



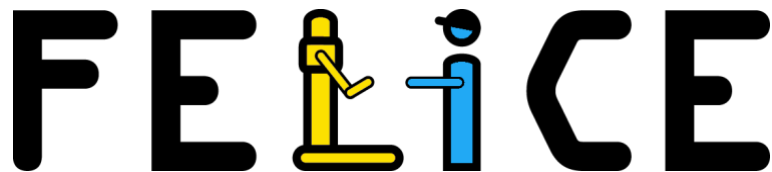
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Robotics in Application Areas and Coordination & Support

Flexible Assembly Manufacturing with Human-Robot Collaboration and Digital Twin Models



D9.1: Project website and visual identity[†]

Abstract: This deliverable describes the design and development of the FELICE website and its connection with the social media channels as main platforms for the dissemination activities to reach the widest audience. Together with the description of the website this document provides details about the visual identity of FELICE, so as to guarantee the consistency of the dissemination material and to make the project easily recognized on all the delivered products. In conclusion, the aim of this deliverable is to describe the underlying infrastructure so as to effectively set up the FELICE on-line presence. This document provides an overview of the set-up and design of the website, the social media channels and the visual identity.

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List of Abbreviations

Abbreviation	Definition
PU	Public Document
CMS	Content Management System
DIH	Digital Innovation Hubs
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol secure
LTS	Long Term Support
URL	Uniform Resource Locator

Executive Summary

This document outlines the website development and the visual identity of the FELICE project (www.felice-project.eu). In brief, the document describes the website infrastructure, the content and the connection with the social media channels. The deliverable shows and describes the initial content and structure of the site at launch, which will be a collaboration tool for knowledge, experience and best practice sharing, as well as for consolidating results and supporting dissemination. This document will be closely linked to D9.2 Dissemination and exploitation plan.

The website will be the main hub of the online dissemination and communication activity for the project. It will be linked to the social media channels (Twitter and LinkedIn) to extend and share to the wider audience the messages and the achievements of FELICE. The website will be publicly accessible and will be the reference for many different target audiences, including workers, employers, researchers, industrial networks and associations, other related national and EU-funded projects, Commission staff, media, and the wider public.

The website has the purpose to show the project brand and provide non-confidential information in a coherent and easily understandable and recognizable context that will comprise project concept, partners, core objectives and workplan, industry-domains, project news and industry-related news, events and contact information. All the news, events and the main achievements of the projects will be also shared through the social media channels.

The basic idea behind the layout design and the content structure of the FELICE website was to realize a visually attractive, engaging, easy to navigate and informative website. Sections for publications and deliverables, media and downloads have been included in the website structure to support relevant content as it becomes available during the project timeline.

Together with the of the website, a big effort has been devoted to the visual identify of FELICE that comprised firstly the choice of the colours and the design of the logo and successively the realization of templates for documents and presentations to be shared to the partners. The result is that FELICE is now easily recognizable in all the material especially online.

The visual identity and online presence comply with all communication requirements set forth by the European Commission. The funding source and Grant Agreement number are mentioned on the website as well as on all communication material.

The successive sections of the document are structured as follows:

- Section 2 presents the visual identity of the project.
- Section 3 presents an outline of the website infrastructure and technical components as well as the link with the social media channels and the statistics.
- Section 4 concludes the present document with a brief outline of future action and updates regarding the FELICE website.

1 Introduction

1.1 Purpose of the document

The purpose of this document is to briefly outline the visual identity and the website development for FELICE. It describes the initial content and structure of the website and the social media channels which will be a collaboration tool for knowledge, experience and best practice sharing, as well as for consolidating results and supporting dissemination.

1.2 Intended readership

D9.1 is a public document (PU) and therefore is intended for the European Commission, the FELICE Project Officer, the members of the FELICE consortium, members of other H2020- funded projects as well as the general public.

The intended readership includes a broad range of different target audiences including workers, employers, industrial networks and associations, other related national and EU-funded projects, Commission staff, media and the wider public.

1.3 Relationship with other FELICE deliverables

This deliverable will be closely linked to D9.2 Dissemination and exploitation plan, due in Month 6 of the project.

2 Visual Identity

2.1 Logo

The logo is the most important element to recognize the project in all the material delivered. The idea is to have a logo representing the main challenge the project is addressing, i.e. the coordinated interaction and combination of human and robot skills. The two central letters are represented as a robot and a worker interacting, also the colours have been chosen to be close to those of the robot used in the production lines as well as for the blue of a worker suit.

It has been realized in two versions, a coloured one shown in Figure 1 that is used on the website and in templates for documents and presentations, and a black and white version (see Figure 2) used watermarks and grey scale material, like printed documents. Finally, a short version of the logo (see Figure 3), composed of the two central letters also has been realized to be used as icon, such as the website favicon.

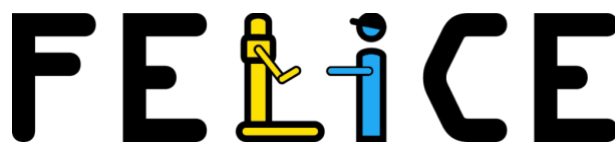


Figure 1 - FELICE project logo

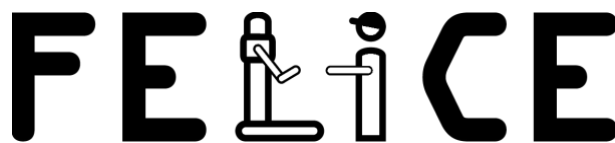


Figure 2 - Version of the logo without colors



Figure 3 - FELICE project short logo

2.2 Documents and Presentations

Microsoft Word and Latex templates have been created for the deliverables and a Microsoft PowerPoint template for the presentations, so that all the material produced are consistent and immediately linked to FELICE project.

3 FELICE Web Site

3.1 Infrastructure

3.1.1 Technical details

The website is realized using the well-known Content Management System (CMS) Wordpress that ensures a high level of customization and allows to easily manage contents and publication workflows.

The website is hosted by UNISA on Ubuntu 20.04 LTS virtual server. The service is ensured by Nginx over HTTPs. The database is based on MySQL Community 8.0.23 and is hosted on the same server.

The backup of the database and the pages are performed on a daily base to remote server, at UNISA, hosted on a different physical server. The backup task is performed using Duplicity, a service that allows us to perform an incremental backup of database, static contents, media and configurations of the website.

Therefore, the basics are provided below:

- Domain: <http://www.felice-project.eu/>
- CMS: Wordpress
- Database: MySQL 8.0.23
- Remote daily backup through Duplicity

3.1.2 Structure and navigation

The website navigation has been designed as shown in Figure 4. From the home page (a.k.a Front Page in the successive sections), through the main menu it is possible to navigate over the main sections:

- **News:** where the news about the projects will be published and recorded as an on-line log of all the achievements of FELICE.
- **Resources:** this section is dedicated to collect the public deliverables and resources realized during the project like document, deliverables, media and other dissemination material.
- **Consortium:** this page is dedicated to the description of the consortium with a short description of all the partners, their main competences and tasks.
- **The Project:** this section is dedicated entirely to describe the vision, the objectives, the pillars and the workplan of FELICE.

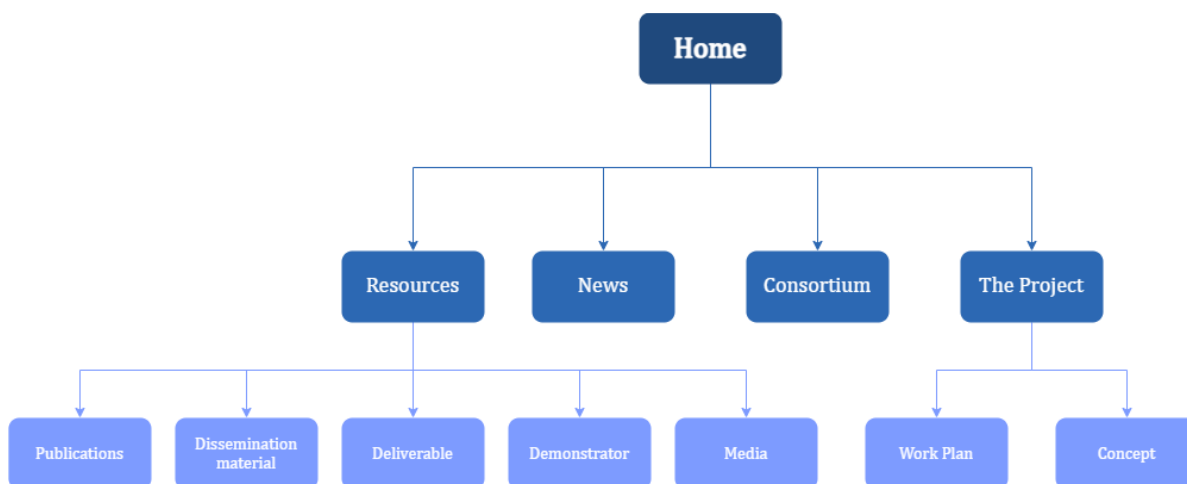


Figure 4 - Website navigation tree

3.2 Content

3.2.1 Front Page

The front page is the main on-line window to FELICE, it has been designed as a single page to briefly and immediately provide the principal information to understand the purposes of the project. Starting from the vision and the description of the problem addressed (Figure 5), then the objectives (Figure 7) and the consortium (Figure 8).

The footer containing the key facts and the funding information is visible in all the pages. In addition, also the twitter timeline of FELICE will be added in the footer.

In Figure 6 an example is shown of the banner image used on top of all the pages that represents a production line with robots.

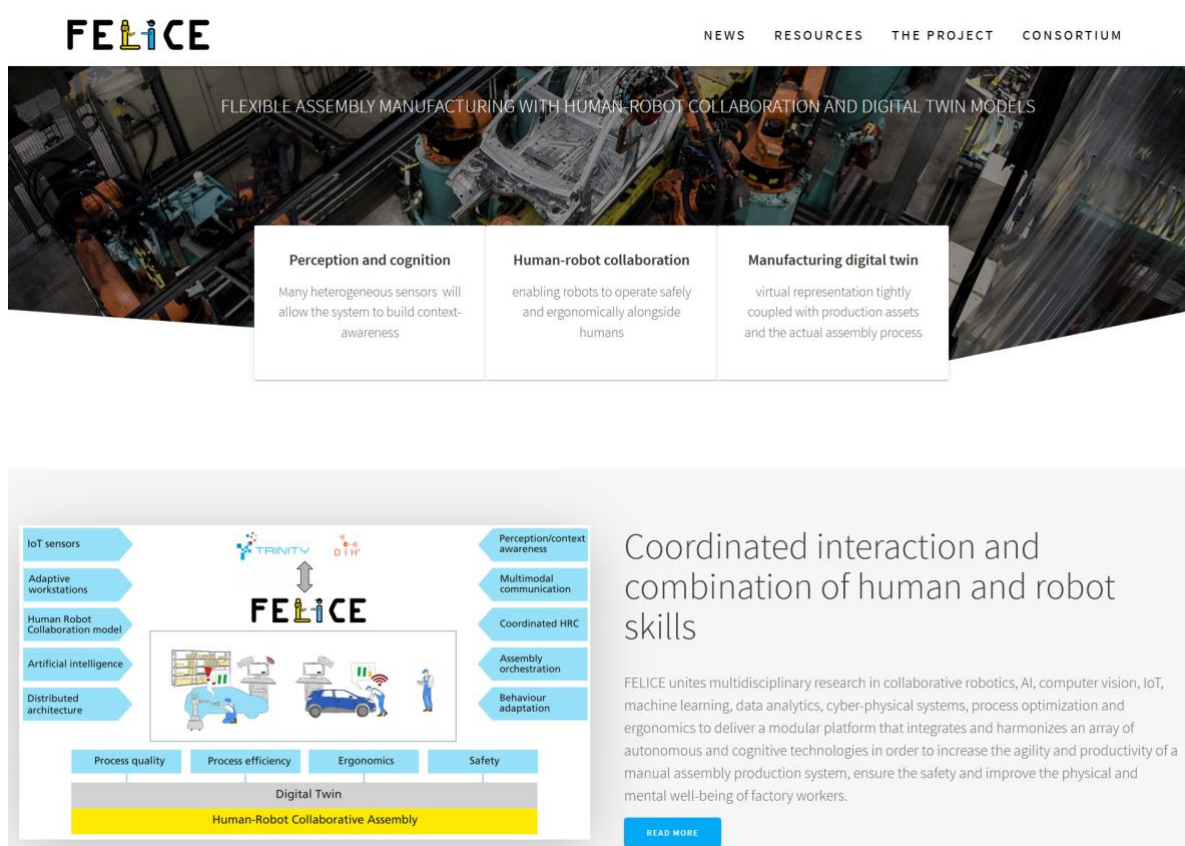


Figure 5 - The vision and the main purpose



Figure 6 - Example of page banner

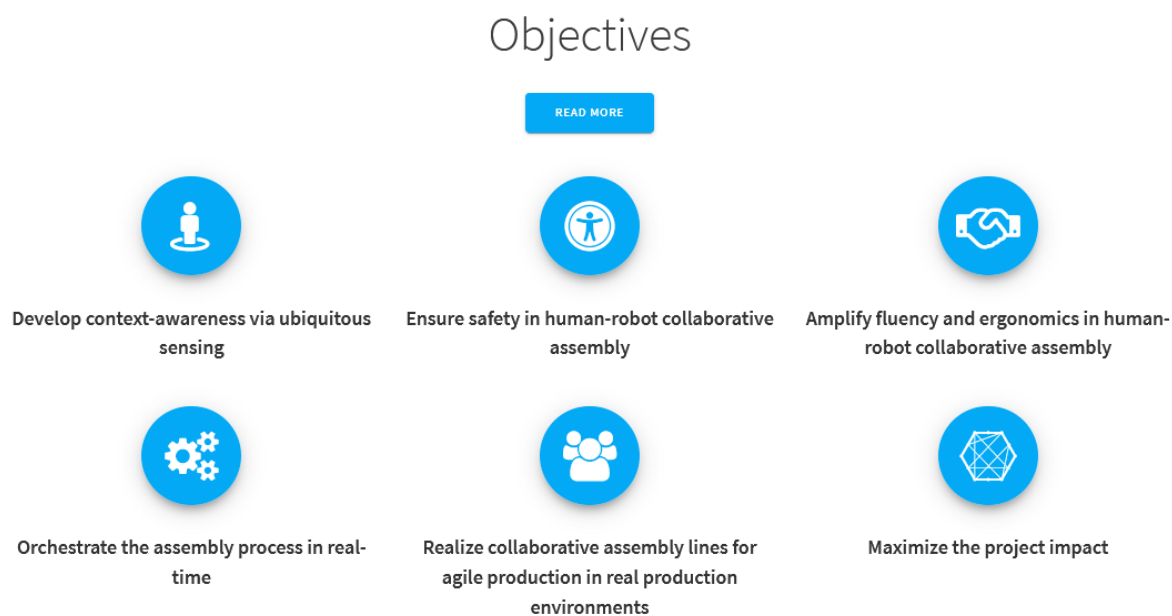


Figure 7 - The objectives in front page

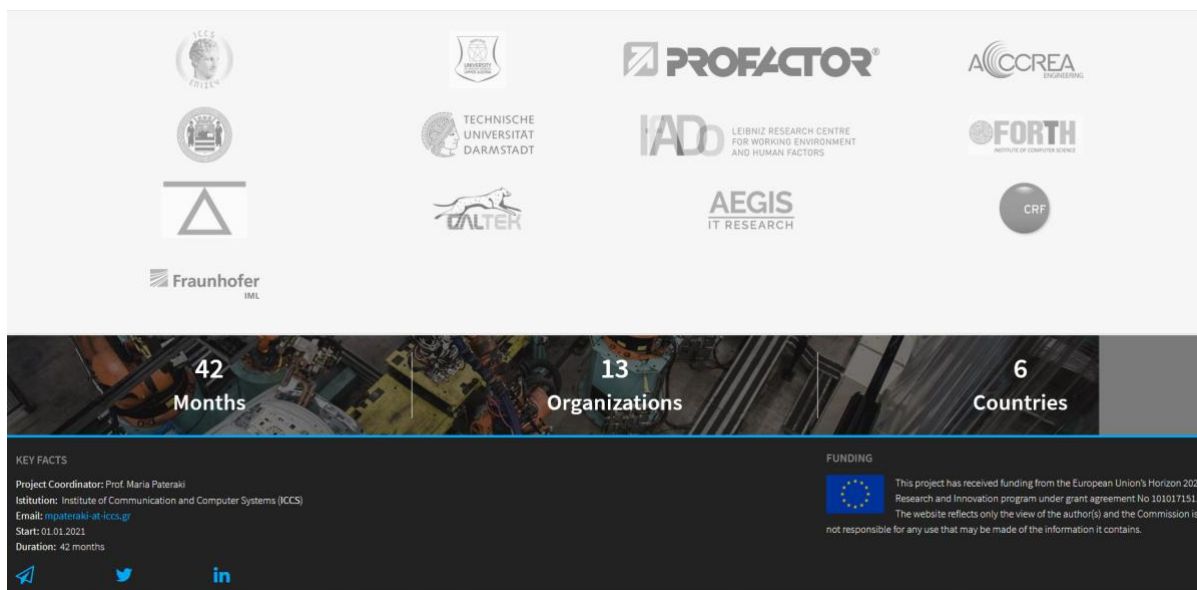


Figure 8 - Consortium, summary information and the footer in the front page

3.2.2 Project Page

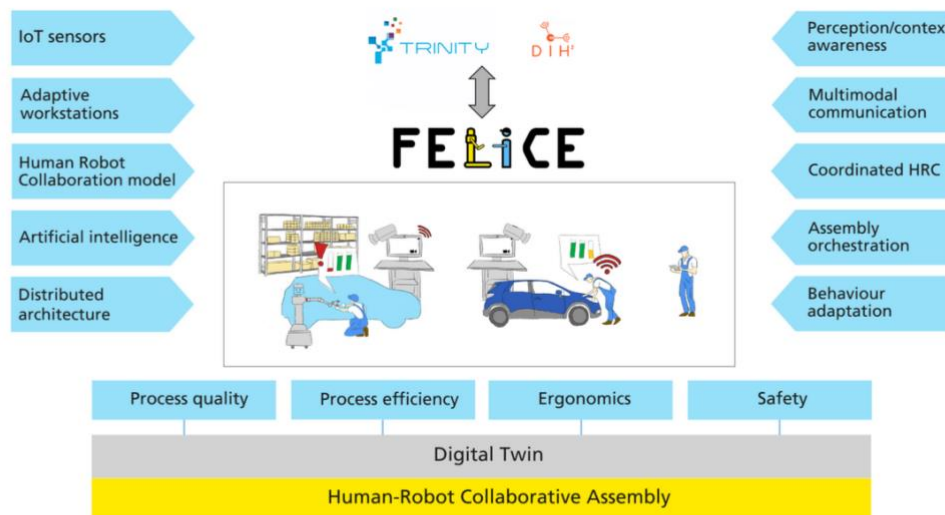
3.2.2.1 Concept

The concept page is designed to present the vision of FELICE together with the objectives and the framework. The concept page is composed of the following sections:

- The Vision section highlights the importance and applicability of the project, shows how it is placed within the industrial environment and the areas it covers. Furthermore, it describes the directions that will be taken (Figure 9).
- The Objectives section shows the intermediate objectives addressed by the consortium to realize FELICE's aspirations and implement its outcomes (Figure 10).
- The Architecture section presents the high-level structure of the framework and the pillars on which it is based (Figure 10).

Vision

FELICE addresses one of the greatest challenges in robotics, i.e. that of **coordinated interaction and combination of human and robot skills**. The proposal targets the application priority area of **agile production** and aspires to design the next generation assembly processes required to effectively address current and pressing needs in manufacturing. To this end, it envisages adaptive workspaces and a cognitive robot collaborating with workers in assembly lines. *FELICE* unites **multidisciplinary research** in collaborative robotics, AI, computer vision, IoT, machine learning, data analytics, cyber-physical systems, process optimization and ergonomics to deliver a modular platform that integrates and harmonizes an array of autonomous and cognitive technologies in order to increase the agility and productivity of a manual assembly production system, ensure the safety and improve the physical and mental well-being of factory workers. **The key to achieve these goals is to develop technologies that will combine the accuracy and endurance of robots with the cognitive ability and flexibility of humans.** Being inherently more adaptive and configurable, such technologies will support future manufacturing assembly floors to become agile, allowing them to respond in a timely manner to customer needs and market changes.



Related developments will proceed along the following directions:

- Implementing perception and cognition capabilities based on many heterogeneous sensors in the shop floor, which will allow the system to build context-awareness.
- Advancing human-robot collaboration, enabling robots to operate safely and ergonomically alongside humans, sharing and reallocating tasks between them, allowing the reconfiguration of an assembly production process in an efficient and flexible manner.
- Realizing a manufacturing digital twin, i.e. a virtual representation tightly coupled with production assets and the actual assembly process, enabling the management of operating conditions, the simulation of the assembly process and the optimization of various aspects of its performance.

Figure 9 - The vision in the concept page

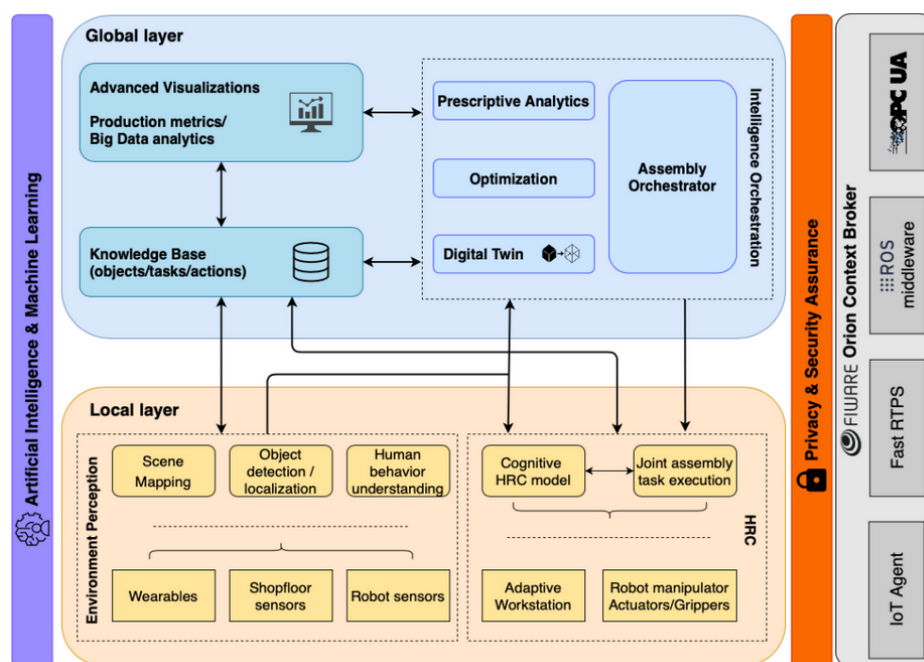
Objectives

1. **Develop context-awareness via ubiquitous sensing.** Process and fuse multiple sensor streams in real-time to represent actors and objects in the assembly line. This regards implementing state of the art perception methods which: i) map the factory shop floor; ii) model and analyse the behaviours of human workers, their actions, intentions and feedback; iii) detect and localize objects of interest; iv) extract verbal commands uttered by workers.
2. **Ensure safety in human-robot collaborative assembly.** Collaborative operation has a higher probability for safety critical situations occurring due to close proximity of workers and robots.
3. **Amplify fluency and ergonomics in human-robot collaborative assembly.** Fluency refers to the level of coordination of a robot's actions with a human when they perform a task side-by-side. For effective collaborative assembly, robots should perform tasks concurrently or even jointly with humans. Such collaboration should also improve the physical and cognitive ergonomics of the assembly process for the benefit of workers.
4. **Orchestrate the assembly process in real-time.** Monitor the assembly line as a whole in order to continuously make corrective decisions related to the operation of the assembly process and the selective use of robots to enhance the performance of the composite line.
5. **Realize collaborative assembly lines for agile production in real production environments.** Showcase the ability of project developments to easily define, adjust, deploy and operate new production processes that achieve smooth and effectual collaboration of human workforce with intelligent artificial systems that autonomously undertake supportive assembly tasks in real industrial settings.
6. **Maximize the project impact.** Promote the project to various audiences (e.g., scientific peers, professional organizations, industry, policymakers) and the society as a whole. Transfer knowledge and innovations beyond the project and pave the road to commercialization.

Architecture

Our framework comprises of two layers:

- A local one introducing a single collaborative assembly robot that will roam the shop floor assisting workers.
- Adaptive workstations able to automatically adjust to the workers' somatometries and providing multimodal informative guidance and notifications on assembly tasks, and a global layer which will sense and operate upon the real world via an actionable digital replica of the entire physical assembly line.



The framework is supported by the following pillared structure:

1. Smart process monitoring via integration of heterogeneous sensors and devices in industrial environments.
2. Collaborative robots with advanced cognitive capabilities, mobility and adaptability for joint task execution, addressing safety and fluency.
3. AI system for real-time orchestration and control of adaptive assembly lines.
4. Distributed architecture computing paradigm and re-usable toolkits.
5. Technology validation in real industrial environments.

FELICE foresees two environments for experimentation, validation, and demonstration. The first is a small-scale prototyping environment aimed to validate technologies before they are applied in a larger setting, provided by the second, industrial environment of one of the largest automotive industries in Europe. It is the view of the consortium that this quest is timely reacting to international competition, trends, and progress, pursuing results that are visionary and far beyond the current state of the art.

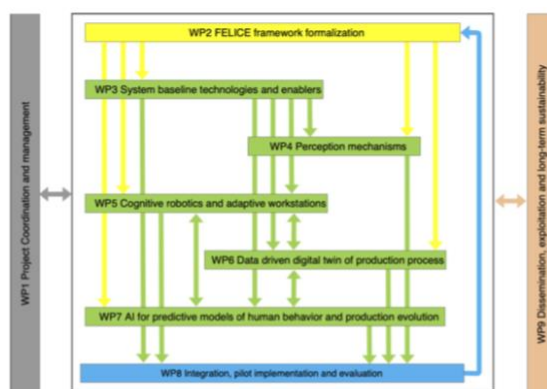
Figure 10 - The objectives and the pillared framework in the concept page

3.2.2.2 Work plan

The work plan page (Figure 11) is dedicated to describing how the project is structured in terms of work packages with the objectives and the deliverables for each work package as well as the duration. For each work package the logo of its leader is shown.

In the beginning of the page the overall structure of the project and the dependencies of each work package is shown.

The work plan strives to maximise the efficiency of all activities carried out in the project and their impact. To this end, it is organised in a way that ensures a synergistic cohesion between related tasks but, at the same time, presents opportunities for concurrency. The project has a duration of 42 months, and is divided into 9 work packages (WPs); one (WP2) concerned with requirements/specifications on interaction and productivity aspects, 5 technical WPs (WP3-WP8), as well as 2 non-technical WPs devoted to coordination & management (WP1) and dissemination, communication, exploitation and long-term sustainability (WP9).



WP1 – Project coordination and management



Duration: M1 – M42

The main objective of WP1 is to coordinate all management activities across the consortium. WP1 is supported by the management structure. In particular, it will address the following objectives:

- Implement and maintain an effective management infrastructure for monitoring and controlling progress.
- Supervise the technical progress of the project and take appropriate actions if needed.
- Implement procedures for quality management.
- Oversee and coordinate ethical and privacy issues.
- Ensure proper knowledge management including handling of IPR.
- Establish and maintain effective communication between project partners and the EC on the status of the project, including financial reports and all documentation required to meet the grant requirements.

Deliverables

- D1.1: Quality assurance plan, (Lead: FHOOE; Due: M03; R[T1.2]; CO)
 D1.2: Data management plan, (Lead: ICCS; Due: M06; ORDP[T1.1]; PU)
 D1.3: Ethics and privacy manual, (Lead: EUN; Due: M06; R[T1.3]; CO)
 D1.4: Innovation management plan, (Lead: CRF; Due: M06; R[T1.4]; PU)
 D1.5: Mid-term Progress Report, (Lead: ICCS; Due: M22; R[T1.1]; CO)
 D1.6: Final Progress Report, (Lead: ICCS; Due: M42; R[T1.1]; CO)

WP2 – FELICE framework formalization

WP3 – System baseline technologies and enablers

Figure 11 - Work plan page

3.2.3 Consortium

The consortium page collects the main information about all the project partners and the competences that they will offer to the purposes of FELICE.



The consortium is comprised of a balanced blend of academic & research organizations (FHOOE, FORTH, ICCS, IFADO, IML, PRO, TUD, UNISA), one of the largest European automotive manufacturers (CRF), three very successful SMEs with significant commercial expertise in engineering and IT (ACCREA, AEGIS, CALTEK) and a legal consultancy service provider (EUN).



INSTITUTE OF COMMUNICATION & COMPUTER SYSTEMS (ICCS)

The Institute of Communication and Computer Systems is the ranking research institute on communications and computers in Greece. ICCS is affiliated with the National Technical University of Athens.

ICCS is a non-profit Academic Research Body established in 1989 by the Ministry of Education in order to carry research and development activities in the fields of all diverse aspects of telecommunications, computer systems and techniques. In *FELICE* the group of computer vision and machine learning of ICCS is involved. This group applies research in (i) computer vision and vision-based perception, (ii) Computer Vision with emphasis on 3D processing to create precise 3D models for enhance interactivity, (iii) Photogrammetry with emphasis on 3D/4D reconstruction (4D involves 3D geometry plus the time) using virtual and augmented reality techniques, (iv) Image Processing & Analysis, (v) deep Machine Learning including Convolutional Neural Networks, Long Short-Term Memory Networks, Recurrent Deep Learning Structures, Deep Auto-encoders, Deep Belief Networks, (vi) Facial Expression Recognition, (vii) Spatio-temporal Event Detection, (viii) human behavioural recognition, (ix) Pattern Recognition, (x) Sparse Graph Approximation, Clustering (xi) Riemannian Manifold Modelling, (xii) Principal Component Analogies and Dimensionality Reduction, (xiii) Nearest Neighbour Search and Vector Quantization and (xiv) Hyper-spectral, multi-spectral and thermal (i.e., non-RGB) image analysis.

The personnel of group of the ICCS consists of six faculty members expert in the above mentioned research domains, three post doc researchers of high experience in the respective research field, seven PhD candidates pursuing their doctoral theses in group main activities and three technical staff members. The groups has participated in numerous research projects funded both at European and national level (Robo Spect, SCOVIS, PHOOTONICS, HYDROPTICS, Panoptis, Inachus).

ICCS will coordinate the project and lead WP4 on perception mechanisms. It will be also involved in activities related to defining and developing the open, interoperable and secure IoT framework that *FELICE* will operate on. ICCS will also contribute to the requirements (WP2), System baseline technologies and enablers (WP3), Cognitive robotics and adaptive workstations (WP5), Integration, pilot implementation and evaluation (WP8), and to the dissemination and exploitation of the project results (WP9).

Figure 12 - Consortium page

3.2.4 Resources Page

3.2.4.1 Publications

This page will collect the reference to all the scientific papers published by the partners as results of activities related with FELICE.

3.2.4.2 Dissemination Material

This section will include the dissemination material of the project.

3.2.4.3 Deliverable

This section will be dedicated to distributing all the public deliverables.

3.2.4.4 Demonstrator

This section will be devoted to the collection of demonstrators showing the results achieved.

3.2.4.5 Media

This section will collect images and video material and all the multimedia useful to promote and show achievements, proceedings and activities of the project.

3.2.5 News Page

The news page is dedicated to publishing regular updates on the activities and achievements of FELICE. This page will include also news about events attended by project partners where FELICE is promoted and presented, or news about relevant results and research activities of the partners that are strongly related to the project. Each news can be easily shared by the reader on its own profile by using the “share this content” buttons. For the sake of clarity, in Figure 13 is shown an example of news published.

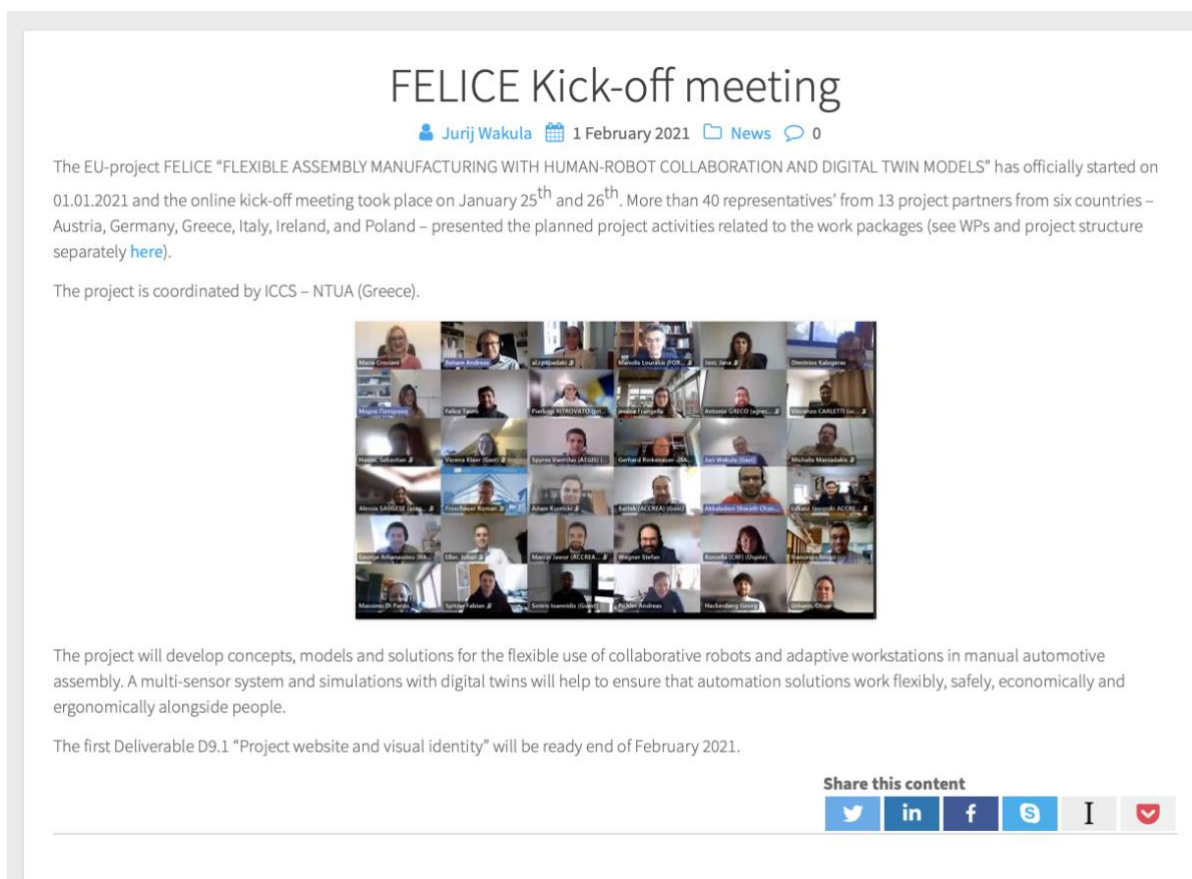


Figure 13 - Example of news published in the News section

3.3 Social Media

LinkedIn and Twitter Social Media accounts have been created by TUD as part of the dissemination strategy to communicate with stakeholders, industry, DIHs, scientific community, and the general public. The URLs are shown in Table 1:

Table 1 –Social media accounts and URL

Site	URL
Twitter	https://twitter.com/FeliceH2020
LinkedIn	https://www.linkedin.com/company/h2020feliceproject

3.3.1 Twitter

The FELICE Twitter account has been created under the name 'FELICE H2020 Project' and has the Twitter handle @FeliceH2020. The visual representation is based on the website design to maintain visual identity.

Six Tweets have been posted during the implementation period to highlight project goals, the kick-off event, and the consortium. Over 100 individuals or other institutions, mainly H2020 projects, have been followed and the monthly goal of more than 20 followers was reached in the first days of the implementation period, indeed more than 50 users are currently following the profile of FELICE.

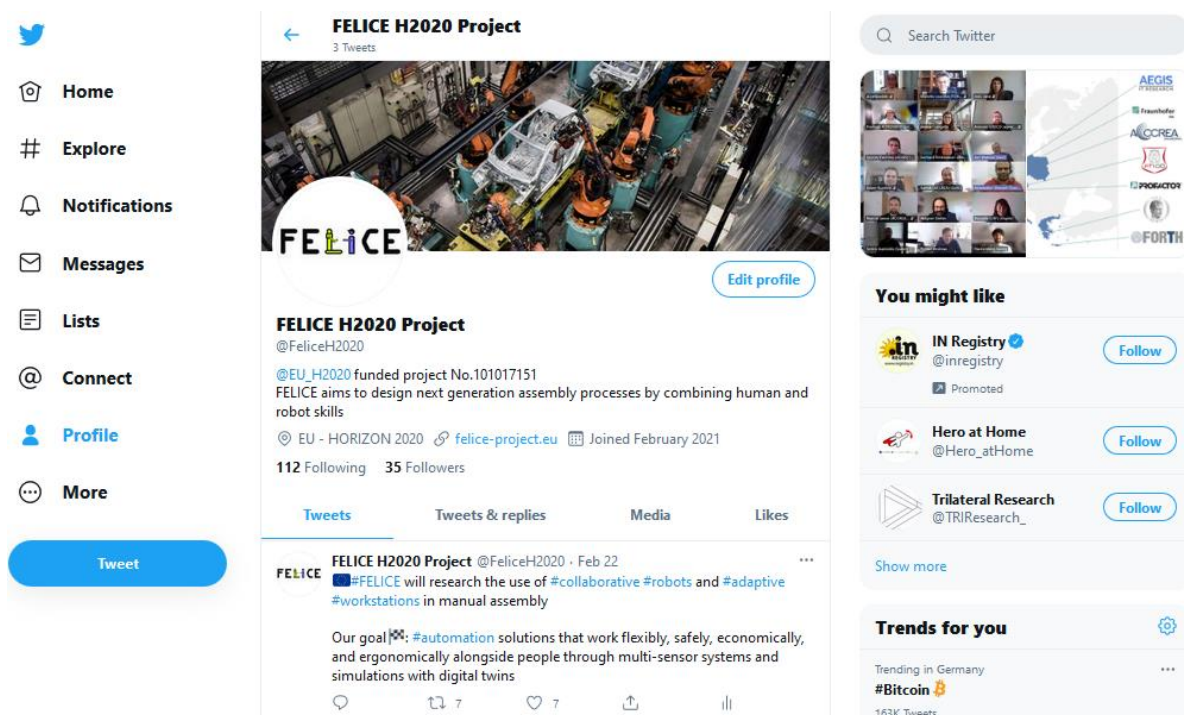


Figure 14 - FELICE Twitter page with the latest tweet

3.3.2 LinkedIn

A LinkedIn corporate page has been created under the name 'FELICE Horizon 2020 Project'. The presentation of the page is based on the Website design.

The page offers an 'about us' section where a short description of the project is given. Project partners have been added in the 'Locations' tab. LinkedIn posts or 'Updates' are based on Tweets but contain more detailed information and are presented more professionally. The monthly goal of more than 20 followers (27 currently) has been met during the implementation period for LinkedIn as well.

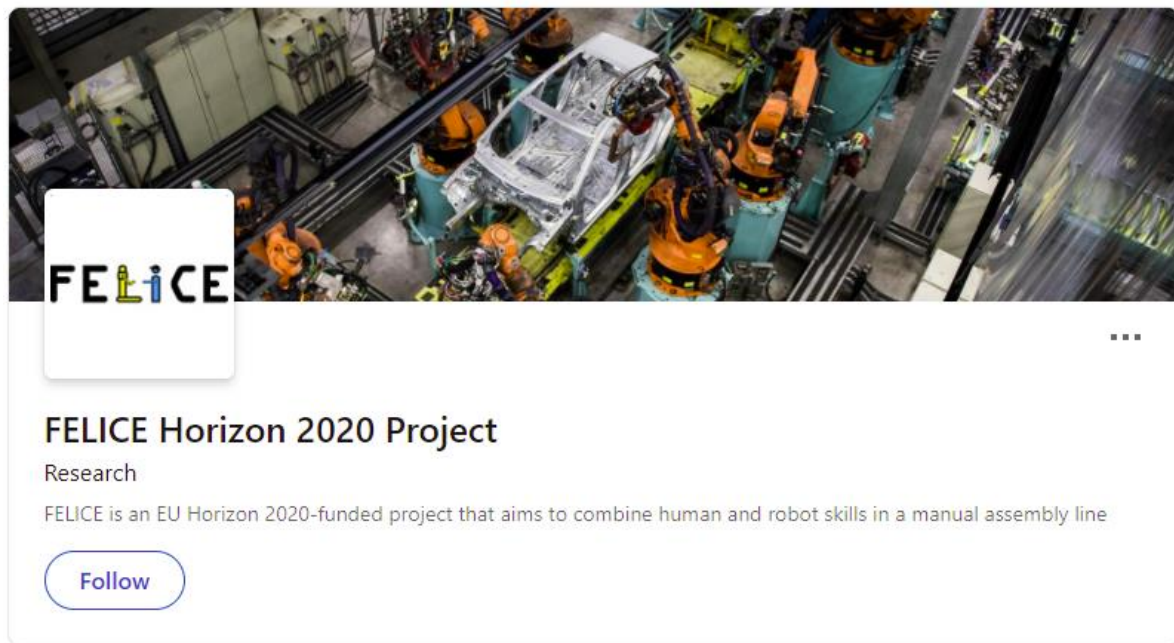


Figure 15 - Header of the FELICE LinkedIn page

3.4 Statistics

The website is the main showcase to promote and show project activities and achievements, therefore getting statistics about the visitors and the content of interest is crucial to improve the impact and the quality of the contents published and to get useful information to lead the communication strategy. To this purpose, a Google Analytics account has been activated to collect statistics about the website. In particular, in Figure 16 and Figure 17 we show, as an example, details of the statistics collected from the page views, the users and the audience.

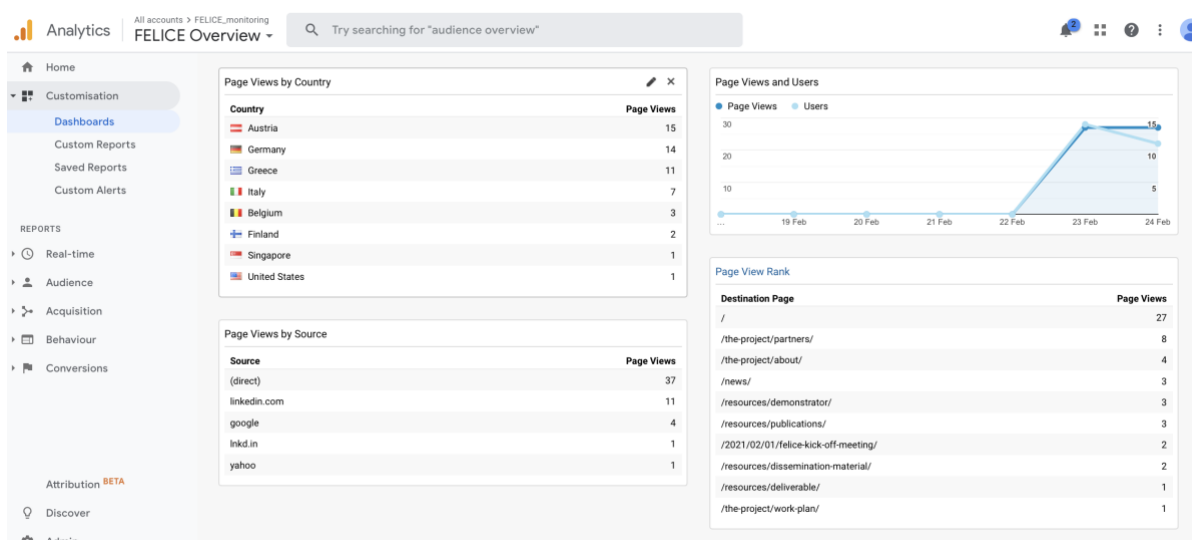


Figure 16 - Google Analytics for users and page visits overview

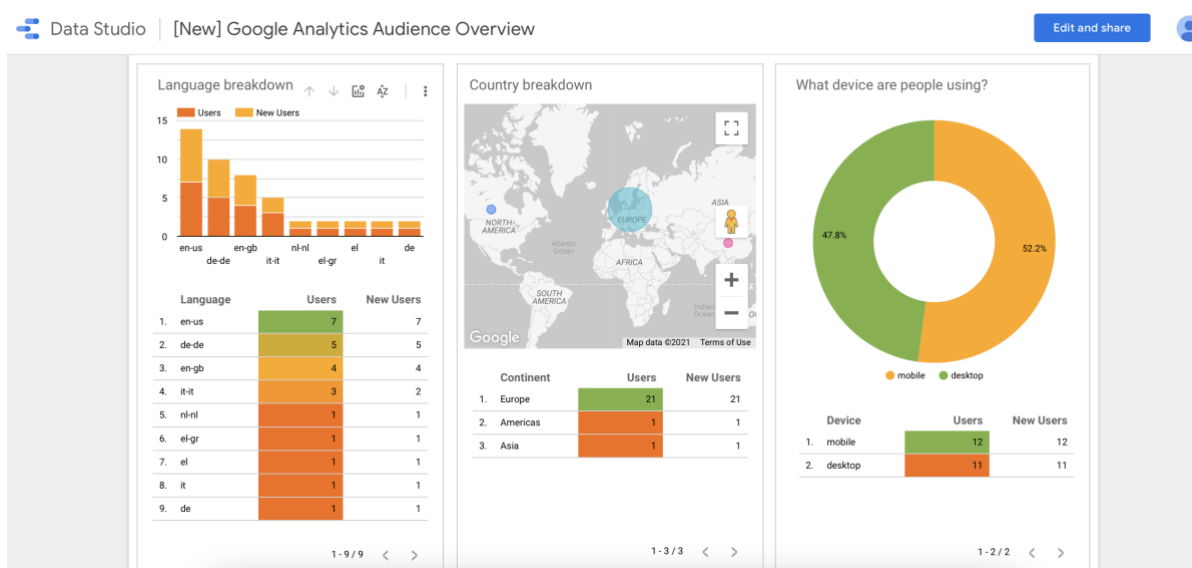


Figure 17 - Google Analytics for audience overview

4 Conclusions and Future Plan

The overall structure of the website has been created and published and all the starting material about the project has been added. The future plan is to extend the contents especially for the resource pages as far as new deliverables, results and material will be provided by the partners. The website is complete in the structure, but in an early stage concerning its contents; it will be periodically updated according to the dissemination strategies and the needs of the project; therefore, further improvements and adaptations will be applied when necessary.