaviour of different parts of a press forming and the occurrence of alarms. • Holding relevant clues which facilitate the FAGOR use case implementation also focused on sensing a press forming, collecting data and sending them to a Cloud platform. • Possibility to access information related to IPRs and exploitable results of iMAIN seeking to evaluate the suitability of using them in CREMA. • Acceptance of Markus Wabner (Fraunhofer IWU - iMAIN coordinator) for membership of the CREMA Advisory Group.
Impact	The event was attended by invitation with an approximate number of 25 people of which about 10 were from R&D organisations and the rest to industrial companies and system developers.
Other relevant information	During the event a contact with NTNU people was held. NTNU coordinates the FOCUS - Factory of the Future Clusters (www.focusonfof.eu), a CSA H2020 project (Call topic: FoF.2014.7), to support the enhancement of the impact of FoF PPP projects. FOCUS will support methodologies for improving the exploitability of the FoF Projects (FP7) belonging to five project clusters. One of which is related to Maintenance and Support with some connections to the FAGOR use case of CREMA. As a result of this, FOCUS will be one of the projects to follow and maintain regular contacts to know the state of exploitation methods development and the convenience of being used in CREMA.

3.3.1.4 SIMPLI-CITY & CREMA Technical Meeting

Description of the Collaboration Action	
Id	CA2015-06
Title and context	SIMPLI-CITY & CREMA Technical Meeting
Date / Location	14-Aug-2015 / Vienna (Austria)
CREMA attendees	Christoph Hochreiner (TUV), Stefan Schulte (TUV)
Description	The main objective of this action was a technical discussion between the EU FP7 STREP SIMPLI-CITY and CREMA. While SIMPLI-CITY is working in the mobility domain, there are some similarities between smart mobility and smart factories. The first meeting was done in order to identify these similarities and discuss the re-usage of RTD results from SIMPLI-CITY in CREMA.
Website	http://www.simpli-city.eu
CREMA related scientific aspects	Like CREMA, SIMPLI-CITY had to find solutions for the integration of data from technologically heterogeneous data sources. Hence, the re-usage of data interoperability solutions has been discussed during this meeting. Furthermore, SIMPLI-CITY has provided some interesting research results in the field of elastic processes, which were also discussed during the meeting. Last but

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	not least, a discussion of lessons learned from the SIMPLI-CITY Unified Data Model was held in order to see which of these insights should be taken into account by CREMA.
Target audience and collaboration level	European. Collaboration will be done on a technical level.
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Insights about the assembling of a unified data model • Re-usage of data interoperability and data integration methods, techniques and tools in CREMA • Application of elasticity means for processes
Impact	Since the focus was on technical aspects, the meeting was kept very small with 4 people attending.
Other relevant information	Both ASC and TUV are partners in SIMPLI-CITY and CREMA, giving the opportunity for collaborations on different levels.

3.3.1.5 1st C2NET & CREMA Technical Workshop

Description of the Collaboration Action	
Id	CA2015-10
Title and context	1st C2NET & CREMA Technical Workshop.
Date / Location	6-Nov-2016 / Calpe (Spain). This event took place in a parallel session to the CREMA Technical Workshop held in Calpe during the week from 2 to 6 November 2015
CREMA attendees	Tim Dellas (ASC), Stuart Campbell (ICE), Philipp Waibel (TUV), Eduardo Saiz (IKER) Figure 3: 1st C2NET & CREMA technical workshop team C2NET was represented by Raul Poler (Polytechnic University of Valencia - UPV) as a Scientific Manager and Raul Peña (Institute of Information Technology – ITI) as leader of the WP2 Elastic Architecture Reference Model and Design

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Description	The objectives of participating in this workshop were: • Maintaining a first F2F meeting to start the collaboration between both projects • Showing an overview of both projects: objectives, contents, work plan, etc. • Sharing relevant information for both projects, specifically on issues related to high-level architectures and design of components and APIs • Coordination of efforts in order to plan future joint actions
Website	www.crema-project.eu / www.c2net-project.eu
CREMA related scientific aspects	Regarding CREMA research activities, the following aspects were considered: • In relation to T3.1 (Global Architecture Definition), C2NET High level Architecture was presented. First, main HLA blocks: External Applications and Services, the Interoperability Framework and the Cloud Based Platform, were reviewed. Then, a description of several architecture components were described and commented. Although there was interest in knowing the C2NET HLA approach this was limited by the near completion of the corresponding CREMA deliverable (D29). • Related to T3.3 (Technical Specification) there was a common interest in sharing information about the process of technologies selection currently in progress in both projects. The idea of having a common space (Linkedin Group or Google Drive) to share this information arised. • Sharing both approaches for security and privacy issues addressed in T3.4 (Holistic Security and Privacy Concept) was another interesting topic discussed because of the relevance of this point in order to overcome fears of companies to use Cloud infrastructures. • Ontologies used in both projects as input for T4.1 CREMA Data Model, Model Library and Profiles were considered as a relevant issue to exchange information. • Finally, aspects related to the design and execution of Cloud collaborative processes included in several tasks of WP5 (Cloud Manufacturing Process and Optimisation Framework) were discussed. At this point it was recognized that the processes referred to in CREMA were more complex than those of C2NET.
Target audience and collaboration level	International CREMA and C2NET project partners
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Possibility to share valuable information during the execution of both projects. Defining common repositories where to leave information, facilitating contacts between respective projects researchers and holding regular meetings F2F were some agreed measures. As an example of this, two specific short-term actions were agreed: o Create a Google Drive account to share information about candidate technologies to be selected in both projects. o Create a private repository where to leave open source code generated by both project. • Chance to joint efforts of both projects in order to jointly organise events such as workshops (e.g., the planned CREMA industrial workshop in 2016 or the scientific workshop for mid-2017), invited sessions in conferences, etc. • Opportunity to create a cluster embryo in the field of Collaborative and

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	Mobile Manufacturing. This “mini-cluster” would be extended with new EU funding projects resulting for the next FoF-11-2016 topic in the area of Collaborative manufacturing and logistics.
Impact	The main aim of the collaboration action has been to detect interest and joint efforts in order to create a tight collaboration between both projects. In this sense, the action has been restricted to some research partners from CREMA: ICE, TUV and IKER and from C2NET: UPV, ITI and IKER.
Other relevant information	In order to prepare a more detailed collaboration plan, responsible for both projects have agreed in providing deadlines for sharing relevant information about the common topics detected in the meeting: • Technologies selection • Security and Privacy • Ontologies • Design and execution of collaborative processes • Exploitation issues • Open source approaches • Standardisation

3.3.1.6 ALFRED & CREMA Technical Meeting

Description of the Collaboration Action	
Id	CA2015-12
Title and context	ALFRED & CREMA Technical Meeting
Date / Location	19-Nov-2015 / Ganderkesee (Germany)
CREMA attendees	Tim Dellas (ASC), Sven Abels (ASC)
Description	The main objective of this action was a technical discussion between the H2020 Project ALFRED and CREMA. While ALFRED is working in the health domain, especially targeting elderly people, there are some similarities especially when it comes to service marketplaces, mobile aware web portal technology and information infrastructure compared to CREMA, especially looking at the storage of sensitive information and the visualisation of data. The first meeting was done in order to identify these similarities and discuss possible reuse of RTD results from ALFRED in CREMA or vice versa.
Website	http://alfred.eu/
CREMA related scientific aspects	ALFRED is an FP7 project, which is currently entering the third year of the project. Thus, ALFRED has already developed robust prototypes and has performed in-depth tests for all project aspects. Like in CREMA, in ALFRED had to deal with the challenge of storing information that is requiring high reliability and security aspects. Sensor information of patients has been gathered via wearable technologies and external sensors have been integrated, leading to large amounts of data sets. CREMA faces the same problem although being located in a different domain. Both projects therefore exchanged on data storage technologies and scalability issues as well as on the security approach around it. For CREMA, this had a positive impact to its security and privacy approach outlined in T3.4 and to its data management approach of T4.3. Additionally, both projects exchanged on how to visualize information in a

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	responsive way while providing personal and easy to understand data visualization. For CREMA this aspect is especially important in the light of its dashboard approach in T6.5.
Target audience and collaboration level	European. Collaboration will be done on a technical level.
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Possible reuse of part of the KIS (Knoweldge Information System) base libraries of ALFRED leading to more advanced and more robust data storage in CREMA. • Insights and recommendations as well as sample code for the T6.5 visualization aspects of CREMA.
Impact	Since the focus was on technical aspects, the meeting was kept very small with 4 people attending. Thus the impact was low in terms of the person days invested by CREMA. Nevertheless the potential impact to CREMA is high due to the possible benefits outlined above.
Other relevant information	ASC has the same technical and coordination role in CREMA as it fills in ALFRED.

3.3.1.7 ACCEPT & CREMA Technical Meeting

Description of the Collaboration Action	
Id	CA2015-13
Title and context	ACCEPT & CREMA Technical Meeting
Date / Location	09-Dec-2015 / Ganderkesee (Germany)
CREMA attendees	Tim Dellas (ASC), Sven Abels (ASC)
Description	The main objective of this action was a technical discussion between the H2020 Project ACCEPT and CREMA. While ACCEPT is working in the construction sector, there are some similarities between information infrastructure, use of mobile devices and location identification technologies on construction sites and smart factories. The first meeting was done in order to identify these similarities and discuss possible reuse of RTD results from ACCEPT in CREMA or vice versa.
Website	http://www.accept-project.com/
CREMA related scientific aspects	ACCEPT has started at the same time as CREMA. As such, the phase of both projects is similar in terms of technology exploration and technological experiments. ACCEPT has performed an in-depth analysis of augmented reality and smart glasses technologies including Hololens and the Daqri Smart Helmet in comparison to Google Glass technologies and the usage of Smartphones. CREMA has been able to benefit from those analysis results in the course of its CREMA Agile Personal Collaboration Environment which is planned in T6.4 mainly involving ASC and UBI. As an additional aspects, CREMA and ACCEPT will both use sensors for measuring values such as temperatures, humidity or optical information. Thus, fast sensor processing and flexible integration are aspects equally relevant for both projects. CREMA will handle this within its CREMA Cyber-Physical Systems,

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	Sensor Abstraction and Virtualisation task. Both projects have discussed their approach and have mutually agreed to continuously synchronise on their aspects. Finally, both projects will establish a marketplace environment and both have discussed the management of marketplace assets as well as the management of marketplace transactions. It has turned out that the UI driven approach of ACCEPT may be fed in into CREMA while CREMA may in return deliver help on the service aspects of ACCEPT. Both projects have agreed on further meetings to elaborate the potential cooperation during 2016 as soon as their implementation phase has started.
Target audience and collaboration level	European. Collaboration will be done on a technical level.
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Insights within the visualisation and personal collaboration aspects, especially in the domain of wearable devices and smart glasses for T6.4. • More robust discussion of the sensor abstraction approach of T4.4. • Possible saving on implementation efforts during the CREMA Marketplace implementation phase of T6.1.
Impact	Since the focus was on technical aspects, the meeting was kept very small with 4 people attending. Thus the impact was low in terms of the person days invested by CREMA. Nevertheless the potential impact to CREMA is high due to the possible benefits outlined above. It should be noted that both projects benefit from this cooperation leading to better efficiency of their person days and budget consumption for both H2020 projects.
Other relevant information	ASC has the same technical and coordination role in CREMA as it fills in ACCEPT.

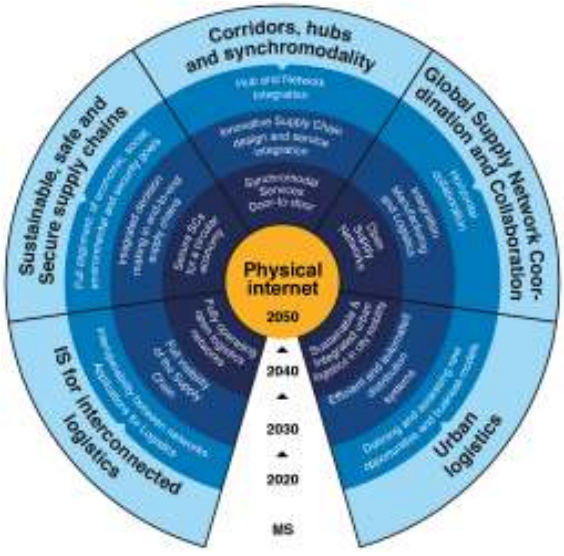
3.3.2 Collaboration Activities with ETPs and Associations

In regards to ETPs and Associations, two relevant activities have been conducted in this period:

- The first activity to highlight is the contact made with the Secretary General of ALICE ETP in order to enhance CREMA visibility and participate in their working groups (WGs), especially, the WG4 Global Supply Network Coordination and Collaboration. Future contacts to materialise these objectives will be conducted.
- The second was the contact with the Spanish Technological Platform for Advanced Manufacturing MANU-KET with more than 180 members belonging to research, industrial and public organisms. Increasing the visibility of CREMA project by means of newsletters and project results dissemination in MANU-KET are some collaboration activities which have been agreed. Possibility to present the project in the next General Assembly is another planned activity for 2016.

In the following subsections, these activities are described in more detail.

3.3.2.1 Contact with ALICE – Alliance for Logistics Innovation through Collaboration in Europe

Description of the Collaboration Action	
Id	CA2015-04
Title and context	III Jornadas TICS4LOG - Event
Date / Location	26-May-2015 / ITAINNOVA Instituto Tecnológico de Aragón, Zaragoza (Spain)
CREMA attendees	Eduardo Saiz (IKER)
Description	The purpose of participating in this event was to contact Fernando Liesa, Secretary General at ALICE, Alliance for Logistics Innovation through Collaboration in Europe (http://www.etp-logistics.eu/), the ETP set-up to develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe. To present the CREMA project to the ALICE platform and evaluate possibilities for future cooperation are the main goals to be achieved as a result of this contact.
Website	http://www.itainnova.es/actualidad/eventos/iii-jornadas-tics4log
CREMA related scientific aspects	During the event, Fernando Liesa made a presentation on the current state of the innovation and ICT developments for logistics in Europe. He also presented the ALICE ETP (Objectives, Steering Group composition, Plenary members and five Working Groups -WGs). The WGs are responsible for the preparation of the ETP documents such as Strategic Research and Innovation Agendas and Research and Innovation Roadmaps identifying research gaps to be proposed to the Steering Group as potential input for the HORIZON 2020. Figure 4 shows these five WGs and their evolution from the current status of Logistics to a future situation in 2050 called Physical Internet. This is an open global logistics system founded on physical, digital, and operational interconnectivity that is intended to replace current logistical models transforming the way physical objects are handled, moved, stored, realized, supplied and used, aiming towards global logistics efficiency and sustainability.  Figure 4: ALICE ETP roadmap scheme

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	Two of ALICE WGs, namely WG3 Information Systems for Interconnected Logistics and, especially, WG4 Global Supply Network Coordination and Collaboration, have close ties with the scope of CREMA. CREMA WP6 Cloud Manufacturing Collaboration, Knowledge and Stakeholder Interaction Framework has close links with the scope of the ALICE WG4 and CREMA WP4 Manufacturing Virtualisation & Interoperability with ALICE WG3.
Target audience and collaboration level	National audience with some international speakers (BIBA, Fraunhofer IML)
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Increasing visibility of CREMA project in ETPs like ALICE. • Opportunities for future collaborations (e.g. contribute to any of the active ALICE WGs)
Impact	About 100 people from the industry and research communities attended the event.
Other relevant information	Information about CREMA was sent to Fernando Liesa in order to be evaluated by people responsible for related ALICE WGs.

3.3.2.2 Contact with MANU-KET – Spanish Technological Platform for Advanced Manufacturing

Description of the Collaboration Action	
Id	CA2015-09
Title and context	Contact with the Spanish Technological Platform for Advanced Manufacturing MANU-KET (Irantzu Murguiondo web-site contents manager)
Date / Location	02-Nov-2015 / Mondragon Corporation Headquarters, Arrasate-Mondragón (Spain)
CREMA attendees	Eduardo Saiz (IKER)
Description	The main aim of this action is to increase CREMA dissemination by: • Posting CREMA newsletters and relevant project events on the MANU-KET website. • Considering the possibility to present CREMA project in the next MANU-KET General Assembly.
Website	http://www.manufacturing-ket.com/en/
CREMA related scientific aspects	NA
Target audience and collaboration level	National audience
Benefits for CREMA	Main benefit for CREMA as a result of this action is: • Increasing CREMA visibility to the Industrial and Research community.
Impact	As members of the platform they are currently registered • 64 Research Centres and Universities,

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	• 88 Industrial companies, • 28 Public and Private Institutions and Associations. To this should be added all the potential audience that is not registered.
Other relevant information	

3.3.3 Collaboration Activities with European Initiatives and Clusters

As far as to European Initiatives and Clusters, two relevant activities have been conducted in this period:

- The first activity was to contact the I4MS initiative to explore possibilities of CREMA objectives and results dissemination. There are few possibilities to have a tight collaboration with I4MS due to its objectives are other than giving space for open EU projects dissemination. Only to publish CREMA news could be a possibility to fit in the future.
- The second was the organisation by TANet of the third SMECluster event to bring the industrial community the latest news and break-through technologies that are making their way to the Manufacturing Sector as well as other sectors. CREMA project was presented by ICE in this event.

In the following subsections, these activities are described in more detail.

3.3.3.1 Contact with I4MS

Description of the Collaboration Action	
Id	CA2015-03
Title and context	I4MS 2015: Enhancing digital transformation in manufacturing SMEs
Date / Location	22-May-2015 / DIAMANT Conference & Business Centre, Brussels (Belgium)
CREMA attendees	Eduardo Saiz (IKER)
Description	Taking advantage of attending this event, a contact with Silvia de la Maza, Coordinator of I4MS-Gate (Innovalia Association), was made. The main aim of this action was to explore future collaboration possibilities with I4MS (ICT Innovation for Manufacturing SMEs), initiative promoted by the European Commission to support the European leadership in manufacturing through the adoption of ICT technologies in the following areas: • Robotics • High Performance Computing (HPC) cloud based simulation services • Laser based applications • Intelligent sensor-based equipment As a result of the conversation, dissemination of CREMA and other EU projects findings is not a primary objective of this initiative. Only to publish some CREMA news in its website and in social media channels (LinkedIn, Twitter, Youtube) manage by I4MS could be possible. I4MS is focused in giving support to projects funded under specific ICT Innovation for Manufacturing SMEs (I4MS) calls. At present, there are eleven projects under the umbrella of I4MS providing project

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	dissemination and promoting internal calls of these projects asking for experiments where SMEs are main actors.
Website	http://i4ms.eu/
CREMA related scientific aspects	NA
Target audience and collaboration level	International audience
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • To increase visibility of CREMA project to the large I4MS community.
Impact	NA
Other relevant information	

3.3.3.2 The Connected Business Community 4.0 – Service Based Economy

Description of the Collaboration Action	
Id	CA2015-11
Title and context	The Connected Business Community 4.0 - Service Based Economy
Date / Location	19-Nov-2015 / Waterton Technology Centre, Bridgend, South Wales. UK
CREMA attendees	Gash Bhullar (TANet), Simon Osborne (TANet) and Stuart Campbell (ICE)
Description	This event presented Industry 4.0 to SMEs and also shared what it has to offer to the UK. It demonstrated the latest trends in technology with top Industrial Organisations like Tata Steel and Balluff UK presenting their vision on Industry 4.0. There was also a focus on the growth of “Wearables”, the continuous developments of “Big Data” with the rise of the “Semi-Autonomous Robots” in industry. The latest technologies for virtual / augmented reality and the types of hardware hitting the marketplace were showcased
Website	www.smecluster.com
CREMA related scientific aspects	Main areas of clustering activities and dissemination.
Target audience and collaboration level	Large and Small Industrial Companies. Academics and other consultancies.
Benefits for CREMA	Main benefits for CREMA as a result of this action are: • Gain understand of the market for selling CREMA • Looking at what else is on the market
Impact	Development of CREMA Inc in order to for a clear business case.
Other relevant information	

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4 CREMA Standardisation Plan

The aim of the CREMA Standardisation Plan is to make sure that the project makes maximum use of existing (European) standards, and to communicate relevant findings of the project to standardisation bodies. The usage of existing standards is part of the Functional Specification and Technical Specification and therefore not repeated here. Hence, in the following subsections, we will discuss the communication of CREMA results to relevant standardisation bodies. For this, best practices for standardisation are named (Section 4.1), relevant standardisation bodies are identified (Section 4.2), and a preliminary standardisation plan (Section 4.3) is set up.

4.1 Best Practices on Standardisation Efforts in European Projects

To facilitate standardisation activities, the CREMA consortium applies the Cooperation Platform for Research & Standards (COPRAS) Standardisation Guidelines[26], which are recommended by the European Commission for bringing outcomes from IT-driven research projects (like CREMA) to the standardisation community. Since the COPRAS Standardisation Guidelines provide a comprehensive overview on best practices, not all its aspects will be repeated here. Instead, the focus will be on recommendations on interfacing with standardisation bodies and what this concretely means for CREMA. A preliminary standardisation plan can be found in Section 4.3.

Standardisation activities should either be considered with a specific goal, e.g., aiming at standardisation of a particular project outcome or extension of an existing standard based on project outcomes (e.g., by domain-specific elements), or can alternatively be used as a separate dissemination activity. Within CREMA, both approaches are possible, depending on the concrete project outcomes. While some of them can already be estimated, further results have to be identified during the course of the second and third project year.

Regarding the identification of possibilities for cooperation with standardisation activities, for each output, the COPRAS guidelines propose to answer the following questions. This will be done in CREMA once the Technical Specification and therefore the functional and technical scope of each component has been finalized:

- Does the output rely on an existing standard?
- Will the output be exploited by organisations already using standards for their products or services?
- If an industry standard changed, would the output need to be modified?
- Is the output a basis for commercial companies to develop new products or services?
- Does the output need to be used consistently by industry for the project to deliver expected benefits?
- Is the output intended to encourage many other organisations to create compatible technologies?
- Will products from multiple suppliers utilise the output?

[26] http://www.w3.org/2004/copras/docu/D27.pdf

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- Is the output essential for the correct operations of higher level features and capabilities?
- Will the output fill a gap or address an area only partially covered by an existing standard?

These questions provide the foundation for a structured analysis of the project results. The results will be provided as a non-public spreadsheet accompanying the next iteration of the Project Collaboration and Standardisation Engagement Reports. Based on this structure, CREMA is able to prepare the formal submission, build constituency and consensus for future standardisation activities, resolve conflicts between the involved partners, and disseminate the according activities.

According to COPRAS, standardisation should be considered at different milestones throughout the project lifetime. Two of these milestones are the proposal preparation stage and the start of the project contract, which have already happened for CREMA. During both stages, a general discussion of the contributions to standards has taken place and responsibilities for standardisation have been identified. Further milestones foreseen by COPRAS are the definition of requirements, which led to a discussion of the standardisation bodies to be approached, as can be found in Section 4.2. However, an update of this list may occur because of the final results from the Functional and Technical Specifications. COPRAS' Milestone 4 denominates the point of time when actual results are available for submission to standardisation bodies, i.e., during the second and third CREMA project year. Finally, COPRAS' names also the project end as a Milestone and highlights the need to define the further procedure after the contract expires.

Timing of standardisation activities should not be underestimated, since the process can be very time-consuming, taking one to three years. For CREMA, this means that even after the project lifespan, according activities will have to continue if standardisation efforts should be successful. However, the according input needs to be prepared during the project lifetime and/or partners need to be able to proceed with these activities after the project end on their own cost. During the project lifetime, either the project or some partners need to become members or participants in the corresponding standardisation bodies. In CREMA, this will be done on the level of individual partners. This also means that the direct and indirect costs of the memberships will be covered by the individual partners.

4.2 Identification of Relevant Standardisation Bodies

On a European level, there are three formal standards organisations: The European Committee for Standardisation (CEN)[27], the European Committee for Electrotechnical Standardisation (CENELEC)[28] and the European Telecommunications Standards Institute (ETSI)[29]. These are recognised by the European Union and meet the World Trade Organization's (WTO) criteria for standards setting. All three have cooperation arrangements in place with their global counterparts: the International Organization for Standardisation (ISO)[30], the International Electrotechnical Commission (IEC)[31] and the

[27] http://www.cen.eu/
[28] http://www.cenelec.eu
[29] http://www.etsi.org
[30] http://www.iso.org

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International Telecommunication Union (ITU)[32]. In addition, there are several formal standards bodies working on a national level, which also have wider impact (e.g., the German Institute for Standardisation (DIN)[33], the American National Standards Institute (ANSI)[34] or the British Standards Institution (BSI)[35]). In case of aiming to set standards that ultimately should have a more legal (or mandatory) character, choosing a formal standards body could be the best route. This however implies that consequences associated with formal standardisation processes (e.g. the relatively long periods required for formal approval processes) have to be taken into account.

Many aspects of Information and Communication Technologies (ICT) standardisation are however covered by other forums (e.g., the World Wide Web Consortium (W3C)[36] for the Web and the Internet Engineering Task Force (IETF)[37] for the Internet), industry consortia and trade organisations rather than by formal standards bodies. Industry consortia do not primarily aim at producing formal standards, and many times set out to address or resolve only a limited number of specific issues. Usually, they have a lifespan between 5 and 15 years, as their activities tend to terminate once their original standardisation goals have been accomplished. Despite the less formal character of the industry standards they produce, their focus on specific market segments often proves to be an efficient way for generating critical mass among stakeholders, necessary for successfully completing standardisation processes.

Standardisation bodies' and industry consortia's activities sometimes seem to overlap. Although this is occasionally unavoidable due to the dynamics of ICT developments, industry consortia may also address only specific elements within standardisation processes; for example: while one organisation may concentrate on the development and maintenance of the actual specification, others may be involved in developing implementation guidelines, reference implementations or test and certification procedures.

It must be taken into account that a first identification of relevant standardisation bodies for CREMA could be extended in the future as the collaboration with the selected standardisation bodies takes place.

In order to prioritize the collaboration activities to be carried out within the CREMA project, some of the identified bodies have been selected (see Table 6). The criteria used for selection has been based on the belonging to the so-called and known European Standards Organizations (ESOs). In this way a first selection comprises the CEN, CENELEC and ETSI organisation as they are officially recognised by the European Commission and act as a European platform through which European Standards are developed.

In fact, in the EU, only standards developed by CEN, CENELEC and ETSI are recognised as "European Standards". Hence, these standardisation bodies closely cooperate; working jointly in the interest of European harmonisation, creating both standards requested by the market and harmonized standards in support of European legislation. In addition to these

[31] http://www.iec.ch
[32] http://www.itu.int
[33] http://www.din.de/en
[34] http://www.ansi.org
[35] http://www.bsigroup.com
[36] http://www.w3.org
[37] http://www.ietf.org

entities, the selection includes those national bodies that will serve as platform for interfacing with them and with other international standardisation organisations outside Europe.

Table 6: Selected Standardisation Bodies, Groups and Standards

Standardisation Body		Groups and Standards
CEN	European Committee for Standardisation Contact: https://www.cen.eu/helpers/Pages/contactus.aspx	Identified Groups: CEN/WS DPP - DPP/WS WS on Data Protection and Privacy CEN/WS RACS - Requirements and recommendations for Assurance in the Cloud Identified Standards: CWA 16871-1:2015 - R CWA 15499:2006 Personal Data Protection Audit Framework (EU Directive EC 95/46) - Part II: Checklists, questionnaires and templates for users of the framework CWA 16871-1:2015 - Requirements and Recommendations for Assurance in Cloud Security - Part 1: Contributed recommendations from European projects
CENELEC	European Committee for Electrotechnical Standardisation Contact: http://www.cenelec.eu/aboutcenelec/contactus/contact_entry.htm	Identified Groups: CLC/TC 65X: Industrial-process measurement, control and automation CLC/TC 108X : Safety of electronic equipment within the fields of Audio/Video, Information Technology and Communication Technology Identified Standards: prEN 62657-1: Industrial communication networks - Wireless communication networks - Part 1: Wireless communication requirements and spectrum considerations prEN 62657-2: Industrial communication networks - Wireless communication networks - Part 2: Coexistence management prEN 62949: Particular safety requirements for equipment to be connected to information and communication networks
ETSI	European Telecommunications Standards Institute Contact: http://www.etsi.org/about/getting-to-etsi	Identified Groups ETSI Could Standards Coordination (CSC). Identified Standards ETSI TR 103 290 2015 Machine-to-Machine communications (M2M); Impact of Smart City Activity on IoT Environment All related with Cyber Security
AENOR	Spanish Association for Standardisation and Certification Contact: https://www.en.aenor.es/aenor/normas/servicios_informacion/infoaenor.asp	Identified Groups CTN: AEN/CTN 71/SC 38 - SERVICIOS Y PLATAFORMAS PARA APLICACIONES DISTRIBUIDAS Identified Standards UNE 71380:2014 Tecnología de la información. Computación en la nube. Vocabulario y definiciones.

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4.3 Preliminary Standardisation Plan

As mentioned above, the CREMA standardisation plan is based on the COPRAS Standardisation Guidelines. It takes into account both the usage of standards within the CREMA project as well as the standardisation of CREMA components, methods, and models. Table 7 provides an overview of the planned activities.

As a starting point to identify potentials for standardisation, a spreadsheet will be set up according to the COPRAS guidelines. This will be done once the CREMA Technical Specification has been finished at the start of the second project year, since it is first necessary to clearly define both the technologies used in the project and the envisioned outcomes in more detail. The analysis of standardisation potentials will follow the CREMA task and software component structure, since this structure provides clearly defined elements. For each identified standardisation potential, an owner will be named who leads the standardisation activities for this particular element. The owners will be supported by the SIMPLI-CITY Standardisation Manager.

At the moment of writing this deliverable D9.14, the consensus within the consortium is that it is more likely feasible to work on extensions of existing standards by domain-specific elements than to come up with a new stand-alone standard.

Regarding the standardisation bodies to be approached by the CREMA consortium, a preliminary identification has been done during the first project year (as presented in Section 4.2). However, it is very likely that this list will be updated based on the outcome of the Functional and Technical Specifications. Also, the project is open to suggestions by the EC or CSAs.

One particular aspect of the CREMA standardisation plan is the collaboration with other EU H2020 projects from the same area, in order to join forces and multiply the influence of the single projects in standardisation activities. Most importantly, initial discussions with CREMA's "sister project" C2NET have already been started, while discussions with other running projects in the field of "Networked Factories" are also possible. Preferably, such discussions would be facilitated by the CSAs in the area, e.g., through planned meetings. In addition, CREMA will also take into account cooperations with projects from other fields if this makes sense from a technical point of view.

Table 7: Preliminary Standardisation Plan for the First and Second Project Year

Month	Description	Comment
M12	Setup of preliminary standardisation plan	Already achieved
M12	Preliminary identification of relevant standardisation bodies	Already achieved.
M14	Partners fill in standardisation spreadsheet	Will be filled in once the Technical Specification has been finished, i.e., when the used technologies have been clearly defined.
M18	Meeting with other projects to discuss joint standardisation activities	Preferably as part of a meeting organised by a CSA or the European Commission.
M23	First meeting with standardisation body	This meeting might happen online, i.e., it is not necessarily a physical meeting.
M24	Documentation of standardisation activities within the second project year	As part of D9.15.

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5 Conclusion

This deliverable provides the Collaboration Plan and the Standardisation Plan in which the list of collaboration and standardisation activities to be done during the next two years of CREMA project are described. Both plans constitute a necessary reference to guide contacts and clustering actions to strengthen CREMA research and dissemination tasks.

Apart from the activities started in the first year of the project that will continue during the rest of the project, specific actions to contact, involve and collaborate with different kind of EU projects and organisations have been planned. As a result of them, it is expected to increase the number of collaboration and standardisation activities during the second year of the project contributing to enhance CREMA outputs.

As living documents, both plans will be continuously monitored and updated over time including new activities resulting from contacts made along the project. Special attention should be paid to the interaction with other CREMA tasks such as T9.2 Promotion and Promotional Material and, particularly, T9.3 Dissemination and Workshops, in order maximise project results impact and to optimise involved resources.

All this inputs will be used as a basis to prepare the next deliverable Project Collaboration and Standardisation Engagement Reports II (T9.4, D9.15) to be submitted at the end of 2016.

Annex A: List of EU Projects Reviewed

Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
ACCEPT	Assistant for Quality Check during Construction Execution Processes for Energy-efficienT buildings	H2020 EeB-03-2014	ACCEPT will create an assistant for quality check during construction execution processes for energy-efficienT buildings. The assistant will run on Smart Glasses and unobtrusively guide workers during the construction on site. This provides a standardized and coordinated process for all workers, ensuring that all benefits of energy-efficient building components are maintained. From a user perspective ACCEPT is focused on the following very clear main results: 1) The Construction Operator Assistant App (CoOpApp) running on Smart Glasses, which passively collects data and actively provides guidance to the worker on site during the building process. 2) A Site Manager App (SiMaApp) running on a mobile device, which allows to remotely coordinate the working process as well as collect additional data on site by different sensors. 3) An interactive web-based Dashboard as a monitoring and quality assurance solution.	01/01/2018		X		ASC ICE (TIE)
C2NET	Cloud Collaborative Manufacturing Networks (C2NET)	H2020 FoF-01-2014	The goal of C2NET Project is the creation of cloud-enabled tools for supporting the supply network optimisation of manufacturing and logistic assets based on collaborative demand, production and delivery plans. C2NET Project will provide a scalable real-time architecture, platform and software to allow the supply network partners: to master complexity and data security of the supply network, to store product, process and logistic data, to optimize the manufacturing assets by the collaborative computation of production plans, to optimize the logistics assets through efficient delivery plans and to render the complete set of supply chain management information on the any digital mobile device (PC, tablets, smartphones, …) of decision makers enabling them to monitor, visualize, control, share and collaborate.	01/01/2018	X	X	X	IKER
Co-FACTOR	Cooperate, Communicate and Connect to boost smart Components for tomorrows Industry	H2020 FoF-7-2014	Co-FACTOR aims at speeding-up the industrial up-take of results of the FoF projects I-Ramp3, ReBORN, SelSus, T-Rex, INTEFIX and Power-OM , whose common topic centers around smart components. Co-FACTOR pursues the 5 major ambitions: 1) Cooperate: establish close partnership among the core cluster to give better visibility to those high-level performing projects among industry, scientific community and policy makers. 2)	01/01/2017				

Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			Communicate: present and promote as a cluster the involved projects and their approaches and achievements among the full range of potential stakeholders as well as public groups and students. 3) Converge: leverage the impact of the projects by focusing on the cross-cutting issue smart components and assessing reliable and interoperable solutions and standardisation opportunities. 4) Connect: facilitate the immediate or short-term exploitation of project results in industrial settings. 5) Consolidate: analyze remaining bottlenecks for smart components technology deployment to.					
EFFECTIVE	Exploiting Factory of the Future projects through Enhanced Clustering towards Technology Transfer, Innovation and Value creation for European industry	H2020 FoF-7-2014	The EFFECTIVE project foresees the following objectives: 1) analyse business trends and market prospects, and perform reviews & workshops to get a consistent set of information for clustering and exploitation of FoF projects activities and results; 2) develop and industrial exploitation framework for the promotion and transfer of FoF projects activities and results, and structure networks & alliances to achieve such objectives; 3) active clustering of FoF activities and results; 4) analyse best practices and case studies of FoF results clustering, exploitation and transfer; 5) set up instruments for adequate monitoring of FoF activities clustering and exploitation; 6) identification of future FoF priorities within the technological areas; 7) promote and disseminate the EFFECTIVE project results and tools to a large community of European actors; 8)involve international experts and create strategic links with international initiatives.	01/01/2017				
FOCUS	Factory of the Future Clusters	H2020 FoF-7-2014	The FOCUS project will build upon the fundament of five existing FoF Clusters, Zero Defect Manufacturing (4ZDM), Robotics, Clean factory, Precision Micro Production Technologies (High Micro) and Maintenance and support. Objectives:1) Provide pro-active support to disseminate the projects' tangible outcomes to support industrial exploitation and take-up within the clusters; 2) Review the state of the art and formulate future FoF priorities. Building upon these five existing FoF Clusters it will: 1) Deliver a model and associated methodology for effective cluster creation, execution and monitoring in future FoF PPP clusters. 2) Deliver	01/01/2017				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			a model and associated methodology for industrial exploitation and take-up of future FoF PPP projects.					
FoF-Impact	Enhanced impact of the Factories of the Future PPP through technology transfer and expanded community	H2020 FoF-7-2014	'FoF-Impact' ultimately aims to speed up and increase the exploitation and up-take of 'Factories of the Future' project results. 1) Increasing impact To achieve the transformation to an innovation programme, FoF-Impact will integrate a set of tools and measures in support of the exploitation of 'Factories of the Future' project results. 2) FoF-Impact tools and guidelines will be tailor-made, include a 'Factories of the Future' Help-Desk 3) Facilitating Collaboration FoF-Impact will facilitate collaboration between stakeholders who are capable of enhancing the impact of the 'Factories of the Future' 4) The clustering of project results will be supported by the EFFRA Innovation Portal and through thematic events partnership at a local level.	01/01/2017				
MANTIS	Cyber Physical System based Proactive Collaborative Maintenance	H2020 ECSEL-01-2014	The overall concept of MANTIS is to provide a proactive maintenance service platform architecture based on Cyber Physical Systems that allows to estimate future performance, to predict and prevent imminent failures and to schedule proactive maintenance. Maintenance is no longer a necessary evil that costs what it costs, but an important function that creates additional value in the business process as well as new business models with a stronger service orientation. Physical systems (e.g. industrial machines, vehicles, renewable energy assets) and the environment they operate in, are monitored continuously by a broad and diverse range of intelligent sensors, resulting in massive amounts of data that characterise the usage history, operational condition, location, movement and other physical properties of those systems. These systems form part of a larger network of heterogeneous and collaborative systems (e.g. vehicle fleets or photovoltaic and windmill parks) connected via robust communication mechanisms able to operate in challenging environments. MANTIS consists of distributed processing chains that efficiently transform raw data into knowledge while minimising the need for bandwidth. Sophisticated distributed sensing and decision making functions	01/05/2018	X	X		IKER

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			are performed at different levels in a collaborative way, ranging from local nodes to locally optimise performance, bandwidth and maintenance; to cloud-based platforms that integrate information from diverse systems and execute distributed processing and analytics algorithms for global decision making.					
MEMAN	Integral Material and Energy flow MANagement in MANufacturing metal mechanic sector	H2020 FoF-03-2014	MEMAN project will implement an approach to optimise resource efficiency across 3 manufacturing value chains cases, integrating an analytical toolbox based on MEFA and LCA and providing practical decision-making support. Furthermore, new business models will be developed to support the implementation of global energy and resources efficiency along the 3 value chains. Energy characterisations considering the whole value chain, will be also developed within MEMAN.	01/07/2018				IKER
Road2CPS	Strategic action for future CPS through roadmaps, impact multiplication and constituency building	H2020 ICT-01-2014	The project aims to carry out strategic action for future CPS through roadmaps, impact multiplications and constituency building. Objectives: 1) identifying the gaps of current research and bridging the effort; 2) analysing future research priorities and business opportunities; 3) bringing the relevant stakeholders together to facilitate mutually beneficial collaborations between them.	01/02/2017				
ActionPlanT	ActionPlanT - The European ICT Forum for Factories of the Future	FoF.ICT.2010.10.1	The threefold objective of ActionPlanT is to first come up with an ICT-enabled manufacturing vision for use cases and services of the future using this analysis as a basis. Secondly, this vision would pave the way for a detailed roadmap which will prioritise and schedule most promising topics for the upcoming work programme of Framework Programme 8. Lastly, within the scope of ActionPlanT, a validated concept for industrial learning will be developed and extensively piloted via summer schools and workshops amongst stakeholders in industry, academia, and the European technology platforms alike.	31/05/2012			X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
ADVENTURE	ADaptive Virtual ENterprise ManufacTURing Environment	FoF-ICT-2011.7.3	FP7 FoF project ADVENTURE provides the means to build service-based Virtual Factories and therefore shares some basic assumptions with CREMA, most importantly the idea to build manufacturing processes from single services. Especially the project's results regarding process design and runtime support will provide valuable input for CREMA.	31/08/2014		X		ASC TANet
amePLM	Advanced Platform for Manufacturing Engineering and Product Lifecycle Management	FoF-ICT-2011.7.4	amePLM will offer a radically new and extensible approach to collaborative engineering, leveraging state-of-the art research on semantics, heuristics and visualisation. The objectives are to Engineer an ontology that serves as an\n-interoperable model and integrating element for an open engineering system: the amePLM Platform will develop an open engineering platform based on existing tools and libraries, by special consideration of open-source software Research and develop tools to assist in product and process development, analysis, virtual testing and optimisation based on heuristic methods and simulation that operate on knowledge represented by information which is structured by means of an ontology	31/03/2015		X	X	
ALFRED	Personal Interactive Assistant for Independent Living and Active Ageing	ICT-2013.5.1	ALFRED's objective is to develop a mobile, personalized assistant for elderly people, which helps them stay independent, coordinate with carers and foster their social contacts. ALFRED is a mobile, personalized Butler, created using cutting edge technologies such as advanced speech interaction, so you can talk directly to him. ALFRED will be very easy to use and will provide 'context-sensitive services related to social inclusion, care, physical exercise and cognitive games.	30/09/2016	X	X		ASC ICE (TIE)
APPS4AME	Engineering Apps for advanced Manufacturing Engineering	FoF.NMP.2012-6	Apps4aME aims at the comprehensive consideration of ICT-based support of Manufacturing Engineering in all the above mentioned domains, called advanced Manufacturing Engineering (aME). The different life cycles will be aligned by the development of a reference model that provides a detailed overview of all relevant domain specific and inter-domain interdependencies. This life cycle-oriented model enables an integrated product design, process development, factory	30/11/2015	X	X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			planning as well as production planning and factory operation. All stakeholders in these activities will be supported by Engineering Apps (eApps) that will be conceived, developed and validated with two industry-driven scenarios, implemented in three demonstrators: automotive, machining and food industry.					
ARUM	ADAPTIVE PRODUCTION MANAGEMENT	FoF-ICT-2011.7.1	ARUM proposes to develop an intelligent Enterprise Service-Based platform (i-ESB). The platform will integrate a service-based architecture with a knowledge-based Multi-Agent System. The i-ESB platform will gather information from sources such as sensors and resource management systems, giving decision makers and planners better insight into and control over the design-to-production process. Also, time-, cost- and risk-analysis will take place within the platform. The project has a double approach, making use of both prediction (in the pre-planning phase) and real-time control (in the production phase).	30/09/2015	X	X	X	ICE (TIE)
ATHENA	Advanced Technologies for Interoperability of Heterogeneous Enterprise Networks and their Applications	IST-2002-2.3.1.9	ATHENA aims to be the most comprehensive and systematic European research initiative in IT to remove barriers to interoperability, to transfer and apply the research results in industrial sectors, and to foster a new- networked business culture.	31/03/2007	X		X	
BIVEE	Business Innovation and Virtual Enterprise Environment	FoF-ICT-2011.7.3	The BIVEE project intends to develop a rich framework, i.e., a software environment that includes business principles, models, and best practices, to promote innovation in virtual enterprise environments. Effective innovation needs to be aware of what is going on inside the VE, at the production level, and at the same time outside it, where a plethora of elements move fast and often unexpectedly (i.e., markets, technology, finances, competitors, etc.). In BIVEE we introduced the notions of Value Production and Business.	31/12/2014				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
CAP2M-SCHED	Consolidation, industrial Alignment and Performance verification for Movement to Market of a SCheduling solution featuring Heuristics-enhancED simulation & optimisation	SME-2011-3	A major objective of the project is thus to promote confidence that the CAP-SCHED solution can be perceived by prospective commercial partners & industrial customers to confer highest added-value and return on procurement investment. CAP2M-SCHED therefore aims to allow the partners to move with confidence towards market readiness and subsequent commercial exploitation of the CAP-SCHED results, via actions to : * test & consolidate prototype CAP-SCHED process scheduling solutions; * verify the performance of prototypes on a number of typical industrial exemplar processes; * evaluate & fine-tune the capabilities of CAP-SCHED to cope with diverse process conditions encountered in practice; * refine market analysis, business modelling & associated marketing strategy.	01/06/2013		X		
CAPP-4-SMES	Collaborative and Adaptive Process Planning for Sustainable Manufacturing Environments	FoF.NMP.2012-6	This CAPP-4-SMEs project is aimed at enhancing the competitiveness of European companies, particularly SMEs, in sustainable manufacturing environment by: (1) collaborative and adaptive process planning against changes; (2) knowledge-based and integrated process simulation towards first-time-right processes; (3) event-driven function blocks for on-board adaptive process control; (4) machine availability monitoring for real-time job routing; and (5) a Cloud-based services platform for cost-effective and easy access over the Internet.	30/11/2015		X	X	
CELAR	CELAR: Automatic, multi-grained elasticity-provisioning for the Cloud	ICT-2011.1.2	The CELAR Elasticity Provisioning Platform is the central component of the entire platform. Its main goal is to provide the methods and tools to integrate and orchestrate all the submodules of the CELAR platform (decision module, monitoring system, application description tool, etc) into one functional elasticity middleware that can expose its functionality to the external applications with a unified and user agnostic manner.	30/09/2015		X		TUV

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
CHOReOS	Large Scale Choreographies for the Future Internet	ICT-2009.1.2	The CHOReOS project positions itself in the context of the Ultra-Large-Scale (ULS) Future Internet of software services. To address the challenges inherent of ULS as well as other key requirements of the Future Internet, such as fusion of the user/developer/system roles, adaptability and QoS-awareness, to name a few, CHOReOS revisits the concept of choreography-based service composition in service-oriented systems. CHOReOS introduces a dynamic development process, and associated methods, tools and middleware sustaining the ever-adaptable composition of services by domain experts – being the users of business choreographies – in the Future Internet. CHOReOS concepts then encompass formally grounded abstractions and models, dynamic choreography-centric development process, governance and service-oriented middleware, thus providing an Integrated Development & Runtime Environment (IDRE) aimed at overcoming the ULS impact on software system development	30/09/2013				
Cloudi/o		German national project	Cloudi/o delivers a secure and scalable data management platform. This platform takes into account privacy and security aspects. It provides interfaces and clients for mobile environments and can be used for the mobile dashboard implementation of CREMA as well for the security aspects of the project.		X		X	ASC
CLOUDSME	Cloud based Simulation platform for Manufacturing and Engineering	FoF-ICT-2013.7.1	The CloudSME project will develop a cloud-based, one-stop-shop solution that will significantly lower these barriers, provide a scalable platform for small or larger scale simulations, and enable the wider take-up of simulation technologies in manufacturing and engineering SME's. The CloudSME Simulation Platform will support end user SME's to utilise customised simulation applications in the form of Software-as-a-Service (SaaS) based provision. Moreover, simulation software service providers and consulting companies will have access to a Platform-as-a-Service (PaaS) solution that enables them to quickly assemble custom simulation solutions in the cloud for their clients. The CloudSME Simulation Platform will be built on	31/12/2015	X	X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			existing and proven technologies provided by the project partners and partially developed in previous European projects.					
COMVANTAGE	Collaborative Manufacturing Network for Competitive Advantage	FoF-ICT-2011.7.3	With ComVantage we envision an interorganisational collaboration space turning today's organisation-centric manufacturing approach into a product-centric one. Manufacturers will benefit from a flexible, efficient platform that helps them to operate as one virtual factory and thus gain competitive advantages in their markets. The framework of the virtual factory will encompass a secure access control that is founded on dynamic workflow models and flexible user roles accounting for large enterprises, SMEs and for end-customers. To adhere to changing working situations, to efficient communication, and to rich interaction technologies ComVantage will focus on mobile devices. Intuitive and trustful mobile apps shall support users in fast decision making and problem solving. Information from different sources across the organisations is provided and maintained via Linked Data. The integration of sensor data allows for products to be members of the collaboration space.	31/08/2014	X		X	TUV
CONVERGE	Collaborative Communication Driven Decision Management in Non Hierarchical Supply Chains of the Electronic Industry	NMP-2008-3.3-1	The CONVERGE project closes this gap by providing a framework and tools for exchanging tactical and strategic information for decision making in non-hierarchical supply chain networks. CONVERGE delivers a de-centralized decision support system for production planning and resource optimisation based on 1) a new reference model for inter-organisational decision taking, 2) deployment methods to adapt the generic reference model to application fields, networks and companies and 3) existing software supporting customer and supplier relations.	30/11/2011	X	X	X	
CoSpaces	Innovative Collaborative Work Environments for Design and	IST-2005-2.5.9	The CoSpaces project addresses three scientific and technological objectives: 1) Evaluate collaboration at individual, team and enterprise levels, and develop collaboration models emphasising applications of problem solving, creativity, participatory and knowledge based design in innovative	31/10/2009			X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	Engineering		collaborative work environments; 2) Create an innovative distributed software framework that will support easy creation of collaborative work environments for distributed knowledge workers and teams in collaborative design and engineering tasks; 3) Validate the distributed software framework for creating different classes of collaborative working styles required for collaborative design and engineering in the Aerospace, Automotive and Construction sectors.					
CuteLoop	Customer in the Loop: Using Networked Devices enabled Intelligence for Proactive Customers Integration as Drivers of Integrated Enterprise	ICT-2007.1.3	The strategic objective of CuteLoop is to explore how Intelligent Networked Devices such as enhanced RFID-based systems, can be used to effectively 'integrate customers within an Integrated Enterprise' and with this provide an important step towards 'real' Integrated, Real Time Enterprise. Such integrated real time enterprise, having customers as integrated drivers, needs, on one side, highly flexible and dynamic business interconnections to react dynamically and agile, on the other side a highly intensive and just-in-time exchange of knowledge/experience among Large Enterprises (LEs), CuteLoop is aiming at realisation of a holistic approach on:\n- an innovative architecture by integration of event-driven and SOA based principles, intelligent and agile agents combined with an event-driven architecture, decentralised and self-evolving approach for assuring security and trust as well as supporting a customer oriented privacy of data\n- new interaction models and patterns for the real time enterprise.	30/04/2011		X	X	
CyProS	Cyber-Physical Production Systems	German national project	CyProS is a German national project aiming at the development of a reference architecture and prototypical showcases for CPS which can be taken into account for respective work in CREMA.		X	X	X	DFKI
DREAM	Simulation based application Decision support in Real-time for Efficient Agile Manufacturing	FoF.NMP.2012-6	DREAM will offer a radically new and extensible approach to simulation application engineering, leveraging state-of-the art research on simulation and simulation based optimisation. The objectives are: 1. To increase the competitiveness of European Manufacturing Companies through the provision of multi-level just-in-time simulation based application decision support. 2. To engineer a semantic free open simulation application	30/09/2015	X	X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			development platform to promote simulation based applications by European Manufacturing Companies, IT consultants, Open Source community and Researchers. 3. To address the multi-faceted barriers to the adoption of advanced simulation decision support technologies by manufacturing companies, especially SMEs, by developing methodologies to address system knowledge management and human-system interaction challenges. 4. Using the semantic free simulation application platform to implement novel applications to support decisions at multi-levels in European Manufacturing Companies.					
EASY-IMP	Collaborative Development of Intelligent Wearable Meta-Products in the Cloud	FoF.NMP.2013-5	The goal of EASY is to develop new methodologies, tools and ready-to-use components for designing and producing intelligent wearable products as Meta-Products. We propose a Cloud Computing enabled framework for the Collaborative Design and Development of Personalised Products/Services, combining embedded sensors and mobile devices with facilities for joint open development of enabling downloadable applications. The Meta-Products consist of intelligent wearables (clothing, footwear, accessories) equipped with embedded networks of sensors. Sensorial data will be communicated to smart phones via Bluetooth or Wifi.	31/08/2016				
ECOLEAD	European Collaborative Networked Organisations Leadership Initiative	IST-2002-2.3.1.9	Collaborative networks of organisations provide a basis for competitiveness, world-excellence, and agility in turbulent market conditions. They can support SMEs to identify and exploit new business potential, boost innovation, and increase their knowledge. Networking of SMEs with large-scale enterprises also contributes to the success of the big companies in the global market. Reinforcing the effectiveness of collaborative networks, mostly based on SMEs, and creating the necessary conditions for making them endogenous reality in the European industrial landscape, are key survival factors.	31/03/2008			X	IKER
ECLIPS	Extended Collaborative integrated Life cycle supply	FP6-2004-NMP-TI-4	A key challenge to the European industry is to deliver ever-more customized and up-to-date products, again while reducing inventory investments. As a consortium spanning the academic, the business and the world of information technology, we see an	31/03/2009		X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	chain Planning System		opportunity in leveraging recent advancements in information technology to feed breakthrough multi-echelon supply chain optimisation models. Our key value proposal is to improve and automate product life cycle management over multiple levels in a supply chain. This automated switching is a green field from both an academic and a business perspective. Our consortium will develop optimisation components and package them into an add-on that can easily be integrated with existing ERP and APS packages. As such we will extend the current technological means and provide multi-echelon optimisation capabilities through an existing ERP and APS backbone.					
ENSEMBLE	Envisioning, Supporting and Promoting Future Internet Enterprise Systems Research through Scientific Collaboration	FP7-ICT-2009-5	ENSEMBLE coordination and support action aims at enlarging and supporting the FInES research community (research projects, key experts, wider audience) through establishing and maintaining specifically designed electronic collaborative tools and performing specialized workshops and consultations. ENSEMBLE project also aims at a major contribution towards the establishment of a scientific base for Enterprise Interoperability – a grand challenge of the FInES research. Furthermore, ENSEMBLE activities will provide solid support for the ICT research roadmap development in the area of Future Internet, interacting with the research projects and key experts of the area, delivering policy support and research alignment recommendations.	31/08/2012	X	X	X	
EPES	Eco Process Engineering System for composition of services to optimize product life cycle	FoF-ICT-2011.7.3	EPES will provide service oriented ICT solutions to generate services, which improve the performance of highly customized industrial processes, products and services (PPS) during their life, in cases in which no standard, off-the-shelf solutions can be applied. In many sectors. The EPES system will include features for collaborative work, a Virtual Factory knowledge repository, service configuration, and a simulation and decision-making platform, with the ultimate objective of facilitating the use, reuse, storage, analysis and sharing of knowledge within the Virtual Factory.	28/02/2015			X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
EPS 4.0	Elastic Process Support for the Manufacturing Industry	Austrian national project	EPS 4.0 is an Austrian project at TUV. It will provide outputs which could be reapplied in CREMA for process execution and process optimisation.			X		TUV
EXTREMEFACTORIES	On-the-cloud environment implementing agile management methods for enabling the set-up, monitoring and follow-up of business innovation processes in industrial SMEs	FoF-ICT-2011.7.3	The ExtremeFactories project proposes the conception of a collaborative internet-based platform with semantic capabilities (by means of ontology modeling) that implements a new methodology for the adoption of a systematic innovation process in globally acting networked SMEs. The platform will support SMEs to manage and implement the complex innovation processes arisen in a networked environment, taking into account their internal and external links, by enabling an open multi-agent focused innovation.	30/04/2014				
FFD	Future Fashion Design Real-time, Accurate Fabric to Garment Virtual Prototyping in Collaborative Environments	FoF-ICT-2011.7.4	The FFD project aims to remove the main factors inhibiting the wide adoption of Virtual Prototyping (VP) by the Textile and Clothing companies (TCI), by drastically improving the speed of obtaining realistic garment simulations (development of massively parallel simulation techniques based on multi-core computing), the accuracy (simulation from yarn - to fabric - to garment, virtual garment close to real sample) and the functional integration aspects (Collaborative Prototyping offered as a SaaS platform).	30/09/2014				
FINEST	Future Internet enabled Optimisation of Transport and Logistics Business Networks	FI.ICT-2011.1.8	The ultimate aim of the FInest project is to develop a Future Internet enabled ICT platform to support optimizing the collaboration and integration within international transport and logistics business networks. This shall be realized as a domain-specific extension of the FI PPP Core Platform. As the initial FI PPP use case project focusing on international freight transport, the FInest project will design the envisioned solution and provide detailed specifications for its technical realisation, define a	31/03/2013		X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			representative set of real-world use case scenarios with detailed plans for conducting large-scale experiments, and design a suitable Future Internet experimentation environment for transport and logistics.					
FITMAN	Future Internet Technologies for MANufacturing	FI.ICT-2011.1.8	The EU FP7 PPP FITMAN will provide the FI PPP Core Platform with 11 industry-led use case trials in the domains of Smart, Digital and Virtual (one is from TANet) Factories of the Future. DFKI is contributing to the Smart Factory and Virtual Factory use cases, e.g. for monitoring and visualizing the state of production facilities which directly relates to CREMA application scenarios.	31/03/2015	X	X	X	DFKI TANet
FLEXINET	Intelligent Systems Configuration Services for Flexible Dynamic Global Production Networks	FoF.NMP.2013-9	This project aims to provide services that support the design and provision of flexible interoperable networks of production systems that can rapidly and accurately be re-configured. To achieve this FLEXINET takes the view that new product-service global production network modelling methods and models are needed that can model business cases and identify the critical network relations and knowledge that underlies the business operation. In addition, FLEXINET takes the fundamental view that complex manufacturing systems which involve multiple partners and multiple complex network constraints, require a semantically rigorous formal foundation upon which to base the flexible re-configuration of global production networks.	30/06/2016				
FoFdation	The Foundation for the Smart Factory of the Future	FoF.ICT.2010.10.1	The Smart Factory integration towards real-time networking and adaptive capability also envisions: Optimizing the numerically controlled (NC) machining systems including programmable logic controllers (PLC) through an embedded Supervisory Control and Data Acquisition (SCADA) system; Supporting an advanced Manufacturing Execution System (MES); Reducing product integration, time-to-market costs and resource diagnosis-maintenance costs through a common control and monitoring platform; Implementing homogenous information sources generating data from the whole process; Using STEP and related standards to form an interoperable and scalable solution.	31/10/2014				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
GloNet	Glocal enterprise network focusing on customer-centric collaboration	FoF-ICT-2011.7.3	GloNet aims at designing, developing, and deploying an agile virtual enterprise environment for networks of SMEs involved in highly customized and service-enhanced products through end-to-end collaboration with customers and local suppliers (co-creation). GloNet implements the glocal enterprise notion with value creation from global networked operations and involving global supply chain management, product-service linkage, and management of distributed units	28/02/2015	X		X	
GRACE	InteGration of pRocess and quAlity Control using multi-agEnt technology	NMP-2009-3.2-2	The GRACE main objective is to realize a cooperative multi agent system (MAS) operating at all stages of a manufacturing system, integrating process control with quality control, for developing: - self-adaptive procedures into control and diagnostic systems at local and global level handling variation in process set-point and variables and unplanned fluctuations of process/product parameters; - supervision and control schemes at factory level based on a continuous flow of information between agents; - factory-level decision making strategies based on data analysis methods; - a modular engineering methodology enabling the efficient use of MAS production platforms.	30/06/2013		X		
ICARGO	iCargo - Intelligent Cargo in Efficient and Sustainable Global Logistics Operations	ICT-2011.6.6	iCargo IP aims at advancing and extending the use of ICT to support new logistics services that: (i) synchronize vehicle movements and logistics operations across various modes and actors to lower CO2 emissions, (ii) adapt to changing conditions through dynamic planning methods involving intelligent cargo, vehicle and infrastructure systems and (iii) combine services, resources and information from different stakeholders, taking part in an open freight management ecosystem.	30/04/2015	X	X	X	
IMAGINE	Innovative End-to-end Management of Dynamic Manufacturing Networks	FoF-ICT-2011.7.3	IMAGINE addresses the need of modern manufacturing enterprises for a novel end-to-end management of dynamic manufacturing networks and will develop a multi-party collaboration platform for innovative, responsive manufacturing that encompasses globally distributed partners, suppliers & production facilities (SMEs and/or OEMs) that jointly conduct multi-party manufacturing. The project will implement a novel	31/12/2014			X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			comprehensive methodology for the management of dynamic manufacturing networks that provides consolidated and coordinated view of information from various manufacturing sources and systems and enables service-enhanced product and production lifecycle and responsive manufacturing processes throughout the value chain.					
INPRO	Open INformation environment for knowledge-based collaborative PROcesses throughout the lifecycle of a building	FP6-2004-NMP-NI-4	The transformation will be achieved through radical Early Design processes, supported by breakthrough innovations in business concepts and ICT solutions that integrate four crucial aspects of Early Design: - Open and flexible collaboration between all stakeholders of the building value chain - Design from a lifecycle perspective - Decision support to make "informed choices" based on knowledge of each decision's consequences on the building lifecycle - Early planning of build and operation processes based on computer enabled simulations of smart digital prototypes	31/08/2010				
INTEROP	Interoperability research for networked enterprises applications and software	IST-2002-2.3.1.9	INTEROP aims to extract value from the sustainable integration of these thematic components and to develop industrially significant new knowledge. Network's role will be to create the conditions of a technological breakthrough to avoid that enterprise investment be simply pulled by incremental evolution of IT offer. The Joint Programme of Activities aims to:- integrate the knowledge in Ontology, Enterprise Modelling and Architectures to give sustainable sense to interoperability.	30/04/2007				
iSURF	An interoperability service utility for collaborative supply chain planning across multiple domains supported by	ICT-2007.1.3	iSURF will provide an intelligent collaborative supply chain planning network that will: - Realize a knowledge-oriented inter-enterprise collaboration environment in which distributed intelligence of multiple trading partners will be exploited in the planning and fulfilment of customer demand in the supply chain.- Develop a Semantic Interoperability Service Utility.- Provide an open source smart product infrastructure for SMEs.- Enable the definition and execution of inter-enterprise collaboration through the Service Oriented Collaborative Supply Chain Planning	31/07/2010	X		X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	RFID devices		Process Definition and Execution Platform.- Wrap the existing legacy applications with semantically enriched web services.- Facilitate establishing transitory supply chain planning collaborations in case of exceptions.- Provide a Global Data Synchronisation Service Utility.- Ensure the security and privacy of the real time visibility data gathered through RFID devices, the planning and forecasting messages exchanged across enterprise					
KAP	Knowledge, Awareness and Prediction of Man, Machine, Material and Method in Manufacturing	FoF.ICT.2010.10.1	The KAP project will deliver energy management standards and a technology framework for next generation, sustainable manufacturing. KAP stands for Knowledge of past performance, combined with Awareness of the present state, which together can support Prediction of future outcomes. To achieve this goal the project will define a range of sustainable manufacturing standards. Measurements will be gathered through a factory-wide network of sensors. Complex Event Processing (CEP) and data stream analysis will compute on-the-fly production performance indicators (PPIs) for real-time monitoring. Data mining in combination with OLAP will support problem diagnosis and resolution. Computational learning techniques will create a self-improving system for operational control.	31/12/2013				
Know4Car	An Internet-based Collaborative Platform for Managing Manufacturing Knowledge	FoF-ICT-2011.7.4	The Know4Car project will attempt to address the following objectives: The more efficient knowledge management and collaboration throughout the product lifecycle, supporting the capture, the systematic organisation in the form of manufacturing templates of knowledge; To revolutionize the UI context in the engineering office and the shop floor, with particular emphasis on training activities:\n- Faster, easier, error-free UI for data entry / checking in the shop floor along with serious games options for instantaneous knowledge retrieval, training and/or design purposes.	31/08/2015				
LinkedDesign	Linked Knowledge in Manufacturing, Engineering and	FoF-ICT-2011.7.4	The project will develop the Linked Engineering and mAnufacturing Platform (LEAP) as an integrated information system for manufacturing design. LEAP federates all product lifecycle information relevant to drive engineering and	28/02/2015				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	Design for Next-Generation Production		manufacturing processes, independent of its format, location, originator, and time of creation. Besides the unified access to the integrated information, LEAP will provide specific knowledge exploitation solutions like sentiment analysis and design decision support systems to analyse the integrated information.\nWithin LinkkME we aim for a user-centric lifecycle information management. LEAP will provide a context-driven access to federated information and knowledge and foster cross-discipline collaborations between users by novel approaches for collaborative engineering.					
MANSYS	MANufacturing decision and supply chain management SYStem for additive manufacturing	FoF.NMP.2013-9	ManSYS aims to develop and demonstrate a set of e-supply chain tools; to enable the mass adoption of Additive Manufacturing (AM). This will allow businesses to identify and determine the suitability of AM for metal products, and subsequently manage the associated supply-chain issues and 'facilitating' open product evolution.	30/06/2016				
MOBIS	Personalized Mobility Services for energy efficiency and security through advanced Artificial Intelligence techniques	ICT-2011.6.7	The main goal of MobiS is to create a new concept and solution of a federated, customized and intelligent mobility platform by applying novel Future Internet technologies and Artificial Intelligence methods that will monitor, model and manage the urban mobility complex network of people, objects, natural, social and business environment in real-time.	31/05/2015	X	X	X	
MONDO	Scalable Modelling and Model Management on the Cloud	ICT-2013.1.2	FP7 ICT project MONDO provides the means to model large scale models based on Cloud technology. It provides some basic modeling technology that can be used within CREMA.	30/04/2016	X			IKER
MSEE	Manufacturing SErvice	FoF-ICT-2011.7.3	The first Grand Challenge for MSEE project is to make SSME (Service Science Management and Engineering) evolve towards	29/02/2012	X		X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	Ecosystem		Manufacturing Systems and Factories of the Future. The second Grand Challenge for MSEE project is to transform current manufacturing hierarchical supply chains into manufacturing open ecosystems. The synthesis of the two Grand Challenges above in industrial business scenarios and their full adoption in some European test cases will result in new Virtual Factory Industrial Models, where service orientation and collaborative innovation will support a new renaissance of Europe in the global manufacturing context.					
NET-CHALLENGE	Innovative networks of SMEs for complex products manufacturing	NMP-2008-3.3-1	Net-Challenge covers the design and development of effective methodologies, processes and ICT decision support tools. The project outcomes will be: - a methodology to help SMEs in the qualification, formation and operation of dynamic networks (able to quickly respond to market opportunities characterized by low volume, high variety and customer centred products); - reference collaboration processes for non-hierarchical networks, to be used in promoting and facilitating real collaborative business processes; - distributed decision support tools to help companies to manage, manufacturing and logistic processes, including: aggregate collaborative planning with dynamic capacity management and real-time order promising; real-time monitoring with event management and performance management.	29/02/2012			X	
OPDIS	Open Product Data Information System	German national project	The creation of an *Open Product Data Information System* for consumers is the goal of this German national project. The project creates a component called OPDIS-KNOW for allowing the management of connected content assets in a non-semantic but highly flexible way with a variety of interfaces and messaging facilities, which could technically be reused within CREMA for data integration.		X			ASC
OSMOSE	OSMOsis applications for the Sensing Enterprise	ICT-2013.1.3	The main objective of the OSMOSE project is to develop a reference architecture, a middleware and some prototypal applications for the Sensing-Liquid Enterprise, by interconnecting Real, Digital and Virtual Worlds. The OSMOSE project will design and develop a Reference Architecture for modelling and managing shadow images of the same Sensing-	30/09/2016	X			

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			Liquid.					
PlantCockpit	Production Logistics and Sustainability Cockpit	FoF.ICT.2010.10.1	The PLANTCockpit will give production supervisors, foremen, and line managers the required visibility to make well-informed decisions for optimizing plant processes. This includes the holistic visibility of the plan, the current status, deviations and exceptions, and bottlenecks. PLANTCockpit will provide a model for integrating heterogeneous shop floor management systems including ERP, MES, SCADA, condition-based maintenance, energy management, and other special-purpose systems. PLANTCockpit will focus on defining standard interfaces and a reference model for integrating the most prominent manufacturing processes.	31/12/2013	X			
PLAY	Pushing dynamic and ubiquitous interaction between services Leveraged in the Future Internet by ApplYing complex event processing	ICT-2009.1.2	The goal of PLAY is to develop and validate an elastic and reliable federated SOA architecture for dynamic and complex, event-driven interaction in large highly distributed and heterogeneous service systems. Such architecture will enable exchange of contextual information between heterogeneous services, providing the possibilities to optimize/personalize the execution of them, resulting in the so called situational-driven adaptivity.	30/09/2013			X	
PREMANUS	Product Remanufacturing Service System	FoF-ICT-2011.7.3	The goal of PREMANUS is to overcome the asymmetric distribution of information in the End-of-Life (EoL) recovery of products, with a special emphasis on remanufacturing. To achieve this goal, PREMANUS will provide an on demand middleware which combines product information and product services within one service oriented architecture. In addition to closing the information gap, the PREMANUS middleware would compute EoL-specific KPIs based on product usage data and make recommendations to its users regarding the viability (in terms of profitability, scope, and time) of remanufacturing a	30/06/2015	X		X	ICE (TIE)

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			product.					
ProaSense	The Proactive Sensing Enterprise	ICT-2013.1.3	ProaSense's core goal in this context is to pave the way for an efficient transmission from Sensing into Proactive enterprises. This will be achieved through the adoption of the Observe-Orient-Decide-Act (OODA) loop of situational awareness and development of corresponding technologies supporting a scalable, distributed architecture for the management and processing of big-data that will eventually enable continuous monitoring and the need for service adaptation and propose corresponding changes in an (semi-) automatic way. Key innovations include novel approaches for scalable storage and access to sensed data; development of smart sensing services, services for anticipation management, approaches for probabilistic stream processing and goal-driven Complex Event Processing.	31/10/2016	X	X	X	
Probe-IT	Pursuing ROadmaps and BEnchmarks for the Internet of Things	ICT-2011.1.3	PROBE-IT will fully implement the objectives of the call, it will not provide overlap and support as large as the international collaboration and standardisation already provided by CASAGRAS2 or on global vision and collaboration as provided by IOT-I project. PROBE-IT will cooperate with these two projects in complementing the global portfolio with benchmarks, roadmaps and other key inputs on validation and interoperability.	30/09/2013	X			
PROSE	Promoting standardisation for embedded systems	ICT-2007.3.7	ProSE is a supporting standardisation action in the field of Embedded Systems (ES) in which standards are of strategic importance for the creation of markets. ProSE will provide a vision and recommendations on the way that Embedded Systems standards can create cross business domains synergies. For this purpose, the project will develop a framework for analysis of the present standardisation position and a method to determine standardisation priorities for ES. The project will identify relevant standardisation organisations and develop criteria for evaluating candidate standards, a work model and procedures for promoting these candidates to reach the status of	31/10/2014	X	X	x	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			a standard in the long term.					
PROSECO	Collaborative Environment for Design of AmI enhanced Product-Services Integrating Highly Personalised Innovative Functions with Minimal Ecological Footprint along Life Cycle and of Their Production	FoF.NMP.2013-5	The objective is to provide a novel methodology and a comprehensive ICT solution for collaborative design of product-services (Meta Products) and their production processes. The effective extension of products with new services in different sectors (automotive, home appliances, automation equipment etc.) will be achieved by means of Ambient Intelligence (AmI) technology, Lean and Eco-design principles and applying Life Cycle Assessment techniques. New Meta Products, using AmI, will be capable of acquiring knowledge in order to add highly personalized innovative functions, and thus enabling new business models. A Cloud Manufacturing approach will be applied for effective collaborative design of product-services and their production processes, and the effective implementation of innovative services. It will involve all the actors of a value chain, within a product ecosystem, allowing manufacturers to strengthen their competitiveness at the global market. As a result new eco-innovative Meta Products will be offered, which integrate highly personalised innovative functions with minimal environmental footprint along the overall Life Cycle.	30/09/2017		X	X	
REMPLANET	Resilient Multi-Plant Networks	NMP-2008-3.3-1	FP7 NMP project REMPLANET provides methods, guidelines and tools to align strategy, operations, management systems, governance structure, and decision-support in the context of machinery and equipment global manufacturing networks. REMPLANET is focused on the integration of the customer driven innovation influence in the products and manufacturing processes design, and the responsiveness to customised market demands of global manufacturing networks processes under a real-time non-centralised decision making context. Project outputs will be a valuable input for CREMA process modeling, optimisation, simulation and forecasting, monitoring and the Dashboard.	30/04/2012		X	X	IKER

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Road4FAME	Development of a Strategic Research and Innovation Roadmap for Future Architectures and Services for Manufacturing in Europe and Derivation of Business Opportunities	FoF-ICT-2013.7.1	The Road4FAME project has been conceived to respond to this situation by developing a holistic research and innovation roadmap for architectures and services, aligned with the concrete needs and requirements of manufacturing. In the roadmapping process, promising paradigms and concepts shall be evaluated with respect to their applicability and utility as architectures and services in manufacturing. The roadmap will serve to guide the R&D of architectures and services to match precisely the requirements of European manufacturing businesses. Furthermore, the Road4FAME project will yield strategy recommendations and outline business opportunities tailored to decision makers of European manufacturing businesses enabling them to harness the potential of ICT through the right architectures and services.	31/10/2015				
ROBUSTPLANET	Shock-robust Design of Plants and their Supply Chain Networks	FoF.NMP.2013-9	The RobustPlaNet project aims at developing an innovative technology-based business approach that will drastically change the current rigid supply chain mechanisms and the current product-based business models into collaborative and robust production networks able to timely deliver innovative product-services in very dynamic and unpredictable, global environments. The development of this new business approach is based on four major pillars, namely (i) innovative supply services, (ii) innovative product-services enabled by ICT, (iii) innovative methodologies for decision-making integrating the plant and the supply network level and (iv) innovative business and assessment models for value creation based on partnership.	30/09/2016		X		
SCHUMANN	Supply Chain Uncertainty Management Network Optimisation	ESPRIT 26267	The project aims at developing, implementing and testing, on a high performance computing platform, a software system to simulate and optimise the Supply Chain for Manufacturing, Assembly, Distribution and Service (MADS) of Bills of Material by using the automotive sector as a pilot area. The target is to develop and implement mathematical algorithmic approaches jointly with suitable analytic decision data warehouses for a multi		X	X	X	

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			processor parallel high performance computing environment, so that the solution times for a large size case of the above problem lie in the range of 15-30 minutes for a rough cut and 3.0-3.5 hours for detailed allocation and scheduling/planning.					
S-Cube	Software Services and Systems Network	ICT-2007.1.2	FP7 NoE S-Cube was a flagship project aiming at leveraging the next wave of service technologies by providing agile and holistic service engineering and adaptation, which provides important input for the envisioned service virtualisation.	29/02/2012	X	X		TUV
SECURESCM	Secure supply chain management	ICT-2007.1.4	This project proposes to use secure computation to overcome this data sharing problem in supply chain management and enable the secure collaboration and interoperation of supply chain partners to gain the advantages of knowledge-based collaborative supply chain planning, forecasting, benchmarking and management.	31/01/2011	X			
SIMPLE	Self-Organizing Intelligent Middleware Platform for manufacturing and Logistics Enterprises	ARTEMIS	The main goal of the SIMPLE project is to research and deliver an intelligent, self-organizing embedded middleware platform, with particular emphasis on the integration of manufacturing and logistics. SIMPLE will address the issue of supporting the self-organisation and cooperation of wireless sensors and smart (RFID) tags for federated, open and trusted deployment environments in the manufacturing and logistics application domains. SIMPLE will develop a novel and complete sensor and RFID based embedded middleware platform for manufacturing and logistics applications and validate the platform in scenarios dealing with holistic lifecycle management for manufacturing, distribution, recycling and disposal of goods.		X			
SIMPLI-CITY	The Road User Information System of the Future	ICT-2011.6.7	SIMPLI-CITY will provide this framework.\n\nSIMPLI-CITY will facilitate two main RTD results: 1. A European wide service platform allowing the creation of mobility services as well as creation of corresponding apps. This will enable third parties to create a wide range of interoperable, value-added services, and apps for drivers and other road users. 2. An end user assistant allowing road users to make use of the information provided by apps and to interact with them in a non-distracting way – based	30/09/2015	X	X		TUV ASC ICE (TIE)

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
			on a speech recognition approach. SIMPLI-CITY will take advantage of the great success of mobile apps. These apps have created new opportunities and even business models by making it possible for developers to create applications on top of the mobile device infrastructure. Many of the most advanced and innovative services have been developed by new players, who bring in fresh ideas. Hence, SIMPLI-CITY will support third party developers to efficiently realise and sell their mobility-related service ideas by a range of tools and methods. For this, SIMPLI-CITY will deliver a Mobility Service Framework (including according Service and Application Marketplaces), Mobility-related Data as a Service, and the Personal Mobility Assistant, and will build example services.					
Sinno-dium	Software Innovations for the Digital Company	German national project	Sinnodium is a German national project aiming at developing adaptive business process management solutions in several application areas including smart manufacturing and retail.			X	X	DFKI
SMART	Intelligent integration of supply chain processes and consumer services based on unique product identification in a networked business Environment	IST-2005-2.5.8	The SMART project aims to support intelligent business networking and consumer services based on effective and efficient information/knowledge sharing and collaboration across supply chain partners, capitalizing on the fact that products are uniquely identified with the use of smart tagging technology. The objective of this project is to enable innovative supply chain collaboration processes and consumer value management exploiting the possibility for unique product identification across the supply chain. The project will be based on a distributed-software-architecture and innovative electronic services, capitalizing on existing infrastructures and standards, in order to support real time information sharing, decision making and collaboration among supply chain partners, as well as information services to educated customers. Specific processes that will be tackled include the process of collaborative planning and replenishment, product tracking and traceability, reverse logistics, promotions management and consumer in-store support.	30/04/2009				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
SmartF-IT		German national project	The German national project SmartF-IT is looking at cyber-physical IT systems to master complexness of a new generation of multi-adaptive factories due to the intensive use of high-networked sensors and actuators, overcoming traditional production hierarchies of central control towards decentralized self-organisation. Primarily, its outcomes will flow into the monitoring and sensor integration functionalities of CREMA.		X		X	DFKI
Smart-FactoryKL		German national project	The SmartFactoryKL technology initiative located at the German Research Center for Artificial Intelligence (DFKI) in Kaiserslautern, is the first European vendor independent demonstration factory for the industrial application of state-of-the-art information and communication technologies. Therefore, it provides important means for demonstrations of CREMA – not only regarding the RTD work packages, but actually also regarding the use case demonstrations.		X	X	X	DFKI
SMART SME	Smart Forms of Collaboration among Inter-Networked Manufacturing SMEs	1.1.2.-2.2.3 - Dynamic networked organisations	The main common business objectives of the 10 SMEs in the consortium are: (a) to maintain and further improve their competitiveness on the market based on innovative collaborative work within an inter-networked organisation; (b) to identify and eliminate bottlenecks in the current, traditional forms of mutual cooperation and find ways to resolve problems related to resistance to a stronger, active partnership; (c) to identify the appropriate forms of collaborative work; (d) to improve their ability to exploit the opportunities offered by the digital economy by improvement of skills and to prepare themselves for further networking with other companies.	31/03/2002			X	
SOA4ALL	Service Oriented Architectures for All	ICT-2007.1.2	SOA4ALL was a flagship EU FP7 IP aiming to enable “a Web of billions of services”. Especially the functionalities to easily create and consume services and data will be of use to CREMA.	30/04/2011		X	X	ICE (TIE)
TERRIFIC	Towards Enhanced Integration of Design and Production in	FoF-ICT-2011.7.4	The project aims at significant improvement of the interoperability of computational tools for the design, analysis and optimisation of functional products. An isogeometric approach is applied for selected manufacturing application areas (cars, trains, aircraft) and for computer-aided machining.	31/08/2014				

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	the Factory of the Future through Isogeometric Technologies		Computer Aided Design and numerical simulation algorithms are vital technologies in modern product development, yet they are today far from being seamlessly integrated.					
USE-IT-WISELY	Innovative continuous upgrades of high investment product-services	FoF.NMP.2013-5	The project will investigate a new business model that implements continuous product-service adaptation through a sequence of small innovative steps. It will demonstrate that product-service agility and extended service life realized in this way is more viable than large and infrequent upgrades in terms of cost, duration and environmental impact. Use-it-wisely will develop and demonstrate the adaptation platform consisting of the following three elements: (1) multi-disciplinary actors-product-service system model; (2) adaptation mechanism based on the knowledge and skills of all actors involved with the system; (3) interactive collaborative distributed environment, where the actors work out the adaptation steps.	30/11/2016			X	
VENIS	Virtual Enterprises by Networked Interoperability Services	FoF-ICT-2011.7.3	The VENIS project is aimed at bridging the gap of interoperability between Large and Medium-Small-Micro Enterprises, according to the 'Virtual Organisation' paradigm:\n-\ta distributed and secure repository to share the information contained in the file systems, databases, ERPs, CRMs, and other legacy applications of the enterprises, connecting the IT Infrastructures from Large to Micro enterprises;\n-\ta set of lightweight web services for the smart integration of the information exchanged in joint works, based on legacy email systems and boosted by semantic annotations and search a distributed processes engine mechanism, able to link and execute the enterprises business processes, to assist the work in joint businesses and to create novel synergies in products supply chains.	31/08/2015	X	X	X	
VISTRA	Virtual Simulation and Training of Assembly and	ICT-2007.6.3	VISTRA proposes the development of a comprehensive platform for simulation, documentation and training of manual assembly processes based on advanced ICT-technology: auto-generation, realistic physical behaviour, game-based learning, advanced	31/08/2014				DFKI

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Project Acronym	Title	Call topic	Project objectives	End date	WP 3	WP 4	WP 5	CREMA partners
	Service Processes in Digital Factories		user-interaction, low-cost hardware and cross-disciplinary information sharing. VISTRA will allow to train workers in a way which is more efficient, straightforward and resource-saving than today's methods; VISTRA will enable production engineers to analyse assembly processes before physical mock-ups exists.					

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Annex B: List of Standadisation Bodies Reviewed

Standardisation Body		Mission	Groups and Standards
AENOR	Spanish Association for Standardisation and Certification	AENOR is a private non-profit organisation that was founded in 1986. Through the development of technical standards and certification, AENOR helps to improve the quality and competitiveness of companies and their products and services. AENOR is the organisation that is legally responsible for developing and disseminating technical standards in Spain. AENOR represents Spain at the international standardisation organisations ISO and IEC; European CEN, CENELEC and ETSI; and the American COPANT. AENOR takes part in these actively, both on the governing boards and in the undertaking of technical work. In the case of COPANT, AENOR is an adherent member.	
ANSI	American National Standards Institute	As the voice of the U.S. standards and conformity assessment system, ANSI empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment. The Institute oversees the creation, promulgation and use of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accreditation - assessing the competence of organisations determining conformance to standards.	ANSI/ISA-95: Enterprise-Control System Integration
BSI	British Standards Institution	BSI (or BSI Group) is a multinational business services provider whose principal activity is the production of standards and the supply of standards-related services. BSI produces British Standards, and, as the UK's National Standards Body, is also responsible for the UK publication, in English, of international and European standards. BSI is obliged to adopt and publish all European Standards as identical British Standards and to withdraw pre-existing British Standards that are in conflict. However, it has the option to adopt and publish international standards.	

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Standardisation Body		Mission	Groups and Standards
CEN	European Committee for Standardization	Association that brings together the National Standardisation Bodies of 33 European countries. CEN is officially recognized by the European Union and by the European Free Trade Association (EFTA) as being responsible for developing and defining voluntary standards at European level. CEN provides a platform for the development of European Standards and other technical documents in relation to various kinds of products, materials, services and processes. CEN supports standardisation activities in relation to a wide range of fields and sectors including: air and space, chemicals, construction, consumer products, defence and security, energy, the environment, food and feed, health and safety, healthcare, ICT, machinery, materials, pressure equipment, services, smart living, transport and packaging..	CEN/WS DPP - DPP/WS WS on Data Protection and Privacy CWA 15499:2006 Personal Data Protection Audit Framework (EU Directive EC 95/46) - Part II: Checklists, questionnaires and templates for users of the framework CEN/WS RACS - Requirements and recommendations for Assurance in the Cloud CWA 16871-1:2015 - Requirements and Recommendations for Assurance in Cloud Security - Part 1: Contributed recommendations from European projects
CENELEC	European Committee for Electrotechnical Standardization	CENELEC is the European Committee responsible for standardisation in the electrotechnical engineering field. CENELEC prepares voluntary standards, which help facilitate trade between countries, create new markets, cut compliance costs and support the development of a Single European Market. CENELEC creates market access at European level but also at international level, adopting international standards wherever possible, through its close collaboration with the International Electrotechnical Commission (IEC), under the Dresden Agreement.	Not identified
CIRRUS	Certification, InteRnationalisation and standaRdization in cloUd Security	Certification, InteRnationalisation and standaRdization in cloUd Security (CIRRUS) aims to bring together representatives of industry organisations, law enforcement agencies, cloud services providers, standard and certification services organisations, cloud consumers, auditors, data protection authorities, policy makers, software component industry etc. with perse interests in security and privacy issues in cloud computing.	
COPRAS	COoperation Platform for Research And Standards	COPRAS was a support action project in the EU 6th Framework Programme in 2004–2007, aiming to improve the interfacing, cooperation and exchange between IST (Information Society Technologies) research projects and ICT standardisation. It was	As one of its deliverables, COPRAS has developed a set of Generic Guidelines facilitating interfacing between research projects and ICT standards organisations. Its ultimate goal is to bring IST research and

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Standardisation Body		Mission	Groups and Standards
		initiated by several European standards organisations in cooperation with the ICTSB, the coordinating forum for ICT standardisation in Europe. COPRAS addresses the challenge of better synchronizing the continuous technological development in ICT with standardisation processes, thus making the benefits of these technological developments better and earlier accessible to industry and society. Its mission therefore is to stimulate, facilitate, and ease cooperation and exchange between current as well as future IST research projects and ICT standards organisations. Its activities and deliverables therefore support projects finding the relevant standards organisations to signal their output to, enabling them to upgrade their results through standardisation, and hence stimulate their dissemination and usage.	standardisation closer together and to provide research projects as well as other stakeholders in government, industry, and society with a platform facilitating exchange between research and standardisation, and furthering Europe's leading position in ICT development.
CSA	Cloud Security Alliance	The Cloud Security Alliance Cloud Controls Matrix (CCM) is specifically designed to provide fundamental security principles to guide cloud vendors and to assist prospective cloud customers in assessing the overall security risk of a cloud provider. The CSA CCM provides a controls framework that gives detailed understanding of security concepts and principles that are aligned to the Cloud Security Alliance guidance in 13 domains. The foundations of the Cloud Security Alliance Controls Matrix rest on its customized relationship to other industry-accepted security standards, regulations, and controls frameworks such as the ISO 27001/27002, ISACA COBIT, PCI, NIST, Jericho Forum and NERC CIP and will augment or provide internal control direction for service organisation control reports attestations provided by cloud providers	
ETSI	European Telecommunications Standards Institute	ETSI is an independent, not-for-profit organisation and the recognized regional standards body – European Standards Organization (ESO) – dealing with telecommunications, broadcasting and other electronic communications networks and services. ETSI role in Europe includes supporting European regulations and legislation through the creation of Harmonised European Standards. Only standards developed by the three ESOs (CEN, CENELEC and ETSI) are recognized as European Standards (ENs).	ETSI Could Standards Coordination (CSC)

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Standardisation Body		Mission	Groups and Standards
IEC	International Electrotechnical Commission	IEC is the world's leading organisation that prepares and publishes International Standards for all electrical, electronic and related technologies. Over 15 000 experts from industry, commerce, government, test and research labs, academia and consumer groups participate in IEC Standardisation work. The IEC is one of three global sister organisations (IEC, ISO, ITU) that develop International Standards for the world. When appropriate, IEC cooperates with ISO or ITU to ensure that International Standards fit together seamlessly and complement each other. Joint committees ensure that International Standards combine all relevant knowledge of experts working in related areas.	IEC 62264: Enterprise-Control System Integration
IETF	Internet Engineering Task Force	IETF is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.).	
ISO	International Organization for Standardization	ISO is an independent, non-governmental membership organisation and the world's largest developer of voluntary International Standards. ISO is made up of our 162 member countries who are the national standards bodies around the world, with a Central Secretariat that is based in Geneva, Switzerland.	ISO/IEC JTC 1 Information Technology ISO/IEC JTC 1/SC 27 IT Security Techniques ISO/IEC 27001:2013 Information technology — Security techniques — Information security management systems — Requirements ISO/IEC 27002:2013 Information technology — Security techniques — Code of practice for information security controls ISO/IEC DIS 27009 Information technology — Security techniques — Sector-specific application of ISO/IE C 27001 — Requirements ISO/IEC/JTC 1/SC 38 Distributed Application Platforms and Services (DAPS)

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Standardisation Body		Mission	Groups and Standards
			ISO 15926 Industrial automation systems and integration -- Integration of life-cycle data for process plants including oil and gas production facilities
ITU	International Telecommunication Union (ITU)	ITU is an international organisation that is part of the United Nations system. The ITU has 191 Member States and more than 700 Sector Members and Associates (private companies, non-governmental organisations and other entities). The organisation acts as a forum for governments and the private sector to coordinate technical and policy matters related to global telecommunications networks and services. The ITU is comprised of three sectors: Standardisation, Radiocommunication and Development. The ITU Standardisation Sector is responsible for the production of high-quality, internationally accepted, mainly technical, telecommunication standards and related documents that do not fall under the specific domain of the ITU Radiocommunication Sector. Both Member States and Sector Members can actively participate in the standards development work of ITU's numerous study groups. The purpose of the study groups is to develop non-binding technical Recommendations (i.e., voluntary technical standards) and other technical documents, based on contributions submitted by the members.	ITU-T Study Group 13 - Future networks including cloud computing, mobile and next-generation networks ITU-T SG17: Security ITU-T SG20: IoT and its applications including smart cities and communities (SC&C)
W3C	World Wide Web Consortium	W3C is an international community where Member organisations, a full-time staff, and the public work together to develop Web standards. W3C's mission is to lead the Web to its full potential. The W3C mission is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web.	

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