ACIS 2022 Proceedings

Australasian (ACIS)

12-7-2022

# Information System Articulated Logistics and Supply Chains and their Spatial-Temporal Modelling and Management

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## Recommended Citation

Nimmagadda, Shastri; Reiners, Torsten; Wood, Lincoln; and Namugenyi, Christine, "Information System Articulated Logistics and Supply Chains and their Spatial-Temporal Modelling and Management" (2022). *ACIS 2022 Proceedings*. 21.
https://aisel.aisnet.org/acis2022/21

# Information System Articulated Logistics and Supply Chains and their Spatial-Temporal Modelling and Management

## Submission Type: Full Research Paper

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## Abstract

The logistics and supply chains have affected worldwide businesses, particularly in pandemic locations and periods, unsettling supply and demand pursuits. Logistics of global markets have been irregular, with poorly aligned superstore outlets in different geographies. Businesses and their alliances have affected spatial-temporal dimensions. The research explores the significance of Information System (IS) articulations and how IS artefacts can motivate connecting global companies and boost market values. The study aims to improve the Logistics and Supply Chains (LSC) between companies and organizations through evaluable IS artefacts in industry scenarios. The use and reuse of IS articulations are investigated in spatial-temporal dimensions for LSC knowledge management. Further, the IS artefacts are assessed through the logistics performance in geographic dimensions using the Attribute Journey Mapping and Modelling (AJMM) method. The ability to track and trace the supply chain consignments is inferred proportional to attributes of quality of trade and transport systems.

**Keywords:** Information systems, Logistics and supply chains, Spatial-temporal dimensions

# 1 Introduction

Information System (IS) tools can be unreliable with inaccurate information and ambiguous data sources and structures (Yuyus 2019). In addition, poorly aligned data systems that affected the management of elements and processes of the supply chain management systems have motivated us to engage supply chain businesses with innovative IS articulations. As discussed in Najar (2022); Nimmagadda et al. (2019a), we have examined the recent developments in geographic information systems that guided LSC and its adaptability in connecting the disrupted logistics and supply chains worldwide. Supply chains can exhibit a broad range of logistic structural features until the correct material is delivered to projects, including precise information on logistics routes. The data and information, including entities and dimensions of supply chain elements and processes, are building blocks of comprehensive multidimensional frameworks shaped by different business IS artefacts. The constructs and model features are anatomically articulated, cognizing various elements and processes of supply chains, including supply lines. To encounter these challenges, with new data structuring, repository systems and mining, visualization and interpretation artefacts, an integrated methodological framework is designable to improve LSC connectivity by integrating elements and processes of supply chains. Multidimensional ontology descriptions, concepts of digital ecosystems and Big Data innovations are added tools that can streamline the connectivity between events of supply chain operations. The IS articulated LSC constructs and models ensure that the integrated framework manages the global supply chains that obey the laws of geography (Kamble et al. 2015; Foresman and Luscombe 2017). Satisfying the laws of geography in LSC contexts can optimize operational costs, including shortening lead times and enhanced stock and material management. The motivation for research lies with the existence of large volumes and varieties of LSC data sources. In addition, concepts of ecosystems are evolving around LSC modelling and management. The events occurring within elements and processes of LSC exhibit new scopes of research in spatial-temporal dimensions, with which Big Data are accumulated in repository systems. The LSC management perspectives have directed our attention to Big Data with innovative IS constructs and models. The description of multiple attribute dimensions within LSC must address the demands and supplies that need business alignments, for which new dimensional modelling methods are sought.

# 2 Literature Review

The existing literature on Logistics and Supply Chain (LSC) Management and the research gaps of LSC are discussed in this section. The concept of an ecosystem composited with multiple supply chain systems is presented in Auerswald and Dani (2017). Various industry frameworks with internal, company-specific platforms are described in Gawer and Cusumano (2014). External innovation is manageable through an innovative business ecosystem design that can be accomplished by improved industry products, technologies, and services. The design guided economics and strategic management have been the focus, addressing industry and technological challenges. Prater and Whitehead (2012) have reviewed the evolution of supply chain management focusing on global market trends with strategic competitiveness. The competitive supply chain includes forecasting, inventory management, distribution, uncertainty, reverse logistics, and customer service. The research conceptualizes the management of supply chains as an assembly of elements and business processes. The big challenges in achieving industry adoption through collaboration and cooperation are the appropriation of diverse supply chains that may have legacy processes and varying interests (Banomyong 2018). The Block Chain technology is discussed across multiple industries, from manufacturing to retail and finance to energy, with superior transparency and traceability in the supply chains and increased automation of the commercial processes in logistics (Heutger and Kuckelhaus 2018). The concept of sustainability has been the emphasis in multiple industry scenarios, as described in Grant et al. (2017). The relationships between buyers and suppliers are manageable in terms of their perceptions. The impact of buyer dependence is highlighted in business fitness (Ro et al. 2016). Even the relationships may have strained through supply disruptions. A survey was conducted on Big Data tools with findings on new opportunities in supply chain contexts among multinational companies and many countries (Seetha Raman et al. 2018). Structural equation modelling was performed based on the statistical inferences of Big Data. Demand management, vendor rating, the Internet of Things (IoT), analytics, and data science may have affected operational excellence, cost savings, customer satisfaction, and validity, reducing the communication gap between demand and supply chain management. The sentiment analysis technique is explored to boost sales and operations planning (S&OP), engaging exogenous information (Wood et al. 2015). The research has submitted an investigative report with a comprehensive application as a case study in the supply chain drive. The proposed framework in the current research is extendable with sentiment analysis integration, improving supply chain decisions and performance and developing additional analytical capabilities with further empirical research. Misra and Khan (2010) have described the supply chain system as a network of suppliers, factories, warehouses, distribution centers, and retailers to deliver quality information on raw materials and suppliers. The information flow in the entire chain of supply networks and their impact on supply chain loops are interpreted. The implementable SCM systems are reviewed with a requisite for next-generation SCM systems. Aryal et al. (2018) have provided new insights for implementing disruptive technologies, enlightening the Big Data analytics and IoT that emerged with a temporal dimension. In the current research, we identify the significant developments of disruptive technology trends in spatial-temporal dimensions. The latest disruptive technology trend is found in mitigating the COVID-19 pandemic settings (Abdel-Basset et al. 2021). Ivanov (2020); Wilden et al. (2021) discuss the transformation of major supply chain management, describing a new notion of Viable Supply Chain (VSC) and narrating supply chain agility, resilience, and sustainability perspectives with adaptable and amicable designs. The current research can support the idea of the VSC model and future designs of supply chains. Olson (2011) describes various organizations with associated supply chain networks through business applications. The success of the implementation of the entire supply chain depends on the just-in-time lean manufacturing processes with Electronic Data Interchange (EDI) linked chains of organizations worldwide. In addition, integrating data associated with various elements and processes of supply chains is crucial for their successful implementation in business scenarios. Arora and Arora (2020) investigate the moderating effect of small vs large supply chains with the motive of sustainable strategic purchasing (SSP) and Organizational Sustainability Performance (OSP). The current research aims to analyze the cross-functional integration processes and their respective impacts on data resilience capabilities, besides collaborating with the automotive supply chain environment, as discussed in Poberschnigg et al. (2020).

# 3 Research Significance and Motivation

In the entire life cycle of the supply chain, structured data, and quality information, including information systems, are demanding for resolving the LSC modelling and management challenges (Chibba 2017). Ecosystems and their integration have significance in the current research. The spatial, business, economic and logistic ecosystems and their collaborations are important in the LSC modelling and management through which the design of new IS artefacts is motivated. The design of IS artefacts in supply chain contexts, particularly in spatial-temporal dimensions, must match with information flows by deciphering meta-knowledge of supply chain operations and ascertaining the logistics performance. So, multiple domains and systems are involved in the entire life cycle of supply chains. Domains and systems are relatable through the operations and functions of various entities and attribute dimensions of the ecosystems. A typical Design Science Research (DSR) approach is significant in the current research investigations. The construction of IS artefacts and logical multidimensional models can contribute to the makeup of an integrated framework. Motivation envisions optimized costs from supply chain ecosystems and their data modelling strategies to drive and align industry operations, including large business processes in spatial dimensions.

# 4 Research Issues, Research Questions and Objectives

Data system designs and implementations have roles in supply chain organizations and management (Kamble et al. 2015). However, inconsistent IS designs can disorganize the data systems and hinder logical mapping and modelling of supply chain systems. These barriers can deter the decision-making process, constraining the tolerance between supply chains and geographically controlled database systems. New IS designs and models are needed to resolve the data complexity that can smoothen logistics and supply chain operations in spatial-temporal dimensions. The exponential growth of businesses and subsequent intricate data systems, including impediments in the makeup of the construct-design and model development for the speedy data integration process, are challenges of common framework development. As a result, the effectiveness of business models has become a significant issue and indeterminate, causing the prototype evaluation to be uncertain, thus risking new business opportunities. Large-size logistics and supply chains can exhibit data heterogeneity and multidimensionality challenges complicating the Information System (IS) construct design and model development and even precluding the data integration process (Poberschnigg 2020). Outdated IS research cannot integrate the data sources and envisage metadata, unless we articulate new IS articulations, which is critical in the current research. In the current research, we ensure that IS artefact designs match with the research objectives and goals. In addition, using data models and empirical evidence of ability to track and trace of logistics consignments and transport related infrastructure attributes are qualitatively analyzed through map views, presented in Figure 6. Such IS designs and models may complicate the implementation of supply chains, affecting the industry business operations. We recognize the importance of Information System (IS) artefacts in LSC business contexts. Unstructured data may even obscure the artefact designs in geographically distributed LSC systems. We have examined several case studies focusing on IS development for LSC businesses and their growth in new operational areas (Belhadi et al. 2021).

The issues are relevant to LSC management and its associated elements and processes of the supply chains. The heterogeneity and multidimensionality of their data sources can affect the entire life cycle of the LSC management. Semantic description and interpretation of conceptualization and contextualization attributes in the LSC modelling and management are added challenges. At times, the constructs and models used as IS artefacts may not be comprehensive nor explicitly defined in the LSC management. Besides, research on logistics performance is undervalued in spatial dimensions. Data sources of global LSC are large and difficult to manage because of the big supply chain data and their operational constraints, including their spatial and temporal data integration challenges. In addition, data formats and data access methods are different in different LSC management systems. Aligning the elements and processes of supply chains from product generation to delivery is another challenge. These challenges can affect the LSC repository performance. Data modelling, data mining, visualization, and interpretation are vital to perceive the connectivity between supply chains and improve the alignment between organizations in spatial dimensions. We have designed the Research Questions (RQ) and Research Objectives (RO) based on the literature review and research issues:

RQ1: Why do we need the design science constructs and models in the LSC management contexts?
RQ2: How do we evaluate the IS constructs and models in robust modelling and management perspectives?
RO1: Articulate IS constructs and models within DSR activities.
RO2: Evaluate the IS artefacts in the logistics performance contexts. For example, artefacts representing data relationships between attributes of the ability to track supply chain consignments and quality of trade and transport infrastructure features are assessed.

# 5 Research Approach

The Design Science Research approach is used to articulate a common framework within which Information System (IS) artefacts are designed (Peffers et al. 2020). The research aims to investigate, formulate and create IS-guided SCM with multidimensional artefacts, addressing the issues relevant to sustainable supply chains in spatial dimensions. DSR provides strong foundation enabling development of theory behind the LSC and associated sustainable digital ecosystems.

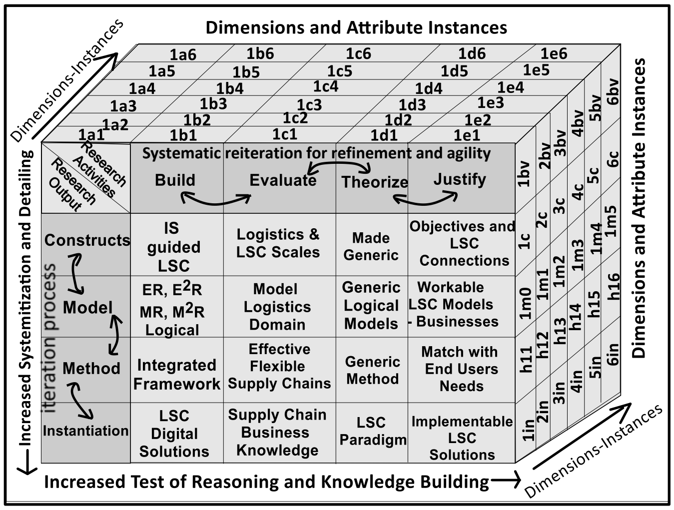

*Figure 1: DSIS framework articulated for logistics and supply chain management (RO1)*

Motivation of DSR approach and associated constructs and models is to interconnect the attributes of the LSC and check the smooth flow of volumes of instances relevant to elements and processes of the LSC in spatial-temporal dimensions and industry contexts. Based on research issues, challenges, and literature review, we have adopted design science approach through which IS articulations are designed to explore the connectivity between multiple supply chains in spatial dimensions (Figure 1). Various schemas are drawn for multiple ecosystems through which empirical modelling of ecological instances is carried out, composing the instantiation process of the DSR approach. As a part of supply chain business IS artefact implementation, the empirical LSC models are fused with logical metadata to extract valuable meta-knowledge. As discussed in Peffers et al. (2020), we have articulated a DSIS framework and extended it in a schematic cuboid structure. We envisage a matrix transformation with various research activities and outcomes in rows and columns and interchanging them through a transpose procedure described in vector algebra (Lei and Wei 2015). The research outputs, constructs, models, methods, and instantiation are transposable with the research activities "build, evaluate, theorize and justify" activities. Several attributes and instances are stored to perform matrix analysis. The purpose of envisaging the articulations is to make the DSIS framework more robust and holistic for LSC management (as per RO1). Based on the data instances emerging in geographic contexts, the constructs, models, and methods of the DSIS are iterated (Figure 1). Research activities are reiterated for refinement and agility of the DSIS approach in the current domain application.

## 6 Modelling Methodology and Framework Development

The current research aims to develop a holistic information system approach in which multidimensional logistics and supply chains and their data views are examined to analyze the connectivity between LSC events through IS ontology descriptions. The integrated framework analyzed with laws of geography can influence the operational costs, sure for better lead times and enhanced stock management. The research outcome relies on the tactical development of the proposed IS framework to examine the sustainability between geographically distributed logistics and supply chains and assess new business opportunities.

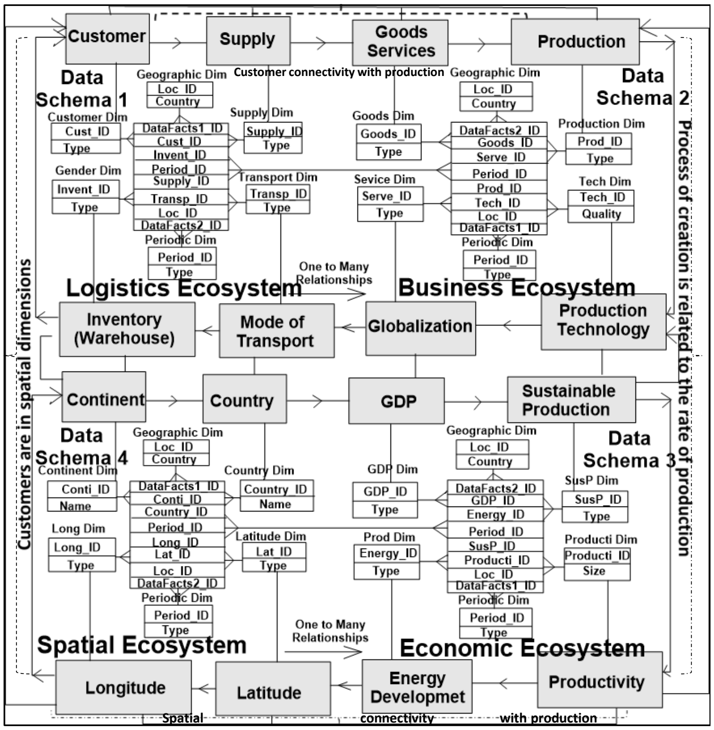

*Figure 2: Connecting multiple ecosystems with spatially controlled supply chain ecosystems*

Integrating schemas belonging to different operational sub-systems for sustainable LSC management is a prerequisite for validating the data structures in multiple industry contexts, as shown in Figure 2. As per RO1, several knowledge-based attribute dimensions are identified from individual ecosystem scenarios to interconnect them through various IS artefacts. The purpose of connectivity between multiple ecologies using LSC models is to acquire knowledge of products and services from diverse ecological functions and activities. Multiple dimensions are interpreted from various operational units of various industries to design star schemas, as described in Figure 2. As shown in Figure 2, supply chains, connectivity, and business life cycle are interpreted through multidimensional attributes connecting data schemas 2-4, emphasizing the warranted exploration of inherent and unknown connections between multiple industries. Multidimensional ontology and Big Data guided ecosystems inevitably depict new knowledge of research outcomes within an LSC geographic area. Big Data novelty can interpret data of multiple ecosystems, with added motivations of connecting supply chain operations and their sustainability in diverse geographies. Use and reuse of IS artefacts, including effectiveness, interoperability evaluable utility properties, have significance in the research. Sustainability is an additional assessable indicator of logistics and supply chains with supportive domain models, resilient data, schema constructs and prototypes, and achievable stable and reliable repository systems.

Further, the ontology descriptions in the LSC application scenarios represent taxonomic hierarchies of classes, class definitions, and class conceptualizations of relationships interpreted in multiple domains. Business rules and axiom constraints are examined to commit conceptualizations during contextual interpretation of geography-based supply chain events. For collaborations, the concept of an ecosystem is beneficial, with several multi-disciplinary entities or dimensions involving conceptualized relationships in the integration process. The symbiotic ecological relations that collaborate with positive-sum associations constitute a self-sustaining system (Petrokas and Baliuckas 2017). The events of elements and processes of supply chains that occur in various geographies develop ecosystem scenarios. In other words, the supply chain describes *what* its structure is, *where* it is located and *how* the structure functions, all interpreted as dimensions in multidimensional modelling contexts. We add *why*, another dimension, to consider the supply chain structure or loop within *where* (location dimension) a failure is observed; all these events are construable in a schema (Figure 3a). In addition, the LSC anatomy characterizes both internal and external organizations of supply chains and their logical and physical data relationships. The functions of data structures are interpreted along with their abilities through factual schemas (Figure 3b). The arrows interpret the connectivity process.

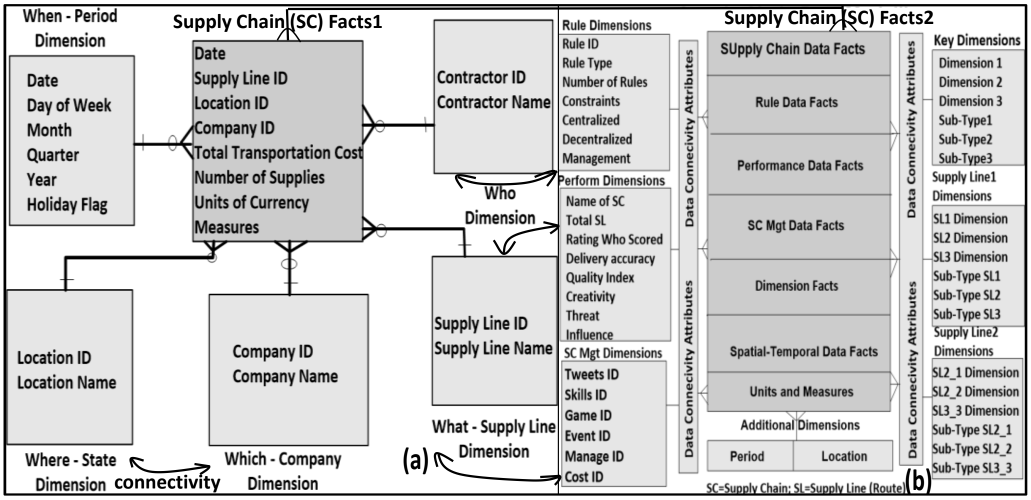

*Figure 3: Connectable schematic views of (a) Supply chain facts model1 (b) Supply chain facts model2*

As described in Figure 3b, several rules, LSC performance and management-related attribute dimensions are connectable with factual instances of supply chains and logistics through a data structure. Several supply chains and logistic route attributes are associated with spatial-temporal dimensions. In addition, decision support systems can strain the ability to decide on knowledge-based supply chains and geographically manageable database systems. The heterogeneity of LSC lies with unstructured spatial data; these challenges pose ambiguities in spatial data interpretation and the knowledge-based connectivity between different supply chains and business logistics. Customer performance, infrastructure quality, ease of arranging shipments, logistics service quality, consignments tracking, and tracing and timeliness of the shipments are challenging through LSC. In addition, controlling transportation costs, keeping customer/industry demands up to date, ensuring reliable carrier capacities, keeping latest technology solutions to meet demands, online and on-time pickup and delivery performance are challenges. The proposed framework and IS artefacts can revitalize to harness the power of automation, modernization, with secured digital supply chains. The business activities within ecological scenarios are envisioned to make supply chains effective at optimized costs. The current research offers a new problem solution in optimizing resources, especially when supply chain events need alignments between multiple industry operations through modelling and management. Several hundred attributes are connectable with large areal extents of systems or networks at both local and global scales. Individual designs of conceptual schemas of various operational units of multiple industries, including their sub-schemas (Figure 3), are contingent on integrated project management.

Broadly, the proposed common framework must envisage several connectable IS articulations to smoothen business operations and ease supply chain complexity and logistics in industry contexts. When businesses engage multiple industries, the project managers ensure optimizing men, machines and materials more judiciously, with minimum operational costs and maximum profits. Other research goals include optimizing the resources using integrated business IS solutions and managing the multiple reliant activities within budgetary constraints (Vanhoucke 2014). As shown in Figure 3, spatially controlled supply chain ecosystems are connected to economic and business ecosystems. We demonstrate business growth to happen in a viable and sustainable economic environment. The framework can deliver a specific quality product or service through interconnected business processes and a network of supply chain element and process entities. The entities interpreted in the business operations are connectable to viable economic objectives and portfolios. As described in Agarwal and Dhar (2014), spatially controlled supply chains and their dimensions can generate volumes and various Big Data. The data sources, which are diverse in industry situations, are used in dimensional modelling with different geographic dimension attributes. Demand management, communication, integration, and collaboration are the basic elements of supply chain systems (Gilles et al. 2018). Data can emerge from strategic demand and supply, procurement, manufacturing, warehousing, order fulfilment and transportation entities as vital processes.

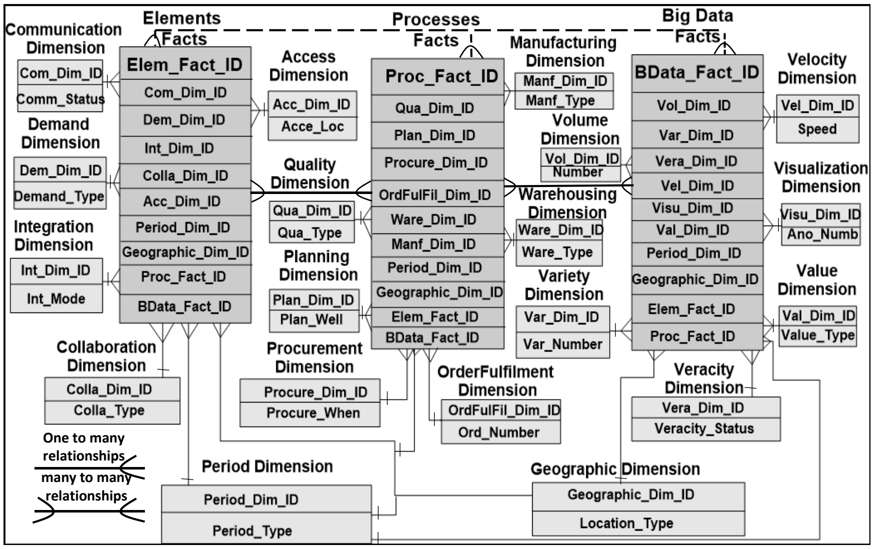

*Figure 4: Connecting the elements and processes of Big supply-chain Data events*

Besides, movement of men, machines and materials, keeping stocks of right materials, timely delivery of materials and supply of the finished goods to the consumers are events considered in the development of the supply chain systems. A robust and holistic resources information system emerges with fast-growing business activities and diverse operations locally and globally. In the current research, we articulate IS constructs and models, describing each element and process of the supply chain ecosystem with knowledge-based entities and or dimensions, their data attributes, and volumes of fact instances of supply chain events. As demonstrated in Figure 4, we interconnect the elements and processes of supply chains with Big Data characteristics through star schemas deduced from conceptualized and contextualized attribute dimensions. We collaborate on the spatially controlled Big Data characteristics, considering the scale and magnitude of the data sources and issues of data bursts in logistics management systems (Nimmagadda et al. 2019b). Volumes and varieties of supply chain data, variability, veracity, and velocity of data flowing within LSC projects are dealt with, including visualization and value of the added IS artefacts. Databases are designable with multi-dimensional star schemas and extended versions of snowflake schemas in industries where business rules rapidly change (Figures 2-4). The schemas are incorporated with periodic attribute dimensions that can assess the sustainment of supply chains, minimizing the ambiguity that may have arisen during database operations. The uniqueness and monotonic properties of the data are maintained, enabling the supply chain business analysts a scope for analysis of knowledge through decision support systems (Belhadi et al. 2021).

# 7 Implementations and Discussions

As discussed in Figures 2-4, we construe the LSC data structures into metadata in a repository system (Kamble et al. 2015). As per RO2, an implementable AJMM framework is articulated for mapping and modelling the attributes of LSC. Attributes can be associated with any features of the LSC in the AJMM implementation procedures. Several plot and map views are extractable for interpreting the performances of attributes in worldwide LSC management. We assess the movement of goods worldwide to interconnect with manufacturers and consumers, intending to make international markets attractive. The performance gaps (between low and high performers) are examined, including supply chain consignments through trade and transport infrastructure practices (Qrunfleh and Tarafdar 2014).

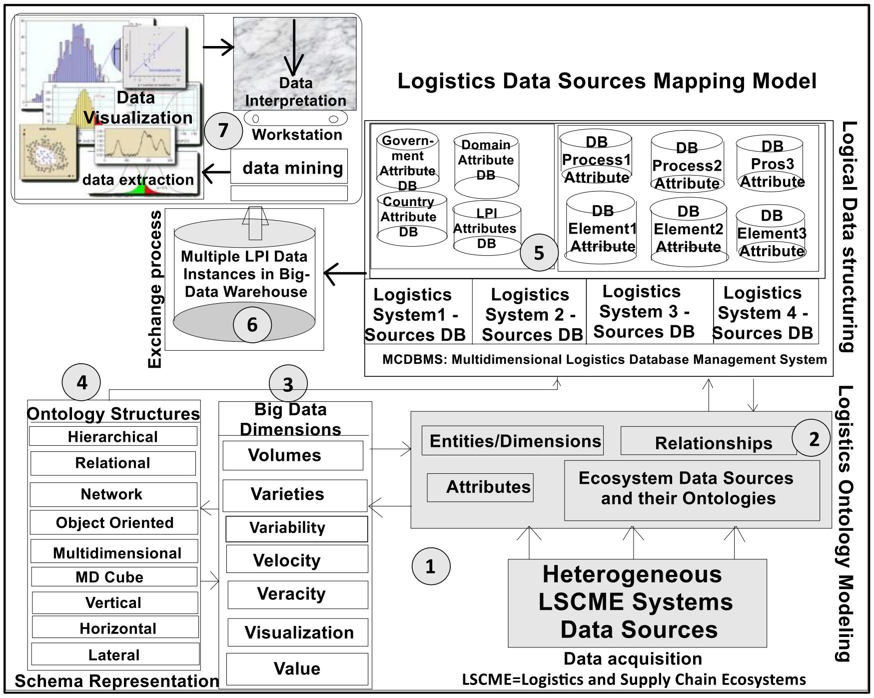

*Figure 5: AJMM implementation framework*

A mapping method is adaptable to examine the performances and prepare sustainable supply chains in business environments (Aryal et al. 2018). Infrastructure, trade, and services are intended to benefit most in the research. As shown in Figure 5, the AJMM methodology describes the implementation of logistics ecosystem contexts. Various stages of the implementation methodology are 1: Data acquisition; 2: Data sorting; 3: Supply chains are spatial- temporal, and they are associated with Big Data. Big Data characteristics are discussed; 4: Types of structures used; 5: Mapping and Modelling; Figures 2-4 are drawn based on stages 2-4 of the AJMM framework. 6: Designing repository system (stage 5); 7: data mining, visualization and interpretation (stages 6 and 7 of Figure 5). Each stage performs a particular LSC task, including designing and implementing IS artefacts and their adaptability in the framework. Several tasks of business operations are interpreted in the AJMM implementation framework (RO2).

In the current research, we have chosen to compare several map views of attributes envisaged by LSC management. For example, we interpret business growth as the ability of supply chains and adaptability to deliver quality products and services. The research explores the connectivity between logistics and supply chains and their performances in different countries. Disaggregation and disengagement of LSC in several countries have been a focus for which effective modelling and management are needed, particularly the performance of logistics and supply chains. In addition, transport and logistic routes may have also affected the international trade, which impacted business and economic growth in several spatial dimensions. The links between the abilities to track the supply consignments and logistic routes and transport systems are paramount in the current investigation for which robust IS artefacts are needed. Suppliers have a great role in tracking and tracing various consignments in the entire life cycle of the LSC management. We explore the manner companies responsible for tracking and tracing the products and services through logistics and supply chain management and investigate their performances in spatial dimensions. The connectivity is established between multiple dimensions involved in the LSC management. Several map views are computed by the AJMM method, and Figures 6a and 6b ascertain high-performing logistics in several countries. The map views describe stronger logistics performance in certain countries, shown in brown and yellow colors. Poorly performed logistics, shown as underperforming countries, are presented in green color (Figures 6a and 6b). In addition, these map views are quality control check tools. Supply chain manager notices which countries perform a lower ability to track and trace consignments. Customer performance, infrastructure quality, ease of arranging shipments, logistics service quality, consignments tracking and tracing and timeliness of the shipments are attribute dimensions used in the IS constructs and models of the framework. Further, the map views motivate us to examine which consignments are tracked and traded faster in spatial dimensions.

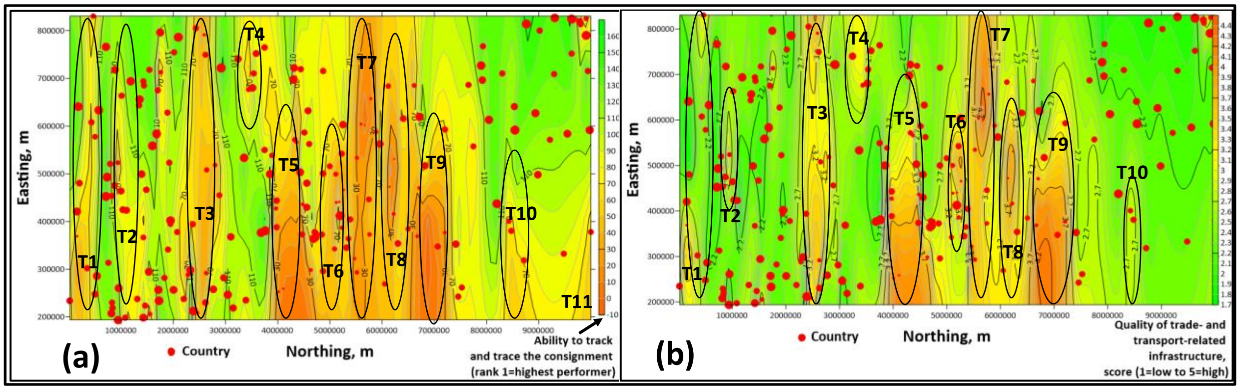

*Figure 6. Mapping and modelling of (a) ability to track and trace consignment attribute (b) trade and transport related infrastructure attribute (RO2)*

Pinpointing which consignment performs better can facilitate further investigation and cause poor performance in other spatial dimensions, as interpreted in Figures 6a and 6b. Besides, the map views represented in ellipsoid-shaped envelopes T1 – T11 are interpreted in Figures 6a and 6b to demarcate good and poor-performing supply chains in various countries. We find additional areas of the ability to track and trace the supply chain consignments compared with the quality of trade and transport-related infrastructures. However, despite the lack of quality of trade and infrastructure facilities, we discern a better ability to track and trace consignment attribute instances. Overall, the findings show that the ability to track the consignment instances is comparable to the quality of trade and transport infrastructure. In addition, the country where the business is occurring must be connected through easting and northing coordinates attributes. Competence and quality of logistic service, ease of arranging competitive prices for shipments (both domestic and international) and the efficiency of the clearance process are the key attribute dimensions considered in the AJMM modelling process. The highest performer is another attribute dimension used in the attribute journey modelling and mapping, as described in the map view in Figure 6a. Several envelopes are interpreted with red and green coloured enclosures, suggesting more performing countries in red zone areas than those in green zone areas, as shown in Figure 6b. Supply chain areas appeared to be more associated with the USA and European Union. Poorly performing areas are relatable to the countries of the African and Asian continents (Figure 6b).

# 8 Research Audience, Limitations and Contribution

The research contributes to designing new IS artefacts and evaluating their efficacy in new knowledge domains using artefact utility properties (Nimmagadda et al. 2019a). IS researchers involved in the LSC management, data analysts, domain experts, supply chain managers and ecosystem application developers are typical research audiences. AJMM ensures good quality data and their authenticity; otherwise, it can affect the visualization and interpretation of map views. However, in the current research, we have reconciled the data qualities and their use in the AJMM process.

# 9 Conclusions and Future Vision

The use and knowledge of IS articulations are emerging in many LSC applications. The robust modelling methods can link multiple supply chains and logistic routes and integrate them into a common framework. Big Data associated with supply chains and logistics are spatial-temporal, and these attributes can leverage the data sources of other coexistent systems for integration. Besides, the data linked with LSC are unstructured, heterogeneous and multidimensional. The data are global, which has the scope to develop new research opportunities focusing on local business IS contexts. Concepts of ecosystems in LSC management are emerging and need new IS articulations. We conducted attribute journey mapping and modelling relevant to LSC management with an extensive evaluation of country-wise logistics performance studies. We will continue to use and develop the AJMM implementation method to investigate global logistics. Our outlook is to infer IS articulations that can substantially improve the global logistics movement between businesses through value-added supply chains. Big data characteristics have collaborated with IS artefacts deduced for LSC management. Ontologies are described wherever necessary to connect supply chains and logistics events globally. The integrated modelling approach describes ways to accomplish cost reduction, process enhancement, faster implementation and new product development. Big data tools facilitate connectivity and interaction among the elements and processes of the supply chain ecosystems in geographic dimensions. The ecosystem concepts and applications can generate economic values among industries that comply with supply chain information systems. Our fusion vision is to examine the logistics and supply chains affected by COVID-19 pandemic locations.

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