FACTLOG
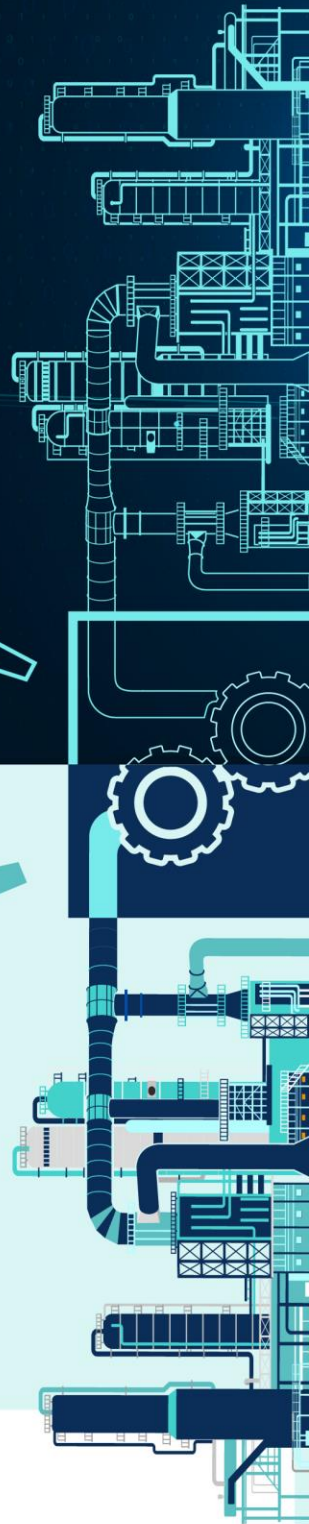www.factlog.eu

ENERGY-AWARE FACTORY ANALYTICS FOR PROCESS INDUSTRIES

Deliverable D8.3

Dissemination and Communication Activities Report V1

Version	**Lead Partner**
Version 1.0	UNP

Date	**Project Name**
02/11/2020	FACTLOG – Energy-aware Factory Analytics for Process Industries

Call Identifier H2020-NMBP-SPIRE-2019	**Topic** DT-SPIRE-06-2019 - Digital technologies for improved performance in cognitive production plants
Project Reference 869951	**Start date** November 1st, 2019
Type of Action IA – Innovation Action	**Duration** 42 Months

Dissemination Level

X	**PU**	Public
	CO	Confidential, restricted under conditions set out in the Grant Agreement
	CI	Classified, information as referred in the Commission Decision 2001/844/EC

Disclaimer

Executive Summary

This document summarises the dissemination and communication activities carried out by the FACTLOG partners in the first year of the project. It includes the activities carried out in its social media channels (such as LinkedIn or Twitter) and also the events targeted by the consortium for dissemination purposes. Due to the COVID19 pandemic, several events were cancelled or moved to online-only, which disrupted the initial plans of the consortium. This document also provides a list of Publications made by FATLOG partners in the initial 12 months of the project and also the list of materials made available to support all communication and dissemination activities. Also included is the status – at month 12 – of the KPIs defined in previously released D8.2 – Dissemination and Communication Plan.

Revision History

Revision	Date	Description	Organisation
0.1	02/09/2020	Initial version	UNP
0.2	15/09/2020	Communication materials added	UNP
0.3	24/09/2020	Targeted events added	UNP
0.4	07/10/2020	Contributions from ALL partners to the events and publications sections	ALL
0.5	15/10/2020	Added KPIs status	UNP
0.6	29/10/2020	First draft released	UNP
0.7	02/11/2020	Internal review	TAGES
0.8	02/11/2020	Internal review	HANSE
1.0	02/11/2020	Final version	UNP

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1 Introduction

1.1 Purpose and Scope

This document is a report on the result of task 8.1, with respect to the dissemination and communication activities in the first 12 months of the project. The task 8.1 objective, as stated in the DoA, is the following:

"The objective of T8.1 is to orchestrate the dissemination and communication activities in order to ensure that the FACTLOG results will be widely known and utilised, leading to a high impact of the project. This, in turn, will ensure rapid uptake and sustainability beyond the project lifecycle. In this task, the dissemination and communication strategy will be defined elaborating on the main dissemination and marketing directions identified in Sections 2.6.2 and 2.6.4. The produced dissemination and communication plan will be annually revised to ensure that project results are appropriately directed both from a technical and a business perspective. The plan will also include specific milestones for publications in journals, presentations in scientific conferences, participation in exhibitions and the project consortium will organise several research and demonstration-oriented workshops and events. Additionally, this task is also responsible for the creation of the online and offline communication and dissemination tools of FACTLOG, namely an interactive website providing comprehensive information about the project's output with special focus on knowledge dissemination to companies outside the consortium (focusing on SMEs. Alongside the website implemented using the latest web technologies, a YouTube channel, a LinkedIn group, as well as presence in social media (such as Facebook, Twitter) will be implemented. Further on a GDPR compliant e-mail collection process will be established in order to enable newsletters pertinent to the project evolution. Pertinent to offline tools for dissemination and communication following the FACTLOG brand story and identity the relative positioning, values and benefits will also be depicted in the offline marketing tools produced by the FACTOLOG project as well (i.e. banners, leaflets, flyers) per EU language."

Due to the COVID19 situation, most of the events targeted by FACTLOG partners were disrupted, or by being cancelled or moved from a presential event to a virtual one. The majority of the dissemination actions were planned to start creating awareness on the community to FACTLOG and the vision of the project.

The document also reports on the publications made by partners in the first 12 months of the project and all the social media activity in the FACTLOG's social media channels. A complete set of materials available to the consortium is also described. There is also the current status of the defined KPIs, with the current assessment what was accomplished in the first 12 months of the project.

1.2 Relation with other Deliverables

This deliverable is the first of a set of 3 deliverables that will be provided to the EC in M12, M24 and M42, respectively. Each of these 3 deliverables will report on the dissemination and communication activities accomplished by FACTLOG's consortium during a period of 12 months, apart from the last one which will report on the last 18 months of the project (M24-M42).

All these 3 deliverables are meant to provide the information stated before, but also to follow-up on the plan defined in D8.2, especially by monitoring the dissemination and communication KPIs.

1.3 Structure of the Document

This report is divided into 5 different chapters:
- Introduction - This chapter provides an initial view on the context of the document, its objective and the relationship with other FACTLOG deliverables.
- Communication Report – In this chapter describes the social media pages that were created for the project.
- Dissemination Report – This chapter describes the publications and activities of the project.
- Dissemination and Communication KPIs – to monitor the current status of the dissemination and communication activities of the project
- Dissemination Materials - this chapter presents the concept of the project and the various dissemination and communication materials

2 Communication Activities Report

2.1 Official Website

The FACTLOG website is already online, and at the time of the release of this document, it looks like the one depicted in Figure 1, and it is available on the following URL: www.factlog.eu
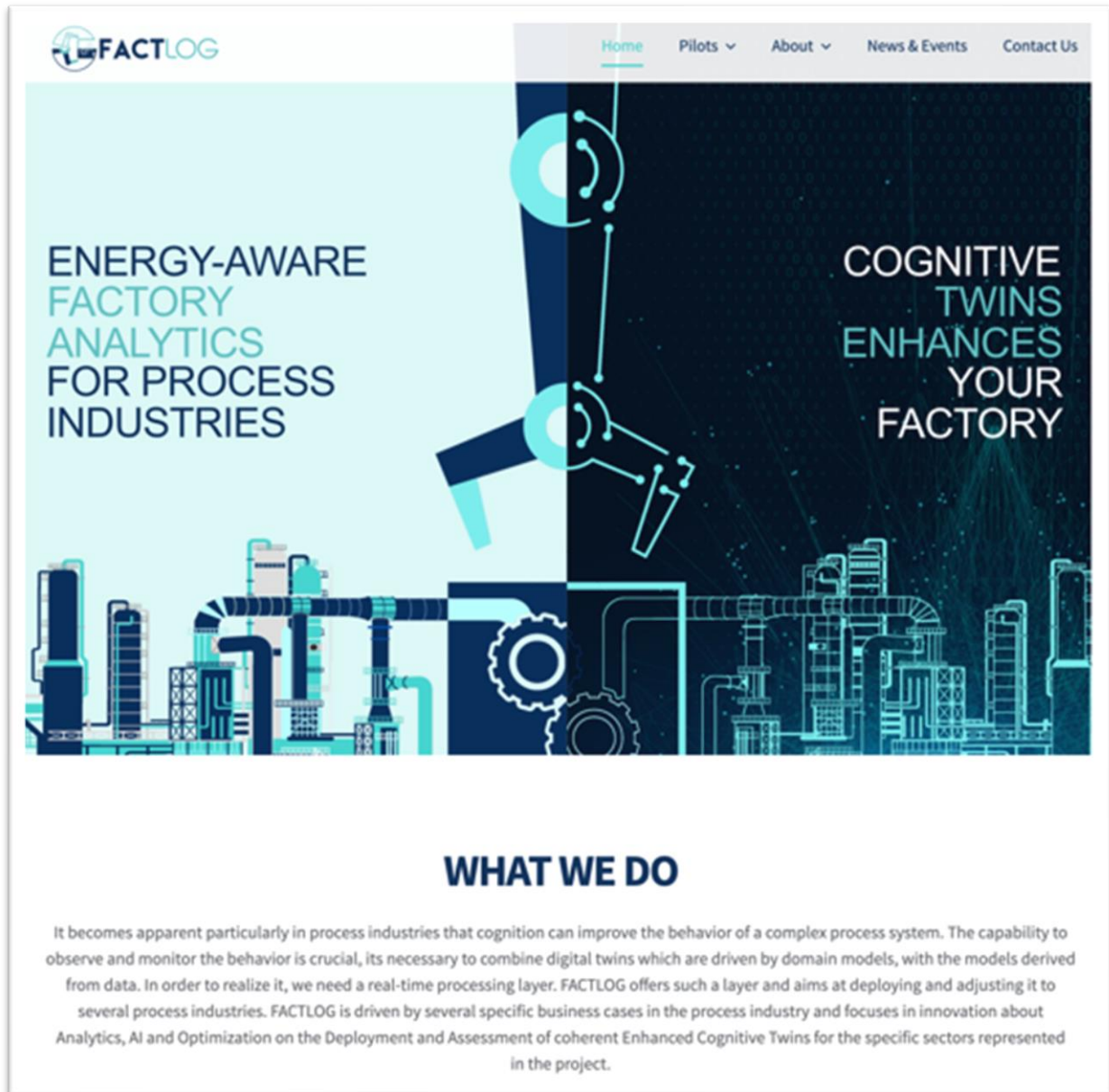
Figure 1 - FACTLOG Website

2.2 Social Media

This section presents all the social media activities, participation on events and publications for which FACTLOG has carried out dissemination activities during the year 2020/2021. FACTLOG relies on different social media channels to maximize the dissemination range and impact of the project among the stakeholders' community.

2.2.1 LinkedIn

Username: FACTLOG Project
URL: https://www.linkedin.com/company/factlog-project

The project's social network page on LinkedIn was created to have an online presence and attract stakeholders to the project.
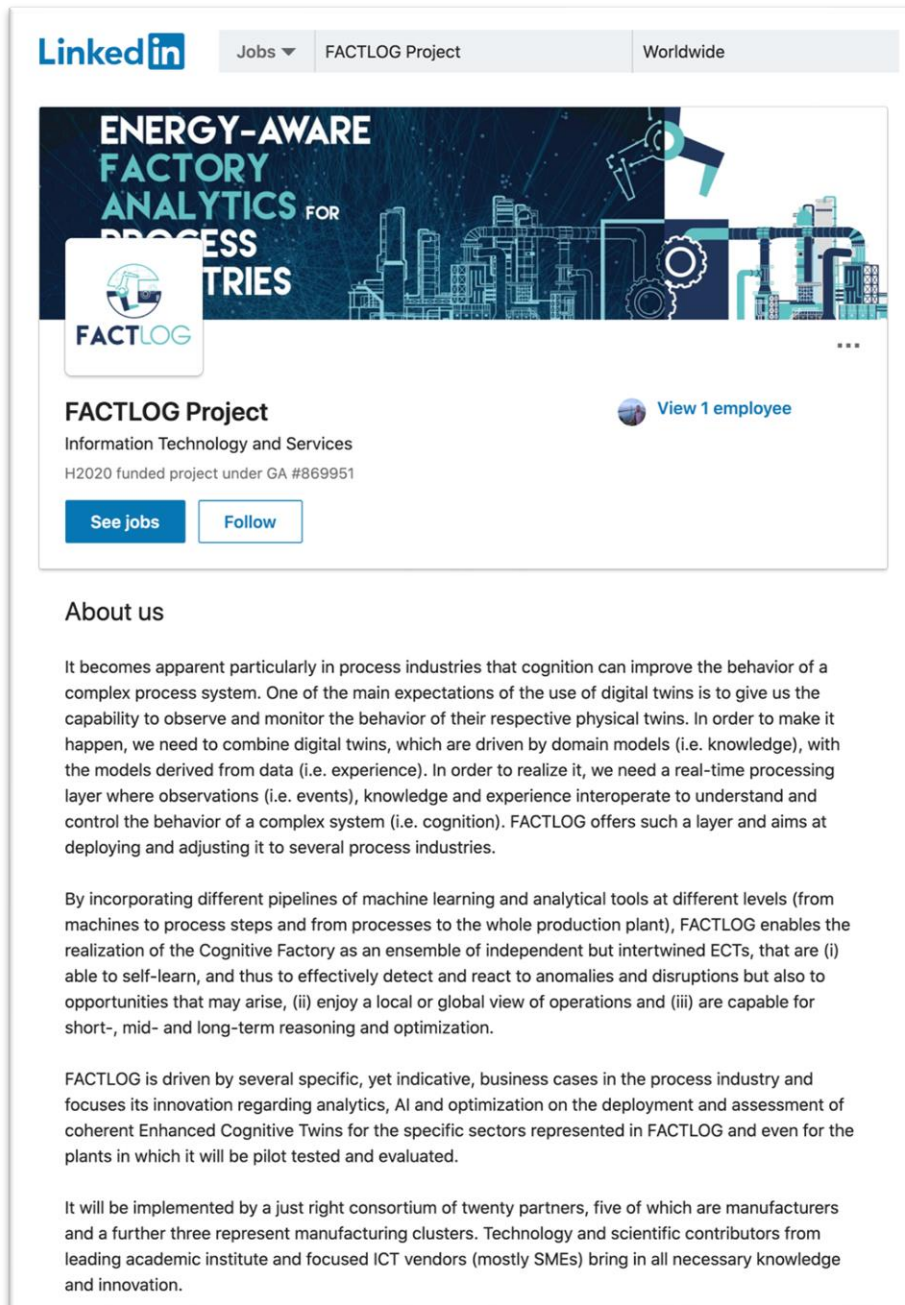
Figure 2 - FACTLOG LinkedIn

The LinkedIn page was created at the beginning of February and to date we have had 350 visits. As we can see in Figure 3 the number of visits for each month.
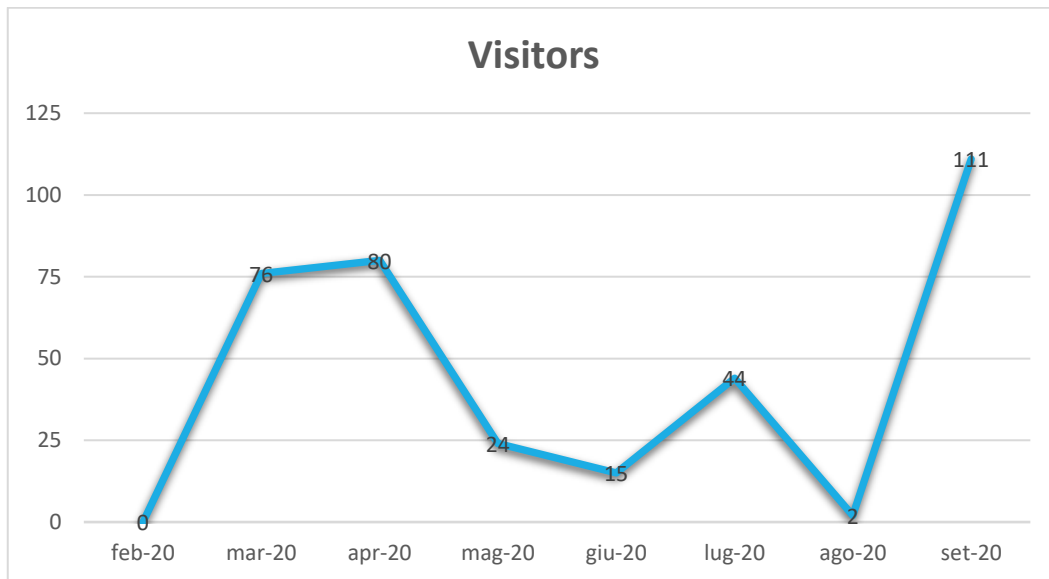
Figure 3 - Visitors Graph

The following figure (Figure 4) shows the different profiles that access the FACTLOG page on LinkedIn.
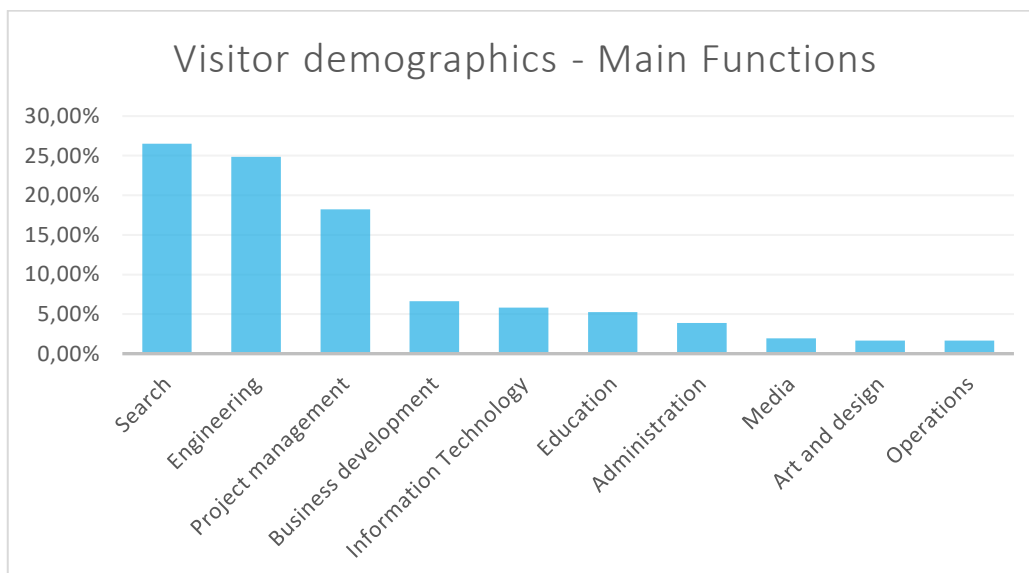
Figure 4 - Visithor Graph - Main Functions

2.2.2 Twitter

Username: FACTLOG
URL: https://twitter.com/Factlog_EU

The project's social network page on Twitter was created to have an online presence and attract stakeholders to the project.

Figure 5 - FACTLOG Twitter

2.2.3 YouTube

Username: H2020 FACTLOG
URL: https://youtube.com/channel/UCveKFxka4J5FTTRsSKKZJ_g

The project's social network page on YouTube was created to have an online presence and store the videos used in our newsletters and our training sessions.
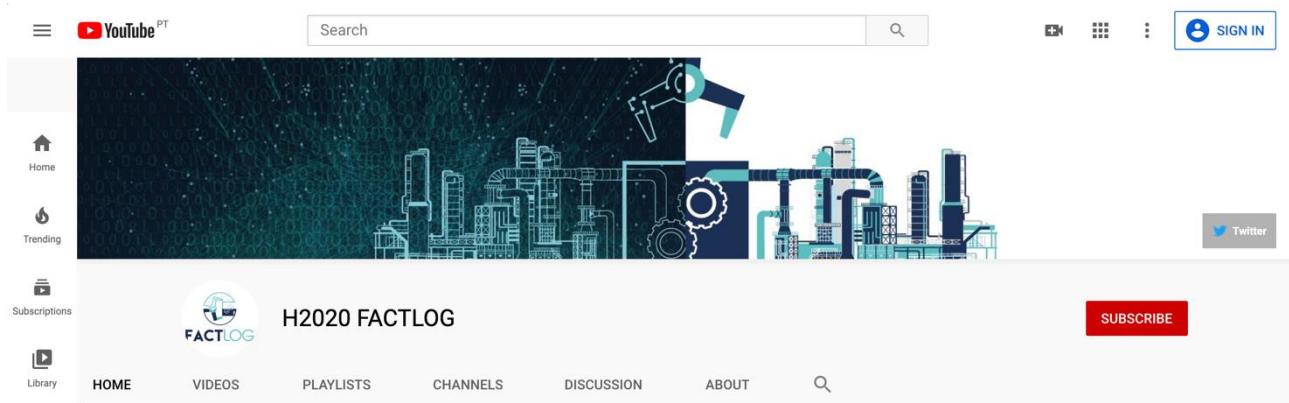
Figure 6 - FACTLOG YouTube

2.3 Newsletters

Our communication plan involves the dissemination of newsletters with some frequency, with the aim of making known our project, its vision and its objectives. The 1st FACTLOG newsletter is available online, on the project website https://www.factlog.eu, and is a video

newsletter. The video is intended to present the FACTLOG project vision on how to unlock the potentials of Cognitive Digital Twins in Manufacturing chains.

Along with the video newsletter, we also created an image to be used for dissemination purposes so that it could be shared among FACTLOG social media networks and via e-mail by partners to their contact networks.

Figure 7 - FACTLOG Video Newsletter for Dissemination

So to attract stakeholders to our website, we decided to have the video newsletter available in our official FACTLOG website, so anyone that wants to see the video needs to go to our website, and check the news section with the latest news feed of FACTLOG's Twitter channel and our newsletter section, where this video can be found.

Figure 8 – Newsletter in the FACTLOG Website

3 Dissemination Activities Report

The dissemination activities are expected to ensure that the project's results are widely diffused to the intended targeted audiences with appropriate mechanisms in a timely manner, and that the key stakeholders for the project exploitation and market uptake are early engaged and actively participating to the various implementation phases. The consortium partners aim to implement an intensive, yet clear, strategy and conduct effective dissemination and communication activities from the very early stages of the project. All partners are committed to mobilise the appropriate stakeholders in order to multiply the effects of dissemination and exploitation activities.

In the actual situation all over Europe, the trade fairs and events have been cancelled or postponed. Physical meetings are not possible. That is why the project team decided to foster activities without physical meetings. These activities are:

Activity	Status
Participation in virtual events and workshops	Active
Organisation of virtual workshops with potential users of developed functions and tools for consideration of their requirements	Planned
Regular end-user webinars for different topics together with other projects to show the possibilities of the developed solutions to other EU projects and their end-users	Planned
Contact the local Chambers of Commerce to be present in the periodic publications (e.g. newsletters).	Planned
Raise the number of publications in different scientific journals, in online conferences and virtual workshops (papers, reviews, etc.)	Active

3.1 Publications

Table 1 shows all the FACTLOG publications made so far. Here is presented an overview of the publications made so far, followed by the abstract of each of the publications. More details on each of the publications can be seen in Appendix I – FACTLOG Publications, with the complete table of publications.

Table 1 – FACTLOG Publications

Author(s)	Partner(s)	Title of the publication	Status / Date of publication	Journal / Conference
Jože M. Rožanec, Lu Jinzhi, Aljaž Košmerlj, Klemen Kenda, Kiritsis Dimitris, Viktor Jovanoski, Jan Rupnik, Mario	JSI, EPFL, Qlector	Towards Actionable Cognitive Digital Twins for Manufacturing	Accepted July 2020	ESWC 2020 conference

Author(s)	Partner(s)	Title of the publication	Status / Date of publication	Journal / Conference
Karlovčec, and Blaž Fortuna				
Eirinakis, Pavlos; Kalaboukas, Kostas; Lounis, Stavros; Mourtos, Ioannis; Rožanec, Jože M.; Stojanovic, Nenad; Zois, Georgios	UNIPI, AUEB, MAG, Qlector, NISSA	Enhancing Cognition for Digital Twins	Accepted 15 – 17 June 2020	ICE 2020 IEEE ITMC Conference
Jinzhi Lu, Xiaochen Zheng, Ali Gharaei, Kostas Kalaboukas, Dimitris Kiritsis	EPFL, MAG	Cognitive twins for supporting decision-makings of internet of things systems	Accepted May 16th 2020	5th International Conference on the Industry 4.0 Model for Advanced Manufacturing
Calefato C., Vallini M., Fasana S.	DOMINA	The cognitive retrofit revolution inside industry: how to modernize factories by Cognitive Digital Twins	Waiting results	XII Congresso Nazionale SIE2020
Gharaei A., Lu J., Stoll O., Zheng X., West S., Kiritsis D.	EPFL	Systems Engineering Approach to Identify Requirements for Digital Twins Development.	Accepted August 25th 2020	APMS 2020. IFIP Advances in Information and Communication Technology

3.1.1 Towards Actionable Cognitive Digital Twins for Manufacturing

Abstract:

Digital Twins (DTs) mirror physical assets and can be enriched with software layers that provide different capabilities. In the case of actionable cognitive twins (CTs), algorithms provide behaviour (make DTs actionable) and a knowledge graph (KG) adds cognitive capabilities. In this paper we present a new ontology that models a shopfloor DT, capturing background knowledge regarding shop-floor assets and actors, data sources, algorithms (with emphasis on artificial intelligence (AI)) and decision-making opportunities as well as their relations. This ontology can be used to enhance DTs with cognitive capabilities and instantiated to a KG to provide meaningful context to data and algorithm out- comes, enhancing decision-making suggestions. We describe this through two use cases for an automotive parts manufacturing plant in Europe.

3.1.2   Enhancing Cognition for Digital Twins

Abstract:

In the era of Industry 4.0, Digital Twins (DTs) pave the way for the creation of the Cognitive Factory. By virtualizing and twinning information stemming from the real and the digital world, it is now possible to connect all parts of the production process by having virtual copies of physical elements interacting with each other in the digital and physical realms. However, this alone does not imply cognition. Cognition requires modelling not only the physical characteristics but also the behaviour of production elements and processes. The latter can be founded upon data-driven models produced via Data Analytics and Machine Learning techniques, giving rise to the so-called Cognitive (Digital) Twin. To further enable the Cognitive Factory, a novel concept, dubbed as Enhanced Cognitive Twin (ECT), is proposed in this paper as a way to introduce advanced cognitive capabilities to the DT artefact that enable supporting decisions, with the end goal to enable DTs to react to inner or outer stimuli. The Enhanced Cognitive Twin can be deployed at different hierarchical levels of the production process, i.e., at sensor-, machine-, process-, employee- or even factory-level, aggregated to allow both horizontal and vertical interplay. The ECT notion is proposed in the context of process industries, where cognition is particularly important due to the continuous, non-linear, and varied nature of the respective production processes.

3.1.3   Cognitive twins for supporting decision-makings of internet of things systems

Abstract:

Cognitive Twins (CT) are proposed as Digital Twins (DT) with augmented semantic capabilities for identifying the dynamics of virtual model evolution, promoting the understanding of interrelationships between virtual models and enhancing the decision-making based on DT. The CT ensures that assets of Internet of Things (IoT) systems are well-managed and concerns beyond technical stakeholders are addressed during IoT system development. In this paper, a Knowledge Graph (KG) centric framework is proposed to develop CT. Based on the framework, a future toolchain is proposed to develop the CT for the initiatives of H2020 project FACTLOG. Based on the comparison between DT and CT, we infer the CT is a more comprehensive approach to support IoT-based systems development than DT.

3.1.4   The cognitive retrofit revolution inside industry: how to modernize factories by Cognitive Digital Twins

Abstract:

The purpose of this paper is to analyse and discuss the potentiality of the use of Cognitive Digital Twin (DCT) for low impact and innovative way to retrofit manufacturing and process industries, enabling the transition toward Industry 4.0. The cross-cutting priorities of Industry 4.0 pushed toward the devising of cognitive architectures for manufacturing and process industries, in order to reach a more effective optimization of the production processes. By having the ability to execute cognitive tasks, a CDT of a plant, a process, a machine or a product will be able to examine the current structure of a system or a process and give recommendations regarding what can be improved at the current moment. As factories and equipment get smarter and armed with new technologies, like IoT, AI, and Cognitive Automation, Industry 4.0 has finally arrived.

3.1.5 Systems Engineering Approach to Identify Requirements for Digital Twins Development.

Abstract: Digital Twins (DT) are proposed in industries to support the entire lifecycle of services with different perspectives. Lack of systematic analysis of DT concepts leads to various definitions and services which challenges the DT developers for data integration and integrated service delivery. In this paper, a systems engineering approach is proposed to identify the requirements of DT in order to formalize the DT concepts from a systematic perspective. The conceptual architecture of DT is defined based on ISO standard 42010. Several concepts are captured to recognize DT, to define related terminologies, and to identity concerns and viewpoints in order to provide cues for delivering DT services to industry. This approach is evaluated by multiple industrial use-cases under the Innosuisse IMPULSE project, from which one-use case is selected for further elaboration. It contributes to the development of DT associated to the use-case by addressing the requirements of DT using a semi-formal approach.

3.2 Dissemination Activities

3.2.1 Target Events

Table 2 shows all events targeted by FACTLOG for 2020 (including some for 2021). These events are detailed in the following subsections with their respective place, date and description. Due to the Covid19 pandemic, some of the events were disrupted by being cancelled or changing to an online event.

Table 2 - FACTLOG Dissemination Events/Conferences

Conference/Event	Date	Location	Status
EFFRA event "Digitalisation and digital platforms for manufacturing"	11/03/2020	Brussels (Belgium)	Online
EFFRA event "ConnectedFactories Projects meeting"	12/03/2020	Brussels (Belgium)	Online
Aircraft Interiors Expo	31/03/2020 – 02/04/2020	Hamburg (Germany)	Online
Hannover Messe (Hannover Fair)	20/04/2020 – 24/04/2020	Hannover (Germany)	Postponed to 2021
ILA Berlin	13/05/2020 – 17/05/2020	Berlin (Germany)	Cancelled
IoT Week 2020	01/06/2020 – 05/06/2020	Dublin (Ireland)	Cancelled
ICE/IEEE ITCM Conference	15/06/2020 – 17/06/2020	Cardiff (Wales, UK)	"Virtual" Conference - Online Event

Conference/Event	Date	Location	Status
Farnborough Airshow	20/07/2020 – 24/07/2020	Farnborough (UK)	Cancelled
Hanse-Aerospace Networking Event (Sailing Cup)	09/10/2020 – 11/10/2020	Baltic Sea (Germany)	Cancelled
AIRTEC (Trade Fair)	12/10/2020 – 14/10/2020	Munich (Germany)	Presential event with FACTLOG participation
Digitisation Workshop with Hanse-Aerospace Member Companies	28/10/2020	Virtual Workshop	Workshop provided by FACTLOG Virtual Workshop
I-ESA 10th International Conference on Interoperability for Enterprise Systems and Applications	17/11/2020 - 20/11/2020	Tarbes (France)	Planned
ICT Conference	01/12/2020 – 03/12/2020	Cologne (Germany)	Cancelled
Hannover Messe (Hanover Fair)	12/04/2021 - 16/04/2021	Hamburg (Germany)	Planned
Paris Airshow	21/06/2021 - 27/06/2021	Le Bourget [Paris] (France)	Planned
Aircraft Interiors Expo	31/08/2021 - 02/09/2021	Hamburg (Germany)	Planned

3.2.1.1 EFFRA event "Digitalisation and digital platforms for manufacturing"

- **Data:** 11/03/2020
- **Location:** Brussels (Belgium)
- **Status:** Online
- **Description:** With respect to content and scope, this workshop will focus on the projects associated to the call topic DT-ICT-07-2018-2019 (Digital Manufacturing Platforms for Connected Smart Factories), complemented by other key projects in this area. The main outcome and objectives of the projects will be presented, while break-out sessions will address domains such as human-centred manufacturing, circular manufacturing, dataspaces for manufacturing and security for manufacturing.

3.2.1.2 EFFRA event "ConnectedFactories Projects meeting"

- **Data:** 12/03/2020
- **Location:** Brussels (Belgium)

- **Status:** Online
- **Description:** Building on the success of the first 'Factories of the Future for Automotive' event organised in February 2018, this second edition will focus on additive manufacturing. The event will provide insight in results of past and ongoing projects and will match these with requirements from the automotive sector, including its value networks. An outlook of future research and innovation requirements will be discussed.

3.2.1.3 Aircraft Interiors Expo

- **Data:** 31/03/2020 - 02/04/2020
- **Location:** Hamburg (Germany)
- **Status:** Cancelled
- **Description:** Aircraft Interiors Expo is the world's leading event for airlines and the supply chain to source the latest innovations, technologies and products for the cabin interiors, inflight entertainment and passenger comfort industries. We unite the world's airlines with aviation interior suppliers over three days of face-to-face business, discovering, networking and buying at the Hamburg Messe. To ensure you have access to the full spectrum of onboard passenger experience solutions, we are co-located with World Travel Catering and Onboard Services Expo, making the potential for networking and connecting with the most relevant and influential people in the business sky-high. The Cabin Space Live seminar programme also gives you the opportunity to hear the views of industry leaders and colleagues as they share experience and case studies to help you solve your latest challenges. We then combine the expertise of both events to bring you the Passenger Experience Conference where you can discover the inside knowledge and solutions to solve today's issues, alongside the blue-sky ideas of the future. The setting for powerful and ambitious collaborations: engineers, buyers, suppliers, cabin crew and designers are working together to find immediate practical answers. If you are involved or responsible for the purchase of cabin interiors, in-flight entertainment, connectivity, passenger experience and passenger services, this is the industry event you cannot afford to miss.

3.2.1.4 Hannover Messe (Hannover Fair)

- **Data:** 20/04/2020 – 24/04/2020
- **Location:** Hannover (Germany)
- **Status:** Postponed to 2021
- **Description:** Hannover Messe cannot take place this year due to the increasingly critical situation surrounding the Covid-19 pandemic. The Hannover region has issued a decree that prohibits the staging of the world's leading tradeshow for industrial technology. From now until the next Hannover Messe in April 2021, a digital information and networking offer will provide exhibitors and visitors with the opportunity for economic policy orientation and technological exchange.

3.2.1.5 ILA Berlin

- **Data:** 13/05/2020 - 17/05/2020
- **Location:** Berlin (Germany)
- **Status:** Cancelled

- **Description:** ILA Berlin is the hub for the international aerospace industry. With over 1,000 exhibitors from all over the world, ILA Berlin showcases the industry's very best in terms of high-tech products as well as research and development projects. More than 65,000 trade visitors and 115,000 members of the public attended the leading aerospace innovation fair in 2018 in Berlin, to experience this fascinating industry first-hand, right in the heart of Europe. The highlights:
    - Innovation for the future of flying;
    - Unmanned aircraft systems for the future of mobility;
    - Largest space exhibition in Europe;
    - An exclusive marketplace for the supplier industry;
    - A fascination for flight

3.2.1.6   IoT Week 2020

- **Data:** 01/06/2020 – 05/06/2020
- **Location:** Dublin (Ireland)
- **Status:** Cancelled
- **Description:** Next-Generation IoT for a Sustainable Future
  The rising awareness of climate change has caused the popularization of sustainability and the realization that we need to do things not only differently, but better. As focus shifts to finding solutions to climate issues, technological advancements and innovation present a promising way forward. The Internet of Things, for example, which Boston Consulting Group estimates will boom into a $267 billion-dollar industry by 2020, promises to facilitate great leaps in our efforts to transform our places and spaces, from homes and offices to entire cities, into sustainable environments. If IoT technologies build on not only established technology but also new capabilities in the backend, such as artificial intelligence, deep semantic interoperability and novel contractual arrangements like Blockchains, they will undoubtedly bring fundamental change to all sectors of activity, improving the way we live and work. In other words, IoT is likely to be an essential element of the Next Generation Internet, setting the groundwork for systems and devices of the future.

3.2.1.7   ICE/IEEE ITCM Conference

- **Data:** 15/06/2020 – 17/06/2020
- **Location:** Cardiff (Wales, UK)
- **Status:** "Virtual Conference – Online Event
- **Description:** "Digitalization through Digital Twins – Innovation in the analysis and management of environmental and physical engineered complex systems" The 26th ICE/IEEE International Technology Management Conference is a place where research, science and innovation are called for original ideas, papers, debates, initiatives and projects. Authors, workshop/tutorial organizers, and participants are invited to contribute to the shaping of the prospective on engineering, technology and innovation solutions for industry and societal challenges.

3.2.1.8   Farnborough Airshow

- **Data:** 20/07/2020
- **Location:** Farnborough (UK)
- **Status:** Cancelled

- **Description:** Discover Experience Explore - The World of Aerospace: See your future take off at the Farnborough International Airshow, as Farnborough Friday gives you unprecedented access to pioneers, technology, aircraft and careers advice that is driving aviation forward.

3.2.1.9 Hanse-Aerospace Networking Event (Sailing Cup)

- **Data:** 09/10/2020 – 11/10/2020
- **Location:** Baltic Sea (Germany)
- **Status:** Cancelled
- **Description:** The event is organised by the association Hanse-Aerospace aiming at an active exchange in the network of small and medium-sized suppliers and service-providers of the aerospace industry.

3.2.1.10 AIRTEC (Trade Fair)

- **Data:** 12/10/2020 – 14/10/2020
- **Location:** Munich (Germany)
- **Status:** Presential event with FACTLOG participation
- **Description:** Airtech Munich is the international B2B trade fair and dialogue platform for aerospace and future mobility at the high-tech location of Munich, Bavaria. In close cooperation between industry, science and politics, Airtech Munich is as much an outstanding transformation showcase as an innovation driver offering forward-looking discussions and solutions for climate-friendly and future-oriented mobility. Exhibitors, keynotes, conference topics, B2B meetings and workshops will focus on core areas such as modern mobility concepts, components & systems, materials & production, design & structures, research & development, legal framework & certification and information & communication.

3.2.1.11 Digitisation Workshop with Hanse-Aerospace Member Companies

- **Data:** 28/10/2020
- **Location:** Virtual Workshop
- **Status:** Workshop provided by FACTLOG
- **Description:** A virtual workshop with Hanse-Aerospace members took place on 28th October 2020 from 09:00-11:00 on the topic "Digital platforms and tools - what can an SME do with them?" The project FACTLOG was presented. Especially the concept of the Cognitive Digital Twin (CDT) was discussed with interest by the 10 participants. The suitability of the concept for larger companies with corresponding automation and mostly homogeneous processes was confirmed. For SMEs, however, it is not immediately apparent whether this technology is suitable for production environments that have so far been little automated. In the aerospace industry often only small quantities are produced, so that continuous automation on shop floor level is not economically feasible. However, whether sufficient digital information can then be made available for the application of this technology was questionable for most of the participants. In principle, however, the fact that Hanse-Aerospace provides insights into current developments in the field of digitalisation and into the FACTLOG project is welcomed. The majority of participants requested further information events on this and related topics.

3.2.1.12 I-ESA 10th International Conference On Interoperability for Enterprise Systems and Applications

- **Data:** 17/11/2020 – 20/11/2020
- **Location:** Tarbes (France)
- **Status:** Online
- **Description:** The I-ESA conference connects the world's leading researchers and practitioners of enterprise interoperability and related domains, including interoperability aspects of enterprise systems and application. It joins new business models, smart services, IoT and Cloud technologies. All these current and future technologies cannot work smoothly without interoperability. I-ESA will be an outstanding opportunity to exchange experiences and business ideas between researchers, service providers, entrepreneurs and industrial stakeholders throw research papers. The Conference welcomes submissions of full papers in the scope of the conference. The maximum paper length is 10 pages. Accepted papers will be published in "Enterprise Interoperability IX (2020)". It will be indexed in Web of Science (WoS) in the "Conference Proceedings Citation Index- Science" which is inside the "Web of Science Core Collection", and in SCOPUS. Industry 4.0, smart cities, Internet of Things, big data, digital transformation are the main paradigms and technologies of the Artificial Intelligence ERA. This ERA requires a foundation for seamless and secure communication called "interoperability". Moreover, the cooperation between different organizations such as manufactures, service providers, government requires intelligent "Enterprise Interoperability" as well as applications and systems. I-ESA 2020 is a forum where industry and research worlds meet and share experience, ideas and challenges on all aspects of enterprise systems interoperability and Artificial intelligence.

3.2.1.13 ICT Conference

- **Data:** 01/12/2020 – 03/12/2020
- **Location:** Cologne (Germany)
- **Status:** Cancelled
- **Description:** The next edition of the largest ICT event in Europe will take place this year in the Koelnmesse in Cologne between 1st and 3rd December 2020. The event, co-organised by the European Commission and the German Presidency of the Council of the European Union, will have the following elements:
  - a high-level conference on digital policies,
  - an exhibition of EU-funded research and innovation projects in the field of ICT;
  - a series of networking activities and many more.

3.2.1.14 Hannover Messe (Hanover Fair)

- **Data:** 12/04/2021 – 16/04/2021
- **Location:** Hannover (Germany)
- **Status:** Planned
- **Description:** When Hannover Messe opens its doors in April 2021, companies will once again have the opportunity to bring their products to life at the world's leading trade fair for industrial technology – analogue, digital and hybrid. Hannover Messe provides all exhibitors with the package that suits them best, from an analogue exhibit to hybrid combinations to a purely virtual presence. The exhibitor decides how he wants to participate in the show during the corona pandemic.

3.2.1.15 Paris Airshow

- **Data:** 21/06/2021 – 27/06/2021
- **Location:** Le Bourget – Paris (France)
- **Status:** Planned
- **Description:** The 54th edition of the show will take place at the Le Bourget Parc des Expositions from 21st to 27th June 2021, and once again will bring together all the players in this global industry around the latest technological innovations. The first four days of the Show will be reserved for trade visitors, followed by three days open to the general public.

3.2.1.16 Aircraft Interiors Expo

- **Data:** 31/08/2021 – 02/09/2021
- **Location:** Hamburg (Germany)
- **Status:** Planned
- **Description:** AIX announces new dates for the 2021 show. AIX will return to the Hamburg Messe from 31st August to 2nd September 2021, moving from the original April dates. We recognise the industry needs more time to allow for the reopening of borders, lifting of travel restrictions and resuming of services. Our priority is to deliver an engaging and COVID-secure face-to-face event for you, and by moving to September, we are giving all our valued exhibitors and visitors the additional time to adapt and continue on the path to recovery. We once again want to thank all of our exhibitors, visitors, and partners for their support. We believe this extra time ahead of the 2021 events will offer exhibitors reassurance and more opportunity to prepare their fantastic showcases, and for our visitors to be ready to restart planning for the cabins of the future. We continue to focus on keeping the industry connected during this time, fostering collaboration, promoting new innovative solutions and helping to nurture critical business contacts. We look forward to facilitating this through a further series of virtual events, set to take place in April, details of which will be announced soon.

As noticed by analysing Table 2, several events were either cancelled, postponed or changed to online events. This is due to the COVID19 outbreak that required organisations across the world to take measures due to the travel restrictions implemented across Europe.

3.3 Clustering Activities

The clustering activities during this period were used in order to help in the initial activities of the project, such as the collection of requirements and KPIs. The consortium and through the 3 clusters from Hanse, Tages, C2K partner networks made tremendous efforts to reach our stakeholders, but as the COVID-19 situation still is in progress we tried to reach them unofficially and not through dedicated workshops as initially planned.

3.3.1 Hanse Aerospace Cluster (HAW)

In the event described earlier Appendix III - Report on the AIRTEC fair in Munich, Hanse-Aerospace presented the EU project FACTLOG at a joint stand. The project aroused great interest among the visitors. During the three days of the fair, an impression of the project was given in a total of 10 in-depth discussions.

3.3.2 Control2K Cluster (C2K)

The following Stakeholders in the C2K network were identified, and are listed in the table below:

Table 3 - C2K Stakeholders

Stakeholder	Nature	Sector	Description
Celsa Steel	Company	Steel	Multinational company, one of the most diversified groups in the steel production market
Energiser Holdings Inc	Company	Battery cells	One of the largest manufacturers of primary battery cells including the global brands Energiser, EVEREADY, Rayovac and Varta
Tata Steel	Company	Steel	Part of the globally recognised Tata group, they are one of the major steel manufacturers in Europe

3.3.3 Tager Cluster

The Stakeholders identified from the Tager network were identified and are described in the table below:

Table 4 - Tager Stakeholders

Stakeholder	Nature	Sector	Description
Özü I4.0 Lab	University	Academia	Disseminator ÖzÜ (Özyeğin University) I4.0 Lab is currently one of the most advanced I4.0 Labs in Turkey, and their manager is well known in industry with their optimization solutions and as well as in monitoring and governance of field data.
PAGDER	NGO	Plastics	3 NGO Disseminators (PAGDER, MİB and İKMİB) are representing leading process industries in Turkey and İKMİB is an umbrella association of 6 major industries (Steel, Iron/Metal, Jewelry, Electrical and Electronical Equipment, Chemical Substances (16 sub-sectors), Mining).
MİB	NGO	Machinery	
İKMİB	NGO	Process	
Teknopar	SME	ICT/System Integrator	Enabler Teknopar is a turn-key system integrator for SCADA systems and participating in

Stakeholder	Nature	Sector	Description
			BigData, I4.0 Research and Innovation projects.
Hassan	Industry	Textile	End User Hassan is in Industrial Textile business and started to renovate their machinery and monitoring the process with several sensors including energy consumption and heat.
Endüstri4.0.com	Platform	Industry	Influencer Ali Rıza Ersoy runs www.endustri40.com platform and their mission is to tutor Turkish Industry in their digital transformation.
Egesys (Arçelik)	SME	Industry	Influencer Haluk Gökmen is a world-wide known networker and opinion leader in ICT and I4.0.
TBV	Platform	ICT	2 Platform/NGO Influencers (TBV and TTGV) are representing Industry and cross-cutting ICT having a major influence in creating awareness in I4.0.
TTGV	NGO	Industry	
Reengen	SME	ICT/Platform Provider	Intermediary Reengen provides monitoring platform for smart meters in Industry for energy distribution and consumption awareness and efficiency.
Siskon	SME	ICT/Platform Provider	Intermediary/Enabler Siskon provides industrial automation systems and process control especially in Automotive and Tobacco industry

4 Dissemination and Communication KPIs

In order to achieve the objectives proposed by the FACTLOG project, dissemination and communication play an extremely important role. So, the consortium defined a set of dissemination and communication KPIs that need to be achieved in order for the work being done in FACTLOG has the expected impact, not only within the consortium members but also with external stakeholders that could provide valuable feedback to all the work to be carried out within the project's lifespan. Table 5 provides the set of KPIs identified, along with the current status at M12.

Table 5 - Dissemination and Communication KPIs

FACTLOG Dissemination and Communication Activities	Planned (M42)	Status (M12)
Demos and talks in relevant SPIRE/ H2020 cluster meetings and workshops	5	0
Hackathons to experiment with FACTLOG tools	4	0
Local workshop co-organized with the national authorities (per countries represented by FACTLOG consortium).	1	0
Newsletters	8	1
Papers / Poster sessions in International conferences and stands	20	4
Papers in Scientific Journals	10	0
Training material & Specific demos (per FACTLOG result)	2	0
Workshops for each domain pilot case with selected supply chain actors	2	0
Workshops in relevant initiatives	5	0
Workshops organized per Software vendor (inside their existing networks of collaborative partners)	2	0
Workshops per large ICT industrial player (MAG, SIVECO) utilizing their existing customer base and commercial marketing channels	2	0
Workshops/Stands in ICT-related events focusing on Industrial automation and supply chain and in Industry 4.0 events	20	2

5 Dissemination Materials

This section presents the set of dissemination materials created for the use of the consortium in all FACTLOG disseminations and communication activities.

5.1 New Materials

As new materials, we have created a Power Point presentation with an overview of the project, presenting the vision and objectives of FACTLOG. This presentation was made available to the partners so they can use it in any activity related to FACTLOG, just as conference, workshop or even a presentation to a potential customer.

Figure 9 - FACTLOG Overview presentation

This presentation was later transformed in a video and used as a video newsletter. It's currently uploaded in FACTLOG's YouTube channel and can be seen in the newsletter section in our official FACTLOG website: www.factlog.eu.

Figure 10 – FACTLOG Overview Video

5.2 All Available materials

Using the FATLOG design concept, several dissemination and communication materials were created. Here follows the list and preview of each one of them.

5.2.1 Document

The design for the document, follow the concept written above, and on the footer it has an area for the project information (Date, Project Name, among others).
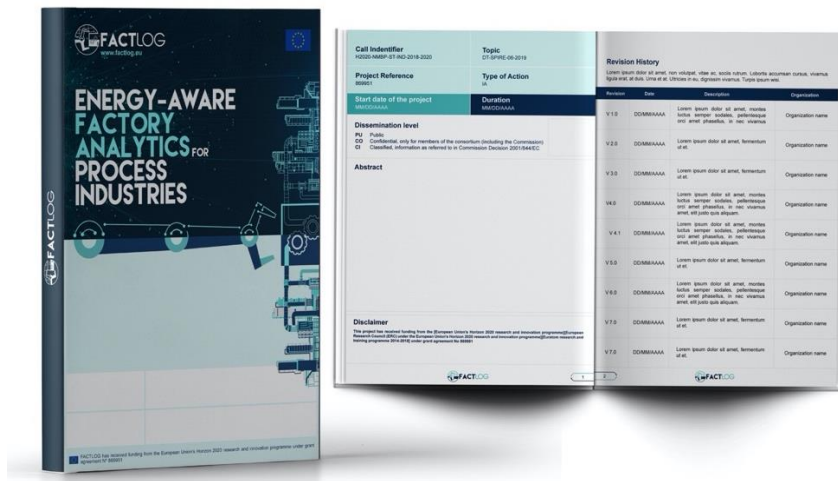

Figure 11 - FACTLOG Document Template

5.2.2 Presentation

For the presentation, it was designed a layout that maintained the two-sided concept: the real and the virtual world. This way, different areas where created – header, title, subtitle, information about the project, among others. The presentation was released in 2 formats: in 16:9 and 4:8.

Figure 12 - FACTLOG Presentation - Overview

5.2.3 Poster

The design of the FACTLOG poster was made according to the sided image division. The first half is to catch the attention of the spectator by using bold and big headlines, and the second half is concise information that can be read in a glance by the spectator.

With this concept, exists the possibility of 2 posters can be completed by using the two sides colours for each part relevant. Using this option, you have to use the 2 posters mandatorily.
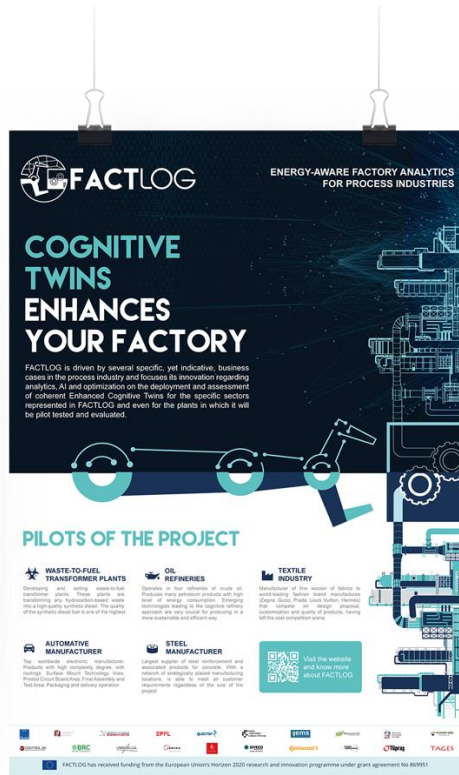
Figure 13 - FACTLOG Poster

5.2.4 Roll Up

The Roll-Up design was conceptualized for major impact and concise information about the project. The main objective is to capture the attention of the spectator and draw his attention to the ma-in concepts of the FACTLOG.
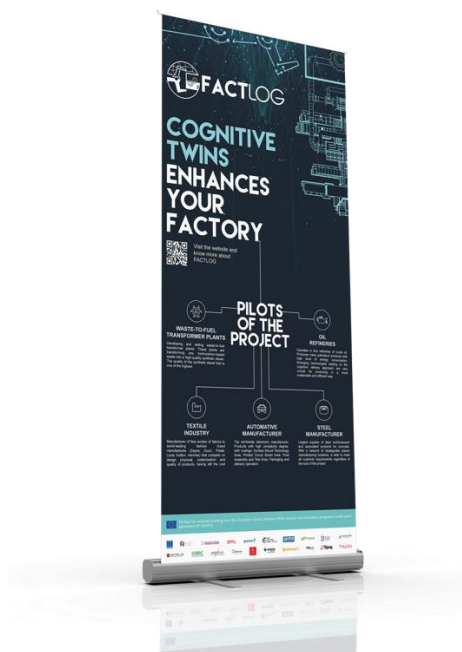
Figure 14 - FACTLOG Roll Up

5.2.5 Flyer

Figure 15 - FACTLOG Flyer

5.2.6 Banner

For the printable banner to expos, fairs or other, it maintains the edgy look of the project brand to capture people's attention towards FACTLOG.

Figure 16 - FACTLOG Banner

5.2.7 Bookmark

For the creation of the FACTLOG bookmark, the concept of the project was represented in the two sides of the bookmark. This way it gives an edgy look when you used it on books or other type of materials.

Figure 17 - FACTLOG Bookmarker

5.2.8 FACTLOG Stickers

FACTLOG consortium also created some stickers, using the project's logo so to give away to partners and the public to spread the FACTLOG brand.

Figure 18 - FACTLOG Stickers

Appendix I – FACTLOG Publications

Author(s)	Partner(s)	Title of the publication	Date of publication	Journal / Conference	Place (city, country)	ISBN	Publisher	DOI	Status	Is it available in Open Access? (Yes/No)	Is it a peer-reviewed publication? (Yes/No)	Is it a joint public/private publication? (yes/no)	Link
Jože M. Rožanec, Lu Jinzhi, Aljaž Košmerlj, Klemen Kenda, Kiritsis Dimitris, Viktor Jovanoski, Jan Rupnik, Mario Karlovčec, and Blaž Fortuna	JSI, EPFL, Qlector	Towards Actionable Cognitive Digital Twins for Manufacturing	July 2020	ESWC 2020 conference	Heraklion, Greece		http://ceur-ws.org/	urn:nbn:de:0074-2615-4	Accepted	Yes	Yes	Yes	http://ceur-ws.org/Vol-2615/paper5.pdf
Eirinakis, Pavlos; Kalaboukas, Kostas; Lounis, Stavros; Mourtos, Ioannis; Rožanec, Jože M.; Stojanovic, Nenad; Zois, Georgios	UNIPI, AUEB, MAG, Qlector, NISSA	Enhancing Cognition for Digital Twins	15 – 17 June 2020	ICE 2020 IEEE ITMC Conference	Cardiff, United Kingdom		IEEE	10.1109/ICE/ITMC49519.2020.9198492	Accepted	No	Yes	Yes	https://ieeexplore.ieee.org/document/9198492
Jinzhi Lu, Xiaochen Zheng, Ali Gharaei,	EPFL, MAG	Cognitive twins for supporting decision-	16 May 2020	5th International Conference on the Industry			Springer	10.1007/978-3-030-	Accepted				https://link.springer.co

Author(s)	Partner(s)	Title of the publication	Date of publication	Journal / Conference	Place (city, country)	ISBN	Publisher	DOI	Status	Is it available in Open Access? (Yes/No)	Is it a peer-reviewed publication? (Yes/No)	Is it a joint public/private publication? (yes/no)	Link
Kostas Kalaboukas, Dimitris Kiritsis		makings of internet of things systems		4.0 Model for Advanced Manufacturing				46212-3_7					m/chapter/10.1007%2F978-3-030-46212-3_7
Calefato C., Vallini M., Fasana S.	DOMINA	The cognitive retrofit revolution inside industry: how to modernize factories by Cognitive Digital Twins		XII Congresso Nazionale SIE2020					Waiting results				
Gharaei A., Lu J., Stoll O., Zheng X., West S., Kiritsis D.	EPFL	Systems Engineering Approach to Identify Requirements for Digital Twins Development.	25 August 2020	APMS 2020. IFIP Advances in Information and Communication Technology			Springer	/10.1007/978-3-030-57993-7_10	Accepted	No	Yes	Yes	https://link.springer.com/chapter/10.1007%2F978-3-030-57993-7_10

Appendix II – FACTLOG Dissemination Events/Conferences

Conference/Event	Date	Location	Status	Tickets	Web site	Deadline/ Info	Key Stakeholders	Comments	Partners Involved
EFFRA event "Digitalisation and digital platforms for manufacturing"	11/03/2020	Brussels (Belgium)	Online	Personal registration required	Link			FACTLOG was mentioned by HANSE as a possible partner in the DMP cluster	Hanse-Aerospace Wirtschaftsdienst GmbH
EFFRA event "ConnectedFactories Projects meeting"	12/03/2020	Brussels (Belgium)	Online	Personal registration required	Link			FACTLOG was mentioned by HANSE as a possible partner in the DMP cluster	Hanse-Aerospace Wirtschaftsdienst GmbH
Aircraft Interiors Expo	31/03/2020 – 02/04/2020	Hamburg (Germany)	Cancelled	For free tickets contact Ingo	Link				
Hannover Messe (Hanover Fair)	20/04/2020 – 24/04/2020	Hannover (Germany)	Cancelled	For free tickets contact Ingo	Link				
ILA Berlin	13/05/2020 – 17/05/2020	Berlin (Germany)	Cancelled	For free tickets contact Ingo	Link				
IoT Week 2020	01/06/2020 – 05/06/2020	Dublin (Ireland)	Cancelled	Personal registration required	Link				Unparallel Innovation, Lda
ICE/IEEE ITCM Conference	15/06/2020 – 17/06/2020	Cardiff (Wales, UK)	"Virtual Conference" – Online Event	Personal registration required	Link				
Farnborough Airshow	20/07/2020 – 24/07/2020	Farnborough (UK)	Cancelled	For free tickets contact Ingo	Link				

Conference/Event	Date	Location	Status	Tickets	Web site	Deadline/ Info	Key Stakeholders	Comments	Partners Involved
Hanse-Aerospace Networking Event (Sailing Cup)	09/10/2020 – 11/10/2020	Baltic Sea (Germany)	Cancelled	Personal registration required for information contact Ingo	No Link				
AIRTEC (Trade Fair)	12/10/2020 – 14/10/2020	Munich (Germany)	Presential event with FACTLOG participation	Personal registration required for information contact Ingo	Link			FACTLOG was presented in a joint booth	Hanse-Aerospace Wirtschaftsdienst GmbH
Digitisation Workshop with Hanse-Aerospace Member Companies	28/20/2020		Virtual Workshop		No Link				
I-ESA 10th International Conference On Interoperability for Enterprise Systems and Applications	17/11/2020 – 20/11/2020		Online	Personal registration required	Link				
ICT Conference	01/12/2020 – 03/12/2020	Cologne (Germany)	Cancelled	Personal registration required	Link				
Hannover Messe (Hanover Fair)	12/04/2021 - 16/04/2021	Hannover (Germany)	Planned		Link			Joint booth organised	Hanse-Aerospace Wirtschaftsdienst GmbH
Paris Airshow	21/06/2021 - 27/06/2021	Le Bourget [Paris] (France)	Planned		Link			Joint booth organised	Hanse-Aerospace Wirtschaftsdienst GmbH
Aircraft Interiors Expo	31/08/2021 - 02/09/2021	Hamburg (Germany)	Planned		Link			Joint booth organised	Hanse-Aerospace Wirtschaftsdienst GmbH

Appendix III - Report on the AIRTEC fair in Munich

From 12 to 14 October, the only aviation trade fair to date in this year 2020, which is marked by the COVID19 pandemic, took place in Munich (Germany). This was an opportunity for small and medium-sized companies, in particular, to present their products and services and "show their colours". The comprehensive hygiene concept allowed personal talks with sufficient distance and personal mouth and nose protection. Specially appointed hygiene officers later drew a positive conclusion. Both exhibitors and visitors adhere to the rules in an exemplary manner.

Hanse-Aerospace presented the EU project FACTLOG at a joint stand. The project aroused great interest among the visitors. During the three days of the fair, an impression of the project was given in a total of 10 in-depth discussions.

In the FACTLOG project, the visitors' interest was mainly focused on the aspect of the "cognitive twin", which allows, especially in the process industry, to create simulations and recommendations for action in the digital world to be able to transfer them to the real world later on. Details at www.factlog.eu

Figure 19 - Joint stand of Hanse-Aerospace at AIRTEC 2020 in Munich (Germany).

The visitors were impressed by the possibilities of the cognitive twin concept in the process industry, but have doubts whether it also works in small and medium-sized enterprises (SMEs). Particularly in the aerospace industry, only small series and unique pieces are usually produced for aircraft equipment. It is often considered uneconomical to automate the machinery with digital extensions. However, it has become apparent that manufacturing

processes on machines with the help of such technologies can possibly be better monitored, and the data can then be evaluated in the direction of predictive maintenance. Mainly when time pressure in production is involved, possible failures can be predicted in good time and possibly even prevented if the production parameters can be adjusted without loss of quality and time.

The essential advantages seen by the interested parties are
– fast availability of data analyses
– transparent and comprehensible decision-making
– substantial decision support

Disadvantages that will be seen when the technology is introduced are
– high costs for upgrading the existing machinery
– high training requirements for the employees
– in the long term, the loss of jobs if decisions are made solely by the systems

In principle, there is an interest in being kept informed about the progress of the project. The sending of further information - especially if industrially practical solutions are available - is desired.

Appendix IV - Report on the Digitisation Workshop with Hanse-Aerospace Member Companies

A virtual workshop with Hanse-Aerospace members took place on 28 October 2020 from 09:00-11:00 on the topic "Digital platforms and tools - what can an SME do with them?" The project FACTLOG was presented. Especially the concept of the Cognitive Digital Twin (CDT) was discussed with interest by the 10 participants. The suitability of the concept for larger companies with corresponding automation and mostly homogeneous processes was confirmed. For SMEs, however, it is not immediately apparent whether this technology is suitable for production environments that have so far been little automated. In the aerospace industry often only small quantities are produced, so that continuous automation on shop floor level is not economically feasible. However, whether sufficient digital information can then be made available for the application of this technology was questionable for most of the participants. In principle, however, the fact that Hanse-Aerospace provides insights into current developments in the field of digitalisation and into the FACTLOG project is welcomed. The majority of participants requested further information events on this and related topics.