

ELEC-E8113 Information systems in industry

Homework 10. Max 3 points.

Deadline 5.12.2022. Answers to ilkka.seilonen@aalto.fi. Please, remember to identify yourself in your answer.

The purpose of the homework is to test your knowledge about the topics of the course and your ability to apply it to an example problem. Read the text below and answer the questions based on it (no more than 2 A4 pages should be enough).

The topic of this question is development and integration of information systems in industry, MOM, MES and ERP. Imagine that you are a development engineer in a manufacturing company. Your company have had problems with lateness of customer orders particularly with new products. Currently detailed scheduling is performed with Excel. Production is monitored with work orders printed on paper. The management of your company has decided to acquire a new detailed scheduling software called Planner. You have been selected as the manager of the project for taking the system into service.

Create a rough plan for the project. (1) Tell which stages the project should have, (2) describe what issues in each stage should be considered, and (3) which people (roles) should be involved in each stage. (4) Identify possible system integration needs the new scheduling system creates, and (5) propose basic ideas for alternative technical solutions.

The situation at your company is explained below and illustrated following figure.

- ERP was acquired a few years ago from vendor A. Its database contains data e.g. about customer orders, rough production schedule consisting of production orders, resources (at a rough level) including human resources, process plans (i.e. production stages of each product type), materials in the warehouse and maintenance plans. It is possible to access the database through SQL and XML-file import/export.
- Planner is provided by a vendor called B. It has a database which should be filled with data about production orders, detailed information about resources and process plans. A user can create detailed schedules containing production orders divided into work orders (associated to production stages) with detailed assignment to resources following a production calendar. The system has a vendor specific REST API and ready-made configurable HTML user interfaces for production managers and shop-floor workers.
- PLCs control automated stages of production. They contain programs that can be identified according to the production stages they perform. The programs would also be able to report the status of the automated stages of work, although this capability is currently not fully utilized. The PLCs have OPC UA servers. The PLCs and their programs were acquired from a vendor C a few years ago.

- Terminals are planned to be placed at the shop floor for the manual stages of production. Information about work orders for these stages of production is to be displayed at them and updated by workers.

