

## Master internship

### Analysis of product and service modularity impact

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#### Overview of the topic

The increasing individualised customer demands require a high variety of the products and services offered to different markets. The modularity is recognised as a major driver for generating high variety while keeping up with the pace of economies of scales. This research topic is concerned by the analysis of the impact of product and service modularity on internal performance of the company, in particular in terms of cost and lead time and on the generated product and service variety. To this end, a literature investigation is required to identify available performance indicators for measuring the impact of different modularity levels (or scenarios) on variety, cost and lead time. A modularity scenario is the result of a clustering process of the products and services into independent modules according to some predefined criteria. A proper calculation procedure of the indicators will be required so as to support the decision making on modularity scenarios. The current research is expected to contribute to a boarder ongoing research aiming at providing methods for variety management of products and services.

#### Expected candidate skills

Candidates should have a good background in Industrial engineering or related field.

**Place :** Ecole des Mines de Saint-Etienne

**Salary:** Training allowances (550 €/month)

**Period:** 5 to 6 months starting from March 15<sup>th</sup>, 2019

#### Application

The application should include a short résumé, a cover letter and transcripts of the past two years (with results of the first semester of 2018 – 2019, if available), and it should be emailed to [khaled.medini@emse.fr](mailto:khaled.medini@emse.fr), no later than January 31<sup>th</sup>, 2019.

#### Some references

Ezzat, O., Medini, K., Boucher, X., Delorme, X., 2018. Product and service modularization for variety management, CARV Conference 2018, Nantes, France.

Brax, S., Bask, Hsuan, J., Voss. C., 2017. Service Modularity and Architecture: An Overview and Research Agenda. International Journal of Operations and Production Management, 37(6), 686-702.

Sakao, T., Song, W., Matschewsky, J., 2017. Creating service modules for customising product/service systems by extending DSM, CIRP Annals Manufacturing Technology, 66(1), 21–24.

Medini, K., 2015. Modularity and variety spinoffs: a supply chain planning perspective. International Journal of Industrial Engineering: Theory, Applications and Practice (IJIE-TAP), 22(6), 753-768.