
The role of product's inventory cost structure while specifying modularity degrees of product and organization in the design phase

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Abstract

This study explores how the marginal inventory cost structure of a product shapes the decisions for product and organizational architecture designs. We roughly presume the inventory cost as a function of the following two sub-items: i) the total number of stock keeping units (SKUs) necessary to satisfy the product variety in a market and ii) the safety stock amount held for each SKU in order not to be stock-out. Considerable number of empirical studies verifies that the modularity in product (PM) and the modularity in organization (OM) go parallel. However, this positively correlated mechanism caused the opposite move of two sub-inventory costs stated above. While high PM decreases the number of SKUs necessary for satisfying the market demand variety, low OM is a way to reduce the safety stock held through close cooperation and coordination. Hence, it is not possible to attain the global minimum point of the total inventory costs within this frame. Thereby, we hypothesize that the marginal inventory cost structure of the product has a role in where design decisions come out in the modularity degree continuum. In other words, it is more likely to be seen "modular (integral) product – modular (integral) organization" when the additional cost of keeping SKU is higher (lower) than the additional cost of holding safety stock.
