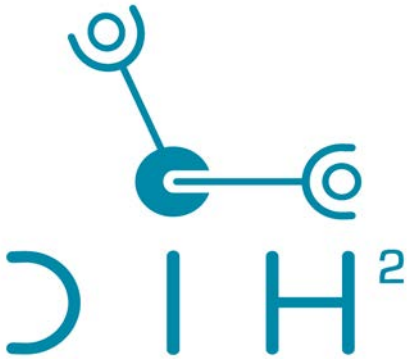

D2.2
Robots and digitalization – Needs for standardisation 1.0
version 1.0

Confidential

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Abstract

Context

DIH² is a network of 26 DIHs (Digital Innovation Hubs) across Europe that should expand to 170 DIHs by the end of the project. The sole aim of the network is to spark incremental (cut 50% cost of advance robotics solutions, double the growth of robotics market) and disruptive (maximum productivity & optimum agility) innovations in over 300,000 Manufacturing SMEs and Mid-Caps. It will support SMEs in their Agile Production challenge (50% increase in productivity) and unleash their digitalization potential by enabling robot solutions that are more cost effective at lower lot sizes.

Scope & Objectives

One of the solutions designed to achieve this ambition is a standardization program that should help companies to get access to more affordable and more interoperable tools. Within this program a Common Open Platform Reference Architecture for Agile Production (COPRA-AP) will be defined. It will be based on Industrial Data Space Reference Architecture Model and FIWARE technologies- to serve the needs of SMEs by means of a continuously growing set of Robotic-based Open Standard Enablers (ROSE-AP). In order to transform those models into running activities underpinning efficient business models, a program of experiments was designed. 2 competitive Open Calls will occur during the project. They will be used to select the experiments based on the Challenges produced by this deliverable and selected with the help of the Industrial Alliance.

This deliverable aims to identify the main issues in the field of Agile Production that could find a solution through a standardization effort. Based on partners 'inputs, D2.2 presents a number of issues that could be tackled with the use of standardization. The Industrial Alliance will then choose the most promising and impactful Challenges among the list provided by the deliverable.

Organization

The document is divided in 6 chapters based on substantial areas of interest (safety, security, human robot collaboration, architecture, modularity, sensing). Each chapter has 4 sections mapping existing standards in each area, describing specific lessons learned by the partners in their region, highlighting common concerns encountered by partners. The last section of each chapter gathers the challenges identified by the three previous sections.

***About the Industrial Alliance**: as one of the main governance bodies of DIH², the Industrial Alliance for Standardisation in AP helps to guide its ambitious Technology Transfer Program (260 Agility Audits, 26 cross-border experiments, leveraging over 26M€ of public & private funding in advance robotics solutions for Agile Production). Composed by large manufacturers and industrial platforms, this group aims to select challenges driving the experiments based on their standardization potential.*

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Manufacturing industries tend to produce an ever growing assortment of products with diverse characteristics (low quantities, good quality, reduced costs and production time). They have to face challenges not only coming from the outside (global competition, demanding market) but also on the internal level, on their shop floors where multiple disorders or disruptions arise (machine failure, operation lateness, smart factory, rising importance of cobots). To satisfy a volatile demand they need to switch of paradigm and include more agility in their largely lean production processes. Manufacturing industries need to cope with more flexibility and be able for instance to adapt the whole production structure to a given order's requirements. This flexibility in terms of internal routing and virtual production areas should help them to answer a more custom demand instead of offering only one or two versions of the same product. But agile manufacturing as a new paradigm entails a larger transformation of the manufacturing processes. To reach an adequate level of flexibility and the possibility of mass customization, companies should think at the enterprise level and not anymore on the factory operations level only. Using dynamic scheduling, they are able to react dynamically to unexpected events both from the shop floor (machine failure) and from the planning level (order priority, delay, cancellation).

This essential transformation raises several issues for companies and especially for SMEs. Among other solutions or enablers, standardization can be seen as an accelerator to handle this transformation. When dealing with agile manufacturing as a whole, standardization can make an impact on various topics along the manufacturing process. Several areas have been identified from the design of those processes to their modification along the course of the factory lifecycle. Architecture, security, human-robot collaboration, sensing safely and modularity are dealt with in separate chapters below. In each chapter we have tried to produce an overview of the available body of standards, then based on the experience of our partners we have described current issues of companies and especially SMEs, eventually we focused on specific problems that are largely encountered by manufacturing companies. This work has enabled us to describe challenges that are gathered at the end of each chapter. They describe gaps in standardization and potential challenges to produce "the material" to cover them. Those challenges will be used for our experiment program: the first round of Open Call of DIH².

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