Project duration:
01/09/2013 – 31/08/2016

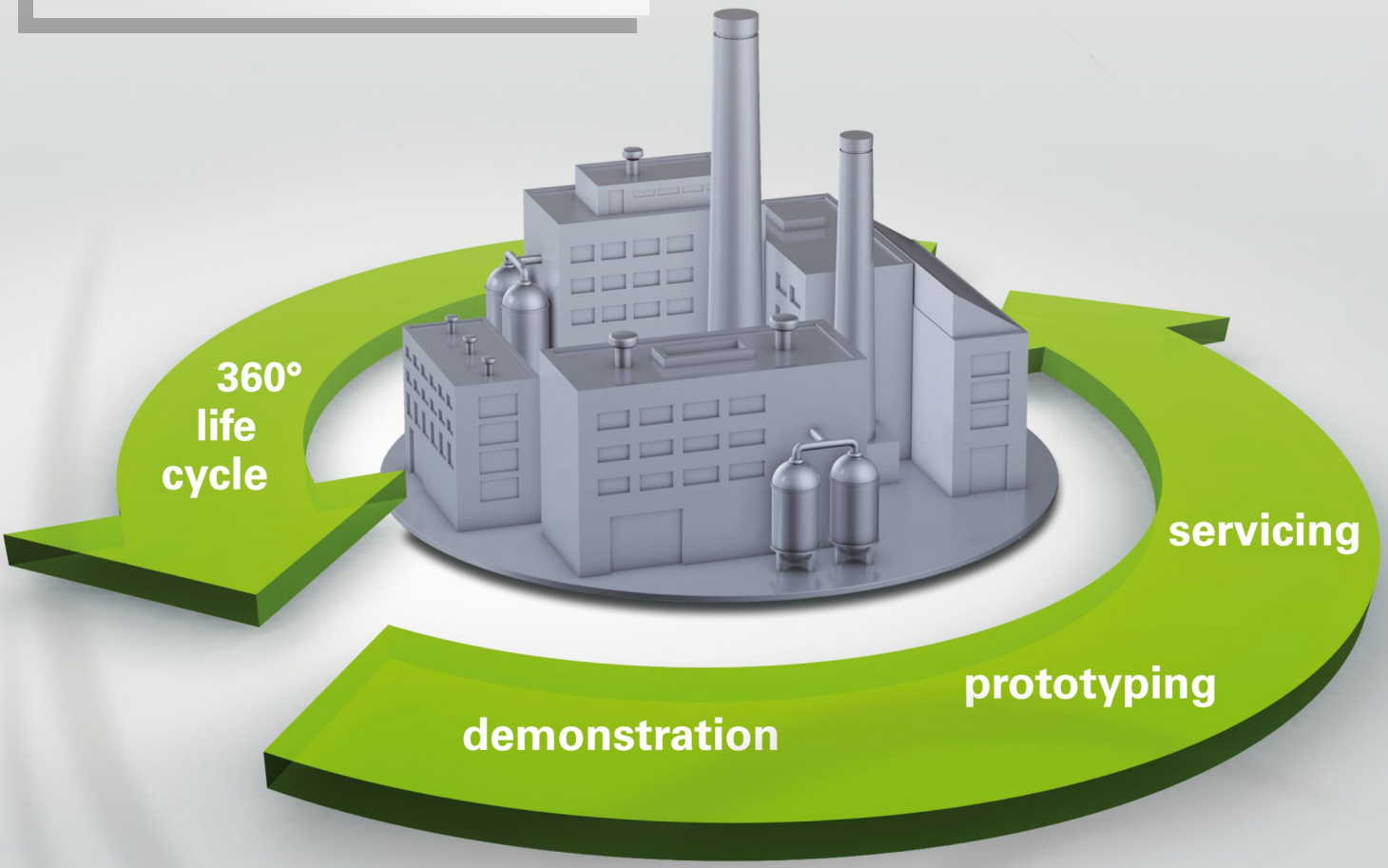
Full project title:
Innovative Reuse of modular knowledge Based devices and technologies for Old, Renewed and New factories

Grant Agreement no:
609223

Partner countries:
Finland, France, Germany, Hungary, Italy, Switzerland, Portugal, Spain, United Kingdom

Organizations:
HWH, Fagor, CMF, CRF, IEF, FhG, SEZ, HSKA, Uoulu, GMX, ISR, ISG, UPM, PARO, ZEC, TNX, LU

ReBorn
Innovative Reuse



NEWSLETTER

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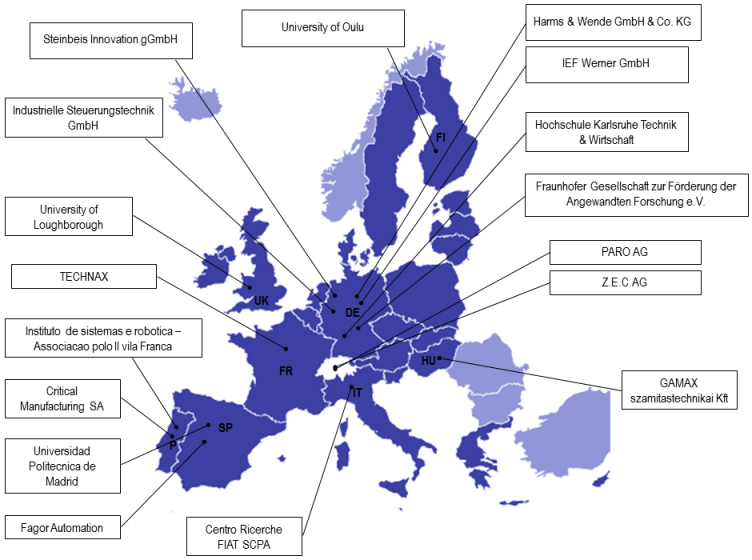

Dear Reader,

well rested the **ReBorn** consortium is back from the summer holidays and happy to present you the 3rd issue of the **ReBorn** newsletter!

As you have probably already read on our website, the evaluation and assessment process of **ReBorn** by the European Commission end of March in Brussels was very successful! Consortiums hard work paid off and the Project Officer and the Technical Advisor have been impressed by the fruits of 18 months work in form of first prototypes! Read more about it on page 6.

In June the **ReBorn** partners met in beautiful Porto (Portugal) in order to fiddle around and work on the concept for the final specifications of the interfaces of the 3 working areas. Read more about it on page 3.

Also in this edition we would like to share with you an interview with one of our partners. Last time we had a chat with Patrick Springer from Fraunhofer IPA, who leads the activities related to 3-D printing within **ReBorn**. He gave us interesting insights into the project developments on Additive Manufacturing and on the upcoming challenges. This time you will get to know José Pérez Berdud from our partner FAGOR from Spain. He is involved as end user to demonstrate the project developments. Read the complete interview on page 4 and 5.

Last but not least, we included a snapshot on past events that our partners attended and announcement of upcoming events in the field and from the **ReBorn** environment (page 6).

Welcome to the world of **ReBorn** and enjoy reading our Newsletter!

Your ReBorn team

To learn more about the project's background, approach and objectives, please visit our LinkedIn profile and the project website:

LinkedIn Profile - ReBorn

http://www.reborn-eu-project.org/

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How modular Plug&Produce equipment, factory layout design and easy assembly and disassembly play together – looking for the not so magic link

Alignment meeting from the 6th - 7th July at ISR in Porto, Portugal

Even though the **ReBorn** project is divided in the three areas A *"Modular Plug&Produce equipment, in-line adaptive manufacturing"*, B "*Innovative factory layout design techniques and adaptive (re)configuration"* and C *"Flexible and low-cost mechanical systems for fast and easy assembly and disassembly"*, an important aspect is the technical connection and mutual information exchange between these areas. This connection is vital since, some of you may remember **ReBorn** seeks a 360° vision on manufacturing equipment (see cover), which implies that several highly inter-dependent aspects have to be considered, although they might – at first sight – seem to be stand-alone subjects. Actively enabling and maintaining this connection is a continuously pursued effort by our team, which gave rise to a recent get together of the teams working in the respective workpackage pairs. After a number of phone and online conferences, the alignment meeting aimed at discussing and further specifying how data coming from the modular Plug&Produce equipment impacts factory layout planning with re-used machines and equipment.

Apparently, here the link is made in particular between the above mentioned areas A and B. The researchers and developers met on 6th and 7th July at the premises of our partner ISR in Portugal. In total, 23 people attended the meeting and discussed the final specification of the interface between the shop floor equipment, the planning and simulation systems. Within several working groups, the participants discussed several approaches for describing and carrying data between equipment and planning tools and finally agreed on the final specification. In addition to that, also a timeline and implementation plan has been worked out in order to transfer the specification into software modules.

Even if the specification now is in a good and stable state, the **ReBorn** developers anticipate that slight adaptions will still be required when turning formal specification into practice. The answer of the **ReBorn** project to such a challenge is - the regular reader of our newsletter might probably anticipate - a "Hackfest" in which the software developers will come together for some days and perform agile software development and specification work. The Hackfest as a part of the implementation plan will take place within the next weeks.

Technical aspects

The major goal of **ReBorn** is to make used equipment and tools ready for re-usage. This includes intelligent, modular equipment ("VERSONs") which is able for self-awareness of their state and performance as well as their evolution over time. Building on those VERSONs, novel concepts for the entire production design process can be derived allowing for the re-use and reconfiguration of existing factory layouts according to conditions required for rapidly changing customers' demands. For that reason, the interface between shop floor equipment and planning tools on system level is of particular interest within the **ReBorn** project. For this interface, basically three parts need to be defined:

1.) Which data needs to be available,

2.) How this data is described,

3.) How this data is communicated.

The first part of the definition has already been done on an early state of the project. Also the communication technology (part 3) is not an issue as **ReBorn** is open for various communication technologies, e.g. OPC UA. The major focus of the meeting in Porto was on the second part, the description of the data. Here the challenge is to describe a wide spectrum of data, from single data items up to complex mathematical functions – e.g. used for equipment lifecycle predictions – in an easy and standardized way.

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Interview with José Pérez Berdud (FAGOR)

José Pérez Berdud profile

José Perez holds a Degree in Electronic Engineering and a Master in Business Administration. 1995 he started to work for the company FAGOR as a technician in the Research & Development department. He has been working in different positions in the firm, always related with manufacturing and technical subjects. Since 2005 he is the manager of the Industrial and Production Area.

Hello José, thanks for taking the time for our short interview! Within ReBorn FAGOR is involved in many different fields of activity. Now the demonstration oriented phase is running since a few months where FAGOR is strongly involved in.

Can you just briefly explain to me what is your role within the project and what are your tasks and responsibilities?

FAGOR Automation is involved in the project as end-user to demonstrate the project developments. In the RTD WPs our role is to include the end-user view and requirements in the different working groups where we are involved. Whereas in the DEMO work packages is to demonstrate, validate and benchmark the different project developments. FAGORs main activities are around our demonstrator "*Design and implementation of a flexible assembly cell"* and very strongly connected with use cases "*Layout Planning / Optimization for new/existing lines and new/re-used equipment"* (by ISG), "*Development of optimization algorithms in the space-time field for modular and flexible production" (*by UPM) and "*Flexible scheduling using MES" (*by CMF). Finally we are supporting SEZ in the elaboration of business model cases from the end-user perspective.

What's your view on how the project evolved within the last two years?

Even being such a big consortium (we are 17 partners) I think the project is going quite smoothly thanks to a good coordination promoted by the project coordinator HWH and supported by SEZ, thanks to both! We could take the pulse of the evolution during the last 18th month meeting in Brussels and I was quite impressed to see all the demonstrators together.

What do you think is necessary in order to achieve a smooth integration of the R&D results in the demonstrators?

ReBorn has a really unique structure of work packages because we have 3 pairs of RTD+DEMO workpackages grouped together (WP2/5, WP3/6 and WP4/7), in order to facilitate the transition from R&D results to demonstrators. I think its important to continue with this work process. Further our regular telephone conferences on a management or planning level and on dedicated work package level are important to share and exchange information about the integration.

Specifically, you representing FAGOR as an end-user, what do you think is now important to consider within the demonstration phase?

I think it is important to establish a concrete action plan with a concrete timeline. Further periodical follow-up meetings are necessary to achieve our goals on time. On the other hand, we have to assure that the end-user requirements and expectations are met.

Follow the interview on the next page!

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Interview with José Pérez Berdud (FAGOR)

Which developments of ReBorn are of most relevance for FAGOR?

We plan to modify one of our plant layout due to the need for more production flexibility.

Within **ReBorn** we have created a lot of use-cases whereas the most relevant ones to us are for instance *Layout Planning / Optimization for new/existing lines and new/re-used equipment* (by ISR), *Development of optimization algorithms in the space-time field for modular and flexible production* (by UPM), *Flexible scheduling using MES* (by CMF), *Line planning methods (*by IPA) and *Self-organizing methods* (by LU), linked to 2 scientific and technological objectives of **ReBorn** which are *Models for innovative factory lay-out design techniques and adaptive reconfiguration and Design methodology for de-manufacturing, dismantling, recycling and value-chain extension incorporating prior expert knowledge and experience.*

With regard to the ReBorn technology could you already give a brief estimation on the impact the technology would have on your business? And the impact on the industry sector?

Yes sure! According to my opinion the impact on FAGORs business would be new more efficient layout and organization, increased flexibility, productivity and reduction of lead times.

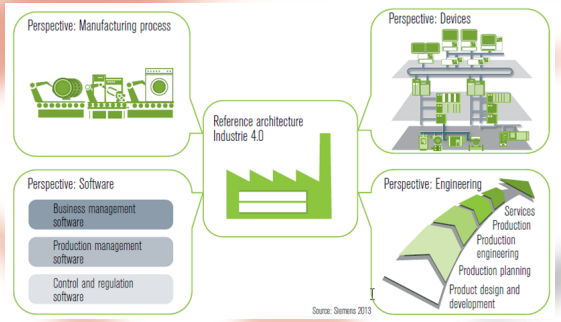
For FAGOR we estimate start using the technology in mid-term:

- Time reduction of setup and ramp-up time by 30-40%
- Cost reduction through optimized reusability of machines and components by 10-15%
- Reduction of down times through predictive and pro-active maintenance by machine condition assessment by 15-20%

And for the industry sector we have to add the importance of the vertical integration from the devices to the high level software that facilitates the planners' decision making process.

Finally, you're also supporting the elaboration of business model cases from the end-user perspective. From your experience, where do you see the largest potential for business model innovation based on ICT enabled, smart technologies like those under development in ReBorn?

The smart technologies under development in **ReBorn** impact in the four perspectives devices, manufacturing process, engineering and software. Furthermore, in the overall project picture we are integrating them vertically and this fact matches perfectly the so called Industrie 4.0 architecture (see picture below).



Source: Siemens 2013

The **ReBorn** project is acting over the four vectors, technology, factory, product and order. We have demonstrators in all of these areas. From my point of view, for business model innovation, there are two main fields we can analyze: Vertical integration from the devices to the high level software for the decision making process and flexibility-reusability impacted by 3D printing process.

And as I mentioned earlier, we have to consider all of this under the Industrie 4.0 umbrella.

Thank you very much for the interview José!

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ReBorn midterm project and review meeting in Brussels - resoundingly successful!

From the 30th of March to the 1st of April the **ReBorn** consortium came together in Brussels in the premises of the European Commission (EC) for its midterm review meeting, in which the project progress has been assessed by the EC. In a well-balanced mix of background presentations and physical demonstration of several already available prototypes, the consortium succeeded in delivering a comprehensive overview of the first 18 months of work. An overall positive feedback of the PO (project officer) and the PTA (project technical advisor) was the reward for consortiums hard work and efforts and motivated all partners to work even harder (if possible) in the second half of the project!

FoF project I-RAMP³ will show off its final results from the 22nd – 23rd September 2015 in Harderwijk, the Netherlands

After 3 years project duration the **I-RAMP³** consortium will present its final results from the 22nd – 23rd of September 2015 during their final project event in Harderwijk, the Netherlands. Join the final event and have a look on how the I-RAMP³ vision has been transferred into concrete demonstrators! Registration is open until the **8th of September 2015**!

http://www.i-ramp3.eu/events.html

MOTEK Fair 2015 from the 6th to the 8th of October 2015 in Stuttgart, Germany

MOTEK concentrates on the fields of production and assembly automation, feed technology and material flow, streamlining through handling technology, and industrial handling. The fair focusses on all aspects of mechanical engineering and automation and on the presentation of entire process chains.

http://www.motek-messe.de/en/motek/

Factories of the Future' Info Day, 16th of October 2015 in Brussels, Belgium

Here you will have the opportunity to receive information on the 2016 'Factories of the Future' call topics provided by the European Commission experts. Further you have the chance to get in touch with potential project partners by uploading an expression of interest in a 2016 call topic on the EFFRA Innovation Portal.

https://scic.ec.europa.eu/fmi/ezreg/PPP2015/start

Co-FACTOR is involved in networking sessions during the ICT 2015 from 20th to the 22nd October 2015 in Lisbon, Portugal

The CSA Co-FACTOR, where **ReBorn** is part of the core, will contribute to Road4Fame networking session *"ICT for Manufacturing and related Business Models"* on guided exchange on experiences and success factors of new business opportunities. Coordinators and partners of current and recent FoF/ICT projects are welcome to share their view.

https://ec.europa.eu/digital-agenda/events/cf/ict2015/item-display.cfm?id=15617

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