GO0DMAN

AGENT ORIENTED ZERO DEFECT MULTI-STAGE MANUFACTURING

Deliverable 2.2

Ontology Definition

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Executive Summary

In recent years, with the shift in the market's demands towards highly customized products and with manufacturers having to come up with new, more agile and flexible solutions to meet these requirements, the industry is bearing witness to a new industrial revolution, commonly coined Industry 4.0.

The Industry 4.0 vision aims to take advantage of the technological advances in the fields of Cyber-Physical Systems, Cloud Computing and the Internet of Things in order to bring about the concept of a smart, truly interconnected factory, capable of facing the new challenges imposed by the market.

However, this interconnectivity poses a considerable challenge in terms of interoperability which one needs to take into account when designing such systems-of-systems solutions, integrating data and knowledge from several heterogeneous elements and varying engineering domains.

The GO0DMAN project is also aligned with this vision and faced with a similar challenge, as the project's goals to develop a multistage Zero-Defect Manufacturing solution for modern production systems entail the employment of a Multi-Agent based Cyber-Physical System integrated with Smart Online Inspection Tools and complex Data Analysis and Knowledge Management.

To this end, this document presents the developments carried out in order to design and implement the GO0DMAN data model, with the purpose of harmonizing the data coming from the different solution's domains at the agent level, enabling a seamless integration and data exchange between each of GO0DMAN's solution actors and the Multi-Agent based Cyber-Physical System.

The entire modelling process, based on the results of previously successful European funded projects and existing standards in the field, as well as the respective implementation are fully documented. This culminates in the modelling of an example test bed, as a way to showcase and verify the applicability of the data model (implemented in AutomationML) in the GO0DMAN scenarios encompassing the exchange of data between the different elements comprising the project's solution.