Welcome to the fifth edition of Impact, the quarterly newsletter from the European Factories of the Future Research Association (EFFRA) focusing on the work of projects launched under the EU’s research and innovation programme for advanced manufacturing – Factories of the Future.

In this edition, we are pleased to bring three events to your attention – a summer school from the Appolo project, an INCLUSIVE project seminar and a free Hannover Messe workshop from the CloudFlow project. Meanwhile the Scorpius project has published its cyber-physical systems in manufacturing roadmap while the LSHARE project announces the launch of new laser-based equipment assessments.

This quarter, the Use-It-Wisely project reports its final results as the project concludes and the Micro-Fast project reports its expected final results. In this edition, we are pleased to introduce the A4Blue and Futuring projects.

The aim of this newsletter is to bring news from these projects and related activities to a European audience. The newsletter is free and readers are welcome to share it with their networks.

If you have project news you wish to share you can submit it to: info@effra.eu.

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**Subscribing to Impact**

*Impact* is available to anyone with an interest in factories of the future and is registered on the EFFRA Innovation Portal.

If you have colleagues/contacts who are interested in receiving this newsletter direct them to the EFFRA Innovation Portal and they will receive our next edition direct into their mailbox.

Access to the EFFRA Innovation Portal and subscription to this newsletter is free.

[Innovation Portal](#)

**APPOLO Announces Summer School on Ultra-Short Pulse Lasers Applications in Material Processing**

The ‘Factories of the Future’ project APPOLO has announced a summer school on ultra-short pulse laser applications in material processing.

Taking place in Vilnius (Lithuania) from 3 to 7 July, the workshop is aimed at students and young researchers working in the field of material processing by using ultra-short pulse lasers.

The workshop will include lectures and industrial and research site visits.

APPOLO is a ‘Factories of the Future’ project which aims to establish a hub of application laboratories for equipment assessment in Laser Based Manufacturing

[More Information](#)

**Save the Date! INCLUSIVE Seminar (24 May)**

On 24 May, the INCLUSIVE project, in collaboration with Factories of the Future projects A4BLUE, Factory2Fit, HUMAN and MANUWORK, will host a seminar: "Continuous adaptation of work environments with changing levels of automation in evolving production systems".

The seminar will include presentations from specialist speakers and discussions centred on the seminar topic.

This seminar runs from 14:30 to 17:30 and takes place within the SPS IPS DRIVES fair (Parma, Italy).

[More Information & Programme](#)
CloudFlow to Host Workshop at Hannover Messe (26 April)

On 24 April, CloudFlow will host a workshop at this year’s Hannover Messe to showcase how manufacturing SMEs have benefitted from using cloud services for engineering and simulation processes.

During the workshop, the following success stories will be presented:

- Optimizing energy consumption and noise emission of the cooling air-flow optimization for compressors.
- More efficient drug production using cloud-based CFD simulation of bioreactors.
- Cloud based optimization of an extrusion die.
- HPC workflow for simulation and optimization of additive manufacturing for improving the production of gearboxes.

Representatives of CloudFlow will also present an introduction to the project and information on how to access its services. In addition, the workshop will include an expert panel discussion on cloud services.

The workshop will be held in Saal Heidelberg from 14:00 to 17:00 (CET).

Deadline for registration: 21 April.

More Information | Registration/Questions

sCorPiuS Publishes Roadmap for Cyber-Physical Systems (CPS) in Manufacturing

The sCorPiuS project has published its CPS in Manufacturing roadmap.

The ‘Factories of the Future’ project sCorPiuS has published a new roadmap for CPS in manufacturing in Europe with the aim of increasing the understanding of how CPS technologies can improve engineering and manufacturing performance.

This roadmap discusses the application domain of CPS technologies applied in manufacturing and presents a broad vision for their adoption. It describes the research priorities identified by sCorPiuS which need further research. The sCorPiuS roadmap is the result of close collaboration between industrial experts and stakeholders organized by the project coordinator, Fondazione Politecnico di Milano.

The sCorPiuS project has contributed to the EFFRA’s “Factories 4.0 & Beyond” recommendations.

sCorPiuS Roadmap | sCorPiuS | Factories 4.0 & Beyond
LASHARE New LEAs Launched

The LASHARE project has successfully entered its second phase of operation. Fourteen laser-based equipment assessments (LEAs) were conducted within the first phase. Equipment that was demonstrated at lab scale has been advanced in technology readiness level by executing a four-stage assessment. An overview about these activities has been published on the LASHARE YouTube channel.

The laser-based equipment assessments start with an initialisation phase, where an industrial user defines the actual manufacturing challenges and objectives, where the solution supplier plans an implementation roadmap and the research partner assesses scientific challenges and moderates the establishment of technology readiness criteria. These technology readiness criteria are the key factors that guide an assessment cycle.

Since the end of 2016, fourteen new LEAs started out to execute the assessment cycle for their benefit. The new LEAs focus on the integration of ICT solutions into the proposed pieces of equipment and to connect to external data processing systems in the context of manufacturing environments. Their specific topics range from automated three-dimensional path planning in laser cutting through equipment integrated process sensors and control to the integration of entire production chains that are built around complex laser-based manufacturing processes like laser cladding for part repair.

[Link to LASHARE Project]
Use-It-Wisely Consortium Reports on Their Project Results

The Use-It-Wisely project consortium reports on their results and the importance European collaboration.

“Top of the line research is driving new products and processes in Europe, in order to respond to rapidly changing markets and customer requirements. EU researchers and businesses across different sectors of EU Manufacturing have developed new business models, tools and applications which will extend the lifespan of industrial products through innovative and continuous upgrades; saving time, money and reducing environmental impact.

Twenty partners from across Europe spanning Industry, Academia, Research and SMEs, worked together on Use-It-Wisely(UlW), a ‘Factories of the Future’ project. Use-It-Wisely aimed to meet the challenges of continuous changes in the production environment and the subsequent requirements for production systems to be continuously upgraded. These innovations have taken place in six distinct industries, but with results that are transferrable and scalable across different sectors.

A cluster of three Greek marine actors; Ocean Yard Company (boatyard), SEAbility (boat owner and operator) INSB (classification society), were involved in developing tools and methodologies to address lifecycle issues in passenger boats. The marine cluster worked with ICCS, a Greek research organisation and Bern University of Applied Sciences to develop a “Vessel Metafile App” and a “Requirements Configuring Tool”. These tools will reduce time and costs related to decision making, designing, manufacturing, updating and operating small craft passenger or other commercial purpose boats.

Dutch furniture design company Gispen, and research organisation TNO examined sustainable adaptive product design to extend product lifespan and reduce waste. Applying the principles of the Circular Economy, Gispen and TNO developed a design framework which is a very practical tool to ensure the lifelong adaptation of products. Easy use and transparent scoring creates the possibility to explain the benefits of a particular product design to the end-user. They also created a Circular Lifecycle Assessment Tool which can assess the environmental impact of initial production and all adjustments during the lifetime of a piece of furniture.

Three companies dominant in the Italian Space industry (Thales Alenia Space Italia, Altec and Vastall), developed a modelling system to provide quicker engineering solutions during the space project lifecycle. The system improves communication and collaboration between the technical engineering team, between companies and with the customer. The technical baseline is shared, and stakeholders can understand
the status of the process and of the technical baseline, allowing for more agile processes.

Volvo AB, one of the world’s leading manufacturers of trucks and other vehicles, and Chalmers University of Technology in Sweden created equipment combining 3D laser scanning and virtual reality to create a virtual factory floor. It can be used to analyse changes to collect important input from several actors including operators, design engineers, maintenance engineers, logistics, facilities engineering, building end management, i.e. the personnel that interact with the system.

Leading Spanish engineering company, Tecnatom and the University of Malaga developed a 3D viewer that will allow better communication during the inspection of turbines. Aside from the improvements in the inspection process, the tools developed by these partners can be applied to training, and other industries.

Finnish companies Metso Minerals (Mining) and RD Velho (Product Design), and VTT (the leading Finnish scientific research centre), found solutions for extending the lifecycle of rock-crushing machinery. This was achieved through the development of Augmented Reality (AR) and Virtual Environment (VE) camera based 3D scanning which will allow rock-crushers to be inspected and upgraded at customer sites. They enable better communication, collaboration and involvement of all stakeholders including customers and suppliers.

Cross-sector collaboration has been one of the key benefits of UIW and the network will continue through a dedicated online platform. The business models, tools and applications developed will be available in a repository accessible through membership. Members can share knowledge, expertise, and receive support and advice. This collaboration is vital to a sustainable and competitive European manufacturing industry”.

Use-It-Wisely | Project Results

Micro-FAST: Expected Final Results

As it nears completion, ‘Factories of the Future’ project Micro-FAST shares its expected results with Update. According to the project consortium, the main exploitable results achieved in this project are as follows:

Machine System and Sub-Systems

The core project result is represented by Micro-FAST machine system for the production of high quality components. It is first kind of the machine developed specifically for the manufacture of miniature to micro-sized bulk components with controlled micro-structures, using a wide range of powder materials. The innovative
and fast process combining micro-forming and electrical-field activated sintering technology (Micro-FAST) and fully automated machine system are expected to generate significant impacts in the manufacturing sector and component users. To accompany this several individual ancillary sub-systems related to the press have also been developed, including that for powder feeding, robotic handling of the die-set, ejector for the formed parts, laser die-cleaning and inspection system. These will also be exploited for other applications in different industrial environments.

**Materials and Tooling**

Several types of high-quality powders have also been developed that can be used in the FAST applications as well as in other powder metallurgy processes. Nanostructured metal-based and ceramic powders are produced with different techniques able to deliver controlled and homogenous chemical and structural composition and optimized flowability, leading to high quality formed parts produced.

Correspondingly, advanced surface treatment and coating techniques for micro-tooling have been developed for high-temperature applications such as Micro-FAST processes, including active-screen plasma co-alloying technology enhancing oxidation and wear resistance and reducing friction coefficient of the tool surfaces.

In addition to these, first kind of multiscale modelling technique and software modules for the modelling of electrical-field activated sintering and forming have been developed, which is able to link modelling of micro-scale electro-plasticity, diffusion bonding and bulk-material deformations to predict the material behaviours during Micro-FAST.

**Components**

High-quality parts produced are expected to have impacts in the field of miniaturised products/systems, both for users and manufacturers. The production of these parts through the Micro-FAST process and the machine will result in better performances, more economical gains and enhanced industrial competitiveness, compared to the current solutions.

**Micro-FAST**
Introducing the A4Blue Project

A4Blue is a recently launched ‘Factories of the Future’ project which is focused on “adaptive automation in assembly for blue collar worker satisfaction in evolvable contexts”.

Project Objective

The main objective of this three-year project is the development and evaluation of a new generation of sustainable and adaptive workplaces dealing with the evolving requirements of manufacturing processes and human variability. For this A4BLUE will introduce adaptive automation mechanisms for an efficient and flexible execution of tasks, ensuring a constant and safe human-machine interaction as well as advanced and personalised worker assistance systems including virtual/augmented reality and knowledge management capabilities to support them in the assembly and training related activities. Furthermore, A4BLUE will provide methods and tools to determine the optimal degree of automation of the new assembly processes by combining and balancing social and economic criteria to maximize long term worker satisfaction and overall process performance.

Aims and Goals

To support the general objective the key features to be covered by A4BLUE are adaptability, interaction and sustainability:

- Adaptability by providing an open, secure, configurable, scalable and interoperable adaptation management and assistance system.
- Interaction by providing a set of safe, easy to use, intuitive, personalized and context aware multimodal human-automation interaction mechanisms.
- Sustainability by providing methods and tools to determine the optimal degree of automation of the new assembly processes that combine and balance social and economic criteria to maximize long term worker satisfaction and overall performance.

Expected Benefits

- 20% increase in adaptability, e.g. product customisation capability.
- 10% quality increase in human and automation performance, e.g. quality or productivity.
- Wide adoption of the new developments in advanced manufacturing systems.
The A4BLUE solution will be instantiated and validated in two real industrial scenarios (at AIRBUS and CESA) and in two lab scenarios (at IK4-TEKNIKER and RWTH Aachen).

**A4Blue**

**FUTURING: Defining a Circular-Economy Strategy for European Manufacturing**

The FUTURING project aims at contributing to the definition of a strategy for the re-industrialization of Europe, by focusing on the role of research and innovation within the framework of other dimensions – economy, society, environment, globalization, geopolitics– and incoming paradigms such as the circular economy.

FUTURING will explore future scenarios, concerning industry in the EU using foresight and other policy intelligence tools. The aim of this is to identify critical factors on which action should be taken to overcome barriers and to foster opportunities for the EU re-industrialization process. A large variety of experts and stakeholders, from across the EU re-industrialization landscape are participating.

[Learn More About FUTURING](#)

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**Contact**

If you have suggestions, questions or comments concerning this newsletter, contact [info@effra.eu](mailto:info@effra.eu).

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