Combining or Separating Forward and Reverse Logistics

Purpose – While forward logistics handles and manages the flow of goods downstream in the supply chain from suppliers to customers, reverse logistics (RL) manages the flow of returned goods upstream. A firm can combine reverse logistics with forward logistics, keep the flows separated, or choose a position between the two extremes. The purpose of this paper is to identify the contextual factors that determine the most advantageous position, which the paper refers to as the most advantageous degree of combination.

Design/methodology/approach – The paper first develops a scale ranging from 0% combination to 100% combination (i.e. full separation). Second, using contingency theory the paper identifies the contextual factors described in RL-literature that determine the most advantageous degree of combination. The set of factors is subsequently tested using a case study, which applies a triangulation approach that combines a qualitative and a quantitative method.

Findings – Results show six distinct contextual factors that determine the most advantageous degree of combination. Examples of factors are technical product complexity, product portfolio variation, and the loss of product value over time. Practical implications – For practitioners the scale of possible positions and set of contextual factors constitute a decision making framework. Using the framework practitioners can determine the most advantageous position of the scale for their firm.

Originality/value – Much RL-research addresses intra-RL issues while the relationship between forward and reverse logistics is under-researched. This paper contributes to RL-theory by identifying the contextual factors that determine the most advantageous relationship between forward and reverse logistics, and proposes a novel decision making framework for practitioners.

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Measuring the complexity of product configuration systems
The complexity of product configuration systems is an important indicator of both development and maintenance effort of the systems. Existing literature proposes a couple of effort estimation approaches for configurator projects. However, these approaches do not address the issues of comprehensibility and modifiability of a configuration model. Therefore, this article proposes a metric to measure the total cognitive complexity of the configuration model corresponding to a product configuration system, expressed in the form of an UML class diagram. This metric takes into account the number and the type of attributes, constraints and the relationships between classes in an UML class diagram. The proposed metric can be used to compare two configuration models, in terms of their cognitive complexity. Moreover, a relation between development time for a PCS project and the total cognitive complexity of the corresponding configuration model is established using linear regression. To validate the proposed approach a case study is conducted where the cognitive complexity is calculated for two configuration models.
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