Stage de master – MSc internship

Planning ramp-up management projects using modelling and simulation

Overview of the topic :

In order to keep up with increasing customer requirements, manufacturing and service industries are experiencing more frequent product and service development and introduction into the market. This led to tremendous increase of offering variety, which opens up the opportunity to reinforce firm's competitiveness at the expense of higher variety-induced complexity. Such complexity coupled with uncertainty and lack of process maturity put major challenges ahead of companies. Ramp-up management comes into play at this point as it is specifically concerned with ensuring efficient ramp-up of products and services (Schmitt et al. 2018). Ramp-up management is relevant not only to novel product or service development, but also to the operation phase when a firm experiences a radical change in market demand (Slamanig and Winkler 2011). The COVID 19 is a perfect example of this situation, as it led many companies to think through their whole portfolios to ultimately adapt to the demand of certain products (e.g. personal protective equipment, staple consumers products) and services (healthcare, energy supply, etc.).

Current MSc research project is concerned with ramp-up management in the context of multi-variant production and considering the crisis context. In this sense, the aim is to support decision making on quick adaptation of firm's capacity to market demand through ramp-up and ramp-down of the production. While previous research from the team relied on analytical models to conduct cost-benefit analyses of different ramp-up management strategies with some restrictive assumptions (Medini et al. 2020; Pierne et al. 2020), current project will focus on the use of simulation in order to deal with complexity and uncertainty. The design of the simulation model will rely on the review of related literature and on the requirements of the application domain (cycling industry). The research project will be conducted in the framework of the RAMP-UP Seed project (https://www.future-industry.org/research/advanced-manufacturing/ramp-up/) and in collaboration with a company from cycling industry.

Desired candidate skills: System engineering, simulation, industrial management.
Location: Mines Saint-Etienne.
Laboratory: LIMOS (UMR 6158) – Laboratory of Computing, Modelling and Optimization of the Systems.
Supervisor: Khaled Medini
Period: 5 to 6 months starting from February/March 2020.
Salary: 577€/month (in the form of internship scholarship).
Application:

- The application should include: short résumé, cover letter, transcripts of the past two years (including partial results of the current semester, if any).
- Application and any request should be emailed to: khaled.medini@emse.fr
- Deadline: January 6th, 2020.

References

Medini K, Pierné A, Erkoyuncu JA, Cornet C (2020) A Model for Cost-Benefit Analysis of Production Ramp- up Strategies. In: APMS 2020.

Pierne A, Medini K, Masmoudi M (2020) Economic assessment of ramp-up strategies in multi- variant production. In: MOSIM 2020.

Schmitt R, Heine I, Jiang R, et al (2018) On the future of ramp-up management. CIRP J Manuf Sci Technol 23:217–225.

Slamanig M, Winkler H (2011) An exploration of ramp-up strategies in the area of mass customisation. Int J Mass Cust 4:22–43.