



D1.1

Requirements for logistics automation version 1.0

Confidential

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Abstract

This report provides requirements of the manufacturing SMEs in logistics automation. The elicitation of the requirements was performed following various activities, which all contributing into eliciting requirements from different perspectives. These include:

- a) Description and analysis of the pilot application experiments and the logistics problems they face. The needs and potential solutions that could provide added value and improve the production in terms of efficiency, cost, etc. have been investigated and documented. These were then analysed into specific requirements for any OPIL-based system.
- b) Online survey to investigate high-level needs from a wider base of manufacturing end-users. These evaluate that the elicited requirements are not only applicable to more applications (other than the pilot application experiments), but also to ensure that there is a gap that OPIL can fill and provide a solution to the manufacturing end-users.
- c) Analysis of interoperability with other enterprise systems. This ensures that OPIL will be seamlessly integrated within the production of a manufacturing end-user and will create added value, without causing other additional problems and costs.
- d) Analysis of needs in collaboration between humans and automation equipment
- e) Analysis and feasibility check of the European targets on Robotics. This ensures that L4MS is aligned with the European Vision for robotics, and that it will be beyond the state of the art.
- f) Analysis of benefits and requirements derived from enabling Industry 4.0 and Cloud Computing in manufacturing.

All results have been assessed for their technical feasibility and their added value, composing a list of properly documented requirements. This will be the baseline for the design of the OPIL platform.

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Notification

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Executive summary

The requirements of the SMEs for logistics automation are described in this report. These requirements are focused specifically on the Open Platform for Innovations in Logistics (OPIL) platform that will be developed within the L4MS project. OPIL is an open platform that aims to enable flexible and cost-effective logistics automation solutions, targeting the manufacturing SMEs and addressing their specific needs. OPIL is not necessarily a logistics final product but an enabler of such solutions. It allows the end-users to customize it into their own processes, to seamlessly interface and integrate their logistics with other enterprise software and exploit its functionalities to improve their production by using different kinds of automation equipment, legacy and new ones.

The main high-level functions of OPIL are:

- Integration with sensors, robots and other applications
- User notifications and application management
- Monitoring and control of automation equipment
- Execution of logistics tasks
- Localisation and navigation of automation equipment

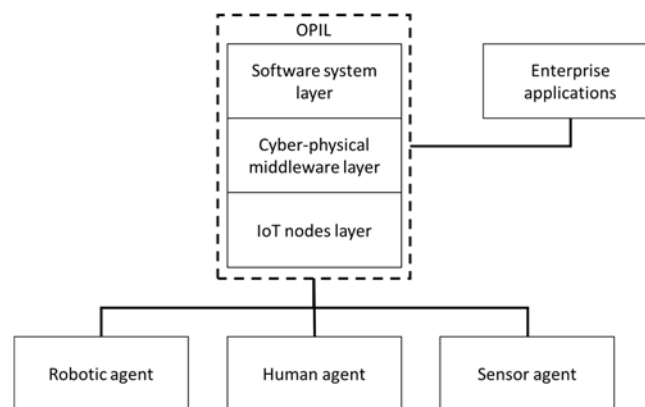


Figure 1: The OPIL platform.

A set of formal requirements are provided as the baseline to start the development of OPIL. The pilot Application Experiments (AE) were analysed and used as a main source to dive into more detailed requirements, apart from generic ones that were derived by literature research, OPIL technical targets and online survey. The consolidation of this work provided the final list, which is not only structured and detailed, but is also based on evidence that this requirements' specification meets the real needs of the manufacturing SMEs.

The **90 requirements**, described in the following, included here are not all to be addressed by OPIL within the timeframe of the project. They were assessed as of their feasibility, value and criticality. Hence, they provide a complete prioritized specification for both the necessary elements which need to be addressed to provide the core added value to the end-users, but also requirements which could be added in the future to improve the system. 52 user requirements (functional and non-functional) were assessed as critical and should be met within the timeframe of the L4MS project to achieve all the initial goals of OPIL. Additional 25 requirements provide the guideline for the first improvements of the system features, which are acceptable to be implemented outside the project timeframe. On top of these, another 13 requirements are documented, to provide an insight and recommendations on what this or other similar system could offer in the future.

During development, new evidence may appear; that means that the list of the requirements included here is possible to change, if it is to better meet the end-user needs, or if new technical risks or opportunities appear.



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