MIM ON MANUFACTURING MODELING MANAGEMENT & CONTROL
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Integrated Planning and Scheduling in Engineer-To-Order industrial contexts

Changes in the industrial market have yielded to the emergence of new production contexts. More particularly, the Engineer-To-Order (ETO) context is considered very representative of the fourth industrial revolution. The ETO context is characterized by the design and production of highly customized products, one-of-a-kind or in small-batch, and often very complex in terms of structure and subject to many constraints and uncertainty. Companies evolving in ETO industrial contexts are constantly looking for new methods and tools to optimize planning and scheduling activities. From a hierarchical view, the so-called tactical or initial planning (i) is executed once the project has been accepted, (ii) concerns the entire project, (iii) integrates organizational and financial decisions, and (iv) usually takes into account employees, teams, or consumable and renewable resources. Operations scheduling uses a more precise definition of time but generally concerns only a subset of tasks and resources (production machines, for instance) and only time-based decisions. However, the resulting planning and scheduling decisions are often interrelated and are impacted by the same events (resource breakdowns, delays, variation in demand, etc.). Therefore, new IT systems such as Advanced Planning Systems use flexible and integrated models such as Advanced Planning and Scheduling (APS) or Integrated Process Planning and Scheduling (IPPS). Planning and Scheduling are both even more difficult in the Engineer-To-Order (ETO) context. The design uncertainty may cause time, resources, and money wastes (when non-standard parts are canceled), and iteration of non-validated design impacts the initial schedule, which needs rescheduling.

This session aims to share the most recent contributions in this area. Researchers and professionals are invited to present their work in the following or related fields:

- Exact, simulation-based, or heuristic optimization methods for planning, scheduling, or integrated problems (based on FJS, RCPS, RCCP, or IPPS);
- Data or process models for Advanced Planning IT Systems;
- Proactive or reactive strategies to overcome the impact of the design uncertainty (time, resource, or ecological waste, loss of quality, and rescheduling) in the ETO context ; and
- Machine Learning applications to planning, scheduling, and control.

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