

Relating Flexibility, Scalability and Security Issues in Internet of Things (IoT) To Strategy of the Firm

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Abstract

Several dimensions are available in literature for describing IT information technology. We extend the same to develop dimensions of IoTs. And by thorough arguments we propose that these are substantially different for different types of firm and/or supply chains strategy. Few interesting hypotheses are proposed. These have substantial implications for management.

H1: Two or three standard IoT providers can join hands and provide flexible services (these IoTs are based on OOA (Object Oriented Architecture) to cost leaders (CLs) with moderate product variety. But this approach may not be suitable for differentiators and integrators who face higher level of uncertainty and is based on higher layered IoT (and these are based on Service Oriented Architecture (SoA)).

H2: For cost leaders, load scalability will be most important. And for differentiators and innovators, generational and administrative (as it has higher level of complexity of work flow) scalability will more important.

H3: Differentiators and innovators will have same schema replicated at different locations (as it has several small facilities that are closer to customers) but will have IoTs that will have ‘Latency’ problem (as they require frequent co-operation between themselves). Latency will not be a major problem for cost leaders that have functional based schemas, and it will be located at different places.

H4: IoTs for cost leaders will need high level of standardization. And differentiators and innovators that are designed for applications across different areas (like automobiles and healthcare) standardization will NOT be possible; whereas IoTs for differentiators and innovators in the same industry will be a lot easier to be standardized.

H5: The more the number of layers in IoTs, more will be the difficulty (and more costs) while implementing security.

H6: IoTs having higher levels of flexibility (through increased redundancy) will have low ‘Latency’ problems; and IoTs having lower levels of flexibilities will higher levels of ‘Latency’ problems.

IoT of differentiators and innovators are more complex than the IoT of cost leaders as former have more number of layers than that of cost leaders. Hence for the sake of ease in interoperability IoT hardware/software of differentiators and innovators will be nurtured in house. And for cost leaders, IoT hardware/software will be outsourced.

H7: IoT hardware/software of differentiators and innovators will be developed in house; and the same for cost leaders will be outsourced.

In this paper we relate IoT related dimensions to strategy types of firm and as well as supply chains. We argue that IoTs of cost leaders and differentiators differ widely on the dimensions of flexibility, scalability, standardization and security. This is a useful contribution we make. A questionnaire-based survey is underway, and we will report it in the future study.

Keywords

Strategy Types, Flexibility, Scalability and Security of IoTs.

Biographies

Prof. R.R.K. Sharma is a professor (HAG Scale) in the Department of Industrial and Management Engineering, Indian Institute of Technology, Kanpur, India. He has more than 26 years of teaching experience in premier educational institute. His research interest lies in the field of operation research, supply chain management, manufacturing strategy and IT deployment in Industrial Engineering. He is a fellow of IIM Ahmadabad. He has published more than 120 articles of international repute and author of many books on MRP. He has guided around 10 students at Ph.D. level and more than 20 at Masters level. Currently he is guiding 12 Ph.D. scholars.

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