



Facilitating demand-driven supplier collaborations using a tender decomposition and matchmaking service

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FACILITATING DEMAND–DRIVEN SUPPLIER COLLABORATIONS USING A TENDER DECOMPOSITION AND MATCHMAKING SERVICE

Keywords: digital economy, Industry 4.0, supply chain, collaboration

One of the key developments taking place within the confines of the digital economy is the concept of Industry 4.0, which represents a policy initiative aiming at digitisation of production processes along the entire value chain. This approach allows for real-time visibility and control of supply-chain processes, which promises flexibility and efficiency gains (Davies 2015, Smit et al. 2016). Adoption of Industry 4.0 at the inter-firm level has the potential of letting various supply-chain members to establish collaborations ‘on-demand’ and share their capacities and capabilities with each other. Such collaborations bring a number of benefits to the partners, such as better capacity utilization and enhanced customer service. Dedicated online platforms may offer matching demand for productive resources with their supply across participating market players. We present the concept of a service that supports formation of manufacturing collaborations on such an online platform. The service allows companies to search for partners suitable for building a consortium and jointly bidding for complex tenders. Essential elements of its functionality are *tender decomposition*, which breaks down the tender into a number of sub-ordinate tasks, as well as *matchmaking*, which matches those tasks against the capabilities of the companies registered on the platform. Prospective consortia are

being evaluated for their suitability according to a range of criteria in order to assist the user in selecting a team of companies to collaborate with. Tender decomposition is driven by an ontological representation of the product structure and the rules of goal decomposition, which are based on the Design Chain and Supply Chain Operations Reference Models (APICS 2014, 2017), as well as on the concept of the product delivery strategies (Olhager, 2003). The service has the flexibility of letting the user build the team incrementally, by searching for sub-teams of suppliers that would deliver individual parts or modules of the whole product. It further permits the user to indicate preferred partners to collaborate with as well as replace specific team members with alternative suppliers or sub-teams of these. Notably, the latter functionality is implemented using the same tender decomposition, matchmaking and team evaluation approach that is used for generating the prospective teams and sub-teams.

List of references

- Design Chain Operations Reference model (DCOR) 1.0. APICS Supply Chain Council// APICS. 2014. URL: <http://www.apics.org/docs/default-source/scc-non-research/dcor-framework-a4.pdf>. (Accessed on 16.01.2019).
- SCOR Quick Reference Guide. APICS Supply Chain Council// APICS. 2017. URL: https://www.apics.org/docs/default-source/scc-non-research/apicsscc_scor_quick_reference_guide.pdf (Accessed on 16.01.2019).
- Davies, R.* Industry 4.0: Digitalisation for productivity and growth// European Parliamentary Research Service. 2015. Document No. PE 568.337.
- Olhager, J.* Strategic positioning of the order penetration point// International Journal of Production Economics. 2003. 85 (3). 319–329.
- Smit, J., Kreutzer, S., Moeller, C. & Carlberg, M.* Industry 4.0. European Parliament, 2016. Document No. IP/A/ITRE/2015–02.