

Cloud-based **R**apid **E**lastic **M**Anufacturing



WP2 – Project Management, Quality Assurance & Reporting

D2.12

State of the Art Wiki Update II

Deliverable Lead: DFKI

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This document describes the results of the second period of updating of the CREMA State of the Art Wiki. The Wiki is being updated continuously in order to ensure that all CREMA partners are well aware of the latest methodologies and technologies in fields relevant for CREMA.



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This deliverable is subject to final acceptance by the European Commission.

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Executive Summary

The purpose of this deliverable is to describe how the CREMA project partners updated both content and functionality of the CREMA State of the Art (SotA) Wiki in the past reporting period. In total, the CREMA SotA Wiki currently contains 19 topic pages with 328 references (as of June 16, 2017) to relevant literature, software, and projects, many of which are commented and provided with an abstract in addition. The number of provided references significantly increased (47%), and the content has been substantially revised and updated by the CREMA partners. In addition, the CREMA SotA Wiki start page has been enriched with a dynamic tag cloud for its content. The CREMA SotA Wiki has been accessed 76,394 times in the past reporting period in total, which is an increase of 23%, and is publicly accessible from the CREMA project Website¹ in order to enable interested parties to share and use its content as appropriate.

CREMA SotA Wiki website: <https://crema-sota-wiki.dfki.de/>

¹ <http://www.crema-project.eu/>

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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.

The CREMA SotA Wiki allows CREMA project partners and externals to actively share, access, and comment on literature, software, and projects in fields that are relevant in CREMA. The CREMA SotA Wiki has been setup in month 6 (see D2.10). Within this deliverable, the results of the first update period for the Wiki are presented.

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 Website².

1.2 Deliverable Purpose, Scope and Context

The purpose of this document is to provide details on the improvements of the functionality, and modifications and additions of the content of the second and final update period for the CREMA SotA Wiki³.

1.3 Document Status and Target Audience

This document is listed in the description of action DoA (and in the grant agreement GA, Appendix 1, p.84) as “public”.

The CREMA SotA Wiki is continuously updated in order to allow external and project partners to keep track on useful articles, software, and projects in fields that are relevant for the work carried out in CREMA. Both, externals and project partners can contribute to this Wiki;

² <http://www.crema-project.eu/>

³ https://crema-sota-wiki.dfki.de/index.php/Main_Page

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contributions made by external parties are subject to the approval by the editor of the CREMA SotA Wiki.

The reports on previous updates of the CREMA SotA Wiki are in the deliverables D2.8 and D2.10. This deliverable (D2.12) is the final report on the CREMA SotA Wiki status, but it remains accessible and edited by the host until the project ends (M36) at least.

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 glossary⁴ and abbreviations list⁵.

1.5 Document Structure

This deliverable consists of 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 (CREMA SotA Wiki Update): Describes the update of the CREMA SotA Wiki in the reporting period. These updates include extensions in the CREMA SotA Wiki functionality and new content.
- Section 3 (Summary): Concludes this deliverable with a summary.

⁴ <http://crema-project.eu/glossary>

⁵ <http://crema-project.eu/abbreviations>

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2 CREMA SotA Wiki Update

2.1 Overview

Added functionality: The start page of the CREMA SotA Wiki displays a tag cloud on its content which is periodically updated by the system.

Content: In the past reporting period, no new topics are added but the content of topic pages has been updated by project partners as appropriate after regular internal calls for contributions to the Wiki. These updates concerned a revision of the topical text and addition of more than 100 references. As of June 16, 2017, the CREMA SotA Wiki contains 328 references in total, and in particular per topic:

1. Cloud Manufacturing 30 [Articles: 22, Software: 0, Projects: 8]
2. Elastic Processes 27 [Articles: 20, Software: 1, Projects: 6]
3. Cloud RAID Infrastructures 23 [Articles: 9, Software: 10, Projects: 4]
4. B2B Marketplaces 11 [Articles: 3, Software: 3, Projects: 5]
5. Big Data 14 [Articles: 7, Software: 5, Projects: 2]
6. Condition Monitoring 19 [Articles: 14, Software: 4, Projects: 1]
7. Cyber-Physical Systems 17 [Articles: 12, Software: 0, Projects: 5]
8. Sensor Technologies 6 [Articles: 5, Software: 1, Projects: 0]
9. Process Optimisation 25 [Articles: 25, Software: 0, Projects: 0]
10. Semantic Data Harmonisation 8 [Articles: 4, Software: 1, Projects: 3]
11. Semantic Services 5 [Articles: 5, Software: 0, Projects: 0]
12. Semantic Service Composition 21 [Articles: 17, Software: 4, Projects: 0]
13. Semantic Service Description 6 [Articles: 2, Software: 4, Projects: 0]
14. Semantic Service Search 42 [Articles: 31, Software: 11, Projects: 0]
15. Stream Processing 32 [Articles: 15, Software: 11, Projects: 6]
16. Semantic Stream Processing 10 [Articles: 5, Software: 4, Projects: 1]
17. User Interfaces 8 [Articles: 7, Software: 0, Projects: 1]
18. Dual Reality Dashboards 8 [Articles: 3, Software: 3, Projects: 2]
19. Smart Glasses 17 [Articles: 11, Software: 3, Projects: 3]

2.2 CREMA SotA Wiki Tag Cloud

The CREMA SotA Wiki has been enriched with a tag cloud for its content (see Figure 1). The size of the tags indicate the frequency of their occurrence, while the colours are used for visible separation of categories in the cloud. The tag cloud computation can be configured only by the editor of the Wiki. For this purpose the user can set the following configuration parameters in the tag cloud related part of the source of the start page (see Figure 2):

- `exclude`: Comma separated list of keywords that are excluded from the tag cloud
- `tagNr`: Maximal number of tags to present (default: 20, if not set; actually 35)
- `width`: the dimension (in pixels or percentage) of the created frame of the tag cloud in the start page
- `backgroundcolor`: Background colour of the within the frame of the tag cloud
- `cache_minutes`: Time of validity of the cache used to compute the tags and after which the tag cloud is re-computed

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Figure 1: Tag Cloud on the CREMA SotA Wiki Start Page

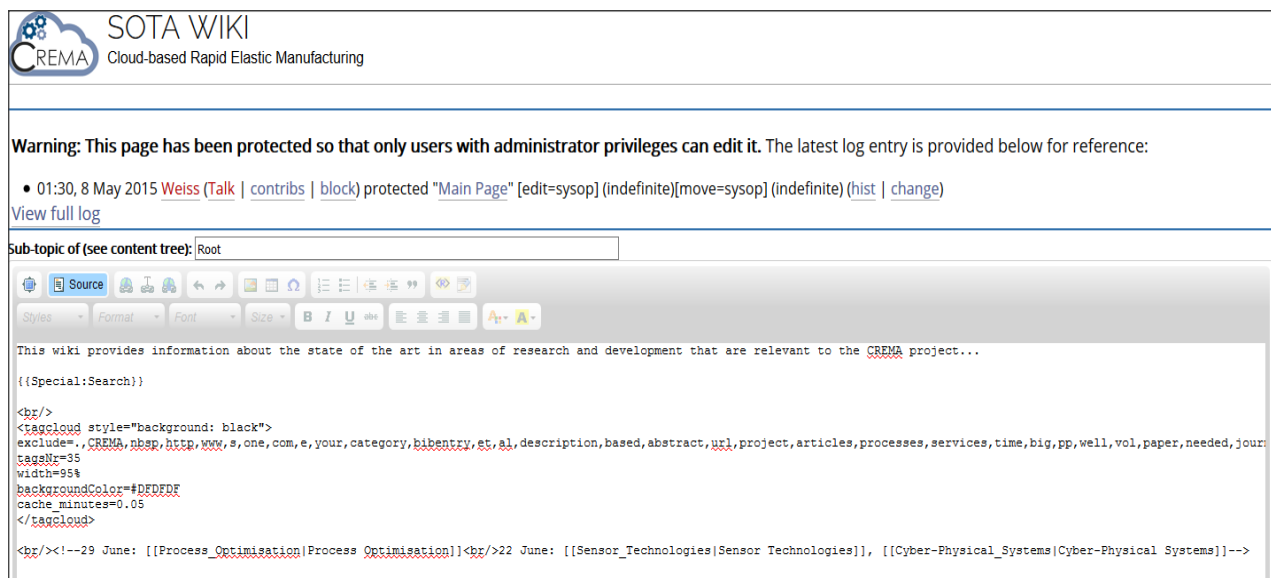


Figure 2: Configuration of Tag Cloud Updates

The extension for the tag cloud was developed starting from an already existing MediaWiki extension, named “Category Tag”, and devoted to represent the tags from the categories headlines. Four main aspects were modified on it: (A) the data source to be used, (B) the actual tag extraction and filtering for common and useless candidates, (C) the addition of a caching mechanism, and, eventually, (D) the library to create the actual HTML tag representation.

For the first aspect, the data source to be used (A), instead of reading the table containing the categories descriptor, a join of three database (DB) tables (page, revision, and text) was envisioned, to reconstruct the content of the last revision of the pages (articles) of the Wiki. Unfortunately, this join is resource consuming, in particular as the result works as the input for the (B) modification, tag extraction and filtering. For this reason, a caching system was added (C), storing a JSON representation of the tag-importance records set for reuse as long as the “cache_minutes” is not passed. This can minimize the tag cloud extension load on the Wiki, even in case of high load.

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Eventually, as the internal representation of the original extension was not satisfactory, we used the library “PtagCloud PHP class” for creating the HTML output to be represented into the Wiki page (point D). Incidentally, as the library also partially offered capabilities for extracting the tags from the text and to represent it as an internal PHP data structure, we modified, adapted and used it for the practical implementation of the point (B).

From the behaviour point of view, our “TextTagCloud” extension works the following:

1. Check if the cached value is still valid (not older than “cache_minutes” minutes):
 - a. If true, go to step 4.
 - b. Otherwise, invalidate the cache.
2. Execute the query on the DB to extract the latest approved revision of each page (article) in the Wiki.
3. Using the modified “PtagCloud PHP class” and the resulting query from the previous step, compute the JSON representation of the tag cloud source, and save it into the cache/
4. Using the value in the cache, transform the JSON representation into an internal PHP data structure representation, and invoke the library to create the actual tag cloud, using the parameters contained in its configuration.

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3 Summary

In total, the CREMA SotA Wiki contains 19 topic pages with 328 references to relevant literature, software, and projects (as of June 16, 2017), many of which are also commented and provided with an abstract. The front page of the CREMA SotA Wiki has been enriched with an automated tag cloud for its content.

The CREMA SotA Wiki has been accessed 76,394 times (as of June 16, 2017) with more than 3,000 page edits since its deployment, and provides the visitor with manually edited information about the state of the art in areas of research and development that are relevant to the CREMA project. The CREMA SotA Wiki has 859 users (as of June 16, 2017). The currently most viewed pages of the CREMA SotA Wiki are concerned with the topics of cloud manufacturing, stream processing, big data, and elastic processes.

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