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The impact of smart logistics on smart city performance: a quantitative investigation

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Extended Abstract

Keywords
Smart city, city sustainable performance, smart logistics, supply chain management, SEM

Purpose
The objective of this study is to investigate empirically the impact of smart logistics on smart city performance.

Research background
Smart city initiatives center around technological development and citizens' quality of life by receiving the goods and services delivered in full and on time. Rapid development of information and communication technologies (ICT) bring relatively new mobile communication known as Internet of Vehicles (IoV), which is a dynamic mobile communication such as V2V (vehicle to vehicle), V2R (vehicle to road), V2B (vehicle to building), V2H (vehicle to home) and V2X (vehicle to everything) (Ang et al., 2019). This contemporary view motivates the studies in the domain of smart logistics. Extant literature indicates a limited studies in relation to smart logistics and its effect on smart city performance.

EU defines a smart city as 'a place where traditional networks and services are made more efficient through the use of digital and communication technologies for the benefit of its businesses and residents' (EUParliament, 2017). Consequently, smart logistics refer to the products being embedded with web-enabled communication devices (e.g., RFID, sensors, actuators). A smart product possesses auto identification tag to hold information about itself and transmits data with its decision support systems that manages it (Wong et al., 2002). Most of the research so far on smart cities broadly focuses on what makes a city 'smart' and its features, and stakeholders' participation in this endeavor (Albino, Berardi & Dangelico, 2015; Allwinkle & Cruickshank, 2011; Benevolo, Dameri & D'Auria, 2016; Hollands, 2008); smart city performance evaluation (Lombardi et al., 2012; Zygiaris, 2013), cooperative city logistics and its impact on city performance via a case study (Nathanail, Gogas & Adamos, 2016).

Gatta, Marcucci and Le Pira (2017) proposed a decision support system for urban freight transport (UFT) planning considering the city culture and stakeholder engagement in this process. Benevolo, Dameri and D'Auria (2016) analysed smart mobility initiatives (i.e., reduction of vehicular pollution, noise, transfer cost and speed, traffic congestion, and increasing people safety) in smart city context and investigated the role of ICT in supporting

these actions. While these studies are rhetoric, mostly occurring in isolation and deal discretely with some aspects around smart city operations, there is still limited understanding yet on how the smart logistics can influence smart city sustainable performance. However, Tachizawa, Alvarez-Gil and Montes-Sancho (2015) have proposed a theoretical framework of smart city initiative and big data analytics together in affecting the supply network and governance mechanism, their results were not sufficiently considered the performance as the target outcome. The proposed empirical study investigating the effect of smart logistics on smart city performance would fill the gap in the literature.

Research questions that guide the objectives:
RQ1: What extent the emerging technologies will be able to make the logistics movement smart?
RQ2: What will be the effect of city-bound smart logistics on smart city operations?

Research methodology
A survey using 7-point Likert scale is being used to collect the responses from those firms who are engaged with city bound logistics. Suppliers, wholesalers, retailers, urban freight transporters and IT vendors in Victoria are the potential respondents. The target sample size of 150 from a population of 1000 businesses from Australia is expected and will result in 20% response rate. The measures used are smart logistics, data analytics, disruptive technologies and smart city sustainable performance. SEM modeling is used to analyse and test the hypotheses.

Findings
The results are yet to come and will be presented in the conference.
The following hypotheses will be tested through SEM modeling.
H1: Smart logistics will have a positive effect on smart city sustainable performance.
H2: The disruptive technologies (e.g., IoT) will moderate the relationship between smart logistics and smart city performance positively.

Contribution
Theoretically, this empirical research is the first in establishing the relationship between smart logistics and smart city performance. While the ICT plays a critical role in integrating the supply chains, extending ICT-enabled logistics processes into city operations and performance improvement is a significant contribution to the literature in both SCM and IS discipline. Practically, making the conventional supply chain a smart one by adapting IoT (e.g., RFID and sensors, video camera, GPS) into everything in logistics will guide the managers effectively in their technology investment decision. The results will make the managers understand that adaption of these technologies in the logistics movement will improve the liveability of cities through economic and social prosperity while reducing environmental impact.

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