

Behavioural Modelling Approach to Simulate Collaboration in Apparel Supply Chains

Lakmal, R. D. S.^{1*}, Rupasinghe, T. D¹

With the rapid evolution of technology and competition in the current business context, supply chain collaboration has become a widely spoken and researched topic. It has become a greater challenge to achieve the optimum efficiencies by performing as isolated partners due to the continuous growth in the depth and the width of the chain partners and their activities. In spite of the fact that a number of studies have been carried out in this respect, a very few number of studies have investigated the practical implications of improving collaboration in supply chains. In this study the authors have utilized a simulation-based approach to assess how collaborative practices among different partners in the supply chain, affect the collaboration level of an industry and time dependent variants for an industry to achieve maximum benefits of collaboration. The simulation models were developed using Netlogo open source modelling platform, focusing on three types of agents in the supply chain where the suppliers, manufacturers, retailers and behavior of these different partners was modeled. The study utilizes the apparel industry as the tested and thus, the Netlogo simulation models determine the effects of collaborative practices across those aforementioned partners. As the main outcome, the study has shown that the key step to enhance collaboration in supply chains, is understanding that there is an interdependence among each other and the level of interdependence required, depending on the organization needs and norms. Furthermore, the study simulates how other main factors of collaboration such as strategic alliances, use of collaborative tools and supply chain metrics will affect the time variant of industry becoming collaborative over the time according to the conditions used in the simulation model. This study facilitates the identification of the crucial factors which partners should focus on, in order to enhance the collaboration in their supply chains. The proposed modelling approach can be generalized further in-to similar industries by studying the correlation among the aforementioned factors.

Keywords: Agent-based simulation, Apparel industry, Collaborative supply chains

¹Department of Industrial Management, Faculty of Science, University of Kelaniya, Sri Lanka

*lakmal.sagara@gmail.com