



Big Data Analytics in Supply Chain Management: A Literature Review on Supply Chain Analytics

Gazi Murat Duman

Advisor: Dr. Elif Kongar

Department of Technology Management, School of Engineering
University of Bridgeport, Bridgeport, CT

Objective

The amount of the data produced by the government, the private sector and the general public has been rising especially over the past decade. With this growing trend, utilizing big data to add value to organizations became a popular topic for the industry and academic research. Converting unorganized and unstructured big data to useful information is investigated under Big Data Analytics (BDA). BDA, when employed appropriately, offers great potential to organizations helping in creating well-defined and meaningful strategic planning process. Supply Chain Analytics (SCA) is a member of BDA with a narrower spectrum, concerned exclusively with supply chain and logistics operations. SCA utilizes various Big Data Analytics techniques such as future trend analysis and prediction and/or operational optimization to increase the overall performance of related activities. This study presents a comprehensive literature survey in the area of Supply Chain Analytics and defines the literature gap in the related area.

Supply Chain, Big Data and Analytics

Supply Chain is defined as a bi-directional flow of products, money and **information** between the initial suppliers and final customers through different organizations (Chopra & Meindl, 2007).

Information one of the most influential drivers of the supply chain as it directly affects each of the other drivers.

The speed, accuracy and accessibility of **information** ("processed data") is directly affects the performance of a supply chain.

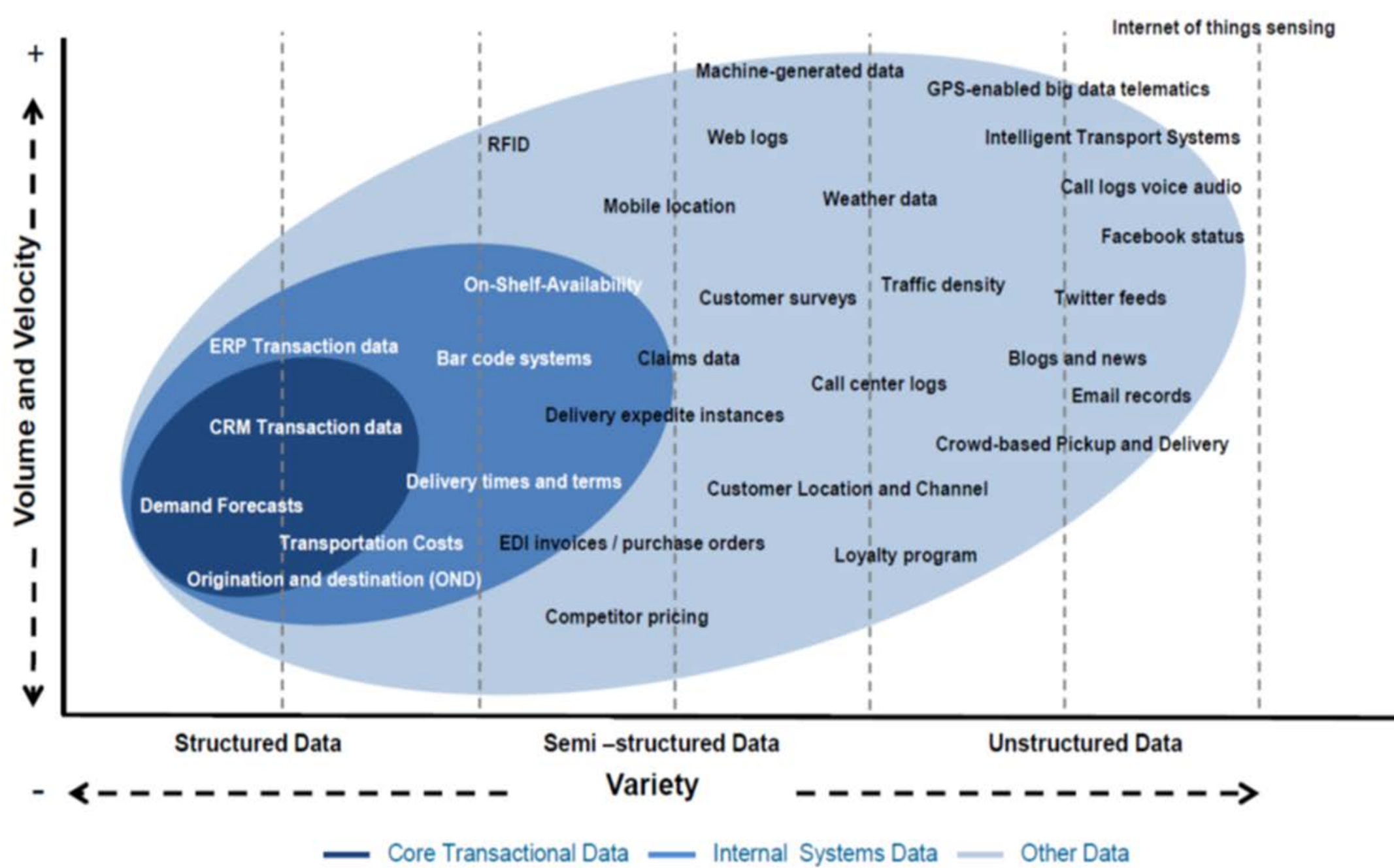


Figure 1: SCM Data Volume and Velocity vs. Variety (Rozados&Tjahjono, 2014)

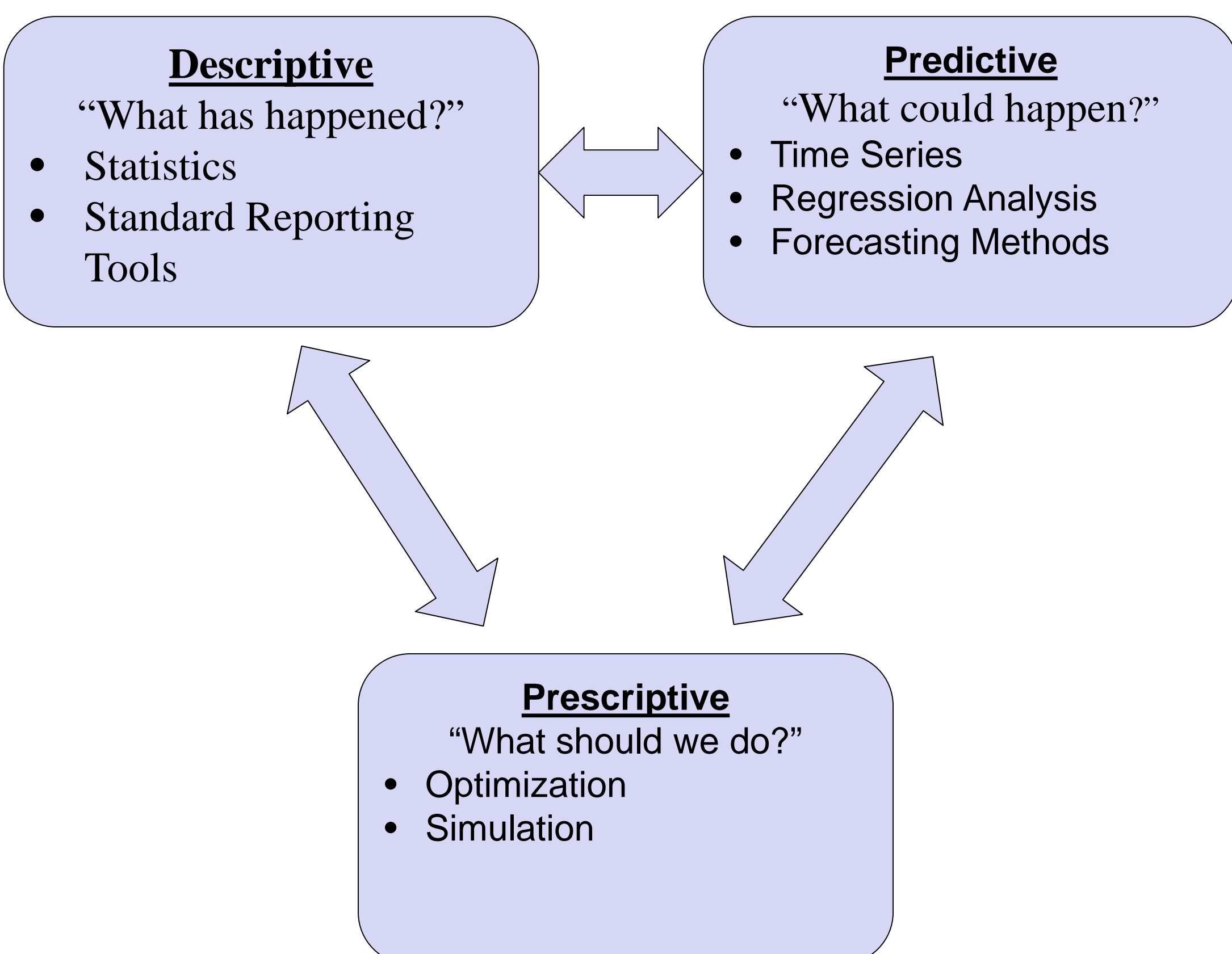


Figure 2: Supply Chain Analytics Approaches

Research Methodology and Design

- The research approach employed is a comprehensive literature review.
- Google scholar was employed to conduct the research.
- Keywords identified were directly associated with Big Data Analytics such as *Big Data Analytics*, *Big Data*, *Analytics*, *Advanced Analytics*, *Supply Chain Analytics* and *Supply Chain Intelligence*. These keywords were then combined with terms such as "*Supply Chain Management*" in order to ensure their relevance to this study.
- More than 300 peer-reviewed journal articles/conference proceedings as well as industrial white papers are collected. Figure 3 depicts the number of related publications over the past 17 years.

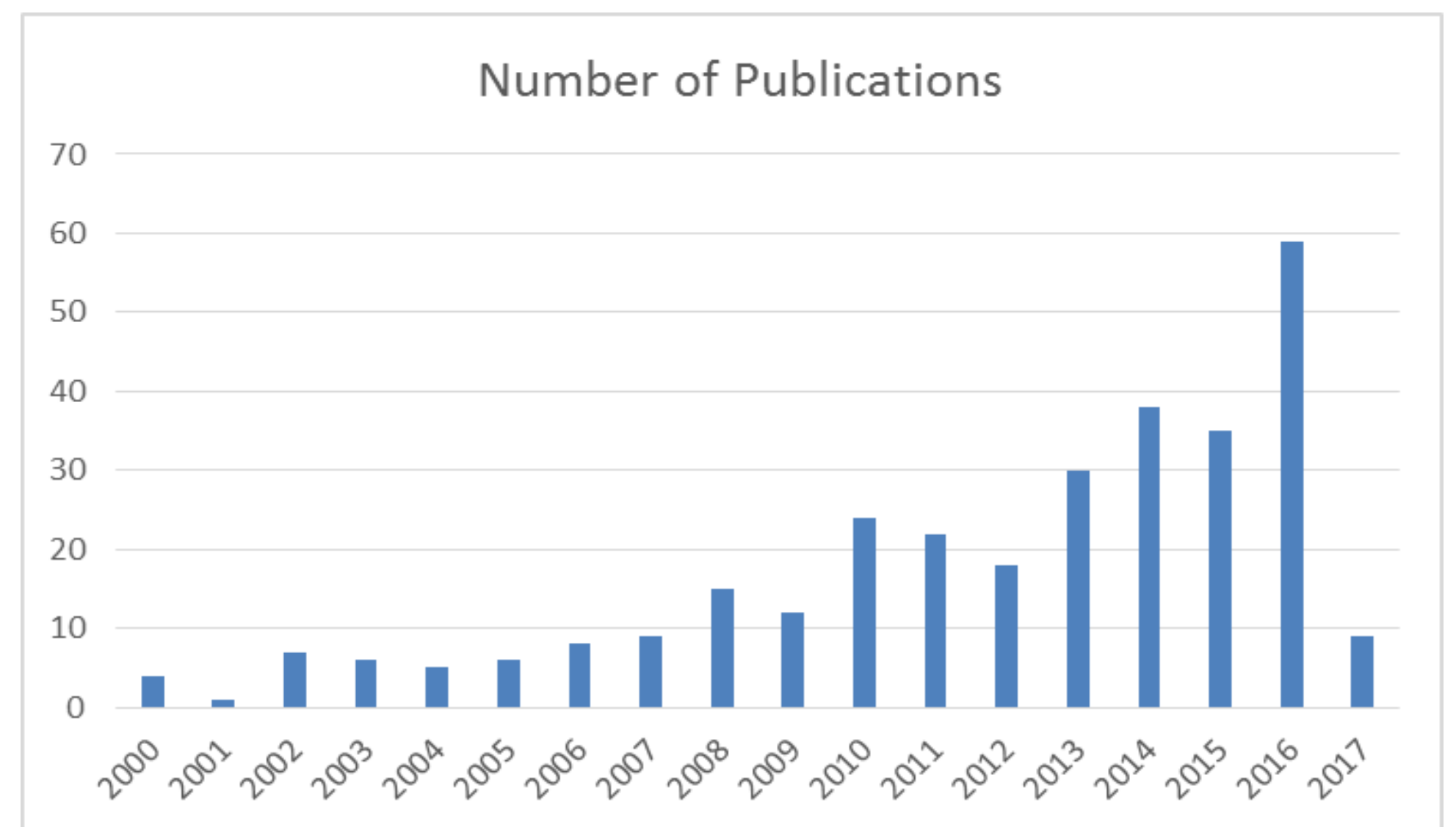


Figure 3: Number of publications over the years

Research Findings

- As it can be observed from Figure 3, there has been a significant increase in the SCA literature in the past decade.
- Despite the fact that there is no consensus on the definition of big data the literature review indicates that all the authors agree on Big Data Analytics.
- There are various software packages and modules focusing on Big Data Analytics in Supply Chain Management (i.e. SAP HANA, Oracle PeopleSoft, SAS Supply Chain Intelligence).
- Academic papers mostly focus on the conceptual framework in SCA while the studies with applications are limited.
- Several studies and industry white papers addressed that SCA can be utilized in end to end supply chain execution which directly affects the operational performance, efficiency and sustainability by improving supply chain visibility, managing volatility, and reducing fluctuations in cost.
- Cognitive analytics is the next step of analytics approach which integrates the consumer behavior in the decision making process.

Conclusions & Future Research

This study presented the findings of a comprehensive literature survey in the area of Supply Chain Analytics. The research findings indicate that big data driven supply chain management is expected to be more efficient in several aspects such as operational performance, supply chain risk management and supply chain collaboration. However, SCA has some challenges in integrating unstructured, unprocessed and seemingly unmanageable data (Wang& Alexander, 2015). This challenges can be the focus of future research.

Several authors also emphasized the importance of focusing on the sustainability aspects of SCA (Wang et al., 2016; Hazen et al., 2016).

References

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