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Improving Supply Chain Operations through Procurement, Inventory Management and Logistics Coordination: An On-the-Job Training Case Study at Desons Engineering Works with a Bibliometric Review

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Abstract **- Small manufacturers depend less on any single function than on how procurement, stores and dispatch share information. This paper reports an On-the-Job Training (OJT) project at Desons Engineering Works, a micro-scale engineering manufacturer in Kupwad MIDC, Sangli, India, and places it within the research literature. The case used a descriptive and exploratory design based on observation, informal discussions and available records. A weighted-mean analysis rated procurement at 3.45/5, a performance-score analysis rated logistics at 3.4/5, ABC classification was applied to inventory as a control framework, and a gap analysis against a desired maturity of 5.0 found the largest gaps in KPI monitoring (2.2) and supplier management (1.8). The weakest individual activities were purchase-order (PO) tracking, delivery follow-up and on-time monitoring. A bibliometric analysis of 416 Dimensions records (2015–2026) and VOSviewer author maps shows that 74.4% of dated records appeared in 2021–2026, that information integration (40.0%) and performance measurement (39.8%) are the most frequent themes, that inventory (7.1%) and logistics (12.0%) are the least represented, and that the author community forms six largely separate clusters. The paper recommends low-cost, connected controls (a PO tracker, ABC/VED stock classification, a dispatch and delivery tracker, a supplier performance record and a short KPI set) before any investment in advanced digital systems.**

Index Terms *- supply chain operations, procurement, inventory management, logistics coordination, ABC analysis, key performance indicators, MSME, bibliometric analysis, VOSviewer.*

I. INTRODUCTION

Supply chain operations cover the coordinated planning and execution of activities through which materials, information and services move from suppliers, through the organization, to customers. Mentzer *et al.* define supply chain management as the systemic, strategic coordination of traditional business functions across the businesses in the chain [1]. Procurement secures inputs, inventory management balances availability against holding cost and risk, and logistics coordination moves materials and finished goods to the right place at the right time. These functions are interdependent: a purchase that lowers unit price but lengthens lead time can raise total cost, high inventory can hide planning problems while tying up working capital, and efficient dispatch cannot compensate for inaccurate stock records. Distorted information also amplifies variability upstream, the well-known bullwhip effect [2].

The issue is acute for micro, small and medium enterprises (MSMEs) in engineering manufacturing, which compete on responsiveness, specialization and customer relationships rather than scale. In such firms coordination is often manual, and information may reside with individuals rather than in shared records.

This paper reports an OJT project undertaken by a Supply Chain Intern at Desons Engineering Works. Rather than treating procurement, stores and dispatch separately, it examines their interdependence and the effect of information flow on operational continuity. The scope covers requirement communication, request-for-quotation (RFQ) and PO follow-up, and supplier coordination; receipt, issue, records, classification and replenishment; dispatch planning, documentation and delivery closure; and communication among these.

The paper makes two contributions. First, it gives a structured, observation-based assessment of the three functions and a prioritized set of practical controls. Second, it positions the case within the literature through a bibliometric analysis of 416 publication records exported from Dimensions on October 15, 2026, and three VOSviewer maps of the author network. Section II reviews background, Section III states the objectives and context, Section IV describes the methods, Sections V and VI report results, and Sections VII–X discuss, recommend, state limitations and conclude.

II. BACKGROUND

A. Integration, Information and Performance

Christopher presents the supply chain as a network focused on value and responsiveness [3]. Lee argues that high-performing chains combine agility, adaptability and alignment [4], which suits an MSME facing variable demand and supplier conditions with limited resources for sophisticated systems. Li *et al.* link supplier partnership, information sharing and customer relationships with competitive advantage and organizational performance [5], and Prajogo and Olhager

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examine long-term relationships, information integration and logistics integration in relation to performance [6].

B. Measurement and Functional Concepts

Beamon reviews supply chain design and analysis models and argues for multi-dimensional evaluation [7], and Gunasekaran *et al.* provide a framework of performance measures and metrics [8]. These support a compact KPI set: PO lead time, supplier on-time-in-full (OTIF), inventory accuracy, stockout frequency, inventory turnover, dispatch lead time, proof-of-delivery (POD) closure time and expediting frequency. In inventory management, ABC analysis ranks items by annual consumption value so that control effort follows value; VED analysis classifies items as vital, essential or desirable by criticality; and the reorder point equals demand during lead time plus safety stock.

III. OBJECTIVES AND CASE CONTEXT

A. Objectives

The objectives were: (1) to examine procurement practices, supplier coordination and PO management; (2) to study inventory management, focusing on stock visibility, classification and replenishment; (3) to analyze logistics and dispatch coordination and delivery follow-up; (4) to evaluate existing processes and identify operational gaps; (5) to recommend integrated controls and KPIs; and (6) to map the research landscape for 2015–2026 through bibliometric analysis and relate it to the case.

B. Company Context

Public business-registry information, as summarized in the OJT report, describes Desons Engineering Works as a proprietorship incorporated on January 12, 2012, classified as a Micro enterprise and engaged in manufacturing in Kupwad MIDC, Sangli, Maharashtra. Its products include round bars, a road construction machine, a steam cooker, a seed grader and turmeric finger. Because public information is limited, this profile should be validated with the company; no verified financial statements, market-share figures or governance documents were available, so none are reported.

The observed operational challenges were keeping material available while limiting inventory investment, managing supplier lead-time variability, keeping stock records accurate, coordinating information across procurement, stores, production and logistics, completing dispatch documentation and delivery follow-up on time, and preventing emergency purchasing from becoming routine.

IV. METHODOLOGY

A. Case Design

The study used a descriptive and exploratory design. Primary data came from direct observation of daily activities and informal discussions with employees in procurement, stores and logistics; secondary data came from available company records. Convenience sampling was used, and no questionnaire survey was conducted, so a statistical sample size does not apply. The sampling frame was the departments, processes and employees involved in the three functions, and the sampling units were the employees and related documents.

B. Analytical Tools

Procurement was assessed by weighted-mean analysis, in which each parameter has a weight and a rating out of 5 and the mean equals the sum of weight × rating divided by the sum of weights. Inventory was assessed with ABC analysis as a classification framework. Logistics was assessed by performance-score analysis, averaging five activity scores out of 5. A gap analysis compared the current assessment with a desired maturity of 5.0 in five areas. All ratings are observation-based judgements, not survey scores, and were not independently validated.

C. Bibliometric Design

The literature was mapped with a Dimensions export [10] and VOSviewer [9]. The query searched full data for "Supply Chain Operations Improvement Procurement Inventory Management Logistics Coordination," restricted publication years to 2015–2026, and restricted results to twelve named researchers or organizations (Ivanov, Choi, Tarigan, Raut, Siagian, Niu, University of Johannesburg, Atkinson, Chen, Garza-Reyes, Jia and Basana). The export has 416 records with title, abstract, source, year, authors, affiliations, countries, times cited and cited references.

To keep the analysis accurate, author-name variants were merged, "University of Johannesburg" was excluded from author counts because it is an organization name, and a record with a missing or non-numeric year (9), citation count (9) or country (73) was excluded only from the calculation that needed that field. Publication years follow the Dimensions year field, which for some papers is the online year. Theme shares use title-and-abstract keyword matching on the 407 records with a valid year; themes overlap, and 37 records have no abstract. The VOSviewer screenshots show cluster, overlay (average year, 2018–2024) and density views; their counting method and thresholds are not visible and are not reported.

V. BIBLIOMETRIC RESULTS

A. Growth and Citation Impact

Of the 416 records, 407 carry a publication year in 2015–2026. Output rose from 4 records in 2015 to a peak of 73 in 2022 (17.9% of dated records) and ranged from 37 to 60 afterwards (Fig. 1); 2026 is a partial year because the export is dated October 15, 2026. In total, 303 of 407 records (74.4%) appeared in 2021–2026.

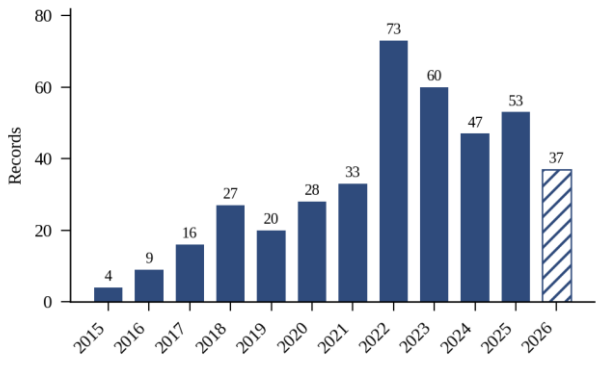


Fig. 1. Records per publication year (n = 407). The 2026 bar is a partial year.

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The 407 records with a valid citation count total 30,171 citations, a mean of 74.1 and a median of 20 per record; 66 records are uncited. Citations are concentrated: 71 records have at least 100 citations, four have at least 1,000, and the ten most-cited records hold 10,150 citations (33.6%). The h-index computed from the exported counts is 81. TABLE I lists the eight most-cited records. They concentrate on disruption and resilience, digital technologies and sustainability; none is primarily about shop-level PO tracking, stock control or dispatch follow-up.

TABLE I
MOST-CITED RECORDS IN THE CORPUS

Ref.	Year	Citations	Focus
[11]	2018	2,009	Digital technology, ripple effect, risk analytics
[12]	2020	1,813	Digital supply chain twin and resilience
[13]	2020	1,563	Blockchain in supply chain operations
[14]	2018	1,009	Big data analytics in operations
[15]	2020	974	Epidemic outbreaks and COVID-19 review
[16]	2017	672	Disruption recovery literature review
[17]	2022	643	Disruptive technologies and Industry 4.0
[18]	2017	528	Collaboration for sustainability

B. Sources, Authors and Countries

TABLE II lists the leading supply chain sources. Two other outlets are large by record count but are not supply chain journals: the Global Encyclopedia of Public Administration, Public Policy, and Governance (27 records, 6 citations) and Centre for Local Economic Development: Topics in Local Development (21 records, 1 citation). They enter the corpus because the query filtered by researcher. Twelve titles also appear more than once under different publication IDs (26 records).

TABLE II
LEADING SUPPLY CHAIN SOURCES

Source	Records	Citations
Int. J. Prod. Res.	35	6,012
Transp. Res. E, Logist. Transp. Rev.	20	3,562
IEEE Trans. Eng. Manage.	19	1,254
Ann. Oper. Res.	17	2,254
Int. J. Prod. Econ.	16	2,051
Uncertain Supply Chain Manage.	15	221
Supply Chain Manage.: Int. J.	11	774

After merging name variants, the most frequent authors are T.-M. Choi (74 records), D. Ivanov (59), F. Jia (46), J. A. Garza-Reyes (45), Z. J. H. Tarigan (40), B. Niu (38), R. D. Raut (33), L. Chen (32), H. Siagian (32) and C. L. Atkinson (27). A further 13 records appear under “Raut, Rakesh,” probably the same person, but the export does not confirm this. Of 410 records with author names, 48 (11.7%) are single-authored, and the median is four authors per record.

Of the 343 records with country data, China (145; 42.3%), the United Kingdom (121; 35.3%), India (62; 18.1%), Germany (61; 17.8%) and the United States (52; 15.2%) lead (Fig. 2). International collaboration is common: 196 records (57.1%) involve authors from two or more countries.

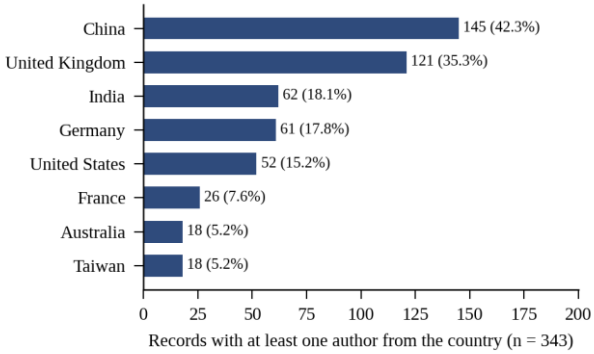


Fig. 2. Leading countries by number of records (343 records with country data). A record is counted once per country, so shares exceed 100%.

C. Co-authorship Network

Fig. 3 shows six clusters, listed here by labelled authors: (i) Jia, Chen and Zhang; (ii) Choi with Chung, Cheng, Guo, Yue and Shen; (iii) Niu with Zeng, Xu, Chen, Yu, Wang, Xie and Dong; (iv) Garza-Reyes with V. Kumar, Luthra, A. Kumar and Cherrafi; (v) Raut with Narkhede, Gardas, Nayal, M. Kumar and Sharma; and (vi) Ivanov with Dolgui and Sokolov. A few small nodes carry no label. Within clusters, links are strong: Jia and Chen share 25 records, Garza-Reyes and V. Kumar 18, and Ivanov and Dolgui 15. Between clusters, links are few and thin; Yue bridges the Choi and Niu clusters, with four records alongside Choi and two alongside Niu.

The density view (Fig. 5) shows six separate concentrations with little overlap, so the community is better described as several tight research groups than as one integrated network. In the overlay view (Fig. 4), judged from the colour scale, V. Kumar, Yue, Shen, Narkhede and Gardas sit towards the older end (about 2018–2020); Choi, Garza-Reyes, Ivanov, Dolgui and Raut are mid-scale (about 2021–2022); and the Niu cluster, Zhang, Guo, Sharma and Nayal are towards the recent end (about 2023–2024). Tarigan, Siagian, Basana and Atkinson are frequent authors in the export but are absent from the maps, probably because the maps show only the largest connected set of authors; the screenshots do not confirm this setting.

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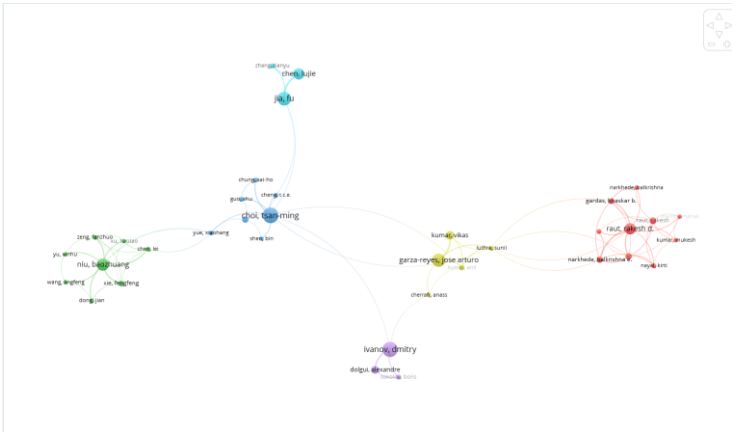


Fig. 3. VOSviewer co-authorship network of authors, coloured by cluster (six clusters).

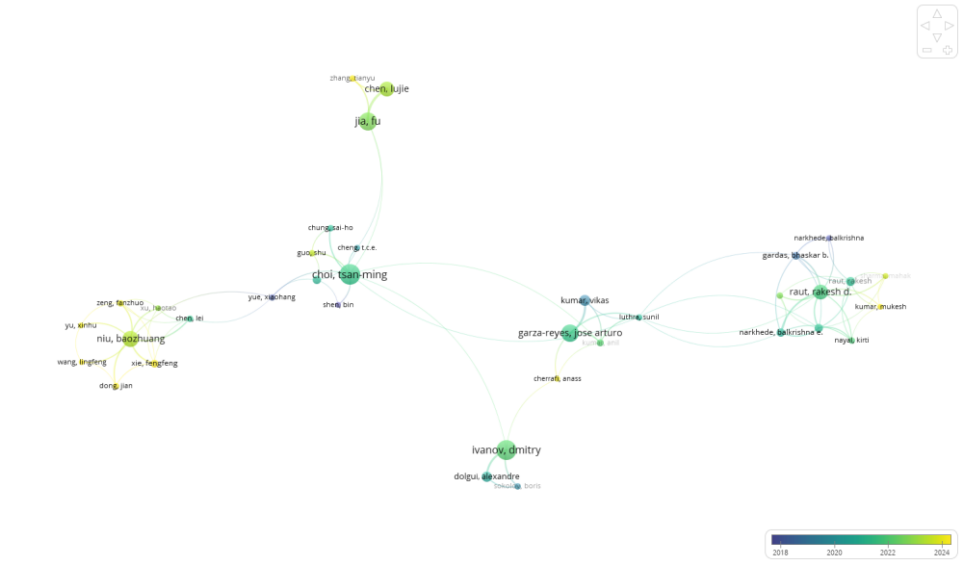


Fig. 4. Overlay visualization by average publication year (colour scale 2018–2024).

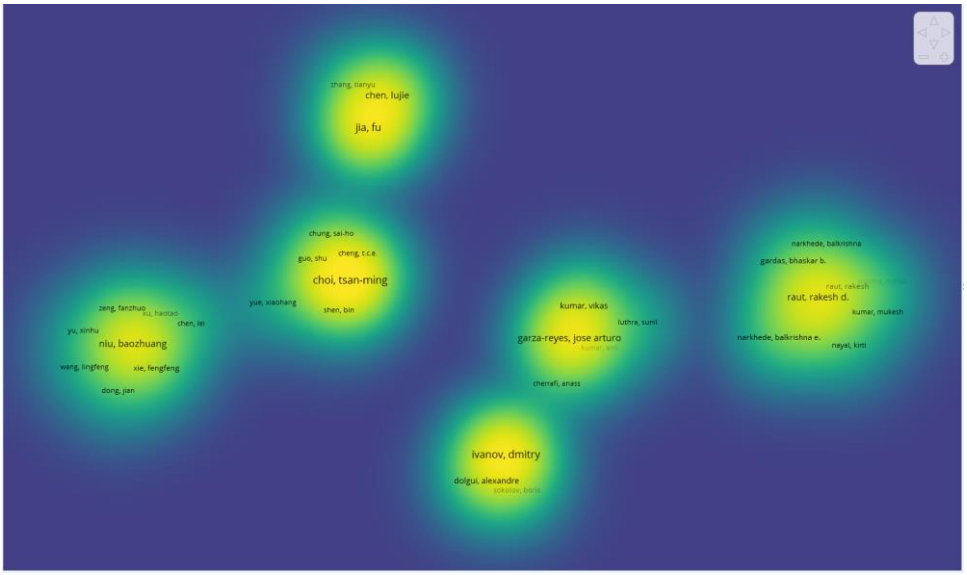


Fig. 5. Density visualization of the author network, showing six separate concentrations.

D. Themes

Fig. 6 compares keyword-based theme shares in the two periods. Information sharing and integration (40.0% of dated records) and performance measurement (39.8%) are the two most frequent themes. Sustainability (22.1% to 42.9%), digital technologies (16.3% to 36.3%) and resilience (14.4% to 32.7%) rose strongly between 2015–2020 and 2021–2026, and COVID-

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19 appears almost only after 2020 (1.9% to 15.5%). Inventory (7.1%) and logistics (12.0%) are the least represented core topics. Because the corpus is built around twelve named researchers, this reflects the emphasis of those groups, not the whole field.

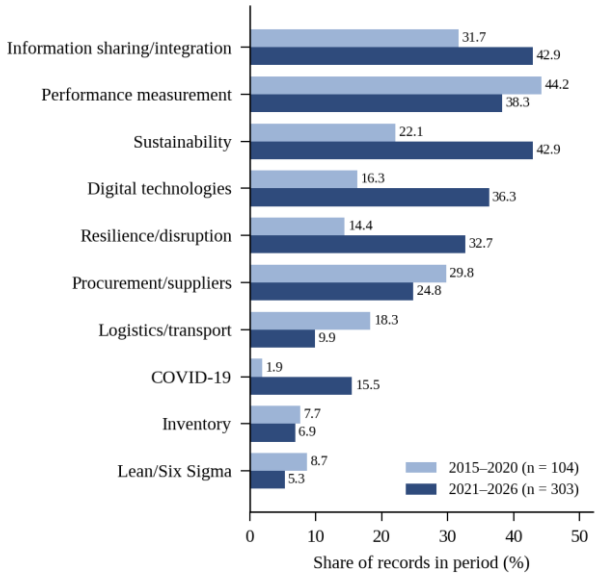


Fig. 6. Theme shares of records, 2015–2020 versus 2021–2026 (keyword matching on titles and abstracts; themes overlap).

VI. CASE RESULTS

A. Procurement and Supplier Coordination

TABLE III gives the weighted-mean analysis: 69 ÷ 20 = 3.45 out of 5. Procurement functions satisfactorily. Supplier coordination and requirement communication are the stronger parameters, while PO follow-up, PO tracking and timeliness have more room for improvement.

TABLE III
PROCUREMENT WEIGHTED-MEAN ANALYSIS

Parameter	Weight	Rating	Score
Supplier coordination	5	4	20
Requirement communication	4	4	16
PO follow-up	4	3	12
Procurement timeliness	3	3	9
PO tracking	4	3	12
Total	**20**		**69**

B. Inventory Management

ABC analysis was applied as a classification framework: A-items (high-value or critical materials) need strict monitoring, B-items (medium value) regular monitoring and C-items (low value or routine) basic monitoring. No item-level consumption or value data were available, so no percentage split is claimed. The inventory practice rating used in the gap analysis is 3.4/5. For critical items, VED classification can complement ABC.

C. Logistics and Dispatch

Dispatch coordination and communication scored 4/5 each, and material movement tracking, delivery follow-up and on-time delivery monitoring scored 3/5 each, for an average of (4 + 4 + 3 + 3 + 3) ÷ 5 = 3.4 out of 5. Coordination is comparatively strong, while tracking and follow-up need attention.

D. Gap Analysis

Fig. 7 compares current assessments with the desired 5.0. KPI monitoring has the largest gap (2.2), followed by supplier management (1.8); procurement, inventory and logistics have smaller, similar gaps (1.55–1.6). These values are an illustrative, observation-based comparison. The weakest items are all about visibility and follow-up, which matches the observation that problems often surface in one function but originate in another: a dispatch delay may start with a late PO, a procurement escalation with an unclear requirement, and a stock mismatch with an incomplete receipt or issue record.

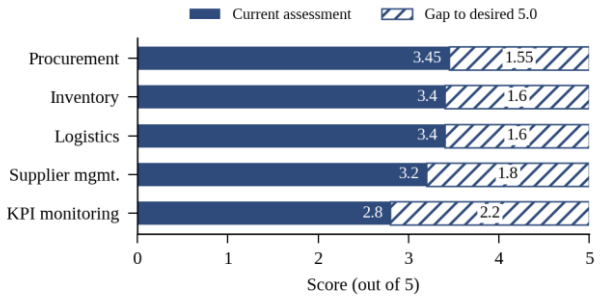


Fig. 7. Current assessment and gap to the desired maturity of 5.0 in five supply chain areas.

VII. DISCUSSION

The bibliometric evidence and the case point the same way. Information sharing and integration is the most frequent theme in the corpus, and performance measurement is a close second, which matches the theory in [5], [6] and [8] and the case finding that the largest gaps lie in monitoring and visibility rather than in core transaction handling.

The corpus also shows where the case differs from the research frontier. Output is increasingly about resilience, sustainability and digital technologies such as digital twins, blockchain and big data [12]–[14], [17]. Desons, a micro enterprise working with registers and spreadsheets, is at an earlier stage. This supports a sequenced approach: establish reliable shared records and a few KPIs first, since they are prerequisites for later analytics or digital-twin use, and consider digital integration afterwards.

Inventory and logistics coordination are comparatively thin in this corpus (7.1% and 12.0%), and the community is organized in largely separate author groups. These are interpretations of the data, not tested causal claims, but they suggest that the case-based controls below add practical value by translating integration themes into low-cost, concrete formats.

VIII. RECOMMENDATIONS

TABLE IV maps five recommended controls to the case evidence. Each can start with existing resources such as Excel or structured registers. The PO register should hold PO number, supplier, order date, expected delivery, confirmation, actual receipt and status; the dispatch tracker should hold dispatch

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date, customer or order, expected delivery, delivery status and POD closure.

TABLE IV
RECOMMENDED CONTROLS AND SUPPORTING EVIDENCE

Control	Evidence from the case
PO tracking register	PO tracking and follow-up rated 3/5
ABC/VED classification and stock monitoring	Inventory rated 3.4/5; gap 1.6
Dispatch and delivery tracker	Tracking, follow-up and on-time monitoring rated 3/5
Supplier performance record	Supplier management rated 3.2/5; gap 1.8
Short KPI set, reviewed monthly	KPI monitoring rated 2.8/5; gap 2.2

Suggested starter KPIs use standard definitions: PO lead time (receipt date minus PO date); supplier OTIF (orders received on time and in full ÷ orders received × 100); inventory accuracy (items where the record equals the physical count ÷ items counted × 100); dispatch lead time (shipment date minus dispatch requirement date); and POD closure time (POD received date minus dispatch date). Reorder-point parameters should be calculated from actual company data before use. A proposed sequence, offered as a suggestion rather than a company plan, is to set up the PO and dispatch trackers first, then classify items and start the supplier record and cycle counts, and begin monthly KPI review once about three months of tracker data exist.

IX. LIMITATIONS

The OJT period was short, so not every procurement, inventory and delivery cycle was observed, and confidentiality limited access to detailed purchase, supplier and inventory data. Ratings and weights are one observer's judgements, convenience sampling limits generalization, ABC analysis could not use real value and consumption data, and the recommended controls were not tested. The bibliometric corpus is researcher-filtered, includes some non-supply-chain outlets and duplicate titles, lacks country data for 73 records and abstracts for 37, and uses keyword matching for themes; the VOSviewer settings are not recorded, and the maps omit several frequent authors. Public company information should be validated with the organization.

X. CONCLUSION

At Desons Engineering Works, procurement (3.45/5) and logistics (3.4/5) work satisfactorily, but visibility and follow-up are weak, and KPI monitoring (gap 2.2) and supplier management (gap 1.8) show the greatest need. Across 416 records, information integration and performance measurement lead recent research, interest in resilience, sustainability and digital technology has grown since 2020, and the author community is split into six groups. Together, the case and the literature support starting with simple, connected controls and measuring their effect before any larger digital investment. Future work can collect actual PO, supplier delivery and dispatch data over a longer period, run ABC analysis on real consumption values, and compare KPIs before and after implementation.

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