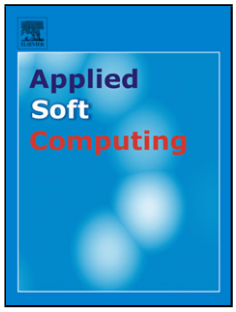

Title: Manufacturing Service Composition Model Based on Synergy Effect: A Social Network Analysis Approach

Authors: Minglun Ren, Lei Ren, Hemant Jain

PII: S1568-4946(18)30314-4
DOI: https://doi.org/10.1016/j.asoc.2018.05.039
Reference: ASOC 4905

To appear in: *Applied Soft Computing*

Received date: 1-11-2017
Revised date: 11-4-2018
Accepted date: 23-5-2018

Please cite this article as: Minglun Ren, Lei Ren, Hemant Jain, Manufacturing Service Composition Model Based on Synergy Effect: A Social Network Analysis Approach, Applied Soft Computing Journal https://doi.org/10.1016/j.asoc.2018.05.039

Manufacturing Service Composition Model Based on Synergy Effect : A Social Network Analysis Approach

Minglun Ren[a,b], Lei Ren[a,b], Hemant Jain[c]

[a] *School of Management, Hefei University of Technology, 230009, Hefei, China*
[b] *Key Laboratory of Process Optimization and Intelligent Decision-making, Ministry of Education, 230009, Hefei, China*
[c] *College of Business, University of Tennessee -Chattanooga, Chattanooga, TN 37403, USA*

Minglun Ren:renml@hfut.edu.cn
Ren lei:renlei2005062134@aliyun.com
Hemant Jain:Hemant-Jain@utc.edu

Highlights

- The paper focuses on the social collaboration feature of manufacturing services, and we try to illustrate how social traits have impacts on the competitiveness of service in service social network (SSN). We believe it is important to consider collaboration capacity as a critical competitive factor in service composition when large number of online services orchestrated together. This paper attempt to integrate social network, service computing and synergy theory to address the new problem of service selection in SSN, and proposed a novel manufacturing service composition method based on weighted synergy network, where synergy effect is measured from the perspective of social relationships strength. The major contributions of the paper are:

- Define and extract five types of social relationships that have impacts on service performance in SSN, and develop calculation methods to measure each relationship strength.
- A service synergy effect model is proposed through the weighted aggregation of five types of social relationships strength, where the weight distribution of each relation factor is obtained by using information entropy and rough set.
- (3) Develop a new service selection optimization model based on synergy effect for building task driven dynamic alliance, and use a simulation experiment of service selection in intelligent automobile cloud manufacturing to verify its validity and advantages.