Thesis Title: Modelling and Integrating Servitization Practices for Indian Automobile Industry

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Abstract

Implementation and execution of servitization philosophies in the automobile manufacturing industries creates a competitive advantage and sustainable revenue stream. Initially the choice of competition is focused on product development and cost minimization. However, increased product varieties, globalization, adoption of lean practices, fierce competition, government regulations for sustainable products and pressure from customers have been instrumental for the organisations to shift from a product-oriented business model to a service-oriented business model typically known as servitization. The new business model based on servitization has shown the manufacturers benefits such as sustainable revenue generation, locking out competition, increased customer satisfaction and loyalty with reduced environmental impact. For effective implementation of servitization practices, manufacturers need correct assessment techniques and execution strategies. The servitization research is in its infancy, and such assessment framework and execution guidelines are absent in the literature. This research typically deals with assessment and execution phases of servitization in the automobile industry.

To assess the status of servitization implementation, a critical service quality index (CSQI) has been developed using graph theoretical matrix method. The proposed methodology elaborates how qualitative inputs based on expert opinion can be quantified to find out the level of servitization attended by the case organisations. The method also identifies the highest and lowest levels which can be achievable in the application of servitization giving a scale to measure the performance of an organisation. The framework identified the key areas of servitization implementation and urged a necessity to identify the barriers creating disturbance in implementing servitization practices. For this purpose, a systematic literature review followed by grey Decision Making Trial and Evaluation Laboratory (grey-DEMATEL) has been applied to find out the barriers and analyse their causality. This research identified ten barriers in the application of

servitization and found out the cause and effect barriers with interconnections among them. Further, this research has identified the failure modes and effects in the implementation phase of servitization using Failure Mode and Effect Analysis (FMEA) in the automobile industry. From the quality parameters obtained in the assessment phase, Critical Success Factors (CSFs) are recognized and are modelled using Interpretive Structural Modelling (ISM) for successful implementation of servitization in the automobile industry. Furthermore, the relevance of the CSFs has been established based on their driving and dependency power by making use of the cross-impact matrix multiplication (MICMAC) analysis.

By implementing the suggested methods for evaluating servitization techniques and from the findings of this study, automobile organisations can improve their sustainability in the competitive environment. The knowledge gained from this research can assist the automobile industry in identifying areas where servitization adoption is lacking and in setting the standards required for the long-term adoption of servitization techniques. The research presented in this thesis can be seen as an initial effort to analyse research challenges unique to Indian automobile sector in the field of servitization integration.

Keywords: Servitization, automobile industry, Critical Service Quality Index (CSQI), graph theoretic method (GTM), multi-criteria decision making (MCDM), Interpretive structural modelling (ISM), Critical Success Factors (CSFs).