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Bibliometric Analysis of Publications on City Logistics in International Scientific Literature

Sławomira Hajduk*

Faculty of Management, Białystok University of Technology, Wiejska 45A, 15-351 Białystok, Poland

Abstract

This article aims to identify the trends and dynamics of changes in city logistics on the basis of bibliometric data of international literature published in the ISI Web of Science, Scopus, Elsevier, Emerald and EBSCO host databases in recent years. The study made use of basic techniques of the bibliometric method with the support of the VOS viewer software. On the basis of a huge number of literary works, the analysis allowed for the assessment in terms of chronological development of research concerning city logistics and the identification of main authors, publications, and journals being of crucial significance to this area of research.

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1. Introduction

On the current level of scientific development any analysis and assessment of a given phenomenon requires that a review of literature be conducted. Scientists often use bibliometric databases. Previous publications create a bibliography of every scientific publication. Citations combine earlier works with later ones and establish a communication channel between scientists as well as perform three additional tasks: (I) formulate the theory used in the work; (II) interpret earlier results of recognized publications; (III) position the author's research within the past scientific achievement of a given discipline. Analysis of the relationships between citations constitutes a test of the network of connections existing between scientific publications. Through citing a document scientists codify knowledge, whereas being quoted in another publication contributes to the diffusion of knowledge. Bibliometric

* Corresponding author. Tel.: +4-885-746-9855.

E-mail address: s.hajduk@pb.edu.pl

methods are used when the huge amount of literature within the range does not permit the analysis and identification of the main trends of development and the relationships. City logistics is one of these scholarly sub-disciplines. The author intends to choose the most groundbreaking publications, to identify the authors and journals which have the largest share in the development of urban logistics as well as to identify research clusters.

The study aims to determine trends in research on city logistics in global literature using various bibliometric analysis techniques. In addition, the author attempts to identify research gaps in the field of city logistics, which intends to deal with in future studies. The article consists of three sections. The first part includes the deliberations of scientists concerning city logistics. The next section presents the data and research methods used. The last part of the study contains results and conclusions of the examination. The analysis made use of the VOSviewer software, Microsoft Excel 2010 spreadsheet and data analysis tools available in the ISI Web of Science, Scopus, Elsevier, Emerald and EBSCO host databases.

2. Background literature

City management must deal with many issues related to the economy, spatial planning and environmental protection [14]. Furthermore, smart cities mostly require the transfer and diffusion of knowledge, innovation and technology [7]. The many tasks carried out by local governments also include those related to city logistics. In literature there is still no consensus on the definition scope of urban logistics. Taniguchi, Thomson and Yamada, creators of this concept, identify urban logistics mainly with the coordination of the flow of goods within the city [26]. This approach has been confirmed in large European city logistics projects such as Bestufs, Trailblazer, Sugar, Grass, C-liege or Enclos. Szymczak defines city logistics as the process of total optimization of transport and logistics in urban areas supported by state of the art information systems and with consideration to economic, environment, social and safety aspects [21]. In addition, it is more and more common to see definitions of urban logistics which take into account the movement of goods and people. This approach is the result of consequences of rapidly growing individual utilizing cars [11]. Moreover, Szołtysek defines city logistics as the process of planning, implementation, coordination and control related to the movement of people, goods and information in urban areas meant to reduce costs and improve the quality of life resulting from the compromise between the needs of diverse stakeholders [22].

Taniguchi has identified three main objectives of city logistics: (I) to improve the quality of life; (II) to improve the flow of people and freight; (III) to protect the environment [26]. The realization of these objectives involves the commitment of many stakeholders who have different expectations concerning city logistics. Literature identifies several groups of stakeholders who represent different areas related to delivery of goods and people within the city: shippers (retailers, manufacturers, wholesalers), freight carriers (warehouse companies, transporters), residents (consumers), administration (national, regional, and city level). Achieving sustainable distribution is a difficult problem due to the complexity of the interactions between various stakeholders [27].

According to Brdulak the subject of the study of city logistics concerns deliberately structured and integrated flows of materials, people and information within the area of any given city. These problems include, for instance: the city's accessibility to transport, supply chains of goods, supplying the agglomeration with water and energy, waste management, removal and treatment of sewage, construction and maintenance of telecommunication networks and environment protection [2]. Szołtysek asserts that the aim of city logistics is to reduce the nuisances associated with transportation in urban areas while supporting their economic and social development. Due to increasing traffic congestion, the rationalization of the flow of people and goods in urban areas is one of the most important problems of effective city management, especially one that is in line with the principles of sustainable development.

City logistics is an increasingly important area of city management. A constantly growing number of urban residents make access to infrastructure more difficult and, consequently, reduces the quality of life. Currently 53% of the world's population resides in cities, a number that is expected to rise to 70% by 2050. Approximately 85% of the EU's GDP is generated in cities [12, 28]. Increased road traffic, transporting both passengers and freight, causes congestion and produces air pollution. European Commission forecasts show that the intensity of freight transport will increase by 40% by 2030 and by more than 80% by 2050 when compared to 2005. At the same time, it is expected that passenger transport will also increase by about 34% by 2030 and by more than 50% by 2050 in comparison to 2005 [31]. On the basis of the result of a study conducted in seven major Polish cities it is estimated that in 2013 costs related to congestion will reach a level of 3.5 billion PLN (average of 2,905 per driver). Additionally, external costs

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