Journal of Management and Innovation Entrepreunership (JMIE)
Volume 3, No 3 – April 2026
e-ISSN : 3026-6505

BIBLIOMETRIC ANALYSIS AND SYSTEMATIC LITERATURE REVIEW: INTEGRATING PRODUCTION PLANNING AND FORECASTING IN MANUFACTURING AND REMANUFACTURING INDUSTRIES.

Rianzah Munawaroh[1], Eni Noviani[2], Alfan Fakhrul Rozi[3], Puji Handayani[4], Nurika Restuningdiah[5]
[1,2,3,4,5] University of Malang, Malang, Indonesia
[1] rianzah.munawaroh.2504158@students.um.ac.id
[2] eni.noviani.2504158@students.um.ac.id
[3] alfan.fakhrul.2504158@students.um.ac.id
[4] puji.handayati.fe@um.ac.id
[5] nurika.restuningdiah.fe@um.ac.id

Received: 28-052- 2026	Revised: 15-04-2026	Approved: 26-04-2026

ABSTRACT

In facing intense market competition and environmental sustainability demands, companies require accurate production planning and forecasting to avoid losses resulting from errors in demand predictions. This research aims to explore the relationship between production planning and forecasting with various analytical tools, as well as to map the methods and practices used by the manufacturing and remanufacturing industries. The method used is a combination of bibliometric analysis and systematic literature review (SLR). The bibliometric analysis, conducted using VOSviewer software, serves to quantitatively map publication trends, co-authorship networks, keyword co-occurrence, and thematic clusters within the existing literature, thereby revealing the intellectual structure of the field. The SLR complements this by providing a qualitative, step-by-step synthesis of the selected studies, ensuring a rigorous and reproducible evaluation of the evidence. Data were sourced from the Scopus and ScienceDirect databases covering the period 2021–2026. From an initial set of 214 articles, a screening process based on relevance, methodology, and alignment with the research questions was applied, The result in the selection of the 10 most relevant articles for in-depth analysis. The study found that no single forecasting method is best for all situations, its effectiveness depends on contexts such as demand volatility, product lifecycle stage, and sustainability constraints. Dynamic forecasting integrated with strategic planning is more resilient to external disruptions. The current research trend is shifting to hybrid models that combine machine learning with traditional statistical methods. The key challenge going forward is bridging the gap between state-of-the-art methods and industry realities, especially for SMEs that lack technical and financial resources. The solution needed is an adaptive framework that responds to disruptions in real time and balances predictive accuracy with practical application.

Keywords: *Accounting, Forecasting, Planning, Accounting, Sustainable*

INTRODUCTION

The need to implement sustainable development models has become a real challenge for various organizations and governments globally (Mira et al., 2025). Currently, to remain competitive in the market, producers are required to produce high-quality products at low costs, to perform customization in a short time, to maintain flexibility, and to respond quickly to changes in customer demand (Bukhori & Rahmi, 2025). On the other hand, concern for environmental sustainability has also become a very important matter. In recent years, various methods with different approaches have emerged to analyze the complexity of

production processes (Efthymiou et al., 2016).

This condition drives production managers and business managers to use tools that are capable of modeling, designing, and analyzing production systems mathematically. These tools help them to design robust policies in the face of various disruptions, while also reducing the negative impact of uncertainty on the production environment (Browning et al., 2023). Production Planning and Control constitutes one of the important tasks in a production system (Long et al., 2025). Specifically, production demand planning plays a crucial role because it is developed based on predictions or forecasts of future demand (Swierczek, 2020).

Recent developments in the literature indicate that production forecasting challenges are becoming increasingly complex with the demands of sustainability and digitalization. Recent research by Erdmann et al. (2025) highlighted that in the remanufacturing industry, the main challenge lies in forecasting the quantity, timing, and condition of product returns (core returns). This study identified the lack of remanufacturing-specific datasets and integrated models as major barriers to the effective application of machine learning. Meanwhile, in the general manufacturing sector, Zhang et al. (2025) developed an Enhanced Hybrid Deep Neural Network (EH-DNN) capable of accommodating varying operating conditions and manual intervention. This framework, with 94% accuracy, significantly bridges the gap between theoretical models and industry reality.

In the context of MSMEs, an editorial in the Annals of Operations Research (2025) confirmed that the adoption of Industry 4.0 and analytics can improve the efficiency and resilience of MSMEs (Venkatesh, 2025). However, challenges such as data complexity and the lack of suitable analytical tools still hamper implementation. Similarly, a bibliometric and systematic study by Wang et al. (2025) on remanufacturing scheduling revealed a shift from deterministic models to frameworks sensitive to uncertainty and sustainability, with reinforcement learning and digital twins as future trends.

The main challenge is how to find the best modeling strategy in order to produce predictions that are statistically accurate and efficient. In reality, frequent forecasting calculation errors by managers result in the production department becoming overwhelmed due to sudden high demand. Therefore, a review of sales forecasting must be conducted to optimize employee productivity (Hudaningsih et al., 2020). Determining an actual and correct production plan is a primary matter for organizations to avoid significant losses due to errors in predicting production volume. Furthermore, the current phenomenon shows that many organizations still face difficulties in forecasting future production volume (Ahmad, 2020).

Bibliometric analysis can help identify existing patterns in previous research, including frequently discussed topics, methodologies used, and results achieved. By analyzing relevant publications, this research can provide a clear overview of knowledge development in the field of accounting, especially in planning and forecasting analysis. Furthermore, it is important to consider how accounting information can be integrated into the control process. By understanding the ways in which this information can be used effectively, managers can improve the quality of their decisions.

An information system is a set of methods that processes data and transforms it into information that can be calculated, compared, presented, and interpreted. Computer-based strategic management accounting is capable of collecting, storing, processing, and reporting financial and accounting data (Putra & Salsabila, 2025). An information system also enables the acquisition, recording, processing, and transmission of information, which is always present in business for communication purposes, decision-making, and use as a competitive tool in a competitive market (Gurbaxani & Whang, 1991)

Managers are faced with various problems related to business activities almost every day during that period, and they make decisions and implement them to solve these problems (Beerepoot et al., 2023). Most of the data that serves as the basis for decision-making is obtained from the company's accounting information system. One of the main tasks of modern accounting information systems, which has emerged as a result of current technological developments in the fields of information and production, is to provide information to users at all levels; to provide reliable and easily understandable information, which will be used in planning and auditing activities, at the required time and place (İyibildiren et al., 2023).

Through bibliometric analysis and systematic literature review, this research aims to explore the relationship between production planning and forecasting with various analytical tools. More specifically, this research seeks to map the results of scientific studies on production planning and forecasting analysis, including the models, methods, techniques, and practices used by manufacturing and remanufacturing industries to understand their demand patterns. In the process, text mining tools are used to guide the methodological flow, thereby facilitating the searching of many documents.

RESEARCH METHODS

The research method used in this article is bibliometric literature analysis and systematic literature review with a focus on accounting information systems in helping to planning and forecasting future production. The tool used in the analysis is the specialized VOSviewer software developed by Van Eck and Waltman at Leiden University, the Netherlands (Van & Waltman, 2020). The mapping function of VOSviewer creates a two-dimensional map where items are positioned at distances that reflect the similarity among them. The data collection is conducted based on the Web of Science (WoS) Core Collection, which is the world's largest data collection from a leading platform for scientific information retrieval, analytics, and citation (Li et al., 2018). The use of Web of Science as the research database is because this article is part of a larger research project that also uses Web of Science. Thus, this research analyzes empirical studies (bibliometric and qualitative) as well as editorial best practice guidelines sourced from Scopus and Web of Science.

In the first phase of this study, a search was conducted using the keywords "management accounting" and "planning and forecasting" on journals indexed in the Web of Science database, and publications related to the subject were collected. Clear inclusion and exclusion criteria will be established to ensure the selection of relevant articles for analysis. These criteria will be

determined based on the research objectives and questions. The inclusion criteria may include: 1) international journals; 2) foreign-language journals; 3) journals published between 2021 and 2026; 4) open access. Meanwhile, the exclusion criteria include: 1) national journals; 2) Indonesian-language journals; 3) journals published before 2021; 4) restricted-access journals.

	Criteria	**Inclusion**	**Exclusion**
1	Journal Type	International	National
2	Bahasa	Foreign-Language Journal (English),	Indonesian-Language Journal
3	Year	2021 – 2026	Before 2021
4	Access	*Open access*	*Restricted access*
5	Index	Scopus	Not indexed scopus
6	Topic	Management accounting planning and forecasting	Does not contain these two keywords
7	Type	Article Type Qualitative, Quantitative	Studies other than these types (e.g., opinion without data, non-systematic review)
8	**Source**	From Scopus and Science Direct	From databases other than Scopus and science direct

The information obtained from this survey was first evaluated in terms of its distribution over the years, and was then analyzed within the scope of other categories such as country, institution, author, journal, keywords, and bibliography. The characteristics of journals related to accounting information systems for planning and forecasting of production processes, based on the year of article publication to be used in the bibliometric analysis in this study, cover the years 2021 to 2026. The literature collected, which is indexed in Scopus and in the ScienceDirect database in this study, uses keywords:

Databases	Keyword
Science Direct	(“accounting information system” OR “planning” AND “forecasting”)

The following is a graph of publications on accounting information systems for planning and forecasting from the years 2021 to 2026.

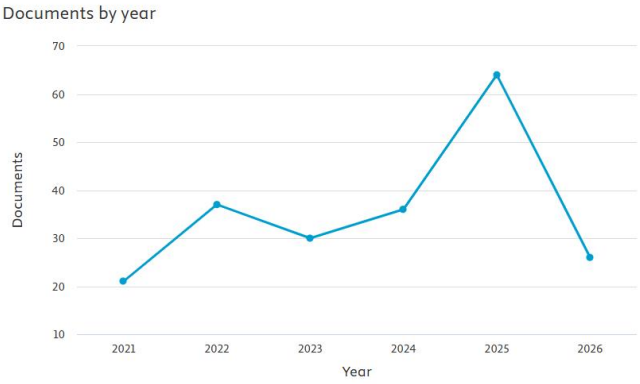
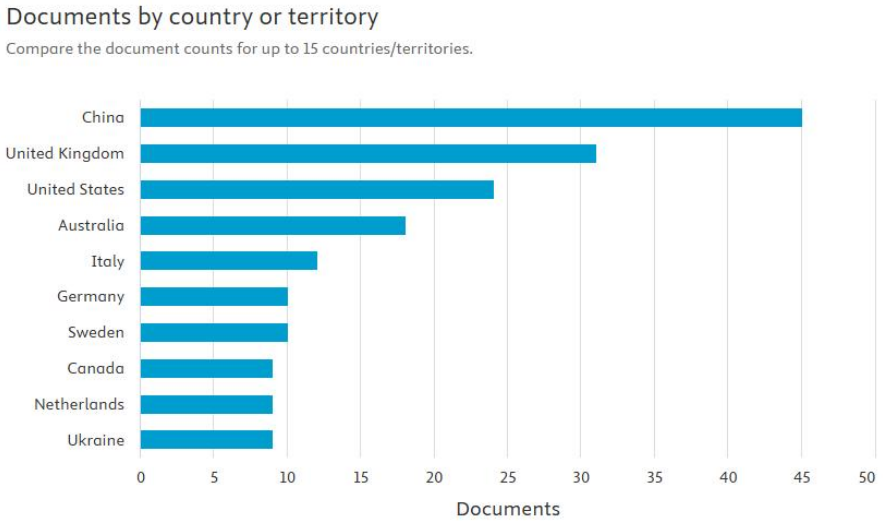


Figure 1 shows that from the last 5 years up to the current year, the number of articles published with keywords related to "accounting information system" or "planning" and "forecasting", specifically with open access articles, amounts to 214. The year 2025 is the year in which the publication rate related to accounting information and planning and forecasting is the highest, with a total of 64 publications, which means that many researchers are conducting studies on this theme. Furthermore, the characteristics of journals by country are explained in the figure below. Several countries conduct research related to accounting information systems and planning and forecasting. The majority of the highest publications on these themes, according to the keywords, are located in China. The following data is an explanation of article publications in ScienceDirect. Through Figure 2, it can be seen that China ranks first with 45 publications indexed in Scopus, followed by the United Kingdom, which holds the second position with 31 publications related to the predetermined keywords or themes.

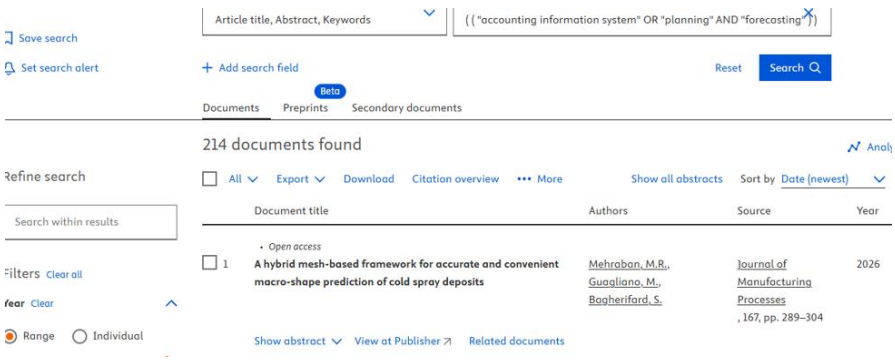


RESULTS AND DISCUSSION

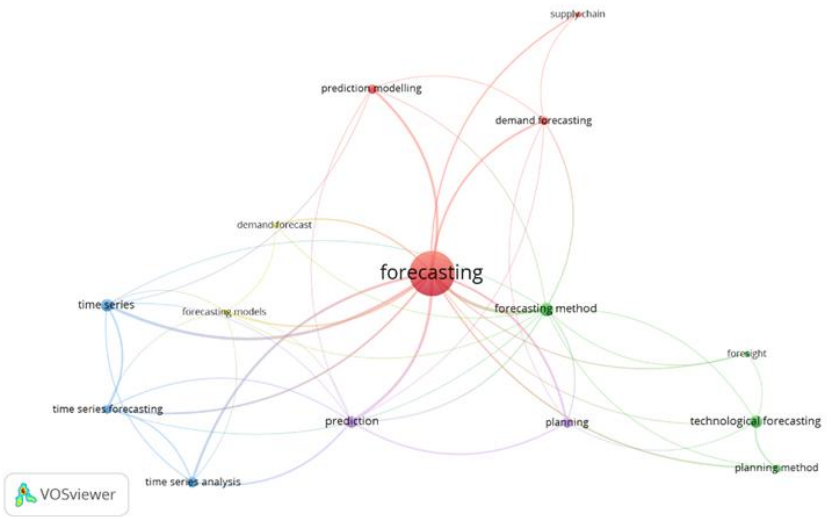
The inclusion criteria included in this bibliometric analysis are

Criteria	Inclusion	Articles

Journal Type	International	1.899
Bahasa	Foreign-Language Journal (English),	879
Year	2021 – 2026	411
Access	*Open access*	367
Index	Scopus	367
Topic	Management accounting planning and forecasting	298
Type	Article Type Qualitative, Quantitative	214

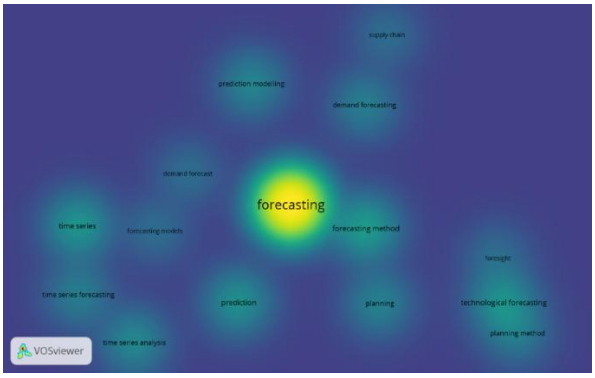


Through the data collection that was conducted previously in accordance with the predetermined keywords and themes, a network graph was created using the VOSviewer software. The size of the nodes and words on the graph indicates their weight. The greater the frequency of nodes and words, the greater their weight. The colors that appear on each network indicate how close the relationship is between the two keywords, and nodes with the same color are grouped back into their respective clusters.



The figure above is a network map that shows the relationships between various concepts in the field of planning and forecasting. The keyword "forecasting" is located at the center, indicating that this is the core topic of the

entire analysis. All other concepts are connected around it. The red cluster focuses on technical and methodological aspects. "Forecasting models" and "forecasting method" indicate that there is an interconnected discussion of various forecasting techniques, which suggests that these forecasting methods are integrated with planning methods. The blue cluster, which discusses time and prediction, emphasizes the foundation and purpose of forecasting. Time series refers to the data used (historical data sequenced by time). Prediction is the final outcome of forecasting, while foresight implies the ability to see the future, which is the essence of forecasting. The green cluster shows the purpose and application domains of forecasting. Planning indicates that the results of forecasting are used for planning purposes. Technological forecasting is used to predict future technological developments, for example, the speed of innovation and the adoption of new technologies. Technological forecasting stands somewhat separately within the green cluster but remains connected to forecasting, indicating that this is a specialized sub-field.



Based on the network visualization, it can be seen that the concept of forecasting becomes the central topic connecting various related keywords. The figure generated by VOSviewer shows that time series forecasting is the primary method supported by time series data. From this method, various forecasting models and forecasting methods emerge, which are used to generate prediction and foresight. The results of the forecasting process are then utilized for planning, including in specialized fields such as technological forecasting. Thus, the figure illustrates that forecasting is not merely a prediction technique, but rather a systematic approach that connects past data, analytical methods, and future planning.

Exploration of the relationship between production planning and forecasting

Based on the established research objectives, this study seeks to explore the relationship between production planning and forecasting using various analytical tools, as well as to map the results of scientific studies on production forecasting models, methods, techniques, and practices used by the manufacturing and remanufacturing industries to understand their demand patterns. To achieve these objectives, this study uses a bibliometric approach assisted by VOSviewer software and a systematic literature review (SLR) guided

by text mining techniques to facilitate the search and mapping of scientific documents.

The mapping results with VOSviewer show that the forecasting concept is at the center of the network (central node) that is closely connected to the planning concept in the same cluster, indicating that forecasting and planning have an integrative and inseparable relationship. The mapping results also found that time series forecasting is the main method supported by time series data, which then gave rise to various forecasting models and methods to produce predictions and foresight. Furthermore, the results of the forecasting process are used for planning purposes, including specialized fields such as technological forecasting.relationship between forecasting and planning is integrative and inseparable.

LITERATURE IDENTIFICATION

After collecting the data and examining the distribution of research related to decision-making through accounting information, a literature review was conducted again in accordance with the predetermined abstracts, keywords, and themes, so that the topics discussed would not broaden and would remain focused. Previously, a total of 214 article had been collected according to the inclusion and exclusion criteria, but they had not yet been screened through abstracts, keywords, and the relevance of content or themes within the articles. Ten articles were found that were very close to the required criteria based on content, theme, abstract, and keywords.

	Author	Title	Finding
1.	Vasilieva, E. A., & Zatylkov, N. I. (2021	Application of techniques for moving dynamics series for Planning and forecasting indicators in agrotourism	The study highlights that choosing the right forecasting method is crucial for success. The Simple Moving Average (SMA) method effectively smooths data fluctuations, achieving up to 96.58% accuracy and helping companies avoid losses from market uncertainty. In contrast, using unsuitable methods like Exponential Moving Average (EMA) on highly variable data can cause forecasting errors exceeding 30%, threatening financial stability. Accurate forecasting enables small businesses to anticipate market demand changes, adjust resources efficiently, and maintain long-term competitiveness and sustainability.
2.	Angos, M., Dietrich, F., & Palm, D. (2023	Review and analysis of artificial intelligence methods for demand forecasting in supply chain management	Selecting the right demand forecasting method is crucial for successful supply chain management (SCM). However, uncertain and dynamic market conditions often make classical statistical methods inaccurate. Artificial intelligence (AI) algorithms are now being used to enhance statistical methods. The existing literature is still general and does not provide a detailed classification of AI. Therefore, a classification of AI based on characteristics such as data dimension, data volume, and forecast time span is needed to help manufacturing companies select the most appropriate AI method for forecasting customer demand.

3.	Zarghami, S. A. (2025).	There are also unknown unknowns': a resilience-informed approach for forecasting and monitoring management reserve in projects	The journal concludes that managing uncertainty in project management requires precise integration of budget reserve planning, distinguishing between contingency reserves (for identified risks) and management reserves (for unforeseen events). Accurate forecasting of these reserves is critical: overestimation can paralyze liquidity and lead to uneconomical project completion, while underestimation causes financial losses and poor performance. To minimize these risks, the study recommends Reference Class Forecasting (RCF) and real-time resilience monitoring to provide early warnings and keep budgets adaptive to disruptions.
4	Alzoubi, H. M., Alshurideh, M. T., Nuseir, M. T., Al Kurdi, B., alhamad, A., & Hamadneh, S. (2024).	The Impact of Demand Forecasting on Effective Supply Chain with Mediating Role of Strategic Planning in the UAE Pharmaceutical Industry	The study concludes that effective supply chain management in the pharmaceutical industry depends heavily on high-quality demand forecasting and strategic planning. Demand forecasting has a significant direct impact on supply chain effectiveness and operational sustainability. Additionally, it exerts a significant indirect influence through the mediating role of strategic planning. Therefore, pharmaceutical companies and other organizations are strongly advised to integrate mature strategic planning practices with accurate demand forecasting systems to enhance overall supply chain performance.
5	Thompson, K., Munn, J., K, Hari., & Rajagopalan., (2023)	Impact of COVID-19 on forecasting and aggregate production planning: a case study	Research findings indicate that forecasting plays a key role in aggregate production planning (APP), as it is used to predict demand, which then serves as a reference for balancing medium-term production capacity and output. This study confirms that integrating dynamic forecasting with an optimization approach is crucial for improving the resilience and responsiveness of production planning in crisis conditions.
6	Infante Roblejo, R., Figueredo Varela, C., & Milán Graell, M. (2023)	Methodology for forecasting planning indicators in the sugar refinery industry: application	Research shows that applying quantitative forecasting methods specifically moving averages and weekly seasonal variation indices improves the accuracy of production downtime predictions and estimates of processed sugarcane volume and sugar output. This supports the development of more adaptive and efficient weekly production plans. The approach enables plan adjustments based on seasonal patterns and actual conditions, while strengthening the link between downtime, productivity, and industrial efficiency. Thus, forecasting methods are proven to be a vital tool in short-term planning to optimize production capacity utilization and improve decision-making quality in the sugar industry.

7	Gorlov, I. F., Usenko, L., N., Kholodov, O. A., & Kholodova, M. A., (2021	Conceptual approaches to planning and forecasting agricultural production transformed by digitalization	Research shows that the transition to a digital-based strategic planning system in the agricultural sector requires the integration of information and communication technologies to support more comprehensive and real-time forecasting models. Digital platforms enable data processing across the entire production and logistics chain, improving the accuracy of demand, production, and distribution forecasts. Supported by new algorithms and technologies such as virtual reality and augmented reality, these systems enhance data-driven planning, create operational efficiencies, and drive economic growth and sustainability through projections that adapt to global market dynamics.
8	Yaremko, S. A., Kuzmina, E. M., Savina, N. B., Yepifanova, I. Y., Gordiichuk, H. B., & Mussayeva, D. (2022)	Forecasting business processes in the management system of the corporation	Business process forecasting enables modeling and optimization of future business activities. Implementing forecasting tools within an integrated corporate governance system makes business easier to predict, manage, and control. With the advancement of information technology, artificial intelligence, and hybrid solutions, the faster companies digitize, the more effective their corporate governance becomes. In turn, effective governance expands investment opportunities and improves company productivity and competitiveness.
9	Aidoo-Anderson, A., Polychronakis, Y., Sapountzis, S., & Kelly, S. (2025).	Investigating demand forecasting practices and challenges in Ghana's Manufacturing Pharmaceutical (mpharma) small and medium enterprises (smes): insights and recommendations	The key findings show that mpharma smes mainly rely on judgemental forecasting methods and lack systematic intermittent demand forecasting, despite receiving significant intermittent orders from customers. These organizations also face challenges including a lack of historical and accurate data, dedicated forecasters, and low technology adoption. Forecasting is typically done by managers with domain knowledge but insufficient training. The size and limited financial resources of these smes further worsen these challenges. This research provides valuable insights into demand forecasting practices among mpharma smes in Ghana, highlighting the need for improved methodologies and training to enhance forecasting accuracy and supply chain efficiency.
10	Brookes, T., Nikolopoulus, K., Listiou, K., & Alghassab, W., 2024	Forecasting and planning for special events in the pulp and paper supply chains	Forecasting is important for program planning, especially within the PPI supply chain. Contingency planning remains underdeveloped, even though it is very crucial. On the other hand, integrated business planning (IBP), long-term scenario analysis, and pre-flood investments have proven to help reduce the impact of disruptions. Effective implementation across the entire supply chain, supported by continuous monitoring and predefined responses, is also very necessary. These insights apply not only to paper manufacturers but also to similar industries.

Based on the review of 10 relevant articles, it can be seen that forecasting and planning are two inseparable functions in supply chain management and

corporate operations. Several key findings emerging from the literature are as follows. First, forecasting accuracy depends heavily on the selection of the appropriate method according to the data characteristics and industry context. Vasilieva & Zatylkov (2021) proved that the Simple Moving Average method is capable of achieving an accuracy rate of up to 96.58% on agrotourism data, while the Exponential Moving Average method produces errors above 30% when applied to data with high variation. This finding aligns with the findings of Roblejo et al. (2023), which show that the application of moving averages and weekly seasonal variation indices is able to improve the accuracy of predicting production downtime as well as the volume of processed sugarcane and sugar. In other words, no single method excels in all situations; rather, the suitability of the method to the data pattern and the forecasting time horizon is the main determinant of success.

Currently, the development of artificial intelligence (AI) offers opportunities for significant improvement compared to classical statistical methods, but its implementation still faces practical challenges. Mediavilla et al. (2022) classify AI methods based on data dimensions, data volume, and forecasting time horizons, to assist manufacturing companies in selecting the most appropriate method. However, the findings of Brookes et al. (2024) show that practitioners in the pulp and paper supply chain still consider AI-based forecasting to be less useful and prefer conventional statistical methods combined with official flood warnings. This contradiction indicates the existence of a gap between the theoretical potential of AI and the practical readiness of the industry, particularly in terms of data infrastructure, human resource skills, and trust in algorithmic outcomes.

Forecasting does not stand alone. rather, it must be closely integrated with strategic planning and risk reserve management. Alzoubi et al. (2024) empirically prove that demand forecasting not only has a direct impact on supply chain effectiveness, but also has a significant indirect influence through the mediating role of strategic planning. This finding is reinforced by Zarghami (2025), who emphasizes that uncertainty mitigation in project management requires precise integration between contingency reserves (for identified risks) and management reserves (for unforeseen events), while recommending Reference Class Forecasting (RCF) as well as real-time resilience monitoring.

External disruptions such as the COVID-19 pandemic from 2019 to 2021 and natural disasters force companies to adopt dynamic and adaptive forecasting approaches. Thompson, Munn, & Rajagopalan (2023) demonstrate that forecasting compiled based on historical data from 2014 to 2019 proved invalid during COVID-19, so companies had to use linear programming to develop various adaptive scenarios. Similar findings are expressed by Brookes et al. (2024), who state that contingency planning remains underdeveloped even though it is critical, while pre-flood investments and long-term scenario analysis help reduce the severity of disruptions. Thus, static forecasting approaches are no longer adequate; what is needed is a system that is capable of updating predictions periodically based on current conditions.

Digitalization and information technology integration open up opportunities for more real-time and collaborative forecasting systems. Gorlov et

al. (2021) emphasize that the transition towards digital-based strategic planning in the agricultural sector enables data processing across the entire production and logistics chain, supported by new algorithms as well as virtual and augmented reality technologies. Yaremko et al. (2022) add that the implementation of forecasting tools within an integrated corporate governance system can make businesses more predictable, manageable, and controllable, where the faster a company digitalizes, the more effective its corporate governance becomes.

However, the adoption of more advanced technologies cannot proceed without addressing the limitations of resources and organizational capabilities, especially in SMEs. Aidoo et al. (2025) find that pharmaceutical SMEs in Ghana mostly still use judgmental forecasting methods, do not systematically perform intermittent demand forecasting, and face challenges such as a lack of accurate historical data, the absence of dedicated forecasters, and low technology adoption. Forecasting activities are usually performed by managers who possess domain knowledge but lack formal training. This condition creates an adoption gap between large companies that are able to implement AI and digital systems, and SMEs that are limited in terms of financial resources and capabilities.

Overall, the ten articles agree that accurate forecasting serves as the foundation for effective planning, operational sustainability, and corporate competitiveness. However, the main challenge going forward is to bridge the gap between the potential of advanced methods (AI, digitalization, RCF) and the practical realities of industry, especially in SMEs, as well as to fully integrate forecasting into strategic planning cycles and risk management. Further research needs to be focused on the development of an adaptive framework that is easy for SMEs to adopt and capable of responding to external disruptions in real-time.

Mapping the results of scientific studies on models, methods, techniques, and practices of production planning and forecasting in the manufacturing and remanufacturing industries.

Based on the results of a systematic literature review of 10 relevant articles, it was found that forecasting accuracy is highly dependent on the selection of the right method according to the data characteristics and industry context, where the Simple Moving Average method is able to achieve accuracy of up to 96.58% on agro-tourism data, while the Exponential Moving Average method actually produces an error above 30% when applied to data with high variation. The development of artificial intelligence (AI) offers significant opportunities for improvement compared to classical statistical methods, but its implementation still faces practical challenges, especially in terms of data infrastructure, human resource skills, and trust in algorithmic results.

Furthermore, this study found that forecasting does not stand alone, but must be closely integrated with strategic planning and risk reserve management, where demand forecasting has been shown to have a significant indirect influence on supply chain effectiveness through its mediating role in strategic planning. External disruptions such as the COVID-19 pandemic and natural disasters force companies to adopt a dynamic and adaptive forecasting approach, as static approaches based on historical data have proven inadequate.

Digitalization and the integration of information technology open up opportunities for more real-time and collaborative forecasting systems. However, the adoption of more advanced technology cannot proceed without addressing resource and organizational capability limitations, particularly in SMEs, many of which still rely on judgmental forecasting methods without a formal system.

Demand patterns in the manufacturing and remanufacturing industries.

This research successfully mapped out how accurate forecasting serves as the foundation for effective planning, operational sustainability, and company competitiveness. However, a significant research gap was identified: there are not many articles specifically discussing forecasting and planning practices in the remanufacturing industry, despite the industry's unique demand patterns (intermittent and based on the availability of used products) that cannot be fully explained by conventional forecasting models developed for the manufacturing industry. Using text mining tools via VOSviewer, the entire methodological flow of this research was systematically guided, from keyword extraction and co-occurrence mapping to grouping concepts into interconnected clusters. This proves that text mining not only speeds up the document search process, but also provides a visual guide that clarifies the knowledge structure in the field of production planning and forecasting.

CONCLUSION

Based on bibliometric mapping using VOSviewer and a systematic literature review of 10 articles, this study concludes that forecasting and production planning have an inseparable integrative relationship in supply chain management, with forecasting as the central network directly connected to planning. Mapping models, methods, and practices in the manufacturing industry reveals that no single method is universally superior; classical methods such as the Simple Moving Average can achieve 96.58% accuracy in certain contexts, while complex methods such as AI still face a gap between theoretical potential and practical industry readiness due to limitations in data, human resources, and trust in algorithms. Accurate forecasting must be dynamic and adaptive, integrated with strategic planning and risk management, especially when facing external disruptions such as the pandemic. Digitalization opens up opportunities for real-time systems, but their adoption is difficult for SMEs due to resource constraints. The use of text mining through VOSviewer proved effective in guiding the research methodology. This study also uncovered a significant gap: the lack of studies on forecasting and planning in the remanufacturing industry, which has unique intermittent demand patterns. Thus, the key challenge going forward is to develop an adaptive framework that is easily adopted by SMEs and the remanufacturing industry and capable of responding to external disruptions in real-time.

REFERENCE

Aidoo-Anderson, A., Polychronakis, Y., Sapountzis, S., & Kelly, S. (2025). Investigating demand forecasting practices and challenges in Ghana's Manufacturing Pharmaceutical (MPharma) small and medium enterprises

(SMEs): insights and recommendations. International Journal of Production Research, 63(21), 7899-7920.

Alzoubi, H. M., Alshurideh, M. T., Nuseir, M. T., Al Kurdi, B., AlHamad, A., & Hamadneh, S. (2024). The impact of demand forecasting on effective supply chain with mediating role of strategic planning in the UAE pharmaceutical industry. In Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges (pp. 561-581). Cham: Springer International Publishing

Beerepoot, I., Di Ciccio, C., Reijers, H. A., Rinderle-Ma, S., Bandara, W., Burattin, A., Calvanese, D., Chen, T., Cohen, I., Depaire, B., Di Federico, G., Dumas, M., van Dun, C., Fehrer, T., Fischer, D. A., Gal, A., Indulska, M., Isahagian, V., Klinkmüller, C.Zerbato, F. (2023). The biggest business process management problems to solve before we die. Computers in Industry, 146, 103837. https://doi.org/10.1016/j.compind.2022.103837

Brookes, T., Nikolopoulos, K., Litsiou, K., & Alghassab, W. (2024, October). Forecasting and planning for special events in the pulp and paper supply chains. In Supply Chain Forum: An International Journal (Vol. 25, No. 4, pp. 428-445). Taylor & Francis.

Browning, T., Kumar, M., Sanders, N., Sodhi, MS, Thürer, M., & Tortorella, GL (2023). Dari risiko rantai pasokan hingga gangguan sistemik: peluang penelitian dalam peramalan, manajemen risiko, dan desain produk. Jurnal Internasional Manajemen Operasi & Produksi , 43 (12), 1841-1858.

Efthymiou, K., Mourtzis, D., Pagoropoulos, A., Papakostas, N., & Chryssolouris, G. (2016). Manufacturing systems complexity analysis methods review. International Journal of Computer Integrated Manufacturing, 29(9), 1025–1044. https://doi.org/10.1080/0951192X.2015.1130245

Grosse Erdmann, J., Ahmeti, E., Wolf, R., Koller, J., & Döpper, F. (2025). Forecasting Return Quantity, Timing and Condition in Remanufacturing with Machine Learning: A Mixed-Methods Approach. *Sustainability*, *17*(14), 6367.

Gurbaxani, V., & Whang, S. (1991). The impact of information systems on organizations and markets. Communications of the ACM, 34(1), 59–73. https://doi.org/10.1145/99977.99990

Gorlov, I. F., Usenko, L. N., Kholodov, O. A., Kholodova, M. A., Mosolova, N. I., & Mosolova, D. A. (2021, March). Conceptual approaches to planning and forecasting agricultural production transformed by digitalization. In IOP Conference Series: Earth and Environmental Science (Vol. 677, No. 3, p. 032022). IOP Publishing.

Hudaningsih, N., Firda Utami, S., & Abdul Jabbar, W. A. (2020). Perbandingan Peramalan Penjualan Produk Aknil Pt.Sunthi Sepurimengguanakan Metode Single Moving Average Dan Single Exponential Smooting. Jurnal Informatika, Teknologi Dan Sains, 2(1), 15–22. https://doi.org/10.51401/jinteks.v2i1.554

Infante Roblejo, R., Figueredo Varela, C., & Milán Graell, M. (2023). Metodología para el pronóstico de indicadores de la planificación en la industria azucarera: aplicación. Ingeniare. Revista chilena de ingeniería, 31, 0-0.

İyibildiren, M., Eren, T., & Ceran, M. B. (2023). Bibliometric analysis of publications on web of science database related to accounting information system with mapping technique. Cogent Business & Management, 10(1). https://doi.org/10.1080/23311975.2022.2160584

Li, K., Rollins, J., & Yan, E. (2018). Web of Science use in published research and review papers 1997–2017: A selective, dynamic, cross-domain, content-based analysis. Scientometrics, 115(1), 1-20

Long, Y., Kroeger, S., Zaeh, M. F., & Brintrup, A. (2025). Leveraging synthetic data to tackle machine learning challenges in supply chains: challenges, methods, applications, and research opportunities. International Journal of Production Research, 1-22.

Mediavilla, M. A., Dietrich, F., & Palm, D. (2022). Review and analysis of artificial intelligence methods for demand forecasting in supply chain management. Procedia CIRP, 107, 1126-1131.

Mira, T. S., Sulistiyawan, E., & Alam, W. Y. (2025). Transformasi Manajemen Sumber Daya Manusia dalam Pembangunan Berkelanjutan (Kajian Literatur terhadap Model dan Implementasi). Journal of Economics and Business UBS, 14(4), 683–692. https://doi.org/10.52644/joeb.v14i4.2764

Putra, I. H., & Salsabila, N. (2025). Pengelolaan kas pada program studi komputerisasi akuntansi. Jurnal Digitalisasi Akuntansi, 2(2), 6-6.

Robi'atul Adawiyah Bukhori, & Vembri Aulia Rahmi. (2025). Strategi Keberlanjutan Usaha Percetakan Cv Dealima Prosent. Jurnal Ekonomi Bisnis Dan Kewirausahaan, 2(4), 01–11. https://doi.org/10.69714/2py4c310

Swierczek, A. (2020). Investigating the role of demand planning as a higher-order construct in mitigating disruptions in the European supply chains. The international journal of logistics management, 31(3), 665-696.

Thompson, K., Munn, J., & Rajagopalan, H. K. (2023). Impact of COVID-19 on forecasting and aggregate production planning: a case study. International Journal of Process Management and Benchmarking, 14(2), 155-175.

Van Eck, N. J., & Waltman, L. (2020). VOSviewer version 1.6. 15, Leiden University's Centre for Science and Technology Studies.

Venkatesh, M., Wamba, S.F., Gunasekaran, A. *et al.* Emerging trends in the interplay between analytics and operations in MSMEs. *Ann Oper Res* **350**, 355–364 (2025). https://doi.org/10.1007/s10479-025-06704-7

Vasilieva, E. A., & Zatylkov, N. I. (2021, September). Application of techniques for moving dynamics series for planning and forecasting indicators in agrotourism. In IOP Conference Series: Earth and Environmental Science (Vol. 848, No. 1, p. 012174). IOP Publishing.

Yaremko, S. A., Kuzmina, E. M., Savina, N. B., Yepifanova, I. Y., Gordiichuk, H. B., & Mussayeva, D. (2022). Forecasting business processes in the management system of the corporation. Informatyka, Automatyka, Pomiary w Gospodarce i Ochronie Środowiska, 12(4), 53-59.

Zarghami, S. A. (2025). 'There are also unknown unknowns': a resilience-informed approach for forecasting and monitoring management reserve in projects. International Journal of Production Research, 63(1), 220-240.

Zhang, M., Bi, J., Yuan, H., Wang, Z., Zhang, J., & Buyya, R. (2025). An enhanced hybrid deep neural network method for adjusted industrial time series prediction with variable operating states. *Expert Systems With Applications*, 130029.

Zheng, Y., Zhang, W., Wang, R., & Ahmad, R. (2025). Scheduling in Remanufacturing Systems: A Bibliometric and Systematic Review. *Machines*, *13*(9), 762. https://doi.org/10.3390/machines13090762