THESIS FOR THE DEGREE OF LICENTIATE OF ENGINEERING

Towards interoperable information and communication systems for manufacturing operations

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ABSTRACT

Mass customization and the demand for flexible manufacturing systems have increase focus on the human workers. Diversity and complexity of the products that manufacturing operators have to handle is constantly on the rise. It is believed that the recent advances in information and communication technology can assist the manufacturing organisations to manage these challenges. As a matter of fact, if organisations manage to implement the systems correctly, the productivity is thought to increase to such an extent that it will give rise to a new paradigm in production, the fourth industrial revolution. However, as it stands now, there is a large gap between the exiting technology and what is actually used in the manufacturing industry. If organisations are to close this gap they need to manage several challenges. The problem addressed in this thesis is how to design and structure the information and communication systems that need to handle the new technologies, and particularly those designed for manufacturing operators and the automation systems. This thesis aims to aid the manufacturing operations organisations to configure their information and communication systems and this has been done regarding interoperability. Interoperability is the ability for systems to communicate and exchange data which is crucial to enable many different systems to co-exist and work together. The information and communication technologies that manufacturing operators use have been connected with several areas of interoperability research, which enable a useful discussion about the implementation and design choices of the technology.

Keywords: Interoperability, Industry 4.0, Information Systems, ICT, Manufacturing operators.

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Paper II	**M. Åkerman**, M. Karlsson, and L.-o. Bligård, "Refining the needs: An exploratory study through usability testing," in The 6th International Swedish Production Symposium, 2014.
Paper III	**Åkerman, Magnus**, Fast-Berglund, Åsa, Karlsson, Malin, & Stahre, Johan. (2016). Introducing Customized ICT for Operators in Manufacturing. Procedia CIRP, 41, 490-495. doi: 10.1016/j.procir.2015.12.074
Paper IV	**Åkerman, M**., Fast-Berglund, Å., & Ekered, S. (2016). Interoperability for a Dynamic Assembly System. Procedia CIRP, 44, 407-411. doi:10.1016/j.procir.2016.02.026

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