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Editorial



# Anniversary 2007–2017



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# From the Editors desk

### Anniversary 2007–2017: 10 Years of quality articles

The Department of Transport and Supply Chain Management at the University of Johannesburg proudly presents to you Volume 11, 2017, of the *Journal of Transport and Supply Chain Management* (JTSCM), an accredited publication unique to South Africa.

## **Fields of study**

The journal continues to serve as an independent publication for scientific contributions in the field of transportation and supply chain management, including logistics, operations management, purchasing management, distribution management, warehousing management, transportation (all modes), production planning and other related fields.

Thank you to all of the authors who have worked so hard to make this an interesting and varied publication. Ongoing gratitude must also be expressed to the editorial panel and reviewers, without whose dedication the annual publication of the JTSCM would not be possible.

This edition of the journal contributes articles that have been reviewed and revised by national and international panel members who are acknowledged scholars and authors.

This year the total contribution of high-quality articles is 21.

Articles that were accepted and published originated from the following institutions: University of Johannesburg, University of Stellenbosch, University of Pretoria, University of South Africa, University of KwaZulu-Natal, University in Zimbabwe, Vaal University of Technology, Aveng Group, Namibian University of Science and Technology, University of Mines Ghana, Politechnic Ghana, University of Delhi, Lulea University of Technology, Sweden, and University of Fort Hare.

# Competitiveness and sustainability in transport and supply chain management

# Introduction

This 2017 volume of articles reports on various aspects related to the competitiveness and sustainability in transport and supply chain management. Four themes broadly encompass these: (1) transportation, (2) demand planning and inventory management, (3) supply chain performance and (4) sustainability in supply chains. The following editorial is presented by the abovementioned themes and provides a detailed synthesis of the work presented within the volume. Each theme is structured and presented by highlighting the background, objectives, main findings and conclusion.

#### **Theme 1: Transportation**

Transportation is a vital node in the supply chain. The competitiveness of businesses, supply chains and countries is significantly influenced by the cost and efficiencies of transport modes. Several studies have investigated and analysed the factors that influence transportation costs and efficiencies. In this volume, six articles fall into the transportation theme and they address issues of competitiveness and sustainability. Saruchera (2017) investigated the shortcomings of rail freight in Namibia and examined possible strategies to improve its competitiveness. From a survey of 80 Windhoek-based industrial and logistics firms, the results of the study revealed that poor perceptions of rail and operational challenges were the main factors that adversely affected the competitiveness of rail freight. Operational challenges of rail in Namibia were attributed to ageing infrastructure. The conclusions of the study highlight the need of private sector involvement in rail operations as a strategy to improve rail efficiency. The narrative article by Ittmann (2017)

#### Read online:



Scan this QR code with your smart phone or mobile device to read online. provides a useful overview of public–private partnerships (PPP) and their role in financing freight infrastructure in South Africa. The author argues that the freight transport sector stands to benefit from PPPs, but the present legal framework in South Africa needs to be strengthened to ensure the consideration of economic circumstances and effective project execution.

Spatial concentration of economic activity has been shown to influence growth and competitiveness by enhancing cooperation among related businesses in a proximate geographic area and to improve the collective competitive advantage for all collaborating businesses (Pisa, Viviers & Rossouw 2017). The article by Coetzee and Swanepoel (2017) explored the spatial dynamics, movement patterns and relationships between various air cargo sectors around the OR Tambo International Airport in Gauteng, South Africa. By analysing extant literature and data on air cargo-related business locations and land use, the study provides novel insights on the impact of OR International Airport on the location of air cargo-related businesses, in African and South African research. The results reveal a high-density concentration of air cargo, freight forwarders and logistics business firms in a 2.5 km radius of the airport. The findings of this study highlight the need for the application of innovative planning and management approaches to airport regions in order to derive optimum spillover benefits from the investments in airport regions. Good-quality infrastructure, particularly transportation infrastructure, improves countrylevel competitiveness by reducing trade costs and order lead times. The study of Hlotywa and Ndaguba (2017) assessed the impact of road transport infrastructure investment on economic development. Using co-integration and a vector error correction model the results of the study revealed a positive relationship between road transport investment and economic development. It is evident from this study that a long-run relationship exists between these two variables and that road transport investment plays an important role in enhancing economic development in South Africa. Therefore, policymakers should create a conducive enabling environment to attract foreign direct investment, particularly for transport infrastructure.

Two articles in this volume address issues on externalities. Tetteh and Dsane-Nsor (2017) applied 0–1 mixed integer linear programming to minimise negative externalities cost in e-commerce environments. In terms of the mode of request, that is, whether an order is placed online or otherwise, the results reveal that externality costs are not influenced by the mode of request but rather by government policies and the number of vehicles used. The authors recommend the use of eco-friendly fuel systems to reduce externality costs. The study by Dumba (2017) focuses on the relationship between informal public transport driver behaviour and the prevailing regulatory framework. They found that the prevailing regulatory policies were conducive for the poor behaviour exhibited by informal public transport drivers. The authors suggest that efforts to prohibit, restructure or formalise

informal public transport will be futile without reform of the regulatory framework.

Although substantial evidence on the effectiveness of PPP in improving transport systems exists, its adoption in developing countries remains limited. Infrastructure plays a vital role in facilitating trade and development. Governments, particularly in developing countries, need to take bold steps to address infrastructure challenges while ensuring that long-term environmental implications are considered.

#### Theme 2: Demand planning and inventory management

Understanding the nature of customer demand and customer demand patterns is essential for the agility, responsiveness and survival of businesses. Demand planning and inventory management enables businesses to be value driven and customer oriented in today's dynamic markets. Raza and Kilbourn (2017) assessed the impact of point-of-sale data in demand planning among South African clothing retailers. Using the grounded theory approach, qualitative data were collected and analysed. The results revealed extensive utilisation of point-of-sale data in demand planning among the clothing retailers. This has the following implications: (1) point–of-sale data should be accurately collected as it plays a vital role in demand planning and (2) point-of-sale data should be used together with other qualitative and quantitative data to improve the demand planning estimates.

Inventory management determines the availability of stock at various stages of the supply chain. Botha, Grobler and Yadavalli (2017) conducted a system dynamics comparison of three inventory management models in an automotive parts supply chain. The study provides a new approach to inventory management and evidence of improved performance from holding lower stock levels in the automotive supply chain. However, the study's different movement category highlights the need for further research to measure the effectiveness of the various methods with other demand distributions. The exploratory article by Govind, Luke and Pisa (2017) investigates the effects of management practices and processes on stock-outs in Johannesburg's warehouse retail liquor sector. The results of this study provide empirical evidence on the negative associations between poor management practices and processes, stock-outs, customer service and business performance. The findings imply that retailers can reduce stock-outs by investing in improvements in demand forecasting, synchronisation through collaboration and employee training programmes. Matsoma and Ambe (2017) also suggests that in the case of clothing manufacturers they consider the types of product offerings before making a decision about adopting the hierarchical or optimal demand planning approaches.

#### Theme 3: Supply chain performance

Companies are increasingly relying on the performance of entire supply chains through supply chain collaboration in order to satisfy changing customer demand and address the complexities of today's global supply chains. Tolmay (2017) tested the correlation between relationship value and business expansion in the South African automotive industry by conducting a survey among Tier 1 suppliers and their Tier 2 suppliers. The findings reveal that direct correlation exists between relationship value and business expansion. These findings suggest that some of the factors that create an enabling environment for collaboration are in place in the automotive industry. In addition, automotive suppliers ought to invest in developing a relationship value governance strategy to derive optimum benefits from collaboration.

The quality of a product influences supply chain performance by affecting the customer's utility and the customer's decision to make repeat purchases. Valentine and Goedhals-Geber (2017) investigated the impact of the logistics processes – in particular, the temperature profile of apples for the first 48 h post-harvest – on the yield and/or quality of the fruit. Using observations, informal interviews and temperature trials, they found that the time of harvest and the time at which the apples are placed under temperature control post-harvest affect the quality of the apples. These findings suggest that efficient operational procedures in the cold chain will ensure high product quality for apple farmers.

The development and tracking of appropriate matrices has been shown to improve supply chain performance by providing criteria based on which performance targets are measured and benchmarked. Utilising performance matrices enables interventions to be effected if targets are not met. Smit, Van Eeden and Van Dyk (2017) developed a performance measurement framework for the South African bulk export wine industry by using an emergent multiphased exploratory approach. The results showed that bulk wine export growth is stagnant owing to lack of measurement practices, which results in the inability to identify and prioritise interventions. Their results provide a reference framework to address the challenges faced by exporters in this sector.

Karrapan et al. (2017) developed an index to evaluate and benchmark third party logistics (3PL) service providers. Data were collected from 103 of the Top 500 Companies in Africa that use 3PLs and factor analysis was conducted. Three important factors in 3PL selection were identified: service quality, information management and compliance as well as collaboration. This study provides a framework to inform strategic decision-making and evaluation of 3PLs prior to contracting. Simba et al. (2017) evaluated the role of supply chain risk management (SCRM) processes in developing supply chain resilience among 12 fast-moving consumer goods manufacturers in South Africa. The result of the qualitative descriptive study revealed a lack of formal SCRM processes to identify, assess, mitigate and monitor disruptions. The findings suggest that supply chain resilience can be strengthened through the formalisation of SCRM processes and the development of risk assessment scores.

The adoption of supply chain management processes and practices has occurred at diverse periods in different industries. The adoption of supply chain management processes and practices results in improved supply chain performance. The construction industry is an example of a late adopter of supply chain management. However, the industry's potential and performance are restricted by numerous challenges. Pillay and Mafini (2017) used a qualitative approach to draw deep insights from senior management on the supply chain bottlenecks in the South African construction industry. They found that the construction industry is constrained by the following factors: lack of skills and qualifications; procurement practices and process; and supply chain integration, supply chain relationships and the structure of the construction industry. These findings imply that the benefits of supply chain management in the construction industry can only be fully realised if more firms in the industry understand and adopt supply chain management practices.

Eickers and Cilliers (2017) provide guidelines for small business retailers to manage their logistical supply chain drivers to be aligned with the supply chain strategy in terms of responsiveness and cost-efficiency.

Public sector supply chains are prone to similar complexities as those faced by private sector supply chains. The performance of public supply chains affects the quality of life of citizens and the levels of economic development for the country. Dzuke and Naude (2017) identify the problems affecting operational procurement processes and public sector service delivery in Zimbabwe. Advertising, bid evaluation and contract stages are identified as the main problems associated with operational procurement and service delivery. The authors recommend that reform in public procurement processes and restructuring can result in improvements in service delivery.

#### Theme 4: Sustainability in supply chains

Environmental sustainability is a growing concern that businesses and governments alike continue to take into account in decision-making processes. Mafini and Muposhi (2017) investigated an under-research niche in supply chain sustainability literature, namely, small- and medium-sized enterprises (SMEs). The aim of their study was to examine the association between green supply chain management practices, environmental collaboration and financial performance in SMEs. Confirmatory factor analysis and structural equation modelling were applied to data collected from 312 Gauteng-based SMEs. Their results show that green, procurement, logistics and manufacturing have a positive effect on environmental collaboration. These findings suggest that SMEs can improve their financial performance if they collaborate on environmental issues.

The qualitative study by Meyer et al. (2017) determined the drivers of internal and external barriers and the drivers of reverse logistics for four major South African grocery retailers. The results revealed that optimisation of profitability and reduction in costs were the main internal drivers, while reducing the organisation's environmental impacts was the

main external driver. The lack of information systems and infrastructure and transportation inefficiencies were identified as the main barriers indicating that investment in these areas will reduce reverse logistics costs and provide a competitive advantage in reverse logistics.

Successful implementation of reverse logistics depends on robust designs that manage all stages of the product(s)' life cycle. Darbari et al. (2017) developed a multi-objective fuzzy mathematical approach for designing sustainable reverse supply chains for an Indian electronics manufacturing firm. The model evaluates facilities under financial, environmental and social factors as well as integration of the facility and integration of the facility selection decisions with network design. The results of the model showed that Indian electronics manufacturers must consider environmental and social performance when choosing recovery facility locations because excluding those factors does not result in significant cost savings. This study provides a decision tool for designing sustainable reverse logistics networks.

# Conclusion

Sustainability issues are increasingly becoming important as governments strive to achieve sustainable growth. Businesses are becoming more accountable for the environmental impact of their operations through improvements in legal frameworks and regulations. Growth and competitiveness will remain an important objective for both businesses and governments alike, but the key challenge remains that of separating growth from the associated negative impacts on the environment.

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