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Business analytics through system dynamics: The case of the IoT technologies on supply chain performance

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Lack of supply chain visibility and underperformance of logistic operations are some of the most significant supply chain challenges. Supply chain processes are complex and difficult to control. Nevertheless, technology applications on supply chain are still a step behind mostly due to the lack of understanding on the implementation and benefits of these technologies, which is the case of the IoT. This work uses system dynamics simulation to perform business analytics on the impacts of IoT on supply chain performance. The study focuses business analytics on decision-making, supply chain connectivity/collaboration/integration, lead-time and asset utilization. The models developed in this study are based on merged data from different primary and secondary sources. Results show that the implementation of data collection or data transmission technologies alone is not sufficient to obtain full benefits. A decision-making processing system, that integrates the complete array of appropriate technologies, should also be implemented. This is the underlying concept and the contribution of the IoT and the business analytics method.

Biography

Mario M Monsreal Barrera is a full-time research scientist at the Texas A&M Transportation Institute, his research focus on simulation and modeling, freight fluidity measures, freight strategies implementations, supply chain risk assessment, urban distribution, AutoID integrated systems, order variability, routing algorithms, data coding and standardization. He also leads technology implementation initiatives and works on cross-border analyses. He accounts for more than 20 years of experience in logistics and supply chain, with direct field hands-on experience in industries such as retail and fast-moving consumer goods, cement and beverages among others. He has been the technical lead for European projects at the Auto Identification Laboratory at the MIT SCALE - Zaragoza Logistics Center (ZLC), Spain, where he also had responsibilities as manager for Latin American projects. He was the Director of the Latin-American Center of Logistics Innovation-México, and a postdoctoral researcher at the Institute for Seeverkehrswirtschaft und Logistik (ISL), in Bremen, Germany.

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