



# INVENTORY MANAGEMENT IN RETAIL SECTOR: A REVIEW.

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## **Abstract:**

The retail sector is among the largest sectors in the world, considering how every single business opportunity requires retailing for their goods or services. Retailers have to constantly engage in multiple operations like warehousing, transportation, shipping costs, minimising costs, maximising profits, time management etc. Retail with n number of SKUs makes it a sector with a vast inventory, which makes inventory management a serious concern for the business. This paper conducts a systematic literature review on inventory control, supply chain management, order management, and warehousing in the retail sector. Essentially all service and manufacturing companies, especially the retail industry, balance inventory strategies that not only stock materials to meet customer demand, but also limit the amount of warehouse space used to meet them. Specific aspects of inventory management were explored in more detail and how they relate to the financial health of any business, covering topics such as supply chain, human resources and more. Effective inventory management is crucial for any retail organization as they have to manage the products effectively according to the supply and demand in the market. Failing may result in heavy losses to the organization on the account of spoilage, loss in customers and high inventory costs etc. This paper aims at giving a review on publications from the year 1998 to 2022 and summarizes to find the areas where future research can take place.

**Keywords:** Operations Research, Literature Review, Retailing, Inventory, management, Retail Sector, Supply Chain, Pricing, Optimality.

## **Introduction:**

In this world of fierce competition, the retail sector has emerged as one of the most dynamic and widespread sectors as they have their roots bound with every sector of this world. Every industry in some way or the other has a part of retail in their business activities and therefore retail has been a part of people's lives since generations.

In this research paper, we have tried analysing the problems, solutions and the most optimal ways to maximise profits and reducing costs focussing on years 1998-2022, including the recession of 2008 and the difference between pre and post Covid-19 pandemic phase.

Examples of the most common problems are location-allocation (LRP) and transportation-routing problems. They are inter-linked with each other, but as mentioned by Hokey Min, Vaidyanathan Jayaraman b, Rajesh Srivastava, the classic difference between the two is that LRP is that once a place is allocated it requires visitation from customers whereas the latter assumes the route directly or indirectly from the facility to the customer. (Min et al., 1998)

Logistics function is one of the central most part, continuin the success of operations research along with the ability of the Operations Research Models that is used for future research directions. (Min et al., 1998)

Furthermore, E-retailing had not emerged completely until very recently but it too has had a huge impact on the retail sector as their major operations includes transporting goods from the source to the customer which should be done with minimum costing.

In order to become more efficient, it is suggested to use operations research methods for better profits and lower costs and that is what we will try and depict in our research paper.

In the last few years, a few very good papers have been reviewed or written such as:

For 1998-2002,

**Near-optimal pricing and replenishment strategies for a retail/distribution system** (Chen et al., 2001)

**Multilocation combined pricing and inventory control** (Federgruen & Heching, 2002)

**E-commerce and its impact on operations management** (Gunasekaran et al., 2002)

(d) **Integrated production/distribution planning in supply chains: An invited review** (Erengüç et al., 1999)

(e) **Complex behaviour in a production-distribution model** (Larsen et al., 1999)

It has been shown that important activities in a supply chain can be coordinated through effective inventory control. Specifically, an effective way to improve supply chain performance is for the vendor to determine the quantities that should be ordered by its downstream customers, rather than the other way around. (Zhao et al., 2006) Vendor-managed inventory (VMI) is a tool used to improve customer service and reduce inventory cost. (Kuk, 2004) It is a supply initiative where the supplier assumes the responsibility of tracking and replenishing a customer's inventory. (Kuk, 2004) Focusing on one supplier one customer relationship, special attention is given to the manufacturer's production scheduling activities. (Disney & Towill, 2003) Evidence has shown that vendor-managed inventory (VMI) can improve supply chain performance by decreasing inventory levels and increasing fill rates; as a result, industry use of VMI has grown over time. (Yao et al., 2007) VMI is a collaborative commerce initiative where suppliers are authorized to manage the buyer's inventory of stock-keeping units. (Yao et al., 2007) One of the most important aspects affecting the performance of a supply chain is the management of inventories, since the decisions taken in this respect have a significant impact on material flow time, throughput and availability of products. (Musalem & Dekker, 2005) In a key report, Andersen Consulting (1996) found that, on average, 8.2% of shoppers fail to find the product(s) of their search in stock. Further, Lee (2002) noted that stock-outs represent 6.5% of all retail sales and that, after adjusting for the sales of alternative/substitute products, retailers suffer net lost sales of 3.1%. (Frankel, 2006) Clearly, there is no shortage of inventory in the supply chain. (Frankel, 2006) The problem, it appears, is that the right product is not in the right place at the right time to meet demand. (Frankel, 2006) It has been shown that important activities in a supply chain can be coordinated through effective inventory control (Thomas and Griffin, 1996). Specifically, an effective way to improve supply chain performance is for the vendor to determine the quantities that should be ordered by its downstream customers, rather than the other way around. (Zhao et al., 2006)

The topic of supply chain sustainability has been of great interest for the last decade both in academia and the practitioners' world (Hassini et al., 2012). Rapid market changes fueled by the explosion of product varieties with short life cycles have increased competition in today's global markets (Darwish & Ertrogl, 2008). To remain in competition, companies have to provide better products and services at a reduced cost for customers with heightened expectations. Operations Research helps to find the most cost-effective method for inventory management as well as in the supply chain. Warehouse managers have to tackle problems with stocking the inventory at various levels and the variety of products make this and even more difficult task. Consumers demand safe, fresh and convenient options which mean the inventory is changing rapidly. To tackle the problem of not having zero inventories, the supply chain management comes into focus. Retailers have become the channel captains and set the pace in logistics. (Sparks & Sparks, 2016) They have the responsibility to form a more cooperative and collaborative supply chain to maximize efficiency. Higher the role of operational research, more the process becomes efficient. This would ensure wealth creation in the short term, and sustainable development in the long term (Subramaniam & Labs, 2016).

Inventory management helps retailers build their logistics strategies in a dynamically growing industry. In the past decade, total retail sales have often grown by 1 to 3% p.a. over the last few years, and the annual growth rate in e-commerce has been generally above 10% p.a (Danneck 2013). Warehouse operations, capacity management, transportation modes, production technology used, capacity constraints, cost structure, and inventory management issues are some of the significant challenges that retailers in the industry face today with the rapid growth of the e-commerce sector. Retailers operating through an online setup have started facing intense competition and cost pressure. Today, Inventory management is crucial in meeting the customer expectations of short delivery times. Retailers' operations in a brick and mortar stores in particular have increasingly faced the challenge of redesigning their warehouse and distribution processes and making them more flexible (Hübner et al., 2015).

Organizations today, especially those working in the retail sector, face many challenges in planning and managing resources. For this sector, having efficient management of human, technological, or material resources refers to the performance that companies characterized by the experience gained in their management could obtain over time. (Mou et al., 2018) This makes good inventory management essential, especially for organizations that specialize in retail. The role of inventory management is to ensure that stocks of raw material or other supplies, i.e., working progress and finished goods, are kept at levels that provide maximum service levels at minimum costs. (MacAs et al., 2021)

Inventory management has been one of the critical factors in many retail sectors for the past few years (Sridhar et al., 2021). Ensuring both product variety and optimal inventory level is always regarded as an operational challenge for retail outlets. (Sridhar et al., 2021) The COVID-19 pandemic has also had significant economic consequences globally. In particular, the world economy faces a negative supply stock because of the pandemic, which has forced factories to keep shutting down, thereby disrupting the global network of supply chains. (Chowdhury et al., 2020). Like other industries, the food and beverage industry has been hit hard by the impact of the COVID-19 pandemic, causing heavy losses in many sectors of the global economy. It is thus all the more crucial to explore the impacts of COVID-19 pandemic on the industry and to consider potential strategies for dealing with those impacts. (Chowdhury et al., 2020)

The term Industry 4.0 was coined to signify the fourth industrial revolution, a new era conceptualised as integrating the Internet of Things (IoT) into manufacturing environments so that machines can exchange information and operate autonomously in a smart factory setting (de Vass et al., 2021) To make Industry 4.0 a reality, all processes in the supply chain must be digitalised and automated. As the cyber-physical era advances,

supply chain management (SCM) must continue to face the growing challenges of digitalization while trying to achieve sustainability goals in a circular economy.

### **Literature Review:**

A wide database was used of various relevant research papers and articles with keywords such as “Inventory Management” AND “Retail” OR “Retail Sector” AND “Operations Research”

Databases such as Google Scholar, Science Direct and Z-library were also used. After finalising a list of few articles, we have conducted a deep review in this SLR paper.

Supply chain management (SCM) has received tremendous attention both from the business world and from academic researchers during the last 15 years (Prahinski & Kocabasoglu, 2006). Stock management is a complex topic that is taught widely in business schools as well as in industrial engineering programs. (Denis et al., 2006) It is a key issue to productivity and competitiveness. (Denis et al., 2006). Intra-chain comparative efficiency in retailing, has been addressed by several authors. (Barros & Alves, 2004). SCM arose through the gradual integration of logistics, distribution, marketing, operations, product design, product procurement and operations as channel members came to realize that they are part of a value chain extending from raw material extraction to finished goods consumption and that all channel participants could benefit by smoothing the flow of product, information, and title. (Brown et al., 2005)

The cooperation in the supply chain is a key factor to ensure minimizing time and cost and maximizing profit. Other factors such as transportation, consumer buying pattern and consumer demand have also been discussed in this paper. The Forward-reserve problem (FRP) is the problem of assigning products to the forward and reserve areas in order to reduce the overall work content in order picking (Strack & Pochet, 2010). The paper also highlights the quantity needed to order to maintain good inventory while also satisfying customer needs. This includes taking into account the procurement cost, holding cost, etc. Some basic policies are put into place to ensure smooth functioning of the supply chain. To achieve maximum effectiveness of supply chains, it became clear that integration, that is, the linking together of previously separate activities within a single system, was required (Sparks & Sparks, 2016). The crisis arising in supply chains have also been discussed and methods adopted to solve these crises have been put in place. This paper aims to propose a multi-structural framework of adaptive supply chain planning with structure dynamics considerations (Ivanov et al., 2010). Due to globalization companies are facing huge problems in relation to product assortment and variety plus maintaining inventory of fresh and convenient products. This problem is faced especially in the retail sectors that provide FMCG. Various demand and supply management techniques have been used to tackle this problem. The foregoing literature review shows that proper demand management through market segmentation, price discrimination, and a combination of supply methods can be an effective means to help organisations provide the required responsiveness to meet the different customer needs while attaining efficiency (Authors, 2013).

The integration of location and inventory decisions has a major impact on cutting costs and making the organization more efficient. Reacher's in the earlier stages considered inventory management and local modelling separately. Currently, Shen et al. (2003), and Daskin et al. (2002) have presented a join location – inventory model where shipment safety stock and location are included. This research has been the biases of several follow-up studies (Shen, 2005; Balcik, 2003; Teo and Shu, 2004; Shu et al., 2005). Recently, several research reviews have appeared that show a renewed interest in new methods and operational context (Ross et al., 2017). Some of these are Snyder (2006), Melo et al. (2009), and Daskin (2011).

Parlar and Berking's (1991) study used EOQ – based (economic order quantity) models and examined the link between expected cost and order size. They were amongst the earliest to study the stochastic nature of supply in

inventory models. Anthony Ross, Milad Khajehnezhad, Wilkistar Otieno and Osman Aydas in their paper (2016) have studied the location inventory model for a donation – demand driven industry. Demand and supply uncertainties, coverage radius restrictions, service level requirements, and numerous product considerations were all factors in this inventory-location dilemma.

Retailers have started to adopt multi - channel retailing due to the shift in retail practices to an online medium. Alexander Hübner et al. in his study of multi – channel retailing interview the top management of German – speaking countries about the network and warehouse operations. He found that network and inventory management is the basis for successful MC operations planning

Chiang and Monahan (2005) studied and analysed inventory policies and allocation based stock levels where they found that based stock levels for MC distribution centres and stores out performed those with single – channel strategies.

Maintaining acceptable quality and ideal inventory levels in the retail and warehouse sectors has become extremely difficult due to the changing customer behaviour, fierce rivalry, rapid technological advancement, and globalisation (Gupta et al., 2020). Analysing numerous indicators including enzymes, microorganisms, temperature, and humidity that provide significant issues while managing perishable goods is one of the monitoring and control parts of warehouse management that practitioners must perform. (Maheshwari et al., 2021)

The article focuses on presenting an extensive literature review concerning inventory control and management in the retail sector. First, the paper comprises of 2 main components:

1. systematic literature review regarding the Key Performance Indicators (KPIs) of inventory control and management in retail companies. (MacAs et al., 2021)
2. The main systems, methodologies, and tools used for inventory management are described. (MacAs et al., 2021)
3. Current trends in inventory handling and management in retail companies are outlined. (MacAs et al., 2021)

Organizations benefit from inventory control management by way of improved sales effectiveness, easy retrieval and storage of material, and reduced operational cost. (Khan et al., 2019) The study also found that there is a significant relationship between utility of inventory control management and operational feasibility in the customer related concerns of an organization and cost effectiveness technique are put into practice in order to improve the return on investment in the firm. (Khan et al., 2019)

Micro, Small, and Medium Enterprises (MSMEs) operating in the food retailing sector encounter two main concerns with respect to their perishable inventory management system, i.e., the product's shelf life and investment in warehouse monitoring systems. (Maheshwari et al., 2021) . New technologies like the Internet of Things (IoT), automated inventory control platforms, and automatic storage and retrieval systems offer effective solutions to these issues (Maheshwari et al., 2021)

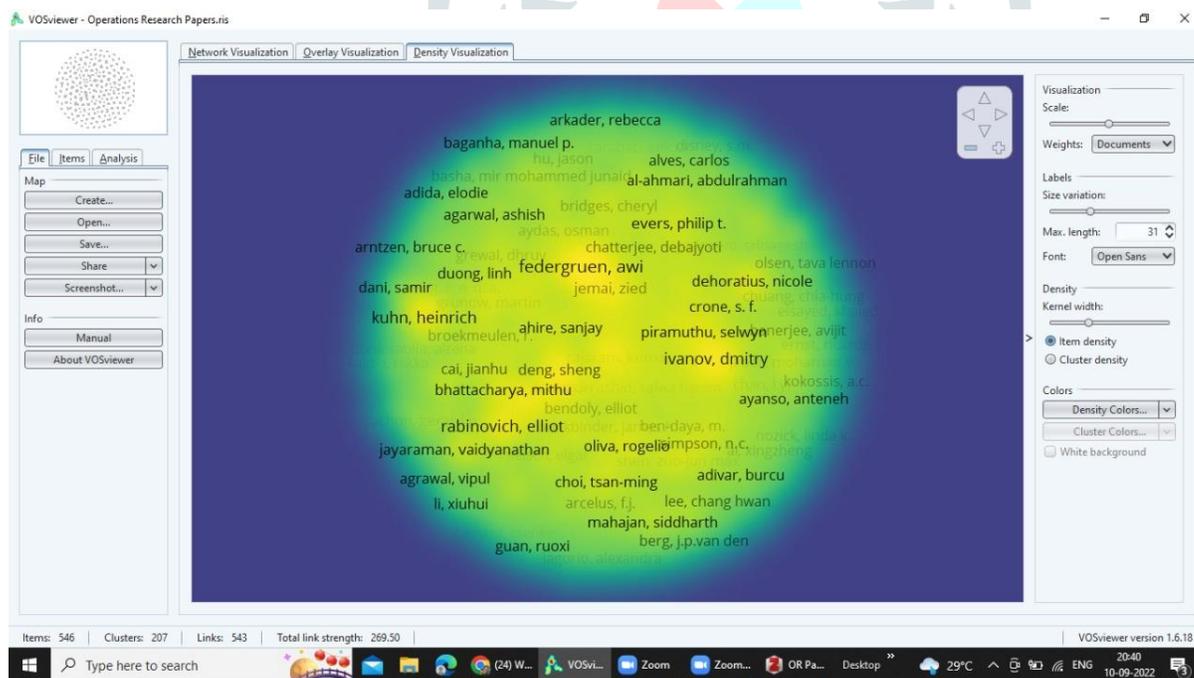
### **Methodology and Analysis:**

This section presents a bibliometric analysis of the authors, keywords presented in the referred papers. The authors from all the contributing articles are shown in Figure 1. Overlay visualization has been used. The clusters represent each paper and the smaller clusters used to make a larger cluster represents the number of authors who worked on each paper along with their names. Density visualization has been used in Figure 2. The higher the density of a particular color, the more number of authors have worked on that paper. The color can be shown

fading towards the outer edge of the circle which represents 2 or less author working on a paper used to make this analysis.

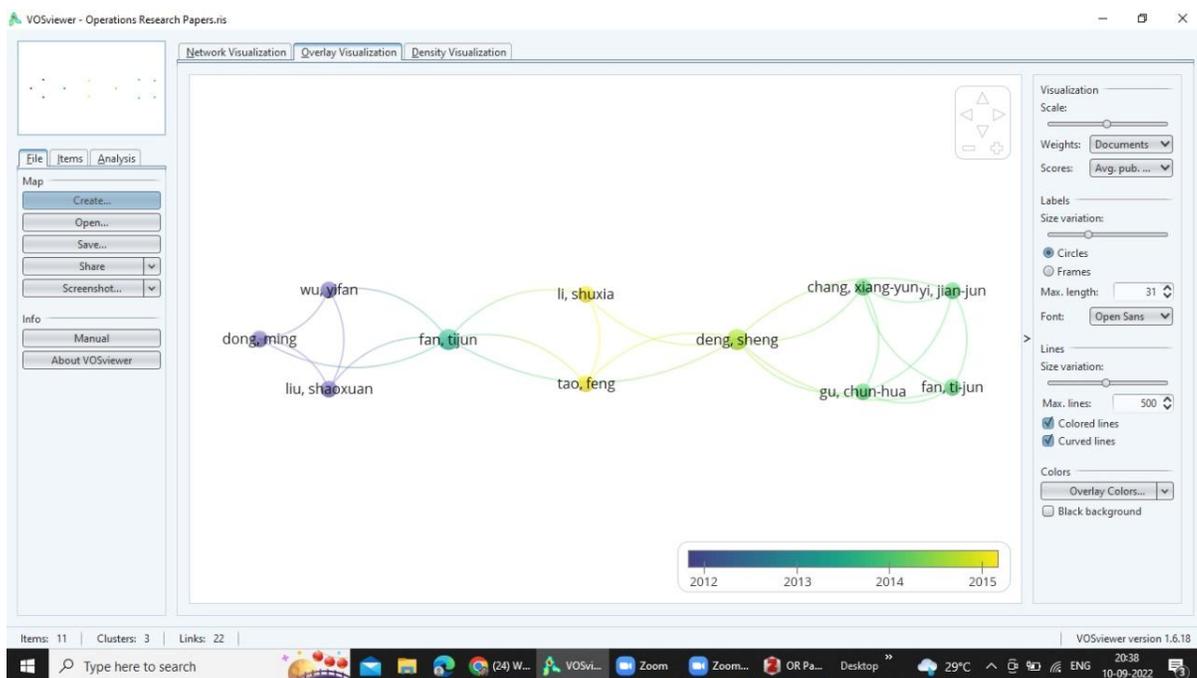


**Figure 1. Co- occurrence of authors used in the selected contributing papers (source: VOSviewer)**



**Figure 2. Density visualization of co- occurrence of authors used in the selected contributing papers (source: VOSviewer)**

The authors from all the contributing articles who are linked to each other have been shown in Figure 3. There are a total of 11 authors who have worked on more than one paper and are interlinked. Out of these authors; author deng, sheng have been linked the most as shown in Figure 4. They have been linked with 7 authors from other papers. Their average publication comes to the year 2014 and 6 months. They are sharing 2 documents with the other authors. These linkages depict that often authors have written multiple papers on the same subject

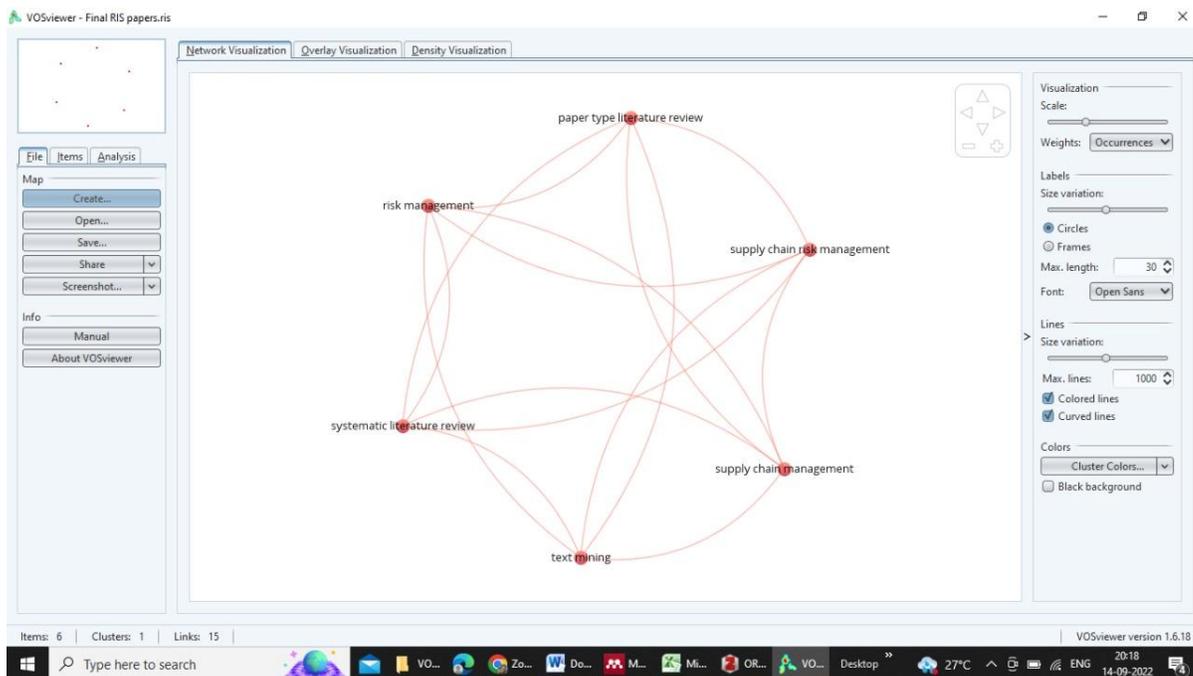


**Figure 3. Co- occurrence of authors used in the selected contributing papers who are inter-linked for more than one paper (source: VOSviewer)**



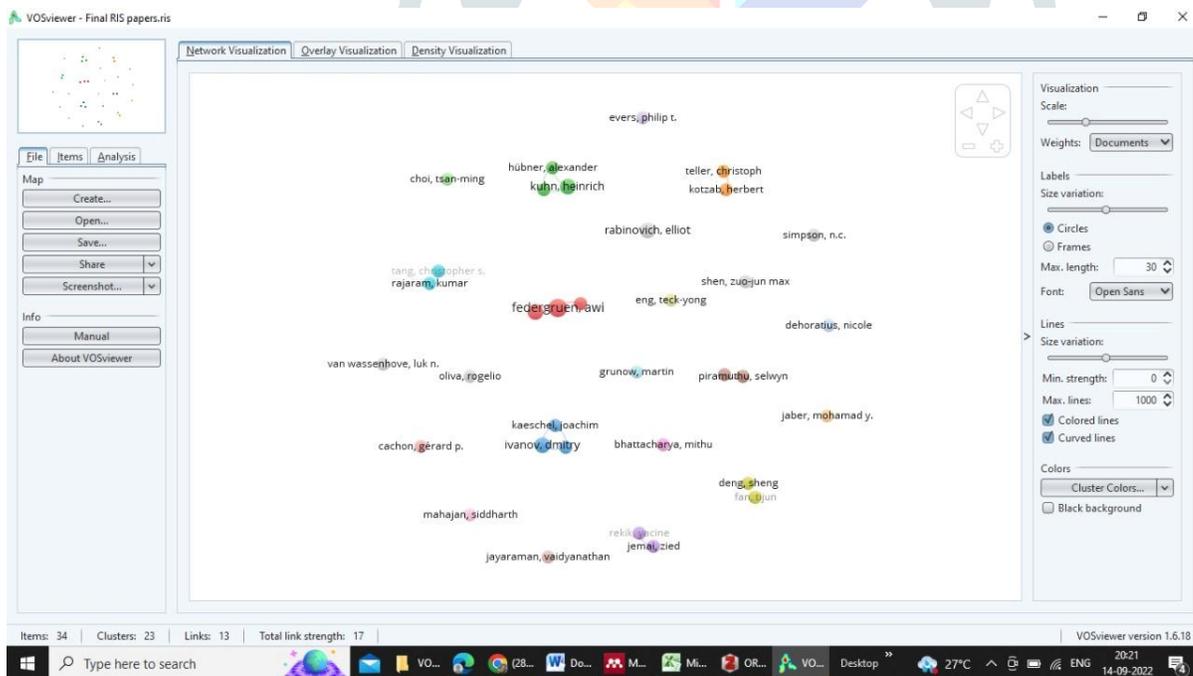
**Figure 4. Inter-linkage of author deng, sheng with other authors (source: VOSviewer)**

The keywords from all the contributing articles that are linked to each other have been shown in Figure 5. They have a total of 15 links. These represent the most used words appearing in the contributing paper keywords and are the basis of the literature review. Each individual keyword has 2 or more connections with another keyword. The most commonly used keyword is systematic literature review followed by supply chain management.



**Figure 5. Co-occurrence of keywords in the selected contributing papers (source: VOS viewer)**

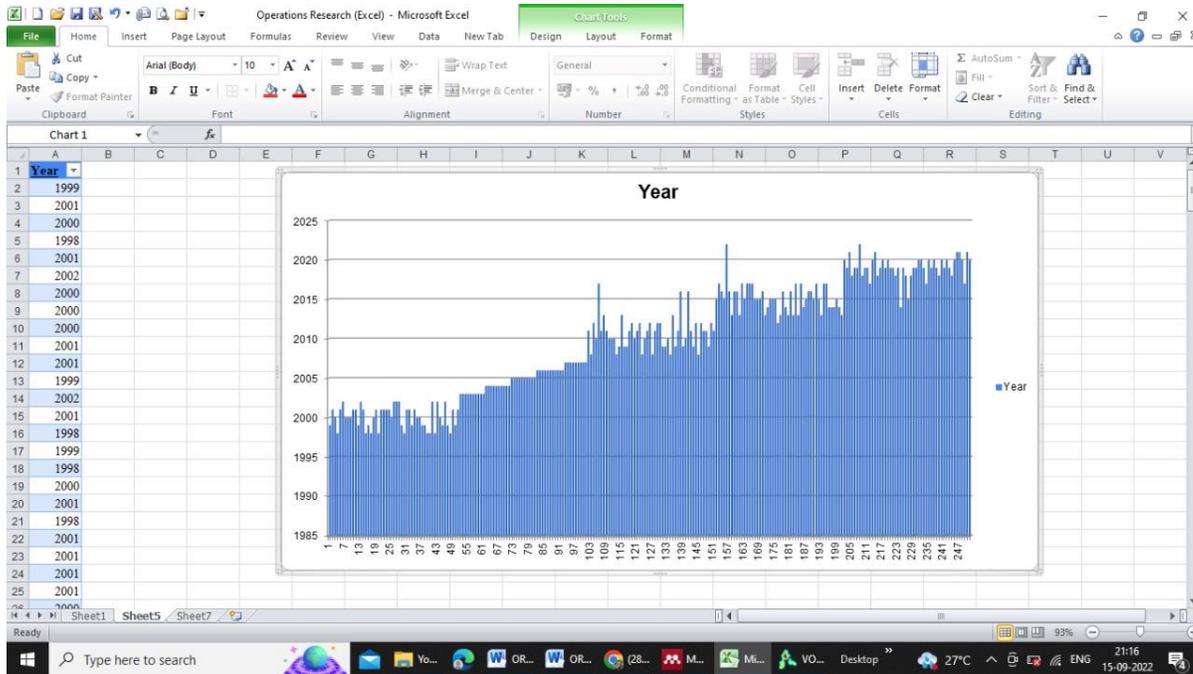
The authors from all the contributing articles that are linked or not linked to each other have been shown in Figure 6. The number of authors has significantly reduced due to the added rule of an author appearing in at least 2 papers or more. Thus only 34 authors meet the threshold. If we were to narrow it down further to authors appearing in 3 or more papers only 3 authors would meet the threshold. This shows us that few authors and their works have been repeatedly used and cited in the research paper.



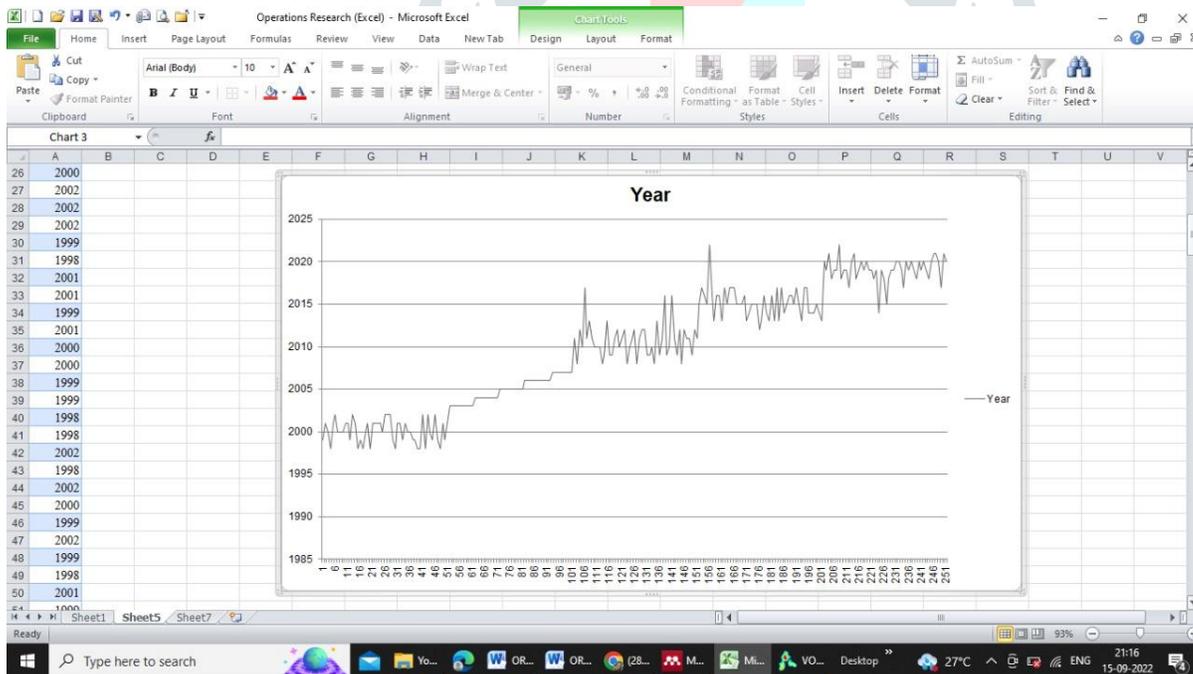
**Figure 6. Co- occurrence of authors used in the selected contributing papers who have contributed in minimum of 2 papers (source: VOSviewer)**

The years in which each contributing research paper has been taken is shown in Figure 7. & Figure 8. A 3-D bar graph has been used to depict the increasing number of papers through the years. As seen papers have drastically

increased for the years 2015 and 2020. The same has also been depicted through a line graph in Figure 8. The COVID-19 pandemic had affected supply chain and thus more papers could be found on the same.



**Figure 7. The number of contributing research papers increasing by each year in a 3D bar graph. (source: Microsoft Excel)**



**Figure 8. The number of contributing research papers increasing by each year in a line graph. (source: Microsoft Excel)**

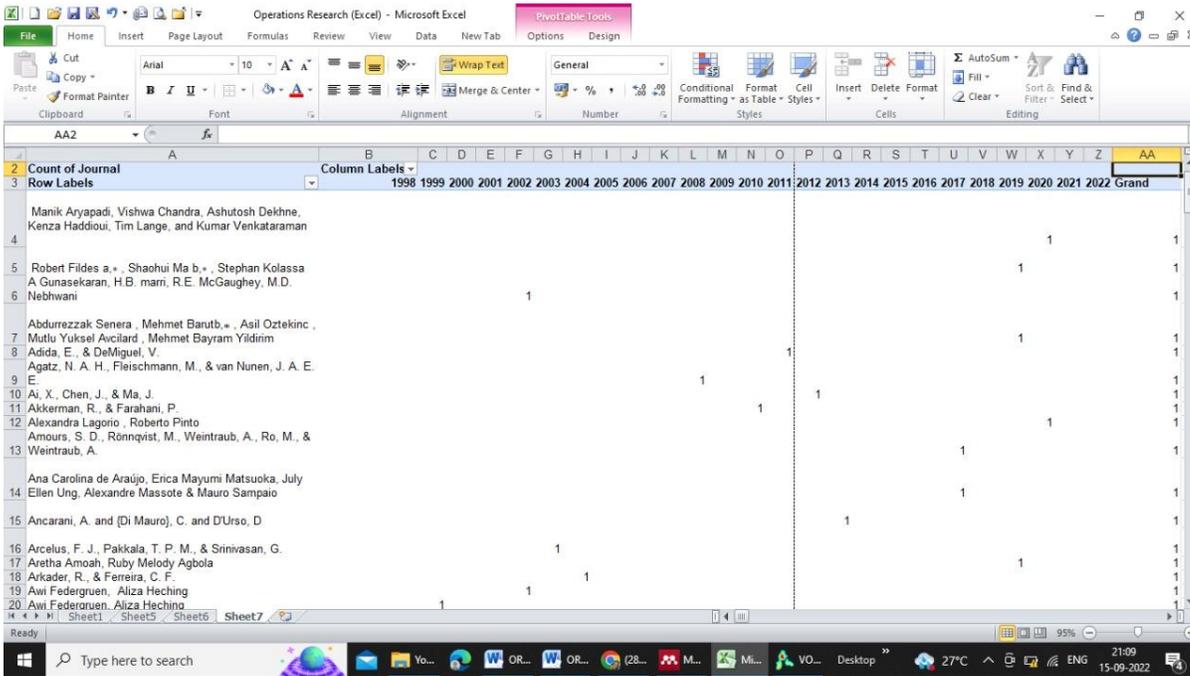


Figure 9. to Figure 20. Represents the publication year of each paper. It also shows the count of papers being published in each year. The count of each journal for each year is also present.

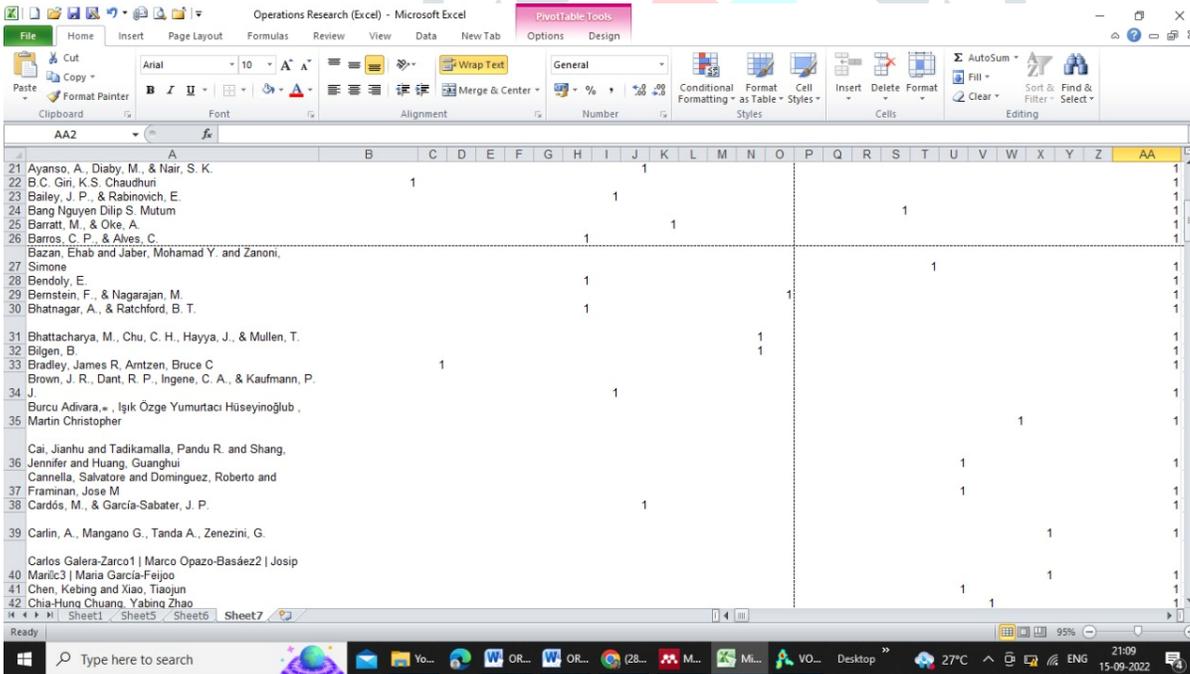


Figure 10.

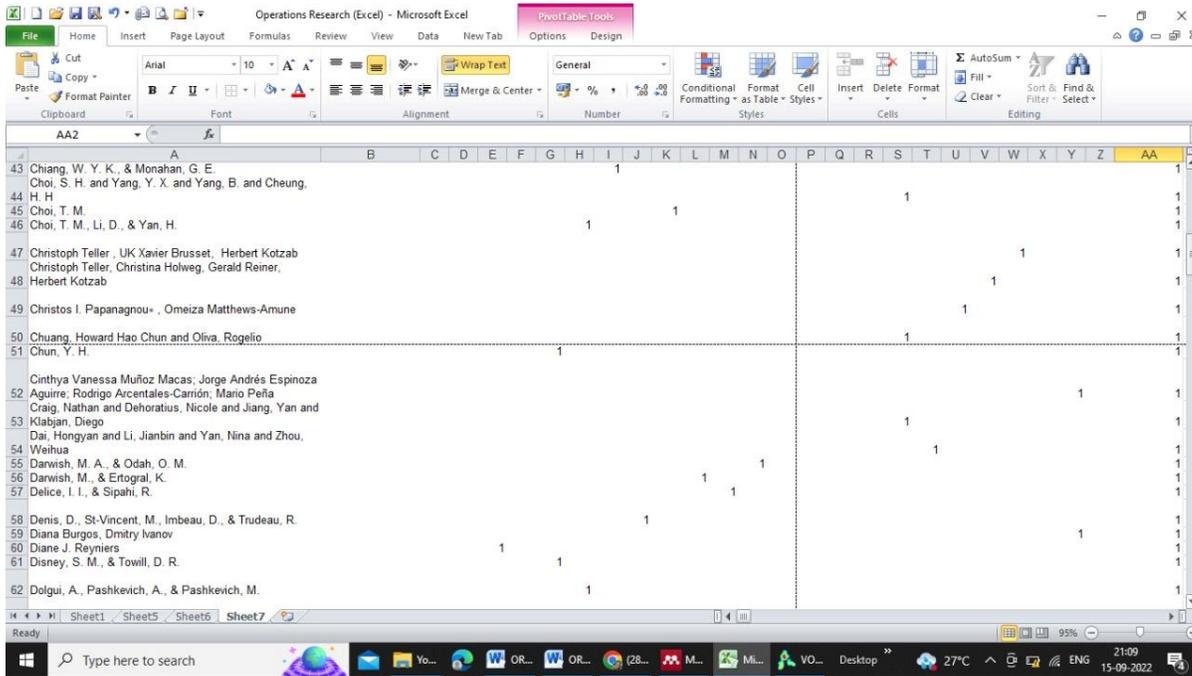


Figure 11.

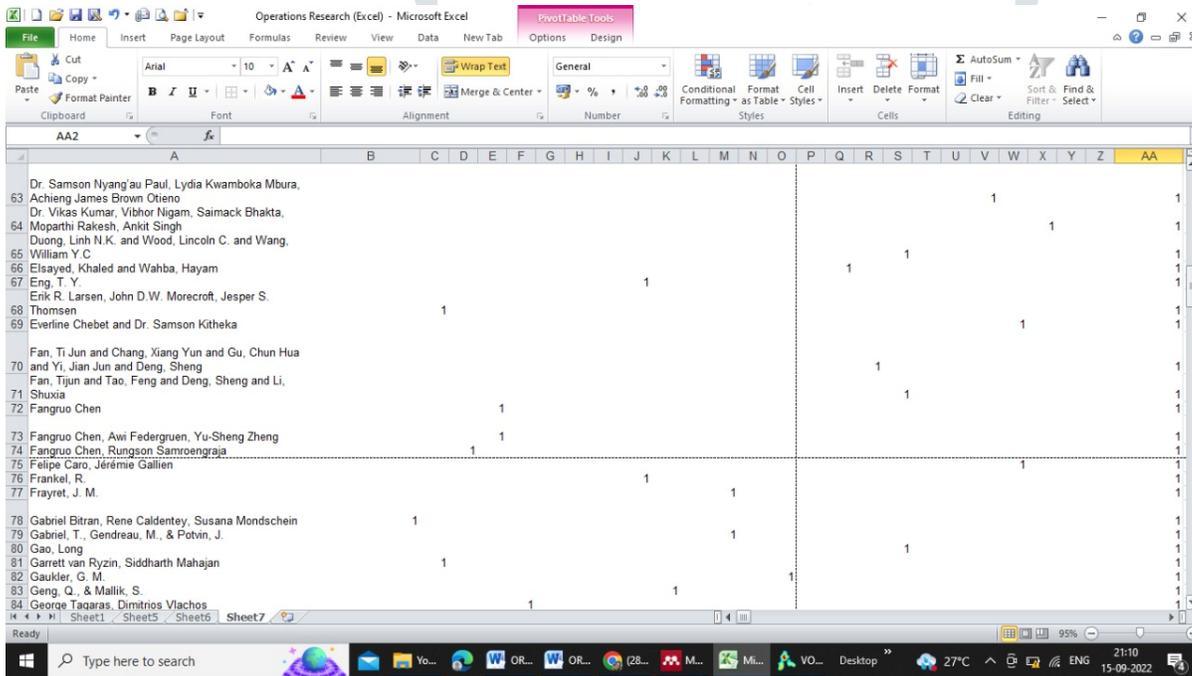


Figure 12.

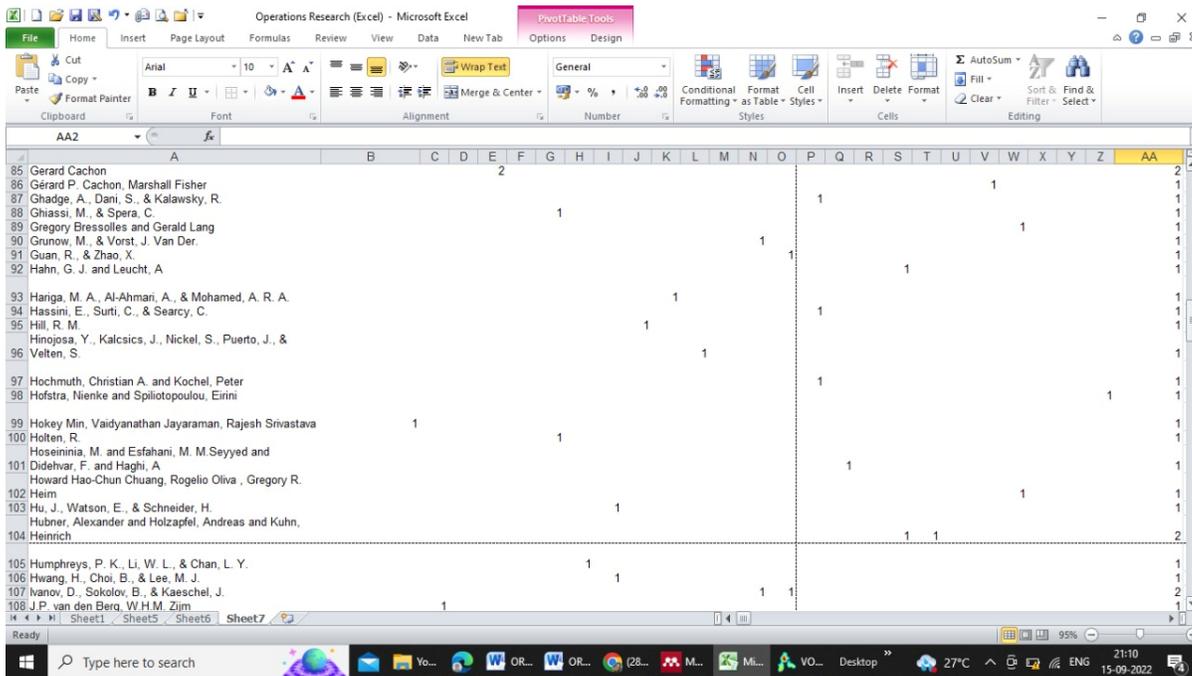


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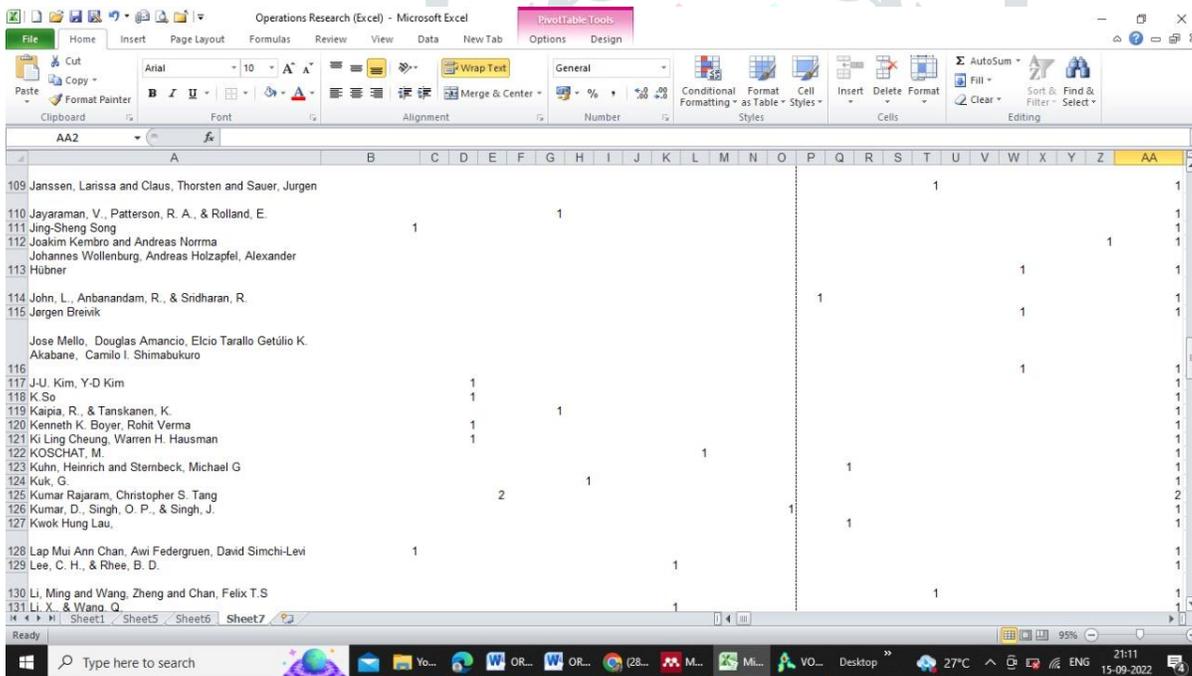


Figure 14.

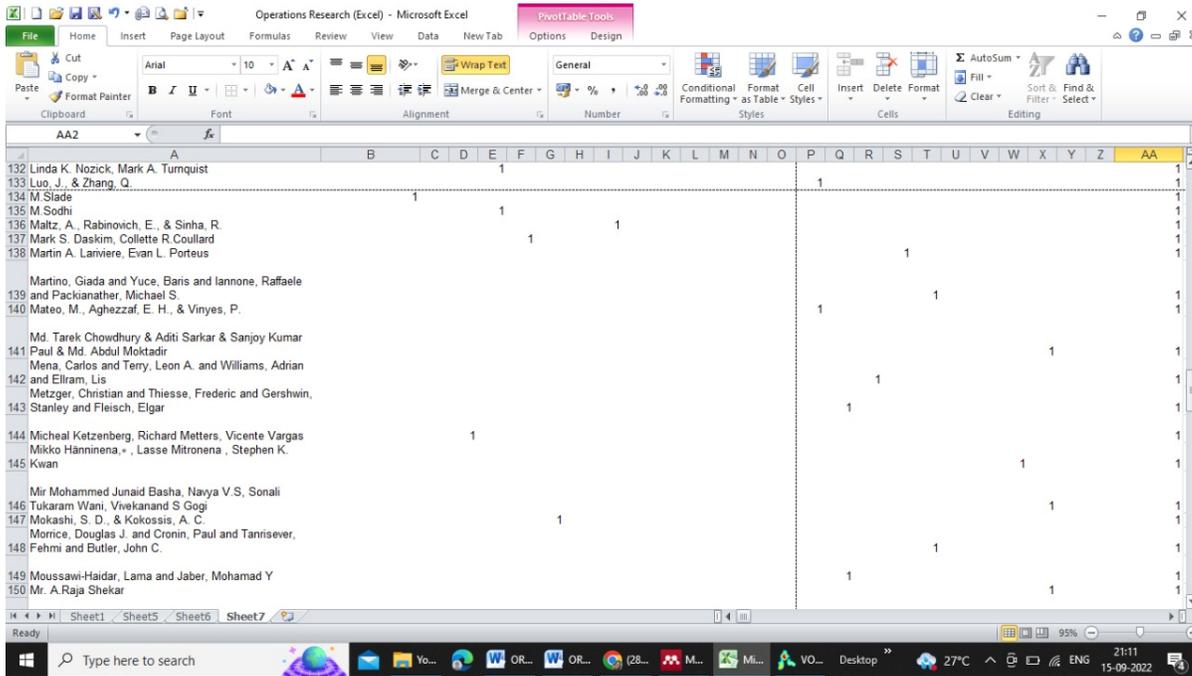


Figure 15.

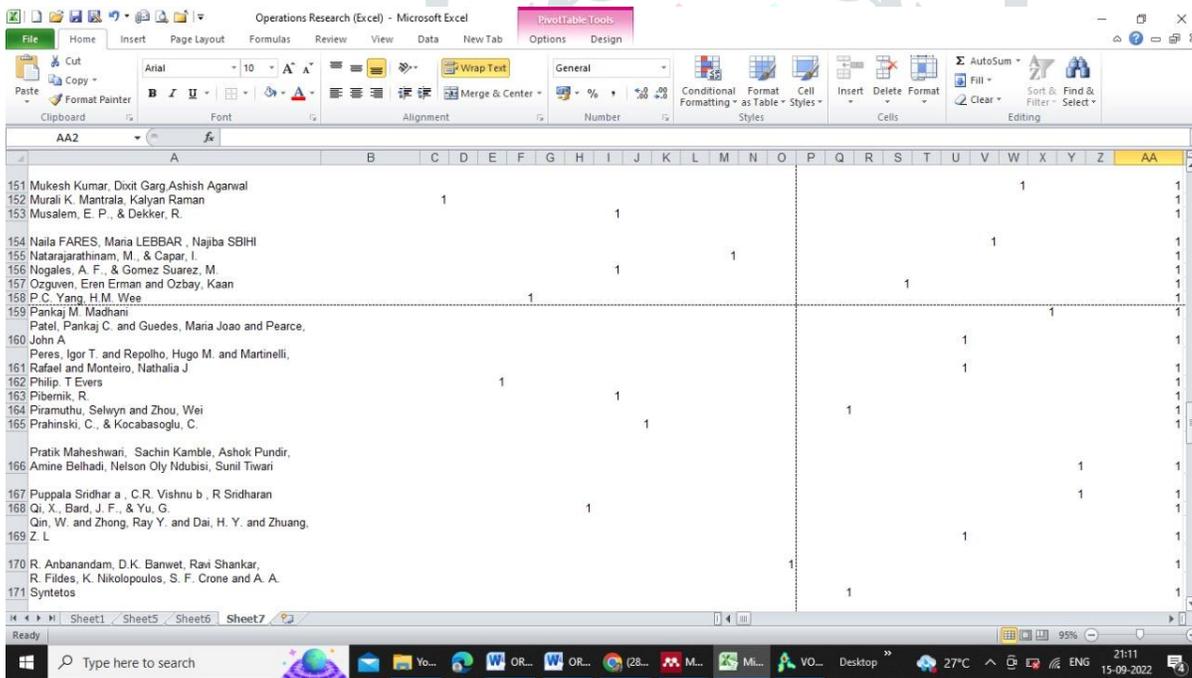


Figure 16.

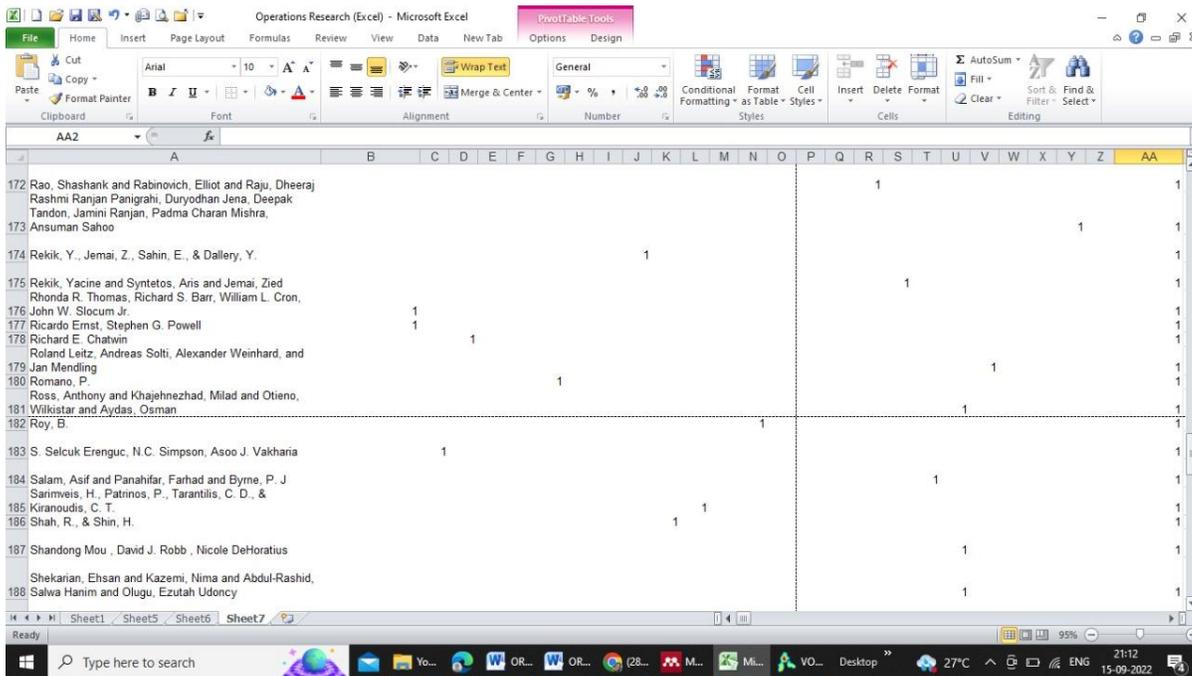


Figure 17.

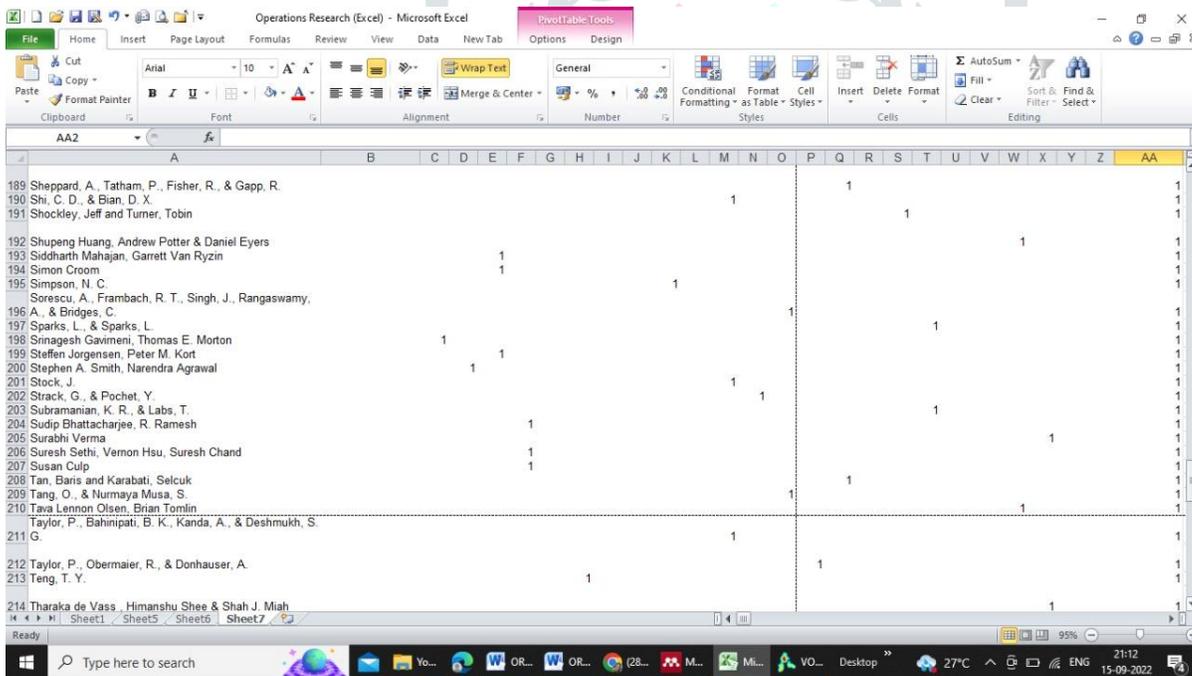


Figure 18.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
215 Thomas F. Golob and Amelia C. Regan					1																						1
216 Tiexin, C., Jingbo, Y., & Tao, G.																1											1
217 Timothy J. Richards, Bradley Rickard																											1
218 Transchel, Sandra																											1
219 Turan, Belma and Minner, Stefan and Hartl, Richard F																											1
220 Ulrich W. Thonemann, James R. Bradley Cornell						1																					1
221 Urban, T. L.																											1
222 V. Daniel R. Guide Jr., Luk N. Van Wassenhove																											1
223 Van der Vorst, J. G.A.J. Beulens, A. J.M.De Wit, W.																											1
224 Fransoo, J.																											1
225 Van Wassenhove, L. N., & Pedraza Martinez, A. J.																											1
226 Viipul Agrawal, S.Seshadri																											1
227 Vishal Gaur, Marshall L. Fisher, Ananth Raman																											1
228 Vlachos, Ilias P																											1
229 Wei Qi, Zuo-Jun Max Shen																											1
230 Wen, U.-P., Chen, Y.-C., & Cheung, K.-H.																											1
231 Wendy W. QU, James H. Bookbinder, Paul Iyogun																											1
232 Wessel Plenaar, W. J.																											1
233 White, L., & Lee, G. J.																											1
234 Wijffels, Luc and Giannikas, Vaggelis and Woodall, Philip and McFarlane, Duncan and Lu, Wenrong, William A. Muir, Stanley E. Griffis, and Judith M.																											1

Figure 19.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA				
235 William A. Muir, Stanley E. Griffis, and Judith M.																											1				
236 Whipple																											1				
237 Williams, Brent D. and Waller, Matthew A. and Ahire,																											1				
238 Sanjay and Ferrer, Gary D																											1				
239 Wu, Y., Dong, M., Fan, T., & Liu, S.																											1				
240 Xia, Min and Wong, W. K																											1				
241 Yan, C., Banerjee, A., & Yang, L.																											1				
242 Yang, Yanyan and Pan, Shenle and Ballot, Eric																											1				
243 Yan-Kwang Chen, Fei-Rung Chiu, Wen-Hsiang Lin, Yueh-Chuen Huang																											1				
244 Yao, Y., Evers, P. T., & Dresner, M. E.																											1				
245 Ydstie, B. E., Jillson, K. R., & Dozal-Mejorada, E. J.																											1				
246 Ye, Taofeng																											1				
247 Yehuda Bassok, Ravi Anupindi, Ram Akella																											1				
248 Yue Dai, Tianjun Feng, Christopher S. Tang, Xiaole Wu,																											1				
249 Fugiang Zhang																											1				
250 Zhao, Q. H., Wang, S. Y., & Lai, K. K																											1				
251 Zhou, Wei and Piramuthu, Selwyn																											1				
252 Zhou, Y. W., Lau, H. S., & Yang, S. L.																											1				
253 ZISOUDIS NIKOLAOS, KARELAKIS CHRISTOS, THEODOSSIOU GEORGE, LOIZOU EFSTRATIOS																											1				
254 Grand Total						9	10	9	15	8	10	10	10	11	9	6	9	8	12	10	12	8	14	11	14	8	18	13	5	2	251

Figure 20.

### Conclusion and Future Work:

This paper presented a literature review of different techniques of Operations Research applied in different dimensions of the retailing Sector. Although a lot of papers have been published in this area, like the approximately 250 research papers we have referred to, ranging from the years 1998-2022, very few review papers have been found. A systematic literature methodology and analysis has been conducted to review and identify the different domains of inventory management in retailing. Contributing to the academic discussion on this topic, we have taken effort to analyse most operations of this sector.

- (i) The barriers and Complex behaviour of production and distribution, like assuming that only *local* information is available to decision makers, which however is not unrealistic. (Larsen et al., 1999)

- (ii) Two out of the many important factors are time and price, but which one is more important? A numerical study analysed showed that different firm factors play an important role in differentiating the services of their firm. (So, 2000)
- (iii) Emergencies are treated wasteful and a sign of bad management. However, getting things right the first time is preferred, we learned that demand can be accurately forecasted every time and precautions can be taken. (Evers, 2001)

Supermarkets have different product groups, each having different logistics characteristics and therefore need different inventory control rules.(van Donselaar et al., 2006) In recent years, renewed attention is devoted in the literature to the multi-item newsvendor problem with substitution.(van Donselaar et al., 2006) The use of intermediate stocks of chips to relax the minimum order quantities facilitates a better control of the supply chain because of shorter lead times and more effective inventory strategies.(Musalem & Dekker, 2005) The retailer is the Stackelberg leader of the game and places an order first.(Geng & Mallik, 2007) We have characterized the conditions under which a manufacturer will satisfy a retailer's order in full.(Geng & Mallik, 2007) To develop an efficient outsourcing strategy, the retailers and retail chains should also consider their attitude towards the suppliers with direct deliveries.(Kaipia & Tanskanen, 2003) Retailers should systematically agree upon the division of the responsibility of functions between the vendors and the retailers.(Kaipia & Tanskanen, 2003) Outsourcing seems not to be a systematically chosen strategy in retailing, but has developed by evolution.(Kaipia & Tanskanen, 2003) The coordination of decentralized supply chain systems is more difficult: facing the same challenge to optimize system performance and also requiring a scheme to reallocate the benefits of coordination so as to maintain the interest and participation of all independent supply chain members.(Li & Wang, 2007)

Inventory management has proven to be very important for all companies to save cost and maximize profits. The smooth supply chain functioning is one of the reasons for an effective inventory control. Retailers have transformed supply chains by taking on their management and organization(Sparks & Sparks, 2016). Operations Researchers might argue that knowing the marginal efficiency at the current inventory level only – which is what we estimated and which is essentially the first derivative of the inventory/sales relationship at the current inventory level – is insufficient for determining the optimal inventory level(KOSCHAT, 2008). The most successful firms are those that regularly check on their inventory management techniques in association with their demand and supply and ensure that they have employed the best possible methods to maintain efficiency. However, this paper has many limitations too. The supply chain can be single-vendor multi-retailer, closed loop, etc. but this paper does not take into account those and therefore it only provides us with a limited idea of possible efficient inventory management decisions.

In conclusion, we would also like to acknowledge that in recent times, retailing has also expanded to e-commerce platforms which affects the management system and the operations of an organisation. Companies that have full potential and are ready to give it their best, E-commerce gives them a chance of a break-through and a wide area of change, including changed expectations from customers or just how an entirely different market is created. Evolving to e-retailing will give the company a competitive advantage which is necessary for success in the 21st century.

Retail companies play an important role in several countries due to their high economic contribution. Therefore, the need to analyse KPIs, as well as the various systems, methodologies, and tools used within the framework of inventory management and optimization becomes very important. From the above perspective, the main trends of inventory management in enterprises have been defined. In terms of KPIs, the results revealed key metrics in inventory management that retailers should consider when evaluating inventory. Among them, key indicators were identified: inventory levels, relationship between actual inventory levels and company information systems, scarcity or frequency of scarcity, frequency of product reorders or replenishments, service availability. level,

frequency of replacement, product availability, excess inventory, number of items on shelves, and amount of income or profit. These metrics enable organizations to understand and manage inventory well, and provide customers with a better picture of service quality and product availability. The importance of using metrics to evaluate your commodity management system is reflected in its key benefits. Reduced financial loss, improved operational performance, increased win rate.

Taken together, the evidence from these papers suggests that order volume, inventory localization, and optimization are the primary factors on which the systems, methods, and tools focus.

We would like to take into account the limitations of this study, as this study primarily focused on papers found in 2 databases that is Google Scholar and Science direct the above study does not take into account the potential other sources of information and knowledge. Thus, sources like books and research journals have not been indexed in the database. The research is also limited to the papers published in English and hence fails to take into account research and literature published in other languages have been ignored.

Companies face huge losses due to inventory inaccuracies and ticket switching. Ticket switching is a scenario where the consumer pays an amount that is less than the actual cost of the product because of the switching of its price identifiers (Zhou & Piramuthu, 2013). RFID technology has been critical in combating these problems. Various studies have analysed the impact of employing inventory control and supply chain profits in various kinds of supply chain and retail formats, further research can be conducted on the impact of RFID on other forms of inventory inaccuracy prevalent in the industry like misplacement, unreliable delivery or transactions. This will help expand the current models and will make them more applicable. Further research can also be concluded on real cases of RFID implementation and can be compared in by using analytical models to investigate the benefits and understand its applicability

### **Bibliography:**

- Authors, F. (2013). *Demand management in downstream wholesale and retail distribution : a case study*. <https://doi.org/10.1108/13598541211269247>
- Barros, C. P., & Alves, C. (2004). An empirical analysis of productivity growth in a Portuguese retail chain using Malmquist productivity index. *Journal of Retailing and Consumer Services*, 11(5), 269–278. [https://doi.org/10.1016/S0969-6989\(03\)00053-5](https://doi.org/10.1016/S0969-6989(03)00053-5)
- Brown, J. R., Dant, R. P., Ingene, C. A., & Kaufmann, P. J. (2005). Supply chain management and the evolution of the “Big Middle.” *Journal of Retailing*, 81(2 SPEC. ISS.), 97–105. <https://doi.org/10.1016/j.jretai.2005.03.002>
- Chowdhury, M. T., Sarkar, A., Paul, S. K., & Muktadir, M. A. (2020). A case study on strategies to deal with the impacts of COVID-19 pandemic in the food and beverage industry. *Operations Management Research*. <https://doi.org/10.1007/s12063-020-00166-9>
- de Vass, T., Shee, H., & Miah, S. J. (2021). lot in supply chain management: a narrative on retail sector sustainability. *International Journal of Logistics Research and Applications*, 24(6), 605–624. <https://doi.org/10.1080/13675567.2020.1787970>
- Denis, D., St-Vincent, M., Imbeau, D., & Trudeau, R. (2006). Stock management influence on manual materials handling in two warehouse superstores. *International Journal of Industrial Ergonomics*, 36(3), 191–201. <https://doi.org/10.1016/j.ergon.2005.11.002>
- Disney, S. M., & Towill, D. R. (2003). The effect of vendor managed inventory (VMI) dynamics on the Bullwhip Effect in supply chains. *International Journal of Production Economics*, 85(2), 199–215. [https://doi.org/10.1016/S0925-5273\(03\)00110-5](https://doi.org/10.1016/S0925-5273(03)00110-5)
- Frankel, R. (2006). The role and relevance of refocused inventory: Supply chain management solutions. *Business Horizons*, 49(4), 275–286. <https://doi.org/10.1016/j.bushor.2005.10.001>

- Geng, Q., & Mallik, S. (2007). Inventory competition and allocation in a multi-channel distribution system. *European Journal of Operational Research*, 182(2), 704–729. <https://doi.org/10.1016/j.ejor.2006.08.041>
- Hassini, E., Surti, C., & Searcy, C. (2012). Int. J. Production Economics A literature review and a case study of sustainable supply chains with a focus on metrics. *Intern. Journal of Production Economics*, 140(1), 69–82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Hübner, A., Holzapfel, A., & Kuhn, H. (2015). Operations management in multi-channel retailing: an exploratory study. *Operations Management Research*, 8(3–4), 84–100. <https://doi.org/10.1007/s12063-015-0101-9>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2010). A multi-structural framework for adaptive supply chain planning and operations control with structure dynamics considerations. *European Journal of Operational Research*, 200(2), 409–420. <https://doi.org/10.1016/j.ejor.2009.01.002>
- Kaipia, R., & Tanskanen, K. (2003). Vendor managed category management - An outsourcing solution in retailing. *Journal of Purchasing and Supply Management*, 9(4), 165–175. [https://doi.org/10.1016/S1478-4092\(03\)00009-8](https://doi.org/10.1016/S1478-4092(03)00009-8)
- Khan, F., Danish, D., & Siddiqui, A. (2019). Impact of Inventory Management on Firm's Efficiency-A Quantitative Research Study on Departmental Stores Operating in Karachi. *Social Science and Humanities Journal SSHJ*, 03(04), 964–980.
- KOSCHAT, M. (2008). Store inventory can affect demand: Empirical evidence from magazine retailing. *Journal of Retailing*, 84(2), 165–179. <https://doi.org/10.1016/j.jretai.2008.04.003>
- Kuk, G. (2004). Effectiveness of vendor-managed inventory in the electronics industry: Determinants and outcomes. *Information and Management*, 41(5), 645–654. <https://doi.org/10.1016/j.im.2003.08.002>
- MacAs, C. V. M., Aguirre, J. A. E., Arcentales-Carrion, R., & Pena, M. (2021). Inventory management for retail companies: A literature review and current trends. *Proceedings - 2021 2nd International Conference on Information Systems and Software Technologies, ICI2ST 2021*, 71–78. <https://doi.org/10.1109/ICI2ST51859.2021.00018>
- Maheshwari, P., Kamble, S., Pundir, A., Belhadi, A., Ndubisi, N. O., & Tiwari, S. (2021). Internet of things for perishable inventory management systems: an application and managerial insights for micro, small and medium enterprises. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-021-04277-9>
- Mou, S., Robb, D. J., & DeHoratius, N. (2018). Retail store operations: Literature review and research directions. *European Journal of Operational Research*, 265(2), 399–422. <https://doi.org/10.1016/j.ejor.2017.07.003>
- Musalem, E. P., & Dekker, R. (2005). Controlling inventories in a supply chain: A case study. *International Journal of Production Economics*, 93–94(SPEC.ISS.), 179–188. <https://doi.org/10.1016/j.ijpe.2004.06.016>
- Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. *Omega*, 34(6), 519–532. <https://doi.org/10.1016/j.omega.2005.01.003>
- Ross, A., Khajehnezhad, M., Otieno, W., & Aydas, O. (2017). Integrated location-inventory modelling under forward and reverse product flows in the used merchandise retail sector: A multi-echelon formulation. *European Journal of Operational Research*, 259(2), 664–676. <https://doi.org/10.1016/j.ejor.2016.10.036>
- Sparks, L., & Sparks, L. (2016). *Supply Chain Management and Retailing Supply Chain Management and Retailing*. 8312(April). <https://doi.org/10.1080/16258312.2010.11517242>
- Sridhar, P., Vishnu, C. R., & Sridharan, R. (2021). Simulation of inventory management systems in retail stores: A case study. *Materials Today: Proceedings*, 47(xxxx), 5130–5134. <https://doi.org/10.1016/j.matpr.2021.05.314>
- Strack, G., & Pochet, Y. (2010). An integrated model for warehouse and inventory planning. *European Journal of Operational Research*, 204(1), 35–50. <https://doi.org/10.1016/j.ejor.2009.09.006>
- van Donselaar, K., van Woensel, T., Broekmeulen, R., & Fransoo, J. (2006). Inventory control of perishables in supermarkets. *International Journal of Production Economics*, 104(2), 462–472. <https://doi.org/10.1016/j.ijpe.2004.10.019>
- Yao, Y., Evers, P. T., & Dresner, M. E. (2007). Supply chain integration in vendor-managed inventory. *Decision Support Systems*, 43(2), 663–674. <https://doi.org/10.1016/j.dss.2005.05.021>
- Zhao, Q. H., Wang, S. Y., & Lai, K. K. (2006). A partition approach to the inventory/routing problem. *European Journal of Operational Research*, 177(2), 786–802. <https://doi.org/10.1016/j.ejor.2005.11.030>

- Authors, F. (2013). *Demand management in downstream wholesale and retail distribution : a case study*. <https://doi.org/10.1108/13598541211269247>
- Barros, C. P., & Alves, C. (2004). An empirical analysis of productivity growth in a Portuguese retail chain using Malmquist productivity index. *Journal of Retailing and Consumer Services*, 11(5), 269–278. [https://doi.org/10.1016/S0969-6989\(03\)00053-5](https://doi.org/10.1016/S0969-6989(03)00053-5)
- Brown, J. R., Dant, R. P., Ingene, C. A., & Kaufmann, P. J. (2005). Supply chain management and the evolution of the “Big Middle.” *Journal of Retailing*, 81(2 SPEC. ISS.), 97–105. <https://doi.org/10.1016/j.jretai.2005.03.002>
- Chowdhury, M. T., Sarkar, A., Paul, S. K., & Moktadir, M. A. (2020). A case study on strategies to deal with the impacts of COVID-19 pandemic in the food and beverage industry. *Operations Management Research*. <https://doi.org/10.1007/s12063-020-00166-9>
- de Vass, T., Shee, H., & Miah, S. J. (2021). lot in supply chain management: a narrative on retail sector sustainability. *International Journal of Logistics Research and Applications*, 24(6), 605–624. <https://doi.org/10.1080/13675567.2020.1787970>
- Denis, D., St-Vincent, M., Imbeau, D., & Trudeau, R. (2006). Stock management influence on manual materials handling in two warehouse superstores. *International Journal of Industrial Ergonomics*, 36(3), 191–201. <https://doi.org/10.1016/j.ergon.2005.11.002>
- Disney, S. M., & Towill, D. R. (2003). The effect of vendor managed inventory (VMI) dynamics on the Bullwhip Effect in supply chains. *International Journal of Production Economics*, 85(2), 199–215. [https://doi.org/10.1016/S0925-5273\(03\)00110-5](https://doi.org/10.1016/S0925-5273(03)00110-5)
- Frankel, R. (2006). The role and relevance of refocused inventory: Supply chain management solutions. *Business Horizons*, 49(4), 275–286. <https://doi.org/10.1016/j.bushor.2005.10.001>
- Geng, Q., & Mallik, S. (2007). Inventory competition and allocation in a multi-channel distribution system. *European Journal of Operational Research*, 182(2), 704–729. <https://doi.org/10.1016/j.ejor.2006.08.041>
- Hassini, E., Surti, C., & Searcy, C. (2012). Int . J . Production Economics A literature review and a case study of sustainable supply chains with a focus on metrics. *Intern. Journal of Production Economics*, 140(1), 69–82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Hübner, A., Holzapfel, A., & Kuhn, H. (2015). Operations management in multi-channel retailing: an exploratory study. *Operations Management Research*, 8(3–4), 84–100. <https://doi.org/10.1007/s12063-015-0101-9>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2010). A multi-structural framework for adaptive supply chain planning and operations control with structure dynamics considerations. *European Journal of Operational Research*, 200(2), 409–420. <https://doi.org/10.1016/j.ejor.2009.01.002>
- Kaipia, R., & Tanskanen, K. (2003). Vendor managed category management - An outsourcing solution in retailing. *Journal of Purchasing and Supply Management*, 9(4), 165–175. [https://doi.org/10.1016/S1478-4092\(03\)00009-8](https://doi.org/10.1016/S1478-4092(03)00009-8)
- Khan, F., Danish, D., & Siddiqui, A. (2019). Impact of Inventory Management on Firm’s Efficiency-A Quantitative Research Study on Departmental Stores Operating in Karachi. *Social Science and Humanities Journal SSHJ*, 03(04), 964–980.
- KOSCHAT, M. (2008). Store inventory can affect demand: Empirical evidence from magazine retailing. *Journal of Retailing*, 84(2), 165–179. <https://doi.org/10.1016/j.jretai.2008.04.003>
- Kuk, G. (2004). Effectiveness of vendor-managed inventory in the electronics industry: Determinants and outcomes. *Information and Management*, 41(5), 645–654. <https://doi.org/10.1016/j.im.2003.08.002>
- MacAs, C. V. M., Aguirre, J. A. E., Arcentales-Carrion, R., & Pena, M. (2021). Inventory management for retail companies: A literature review and current trends. *Proceedings - 2021 2nd International Conference on Information Systems and Software Technologies, ICI2ST 2021*, 71–78. <https://doi.org/10.1109/ICI2ST51859.2021.00018>
- Maheshwari, P., Kamble, S., Pundir, A., Belhadi, A., Ndubisi, N. O., & Tiwari, S. (2021). Internet of things for perishable inventory management systems: an application and managerial insights for micro, small and medium enterprises. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-021-04277-9>

- Mou, S., Robb, D. J., & DeHoratius, N. (2018). Retail store operations: Literature review and research directions. *European Journal of Operational Research*, 265(2), 399–422. <https://doi.org/10.1016/j.ejor.2017.07.003>
- Musalem, E. P., & Dekker, R. (2005). Controlling inventories in a supply chain: A case study. *International Journal of Production Economics*, 93–94(SPEC.ISS.), 179–188. <https://doi.org/10.1016/j.ijpe.2004.06.016>
- Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. *Omega*, 34(6), 519–532. <https://doi.org/10.1016/j.omega.2005.01.003>
- Ross, A., Khajehnezhad, M., Otieno, W., & Aydas, O. (2017). Integrated location-inventory modelling under forward and reverse product flows in the used merchandise retail sector: A multi-echelon formulation. *European Journal of Operational Research*, 259(2), 664–676. <https://doi.org/10.1016/j.ejor.2016.10.036>
- Sparks, L., & Sparks, L. (2016). *Supply Chain Management and Retailing Supply Chain Management and Retailing*. 8312(April). <https://doi.org/10.1080/16258312.2010.11517242>
- Sridhar, P., Vishnu, C. R., & Sridharan, R. (2021). Simulation of inventory management systems in retail stores: A case study. *Materials Today: Proceedings*, 47(xxxx), 5130–5134. <https://doi.org/10.1016/j.matpr.2021.05.314>
- Strack, G., & Pochet, Y. (2010). An integrated model for warehouse and inventory planning. *European Journal of Operational Research*, 204(1), 35–50. <https://doi.org/10.1016/j.ejor.2009.09.006>
- van Donselaar, K., van Woensel, T., Broekmeulen, R., & Fransoo, J. (2006). Inventory control of perishables in supermarkets. *International Journal of Production Economics*, 104(2), 462–472. <https://doi.org/10.1016/j.ijpe.2004.10.019>
- Yao, Y., Evers, P. T., & Dresner, M. E. (2007). Supply chain integration in vendor-managed inventory. *Decision Support Systems*, 43(2), 663–674. <https://doi.org/10.1016/j.dss.2005.05.021>
- Zhao, Q. H., Wang, S. Y., & Lai, K. K. (2006). A partition approach to the inventory/routing problem. *European Journal of Operational Research*, 177(2), 786–802. <https://doi.org/10.1016/j.ejor.2005.11.030>
- Adida, E., & DeMiguel, V. (2011). Supply chain competition with multiple manufacturers and retailers. *Operations Research*, 59(1), 156–172. <https://doi.org/10.1287/opre.1100.0863>
- Agatz, N. A. H., Fleischmann, M., & van Nunen, J. A. E. E. (2008). E-fulfillment and multi-channel distribution - A review. *European Journal of Operational Research*, 187(2), 339–356. <https://doi.org/10.1016/j.ejor.2007.04.024>
- Ai, X., Chen, J., & Ma, J. (2012). Contracting with demand uncertainty under supply chain competition. *Annals of Operations Research*, 201(1), 17–38. <https://doi.org/10.1007/s10479-012-1227-x>
- Akkerman, R., & Farahani, P. (2010). *Quality, safety and sustainability in food distribution: a review of quantitative operations management approaches and challenges*. <https://doi.org/10.1007/s00291-010-0223-2>
- Amours, S. D., Rönnqvist, M., Weintraub, A., Ro, M., & Weintraub, A. (2017). *Using Operational Research for Supply Chain Planning in the Forest Products Industry Using Operational Research for Supply Chain Planning in the Forest Products Industry*. 5986(March). <https://doi.org/10.3138/infor.46.4.265>
- Authors, F. (2011). *Evaluation of supply chain collaboration: a case of apparel retail industry in India*. <https://doi.org/10.1108/17410401111101449>
- Authors, F. (2013). *Demand management in downstream wholesale and retail distribution: a case study*. <https://doi.org/10.1108/13598541211269247>
- Bernstein, F., & Nagarajan, M. (2011). Competition and cooperative bargaining models in supply chains. *Foundations and Trends in Technology, Information and Operations Management*, 5(2), 87–145. <https://doi.org/10.1561/02000000016>
- Bhattacharya, M., Chu, C. H., Hayya, J., & Mullen, T. (2010). An exploratory study of RFID adoption in the retail sector. *Operations Management Research*, 3(1), 80–89. <https://doi.org/10.1007/s12063-010-0029-z>
- Bilgen, B. (2010). Expert Systems with Applications Application of fuzzy mathematical programming approach to the production allocation and distribution supply chain network problem. *Expert Systems With Applications*, 37(6), 4488–4495. <https://doi.org/10.1016/j.eswa.2009.12.062>
- Darwish, M. A., & Odah, O. M. (2010). Vendor managed inventory model for single-vendor multi-retailer supply

- chains. *European Journal of Operational Research*, 204(3), 473–484. <https://doi.org/10.1016/j.ejor.2009.11.023>
- Darwish, M., & Ertogral, K. (2008). *The joint economic lot sizing problem : Review and extensions*. 185, 726–742. <https://doi.org/10.1016/j.ejor.2006.12.026>
- Delice, I. I., & Sipahi, R. (2009). Inventory dynamics models of supply chains with delays; System-level connection & stability. *Lecture Notes in Control and Information Sciences*, 388(617), 349–358. [https://doi.org/10.1007/978-3-642-02897-7\\_29](https://doi.org/10.1007/978-3-642-02897-7_29)
- Fildes, R. (2013). *and operational research : a review*. 59(9), 1150–1172. <https://doi.org/10.1057/palgrave.jors.2602597>
- Frayret, J. M. (2009). A multidisciplinary review of collaborative supply chain planning. *Conference Proceedings - IEEE International Conference on Systems, Man and Cybernetics, October*, 4414–4421. <https://doi.org/10.1109/ICSMC.2009.5346928>
- Gabriel, T., Gendreau, M., & Potvin, J. (2009). Intelligent freight-transportation systems : Assessment and the contribution of operations research. *Transportation Research Part C*, 17(6), 541–557. <https://doi.org/10.1016/j.trc.2008.07.002>
- Gaukler, G. M. (2011). *Item-Level RFID in a Retail Supply Chain With Stock-Out-Based Substitution*. 7(2), 362–370.
- Ghadge, A., Dani, S., & Kalawsky, R. (2012). *PAPER FROM THE 2011 ISL CONFERENCE Supply chain risk management : present and future scope*. 23(3), 313–339. <https://doi.org/10.1108/09574091211289200>
- Grunow, M., & Vorst, J. Van Der. (2010). *Food production and supply chain management*. 861–862. <https://doi.org/10.1007/s00291-010-0222-3>
- Guan, R., & Zhao, X. (2011). Pricing and inventory management in a system with multiple competing retailers under  $(r, Q)$  policies. *Computers and Operations Research*, 38(9), 1294–1304. <https://doi.org/10.1016/j.cor.2010.12.005>
- Hassini, E., Surti, C., & Searcy, C. (2012). Int . J . Production Economics A literature review and a case study of sustainable supply chains with a focus on metrics. *Intern. Journal of Production Economics*, 140(1), 69–82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Hinojosa, Y., Kalcsics, J., Nickel, S., Puerto, J., & Velten, S. (2008). Dynamic supply chain design with inventory. *Computers and Operations Research*, 35(2), 373–391. <https://doi.org/10.1016/j.cor.2006.03.017>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2010). A multi-structural framework for adaptive supply chain planning and operations control with structure dynamics considerations. *European Journal of Operational Research*, 200(2), 409–420. <https://doi.org/10.1016/j.ejor.2009.01.002>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2011). Integrated supply chain planning based on a combined application of operations research and optimal control. *Central European Journal of Operations Research*, 19(3), 299–317. <https://doi.org/10.1007/s10100-010-0185-0>
- John, L., Anbanandam, R., & Sridharan, R. (2012). *Humanitarian supply chain management : A critical review Humanitarian supply chain management : a critical review Lijo John , A . Ramesh and R . Sridharan \* . August 2016*. <https://doi.org/10.1504/IJSOM.2012.050143>
- KOSCHAT, M. (2008). Store inventory can affect demand: Empirical evidence from magazine retailing. *Journal of Retailing*, 84(2), 165–179. <https://doi.org/10.1016/j.jretai.2008.04.003>
- Kumar, D., Singh, O. P., & Singh, J. (2011). Design and analysis of different stages of supply chain: models and methods. *International Journal of Indian Culture and Business Management*, 4(2), 160. <https://doi.org/10.1504/ijicbm.2011.038915>
- Luo, J., & Zhang, Q. (2012). Trade credit: A new mechanism to coordinate supply chain. *Operations Research Letters*, 40(5), 378–384. <https://doi.org/10.1016/j.orl.2012.04.008>
- Mateo, M., Aghezzaf, E. H., & Vinyes, P. (2012). A combined inventory routing and game theory approach to solve a real-life distribution problem. *International Journal of Business Performance and Supply Chain Modelling*, 4(1), 75–89. <https://doi.org/10.1504/IJBPSM.2012.044975>
- Natarajarathinam, M., & Capar, I. (2009). *Managing supply chains in times of crisis : a review of literature and insights*. 39(7), 535–573. <https://doi.org/10.1108/09600030910996251>

- OR FORUM — The Evolution of Closed-Loop Supply Chain The Evolution of Closed-Loop Supply Chain Research. (2009). August 2014. <https://doi.org/10.1287/opre.1080.0628>
- Roy, B. (2010). Robustness in operational research and decision aiding : A multi-faceted issue. *European Journal of Operational Research*, 200(3), 629–638. <https://doi.org/10.1016/j.ejor.2008.12.036>
- Sarimveis, H., Patrinos, P., Tarantilis, C. D., & Kiranoudis, C. T. (2008). Dynamic modeling and control of supply chain systems: A review. *Computers and Operations Research*, 35(11), 3530–3561. <https://doi.org/10.1016/j.cor.2007.01.017>
- Sheppard, A., Tatham, P., Fisher, R., & Gapp, R. (2013). Journal of Humanitarian Logistics and Supply Chain Management Article Title Page. *Journal of Humanitarian Logistics and Supply Chain Management*, 3(1), 22–36.
- Shi, C. D., & Bian, D. X. (2009). Research on supply chain coordination under the price-sensitivity of demand. *2009 International Conference on Business Intelligence and Financial Engineering, BIFE 2009*, 714–717. <https://doi.org/10.1109/BIFE.2009.166>
- Sorescu, A., Frambach, R. T., Singh, J., Rangaswamy, A., & Bridges, C. (2011). Innovations in Retail Business Models. *Journal of Retailing*, 87, S3–S16. <https://doi.org/10.1016/j.jretai.2011.04.005>
- Sparks, L., & Sparks, L. (2016). *Supply Chain Management and Retailing Supply Chain Management and Retailing*. 8312(April). <https://doi.org/10.1080/16258312.2010.11517242>
- Stock, J. (2009). A research view of supply chain management: Developments and topics for exploration. *ORiON*, 25(2), 147–160. <https://doi.org/10.5784/25-2-79>
- Strack, G., & Pochet, Y. (2010). An integrated model for warehouse and inventory planning. *European Journal of Operational Research*, 204(1), 35–50. <https://doi.org/10.1016/j.ejor.2009.09.006>
- Subramanian, K. R., & Labs, T. (2016). *OPERATIONS RESEARCH - CONTEMPORARY ROLE IN MANAGERIAL DECISION OPERATIONS RESEARCH - CONTEMPORARY ROLE IN*. May 2010.
- Tang, O., & Nurmaya Musa, S. (2011). Identifying risk issues and research advancements in supply chain risk management. *International Journal of Production Economics*, 133(1), 25–34. <https://doi.org/10.1016/j.ijpe.2010.06.013>
- Taylor, P., Bahinipati, B. K., Kanda, A., & Deshmukh, S. G. (n.d.). *International Journal of Logistics Research and Applications : A Leading Journal of Supply Chain Management Coordinated supply management : review , insights , and limitations*. October 2014, 37–41. <https://doi.org/10.1080/13675560802476382>
- Taylor, P., Obermaier, R., & Donhauser, A. (2012). *Zero inventory and firm performance : a management paradigm revisited*. October 2014, 37–41. <https://doi.org/10.1080/00207543.2011.613869>
- Tiexin, C., Jingbo, Y., & Tao, G. (2008). Inventory modeling in supply chain management: A review. *2008 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2008*, 1–4. <https://doi.org/10.1109/WiCom.2008.1498>
- Van Wassenhove, L. N., & Pedraza Martinez, A. J. (2012). Using OR to adapt supply chain management best practices to humanitarian logistics. *International Transactions in Operational Research*, 19(1–2), 307–322. <https://doi.org/10.1111/j.1475-3995.2010.00792.x>
- Wen, U.-P., Chen, Y.-C., & Cheung, K.-H. (2011). Equal Pricing Strategies in a Dual Channel Supply Chain. *International Journal of Operations Research and Information Systems*, 2(4), 34–51. <https://doi.org/10.4018/joris.2011100103>
- Wessel Pienaar, W. J. (2011). Application of systems analysis and operations research methodology in the execution and control of business logistics processes. *Corporate Ownership and Control*, 9(1 B), 196–202.
- White, L., & Lee, G. J. (2009). Operational research and sustainable development: Tackling the social dimension. *European Journal of Operational Research*, 193(3), 683–692. <https://doi.org/10.1016/j.ejor.2007.06.057>
- Wu, Y., Dong, M., Fan, T., & Liu, S. (2012). Performance evaluation of supply chain networks with assembly structure under system disruptions. *Computers and Operations Research*, 39(12), 3229–3243. <https://doi.org/10.1016/j.cor.2012.04.006>
- Yan, C., Banerjee, A., & Yang, L. (2011). An integrated productiondistribution model for a deteriorating inventory item. *International Journal of Production Economics*, 133(1), 228–232. <https://doi.org/10.1016/j.ijpe.2010.04.025>

- Authors, F. (2013). *Demand management in downstream wholesale and retail distribution: a case study*. <https://doi.org/10.1108/13598541211269247>
- Barros, C. P., & Alves, C. (2004). An empirical analysis of productivity growth in a Portuguese retail chain using Malmquist productivity index. *Journal of Retailing and Consumer Services*, 11(5), 269–278. [https://doi.org/10.1016/S0969-6989\(03\)00053-5](https://doi.org/10.1016/S0969-6989(03)00053-5)
- Brown, J. R., Dant, R. P., Ingene, C. A., & Kaufmann, P. J. (2005). Supply chain management and the evolution of the “Big Middle.” *Journal of Retailing*, 81(2 SPEC. ISS.), 97–105. <https://doi.org/10.1016/j.jretai.2005.03.002>
- Chowdhury, M. T., Sarkar, A., Paul, S. K., & Moktadir, M. A. (2020). A case study on strategies to deal with the impacts of COVID-19 pandemic in the food and beverage industry. *Operations Management Research*. <https://doi.org/10.1007/s12063-020-00166-9>
- de Vass, T., Shee, H., & Miah, S. J. (2021). Iot in supply chain management: a narrative on retail sector sustainability. *International Journal of Logistics Research and Applications*, 24(6), 605–624. <https://doi.org/10.1080/13675567.2020.1787970>
- Denis, D., St-Vincent, M., Imbeau, D., & Trudeau, R. (2006). Stock management influence on manual materials handling in two warehouse superstores. *International Journal of Industrial Ergonomics*, 36(3), 191–201. <https://doi.org/10.1016/j.ergon.2005.11.002>
- Disney, S. M., & Towill, D. R. (2003). The effect of vendor managed inventory (VMI) dynamics on the Bullwhip Effect in supply chains. *International Journal of Production Economics*, 85(2), 199–215. [https://doi.org/10.1016/S0925-5273\(03\)00110-5](https://doi.org/10.1016/S0925-5273(03)00110-5)
- Frankel, R. (2006). The role and relevance of refocused inventory: Supply chain management solutions. *Business Horizons*, 49(4), 275–286. <https://doi.org/10.1016/j.bushor.2005.10.001>
- Geng, Q., & Mallik, S. (2007). Inventory competition and allocation in a multi-channel distribution system. *European Journal of Operational Research*, 182(2), 704–729. <https://doi.org/10.1016/j.ejor.2006.08.041>
- Hassini, E., Surti, C., & Searcy, C. (2012). Int . J . Production Economics A literature review and a case study of sustainable supply chains with a focus on metrics. *Intern. Journal of Production Economics*, 140(1), 69–82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Hübner, A., Holzapfel, A., & Kuhn, H. (2015). Operations management in multi-channel retailing: an exploratory study. *Operations Management Research*, 8(3–4), 84–100. <https://doi.org/10.1007/s12063-015-0101-9>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2010). A multi-structural framework for adaptive supply chain planning and operations control with structure dynamics considerations. *European Journal of Operational Research*, 200(2), 409–420. <https://doi.org/10.1016/j.ejor.2009.01.002>
- Kaipia, R., & Tanskanen, K. (2003). Vendor managed category management - An outsourcing solution in retailing. *Journal of Purchasing and Supply Management*, 9(4), 165–175. [https://doi.org/10.1016/S1478-4092\(03\)00009-8](https://doi.org/10.1016/S1478-4092(03)00009-8)
- Khan, F., Danish, D., & Siddiqui, A. (2019). Impact of Inventory Management on Firm’s Efficiency-A Quantitative Research Study on Departmental Stores Operating in Karachi. *Social Science and Humanities Journal SSHJ*, 03(04), 964–980.
- KOSCHAT, M. (2008). Store inventory can affect demand: Empirical evidence from magazine retailing. *Journal of Retailing*, 84(2), 165–179. <https://doi.org/10.1016/j.jretai.2008.04.003>

- Kuk, G. (2004). Effectiveness of vendor-managed inventory in the electronics industry: Determinants and outcomes. *Information and Management*, 41(5), 645–654. <https://doi.org/10.1016/j.im.2003.08.002>
- MacAs, C. V. M., Aguirre, J. A. E., Arcentales-Carrion, R., & Pena, M. (2021). Inventory management for retail companies: A literature review and current trends. *Proceedings - 2021 2nd International Conference on Information Systems and Software Technologies, ICI2ST 2021*, 71–78. <https://doi.org/10.1109/ICI2ST51859.2021.00018>
- Maheshwari, P., Kamble, S., Pundir, A., Belhadi, A., Ndubisi, N. O., & Tiwari, S. (2021). Internet of things for perishable inventory management systems: an application and managerial insights for micro, small and medium enterprises. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-021-04277-9>
- Mou, S., Robb, D. J., & DeHoratius, N. (2018). Retail store operations: Literature review and research directions. *European Journal of Operational Research*, 265(2), 399–422. <https://doi.org/10.1016/j.ejor.2017.07.003>
- Musalem, E. P., & Dekker, R. (2005). Controlling inventories in a supply chain: A case study. *International Journal of Production Economics*, 93–94(SPEC.ISS.), 179–188. <https://doi.org/10.1016/j.ijpe.2004.06.016>
- Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. *Omega*, 34(6), 519–532. <https://doi.org/10.1016/j.omega.2005.01.003>
- Ross, A., Khajehnezhad, M., Otieno, W., & Aydas, O. (2017). Integrated location-inventory modelling under forward and reverse product flows in the used merchandise retail sector: A multi-echelon formulation. *European Journal of Operational Research*, 259(2), 664–676. <https://doi.org/10.1016/j.ejor.2016.10.036>
- Sparks, L., & Sparks, L. (2016). *Supply Chain Management and Retailing Supply Chain Management and Retailing*. 8312(April). <https://doi.org/10.1080/16258312.2010.11517242>
- Sridhar, P., Vishnu, C. R., & Sridharan, R. (2021). Simulation of inventory management systems in retail stores: A case study. *Materials Today: Proceedings*, 47(xxxx), 5130–5134. <https://doi.org/10.1016/j.matpr.2021.05.314>
- Strack, G., & Pochet, Y. (2010). An integrated model for warehouse and inventory planning. *European Journal of Operational Research*, 204(1), 35–50. <https://doi.org/10.1016/j.ejor.2009.09.006>
- van Donselaar, K., van Woensel, T., Broekmeulen, R., & Fransoo, J. (2006). Inventory control of perishables in supermarkets. *International Journal of Production Economics*, 104(2), 462–472. <https://doi.org/10.1016/j.ijpe.2004.10.019>
- Yao, Y., Evers, P. T., & Dresner, M. E. (2007). Supply chain integration in vendor-managed inventory. *Decision Support Systems*, 43(2), 663–674. <https://doi.org/10.1016/j.dss.2005.05.021>
- Zhao, Q. H., Wang, S. Y., & Lai, K. K. (2006). A partition approach to the inventory/routing problem. *European Journal of Operational Research*, 177(2), 786–802. <https://doi.org/10.1016/j.ejor.2005.11.030>
- Authors, F. (2013). *Demand management in downstream wholesale and retail distribution: a case study*. <https://doi.org/10.1108/13598541211269247>
- Barros, C. P., & Alves, C. (2004). An empirical analysis of productivity growth in a Portuguese retail chain using Malmquist productivity index. *Journal of Retailing and Consumer Services*, 11(5), 269–278. [https://doi.org/10.1016/S0969-6989\(03\)00053-5](https://doi.org/10.1016/S0969-6989(03)00053-5)
- Brown, J. R., Dant, R. P., Ingene, C. A., & Kaufmann, P. J. (2005). Supply chain management and the evolution of the “Big Middle.” *Journal of Retailing*, 81(2 SPEC. ISS.), 97–105.

<https://doi.org/10.1016/j.jretai.2005.03.002>

- Chowdhury, M. T., Sarkar, A., Paul, S. K., & Moktadir, M. A. (2020). A case study on strategies to deal with the impacts of COVID-19 pandemic in the food and beverage industry. *Operations Management Research*. <https://doi.org/10.1007/s12063-020-00166-9>
- de Vass, T., Shee, H., & Miah, S. J. (2021). lot in supply chain management: a narrative on retail sector sustainability. *International Journal of Logistics Research and Applications*, 24(6), 605–624. <https://doi.org/10.1080/13675567.2020.1787970>
- Denis, D., St-Vincent, M., Imbeau, D., & Trudeau, R. (2006). Stock management influence on manual materials handling in two warehouse superstores. *International Journal of Industrial Ergonomics*, 36(3), 191–201. <https://doi.org/10.1016/j.ergon.2005.11.002>
- Disney, S. M., & Towill, D. R. (2003). The effect of vendor managed inventory (VMI) dynamics on the Bullwhip Effect in supply chains. *International Journal of Production Economics*, 85(2), 199–215. [https://doi.org/10.1016/S0925-5273\(03\)00110-5](https://doi.org/10.1016/S0925-5273(03)00110-5)
- Frankel, R. (2006). The role and relevance of refocused inventory: Supply chain management solutions. *Business Horizons*, 49(4), 275–286. <https://doi.org/10.1016/j.bushor.2005.10.001>
- Geng, Q., & Mallik, S. (2007). Inventory competition and allocation in a multi-channel distribution system. *European Journal of Operational Research*, 182(2), 704–729. <https://doi.org/10.1016/j.ejor.2006.08.041>
- Hassini, E., Surti, C., & Searcy, C. (2012). Int . J . Production Economics A literature review and a case study of sustainable supply chains with a focus on metrics. *Intern. Journal of Production Economics*, 140(1), 69–82. <https://doi.org/10.1016/j.ijpe.2012.01.042>
- Hübner, A., Holzapfel, A., & Kuhn, H. (2015). Operations management in multi-channel retailing: an exploratory study. *Operations Management Research*, 8(3–4), 84–100. <https://doi.org/10.1007/s12063-015-0101-9>
- Ivanov, D., Sokolov, B., & Kaeschel, J. (2010). A multi-structural framework for adaptive supply chain planning and operations control with structure dynamics considerations. *European Journal of Operational Research*, 200(2), 409–420. <https://doi.org/10.1016/j.ejor.2009.01.002>
- Kaipia, R., & Tanskanen, K. (2003). Vendor managed category management - An outsourcing solution in retailing. *Journal of Purchasing and Supply Management*, 9(4), 165–175. [https://doi.org/10.1016/S1478-4092\(03\)00009-8](https://doi.org/10.1016/S1478-4092(03)00009-8)
- Khan, F., Danish, D., & Siddiqui, A. (2019). Impact of Inventory Management on Firm's Efficiency-A Quantitative Research Study on Departmental Stores Operating in Karachi. *Social Science and Humanities Journal SSHJ*, 03(04), 964–980.
- KOSCHAT, M. (2008). Store inventory can affect demand: Empirical evidence from magazine retailing. *Journal of Retailing*, 84(2), 165–179. <https://doi.org/10.1016/j.jretai.2008.04.003>
- Kuk, G. (2004). Effectiveness of vendor-managed inventory in the electronics industry: Determinants and outcomes. *Information and Management*, 41(5), 645–654. <https://doi.org/10.1016/j.im.2003.08.002>
- MacAs, C. V. M., Aguirre, J. A. E., Arcentales-Carrion, R., & Pena, M. (2021). Inventory management for retail companies: A literature review and current trends. *Proceedings - 2021 2nd International Conference on Information Systems and Software Technologies, IC2ST 2021*, 71–78.

<https://doi.org/10.1109/ICI2ST51859.2021.00018>

- Maheshwari, P., Kamble, S., Pundir, A., Belhadi, A., Ndubisi, N. O., & Tiwari, S. (2021). Internet of things for perishable inventory management systems: an application and managerial insights for micro, small and medium enterprises. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-021-04277-9>
- Mou, S., Robb, D. J., & DeHoratius, N. (2018). Retail store operations: Literature review and research directions. *European Journal of Operational Research*, 265(2), 399–422. <https://doi.org/10.1016/j.ejor.2017.07.003>
- Musalem, E. P., & Dekker, R. (2005). Controlling inventories in a supply chain: A case study. *International Journal of Production Economics*, 93–94(SPEC.ISS.), 179–188. <https://doi.org/10.1016/j.ijpe.2004.06.016>
- Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. *Omega*, 34(6), 519–532. <https://doi.org/10.1016/j.omega.2005.01.003>
- Ross, A., Khajehnezhad, M., Otieno, W., & Aydas, O. (2017). Integrated location-inventory modelling under forward and reverse product flows in the used merchandise retail sector: A multi-echelon formulation. *European Journal of Operational Research*, 259(2), 664–676. <https://doi.org/10.1016/j.ejor.2016.10.036>
- Sparks, L., & Sparks, L. (2016). *Supply Chain Management and Retailing Supply Chain Management and Retailing*. 8312(April). <https://doi.org/10.1080/16258312.2010.11517242>
- Sridhar, P., Vishnu, C. R., & Sridharan, R. (2021). Simulation of inventory management systems in retail stores: A case study. *Materials Today: Proceedings*, 47(xxxx), 5130–5134. <https://doi.org/10.1016/j.matpr.2021.05.314>
- Strack, G., & Pochet, Y. (2010). An integrated model for warehouse and inventory planning. *European Journal of Operational Research*, 204(1), 35–50. <https://doi.org/10.1016/j.ejor.2009.09.006>
- van Donselaar, K., van Woensel, T., Broekmeulen, R., & Fransoo, J. (2006). Inventory control of perishables in supermarkets. *International Journal of Production Economics*, 104(2), 462–472. <https://doi.org/10.1016/j.ijpe.2004.10.019>
- Yao, Y., Evers, P. T., & Dresner, M. E. (2007). Supply chain integration in vendor-managed inventory. *Decision Support Systems*, 43(2), 663–674. <https://doi.org/10.1016/j.dss.2005.05.021>
- Zhao, Q. H., Wang, S. Y., & Lai, K. K. (2006). A partition approach to the inventory/routing problem. *European Journal of Operational Research*, 177(2), 786–802. <https://doi.org/10.1016/j.ejor.2005.11.030>