Maintainability and evolvability of control software in machine and plant manufacturing - An industrial survey

Automated Production Systems (aPS) have lifetimes of up to 30-50 years, throughout which the desired products change ever more frequently. This requires flexible, reusable control software that can be easily maintained and evolved. To evaluate selected criteria that are especially relevant for maturity in software maintainability and evolvability of aPS, the approach SWMAT4aPS+ builds on a questionnaire with 52 questions. The three main research questions cover updates of software modules and success factors for both cross-disciplinary development as well as reusable models. This paper presents the evaluation results of 68 companies from machine and plant manufacturing (MPM). Companies providing automation devices and/or engineering tools will be able to identify challenges their customers in MPM face. Validity is ensured through feedback of the participating companies and an analysis of the statistical unambiguousness of the results. From a software or systems engineering point of view, almost all criteria are fulfilled below expectations.

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