International Journal of Multidisciplinary Research and Growth Evaluation.

Establishing Purchasing Strategy for Collaboration Contract Strategy Using Kraljic's Supply Positioning Model and 5 Whys Analysis (Case Study: PT Usaha Gedung Mandiri)

Chaterine Alvina Prima Hapsari [1*], Hilda Marwa Fauziyah [2], M Mujiya Ulkhaq [3]
[1-3] Department of Industrial Engineering, Diponegoro University, Indonesia

* Corresponding Author: **Chaterine Alvina Prima Hapsari**

Article Info

ISSN (Online): 2582-7138
Impact Factor (RSIF): 7.98
Volume: 06
Issue: 06
November - December 2025
Received: 21-09-2025
Accepted: 24-10-2025
Published: 19-11-2025
Page No: 887-892

Abstract
PT Usaha Gedung Mandiri is a construction company that focuses on services related to building needs, from construction to maintenance and operational requirements. The company has problems with the purchasing administration process, which is still manual. This creates uncertainty in the procurement process due to inconsistent vendor delivery times. Another issue that arises concerns the impact on the company's profits. One cause is the lack of a classification system for each item into multiple categories based on value and risk level. This can lead to an increase in inventory value and uncontrolled item turnover rates. Therefore, a strategy for classifying goods by value and risk level is needed, and it should also aim to develop an appropriate collaboration contract strategy with vendors. The Supply Positioning Model method will classify goods into four quadrants: routine, critical, bottleneck, and leverage based on grouping results from three aspects: profit impact with ABC Analysis, Supply Opportunity, and Inventory Risk. Then, a root cause analysis is conducted using the 5 Whys Diagram to determine appropriate recommendations to address the root problems in the procurement process.

DOI: https://doi.org/10.54660/.IJMRGE.2025.6.6.887-892

Keywords: Supply Positioning Model, Purchasing, Kraljic Matrix, ABC Analysis, 5 Whys, Contract

Introduction

Supply Chain Management (SCM) is a series of integrated activities involving all parties in the production and distribution process, from raw material suppliers to the end consumer. SCM not only manages the flow of goods, but also the interconnected flow of information and finances within the production chain. The main goal of SCM is to improve operational efficiency, reduce costs, improve quality, and ensure product availability at the right time and location [1]. In the context of procurement, companies must be able to manage various types of goods with varying characteristics and levels of risk. The goods purchased by a company can have varying purchase values and different levels of supply risk, such as the risk of late delivery, quality risk, and the risk of dependence on a particular supplier. Therefore, the procurement strategy implemented must be tailored to the characteristics of each item so that procurement management can be effective and efficient [2].

With so many buildings to manage, PT Usaha Gedung Mandiri must ensure that every category of goods needed for each building is available and adequately stocked. Purchasing activities at this company can involve very large quantities in a single purchase or even small purchases, depending on the category of goods being procured. PT Usaha Gedung Mandiri has 16 procurement categories, including office supplies, stationery, electrical equipment, air conditioning, water, and so on, as well as employee uniforms. Not all of these categories are routinely procured, such as equipment or components for air conditioning, electrical equipment, water installations, machinery, and several similar categories. These items are incidental and will be used if the equipment or components are damaged and need immediate replacement. Therefore, the company does not routinely procure these items, and the purchase volume depends on the current situation (not fixed). This is different from consumable items such as gardening supplies, cleaning supplies, and other items that require regular procurement due to their high usage.

Of the previously mentioned categories, cleaning supplies are the most frequently requested daily item because they are consumable (single-use) and therefore require regular procurement. However, some cleaning supplies are incidental and do not require routine procurement, but are still procured. This is because the company has not classified the items based on their risk and purchase value. If this issue is not addressed, it will impact the company's profit. Therefore, a strategic procurement management method is needed so that each item can be procured effectively and efficiently, according to the specified time and quantity. The company can optimally monitor inventory turnover.

Currently, the purchasing process at PT Usaha Gedung Mandiri is carried out through a manual administrative process, starting with a memo or goods request (PB) form submitted by the warehouse based on a direct request from the client. The purchasing division then makes the purchase according to the quantity stated on the memo.

Considering that this process is still largely manual, it can lead to uncertainty in the schedule and quantity of goods to be purchased because the company only processes orders by demand, but vendor delivery times are inconsistent. Therefore, when there is a shortage in the previously procured quantity, the company must restart the procurement process. Furthermore, the administrative process from goods request (PB) to order approval can take a significant amount of time, from one week to several months, depending on the type of goods being procured. Uncertainty in selecting multiple vendors for comparison, price negotiations, contract requirements, and vendor delivery times also determine the length of the procurement process and distribution of goods to clients.

Previous research used a purchasing strategy method using the Kraljic Portfolio Matrix in an investment management company to group goods based on their supply risk level and profit impact, in order to minimize supply risk and maximize purchasing profits [1]. Another study determined a purchasing strategy for cooperation contracts using the Supply Positioning Model because the company had a large inventory value due to the lack of material classification based on risk and purchasing value, and the lack of an appropriate cooperation contract strategy with suppliers [2]. In addition to the Supply Positioning Model, there is the Supply Relationship Management method, which has been researched at PT. Karyamitra Budisentosa. This method focuses on supplier selection, grouping, and development, using several assessment parameters to strengthen supplier relationships [3]. Another study conducted at PT Krakatau Pipe Industries used the SRM method to routinely evaluate suppliers and identify key suppliers [4]. Although the SRM method focuses more on the level of supplier capability in procurement management to achieve cost efficiency and increase customer satisfaction, this method does not consider the importance of the material's value to the company [5]. Therefore, in addressing the problems encountered at PT Usaha Gedung Mandiri, which had not yet classified materials based on their value and risk to determine procurement strategies with suppliers, the Supply Positioning Model would be more relevant for use in this research.

Furthermore, research has been conducted to improve service supply chain performance using the Lean Six Sigma method using Root Cause Analysis at CV Ekspedisi due to customer complaints regarding poor delivery quality, such as late delivery times, damaged goods, and incorrect delivery destinations [6].

Another method frequently used in Root Cause Analysis is Fault Tree Analysis. Similar to the 5 Whys method, the FTA method conducts an in-depth identification of the root causes of a problem and the cause-and-effect relationships within it [7]. However, the FTA method is more suitable for use when resources and information are complete, and the identification of cause-and-effect problems is used for more complex problems, such as production defects, which consider probability [8].

Based on previous research conducted on similar issues at PT Usaha Gedung Mandiri, this study will design optimal long-term relationships with vendors to implement purchasing strategies in accordance with the principles of the Supply Positioning Model (SPM) and provide recommendations for improvements in business processes using the Root Cause Analysis method with the 5 Whys Diagram tool.

2. Materials and Methods

This research begins with a preliminary study to identify the problem and related research topics. It then outlines the indications of problems found in the General Affairs Division of PT Usaha Gedung Mandiri. This stage is conducted to identify the research object, required data, and issues to be further investigated. Subsequently, data will be collected at PT Usaha Gedung Mandiri's General Affairs and Warehouse Division. The data used includes historical procurement and expenditure data for a total of 83 types of cleaning supplies from 2023 to 2024, unit price data, supplier data, and goods movement data from 2022 to 2023.

Based on the data obtained, data processing will be carried out, divided into two parts: first, calculating the value of goods using the ABC Analysis method to determine the total purchase value (profit impact), and then, analyzing the level of risk of the goods, which will then be weighted. The risk level of an item is determined based on the movement of the item (Month Movement/MM) and the suppliers who supply the item (supply opportunity) [2].

Supply Opportunity data is derived from the number of suppliers who meet the company's inventory needs. The level of supply opportunity can be categorized as limited, moderate, or high, depending on the number of available suppliers [2]. Meanwhile, inventory risk or impact data is obtained from the analysis of the movement of items (month movement) within a period to determine the category of inventory as dead stock (no movement), slow-moving (slow-moving stock), or fast-moving (fast-moving stock). Month Movement (MM) is a metric used to measure the frequency of an item's movement within a period [9].

The risk weighting of the item is based on its level: High (4), Medium (3), and Low (2). Next, the risk values are summarized to determine the risk level for each item. Tables 1 and 2 provide a reference to the product categories based on the number of suppliers and their movement.

After grouping the goods based on tables 1 and 2, a summary calculation of the goods' risk levels will be performed using the following equation:

$$Risk\ Level\ Score: \frac{SO+IR}{2} \quad (1)$$

Description:
SO: Supply Opportunity Risk Value
IR: Inventory Risk Value
Table 3 is a reference for the recapitulation of risk levels.

Table 1: Supply opportunity

No	Category	Description
1	High (H): Limited (1 Supplier)	The fewer suppliers there are to provide a product (1 supplier), the higher the supply opportunity for that unit due to the limited choice of suppliers.
2	Medium (M): Several (2 Suppliers)	If the number of available suppliers is limited (only two suppliers), then the supply opportunity is at a medium level because there are only a few alternative suppliers who can provide the goods.
3	Low (L): Many (more than 2 Suppliers)	The more suppliers available (more than 2 suppliers), the lower the supply opportunity because the goods can be easily obtained from various sources, so the supply risk is smaller.

Table 2: Inventory risk

No	Category	Description
1	High (H): MM ≥ 4	The lower the movement of an item, the greater the impact on the item because the item tends to remain unused for a long time, increasing the risk of dead stock.
2	Medium (M): 2 ≤ MM ≤ 3	Slow-moving goods have a moderate impact on goods because the goods are still used, but at a slower frequency.
3	Low (L): 0 ≤ MM ≤ 1	The faster an item moves, the lower its impact on the item because the item remains available and is replaced regularly, thus preventing disruption to operational activities.

Table 3: Risk level score

No	Score	Risk Level
1	1 ≤ Risk Level ≤ 2.5	L Risk Level
2	2.5 ≤ Risk Level ≤ 3.5	M Risk Level
3	3.5 ≤ Risk Level ≤ 4	H Risk Level

Table 4: Supply positioning model classification

Risk Level (Supply Opportunity, Inventory Risk)	ABC Analysis for Purchasing Goods	Quadrant
H	A	Critical
L, M	A	Leverage
H	B	Critical
L, M	B	Leverage
H	C	Bottleneck
L, M	C	Routine

Table 5: Cooperation contract recommendation

No	Quadrant	Number of Suppliers	Cooperation Contract Type	Length of Cooperation Contract
1	Routine	>3	Spot Purchase	6 months – 1 year
2	Leverage	1	Fixed Contract	1-5 years
3	Bottleneck	2	Fixed Contract	1-5 years
4	Critical	1	Partnership	≥5 years

In ABC Analysis calculations, purchases are classified based on their importance, with the price being the primary consideration. Data processing involves sorting purchase data based on total cost and then calculating it as a percentage of purchases. Firdaus and Hadining (2023) explain the principles of ABC Analysis classification as follows:

- Class A accounts for approximately 70-80% of the total value of goods but only about 20% of the total inventory because it has the highest rupiah absorption rate.
- Class B accounts for approximately 15-25% of the total value of goods and accounts for approximately 30% of the total inventory.
- Class C accounts for only about 5-10% of the total value of goods but accounts for approximately 50% of the total inventory. Because it has the lowest rupiah absorption rate, Class C requires minimal supervision in purchasing.

Once the risk level and profit impact are determined, the goods will be classified using the Kraljic Matrix, which divides goods into four quadrants: Routine, Bottleneck, Leverage, and Critical. This classification process is based on the risk summary data and material purchasing data using the previously conducted ABC Analysis. The purpose of this stage is to develop a collaboration strategy with vendors based on the predetermined product categories [9]. Figure 1 shows the quadrants of Kraljic's Supply Positioning Model. Table 4 shows the Supply Positioning Model classification.

After classifying goods into four quadrants, the next step is to formulate recommended cooperation contracts with vendors. These recommendations are based on the grouping of materials in the Kraljic Matrix using the Supply Positioning Model (SPM), so that cooperation strategies can be optimized according to the existing product categories. These cooperation contract strategies will be tailored to seven types of Supplier-Buyer Relationships: Spot Purchasing, Regular Trading, Call-Off Contracts, Fixed Contracts, Partnerships, Joint Ventures, and Internal Provision [10]. Table 5 shows the recommended cooperation contracts based on the SPM quadrants.

In addition, to optimize the company's procurement strategy, a root cause analysis will be conducted using Root Cause Analysis with the 5 Whys Diagram tool. Root Cause Analysis will identify the causal factors of a problem or incident [12] and make adjustments or changes to the existing system to prevent the same error from recurring [13]. In the 5 Whys method, the most common method is to ask five questions, but additional questions can also be asked if the problem identification is deemed insufficient [14].

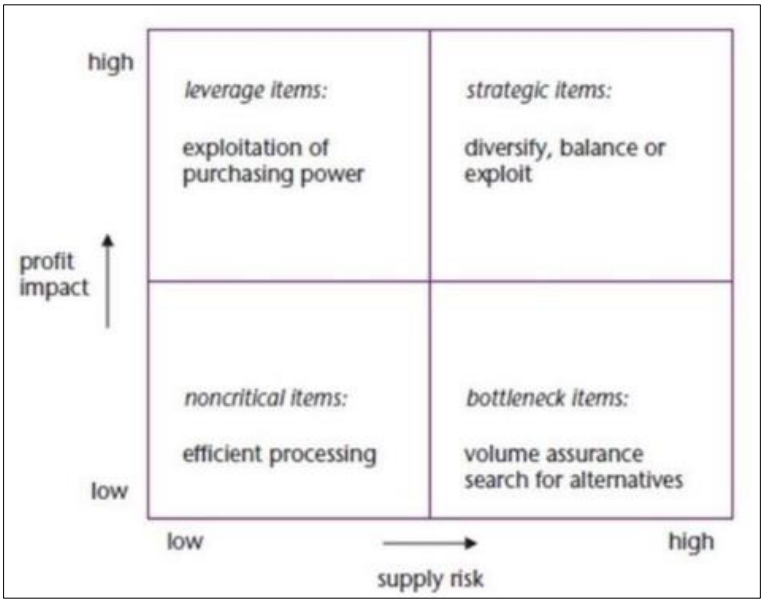

Fig 1: Kraljic's Matrix

3. Results and Discussion

Profit Impact Processing with ABC Analysis

Data processing using ABC Analysis will be used to determine the purchase rate for each item. The data processing step involves sorting the purchase data from highest to lowest total cost. Then, the percentage of each item is calculated and the items are grouped into ABC categories [16]. Figure 2 shows the Pareto diagram for the ABC analysis

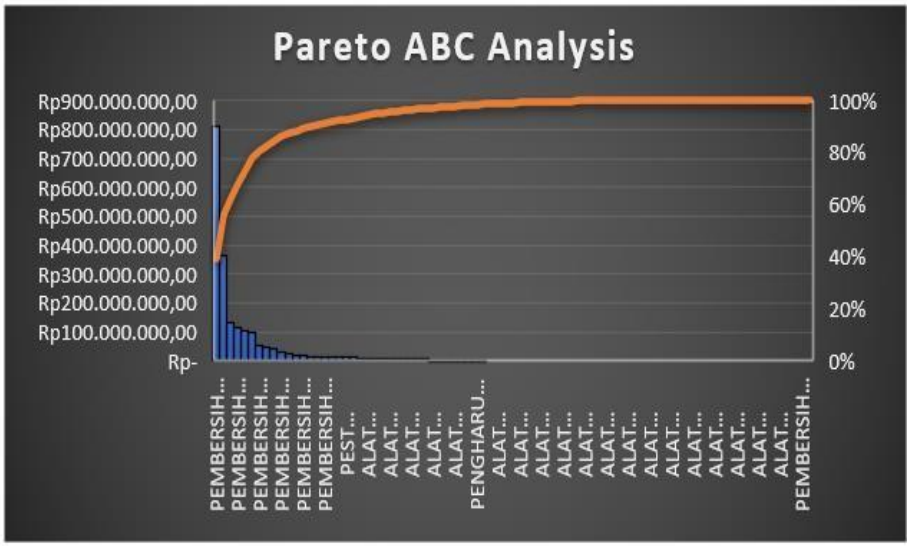

Fig 2: Pareto diagram for ABC Analysis

Based on the calculations performed, there are 17 items fall into category A, 25 items fall into category B, and 42 items fall into category C. Therefore, it can be concluded that a large number of items belong to category C, indicating that most cleaning products have a low purchase frequency.

Recommended contracting strategies based on the SPM

In the routine category, there are 34 items. The recommended strategy for this category is *Spot Purchasing*. This type of cooperation typically uses a contract duration of 6 months to 1 year and involves more than three suppliers. The main procurement focus for this contract type should be on procurement efficiency and obtaining competitive quotations from various suppliers. Procurement efficiency for routine items emphasizes selecting suppliers based on item-by-item price considerations.

In the leverage quadrant, there are seven items. The leverage quadrant is characterized by medium risk but high value to the company. The recommended contract type for this quadrant is a *Fixed Contract* with a duration of one to five years, focusing procurement on a single supplier due to the high purchase value. Using a single supplier benefits the supplier through high-volume purchases, while the company—as the customer—can negotiate priority in terms of quality, delivery, and price. In this arrangement, both parties can establish mutually beneficial agreements across all aspects of procurement.

In the bottleneck quadrant, there are six items. This quadrant has high risk but low value to the company. The recommended contract type is also a *Fixed Contract* with a duration of one to five years, but with two suppliers to mitigate the high risks associated with these items. In this

quadrant, the company may include clauses related to price protection and product quality. To further reduce the elevated risk, the company can incorporate purchase commitments for several future periods within the contract.

In the critical quadrant, there are 27 items. This quadrant carries both high risk and high value to the company. Because this quadrant represents the most significant value among all categories, the company must give considerable attention to items classified as critical due to their strong influence on profitability. The recommended contract type is a long-term *Partnership*, typically lasting five years or more. This is necessary to ensure that suppliers can reliably provide the required items at the appropriate time, quality level, and price. Additionally, both the supplier and the company gain flexibility regarding procurement timing, given the high level of interaction and collaboration established between them.

Based on the recommended number of suppliers for each cleaning product, it is evident that the current supplier base at PT Usaha Gedung Mandiri does not fully meet the recommended levels—particularly for items in the routine and bottleneck quadrants. Routine items require more than three suppliers, yet the company currently has only one to two. For bottleneck items, the recommendation is two suppliers, but several items are still handled by only one. Therefore, to optimize procurement performance, the company should reevaluate its current supplier allocations and assess the potential improvements that could result from increasing the number of suppliers in accordance with the recommendations.

Improvement recommendations using the whys diagram

One of the main problems in the procurement process at PT Usaha Gedung Mandiri is the inconsistency of vendors' delivery times. Items purchased from certain vendors may be delivered immediately, while others require a waiting period of three to seven days depending on factors such as whether the order is placed during working hours, the quantity ordered, and the distance between the vendor and the company.

From this issue, the first identified cause is that the company makes purchases solely based on client requests without performing long-term planning or analyzing the patterns of order schedules and quantities. This leads to the second why, which reveals that the company does not apply an adequate demand forecasting system or inventory control mechanism. Current procurement activities rely only on estimation without considering historical purchasing data.

Proceeding to the third why, the issue stems from the procurement process being reactive—purchases are made only when a need arises, whether it is for fulfilling client demand or for building operational needs at PT Usaha Gedung Mandiri. Additionally, the procurement process does not consider the risk level or purchase value of the items. As a result, purchases for non-client operational needs lack proper evaluation regarding quantity and durability. This situation causes certain warehouse items—especially those with expiration dates, such as fragrances, hand soaps, and similar products—to accumulate and eventually be discarded due to expired shelf life.

From these observations, the root cause of the problem is identified as the lack of optimal integration between the purchasing and warehouse departments. Most processes remain manual, including inputting purchased items, entering prices, and determining purchase quantities.

Based on the identified root cause, several improvement recommendations can be made. The company should implement an integrated system such as E-Procurement, which would allow both purchasing and warehouse divisions to monitor and control available inventory, items requiring procurement, and procurement requests from the warehouse to purchasing. Moreover, the company should consider selecting vendors located closer to the company to minimize delivery delays. Lastly, the company is advised to consolidate procurement activities by grouping purchases that can be sourced from a single vendor, thereby simplifying the procurement and delivery process into a single purchase memo.

5. Conclusion

Based on the results of data processing and the analyses conducted, the following conclusions can be drawn to answer the objectives of this research:

1. The dataset of cleaning items used at PT Usaha Gedung Mandiri consists of 83 items, with a total expenditure of Rp2,077,803,200 during 2023–2024. From the analysis of this dataset, it is evident that the company has not yet implemented a purchasing strategy that considers the risk level of each item. Therefore, a new strategy can be applied by classifying items using the Supply Positioning Model (SPM) to determine purchasing decisions based on risk level and profit impact.
2. The classification of items using the Supply Positioning Model is based on Profit Impact—calculated using ABC Analysis—along with Supply Opportunity and Inventory Risk. The items are then classified into four quadrants:
   - Routine quadrant: 34 items
   - Bottleneck quadrant: 7 items
   - Leverage quadrant: 6 items
   - Critical quadrant: 27 items
3. Procurement uncertainties and opportunities for optimization can be managed by determining appropriate supplier contracting strategies. The recommended contract strategies for each quadrant are as follows:
   - Routine category**:** Medium risk and low value; recommended strategy is *Spot Purchasing* with contract duration of 6 months to 1 year and more than three suppliers.
   - Leverage quadrant: Medium risk but high value; recommended strategy is a *Fixed Contract* for 1–5 years with procurement focused on a single supplier due to the high purchase value.
   - Bottleneck quadrant: High risk but low value; recommended strategy is a *Fixed Contract* for 1–5 years with two suppliers to mitigate risk.
   - Critical quadrant: High risk and high value; recommended strategy is establishing a long-term *Partnership* contract lasting five years or more.
4. The key issue identified is that the company conducts procurement on an order-by-demand basis, but vendor delivery times are inconsistent. Through the 5 Whys analysis, the root cause was identified as the lack of optimal integration between the purchasing and warehouse departments. The procurement process remains manual, including item entry, price input, and determination of purchase quantities. Based on this root cause, an improvement recommendation is proposed: the implementation of an integrated system such as E-Procurement, which would allow both departments to

efficiently monitor and control procurement activities.

6. References

1. Adi DE, Pujotomo D, Sriyanto. Penggunaan Kraljic's purchasing portfolio model dalam perancangan strategi pengadaan bahan baku pada PT Masscom Graphy. 2017.
2. Aditya BAAP, Winursito YC. Analisis bottleneck pada proses ganti meter baru di gudang PDAM Surya Sembada Surabaya dengan metode root cause analysis. JUTIN: Jurnal Teknik Industri Terintegrasi. 2024.
3. Afma VM, Sumarya E. Analisis cacat menggunakan metode FTA dan FMEA pada departemen buffing untuk menurunkan jumlah unit cacat (Studi kasus: PT BWB). 2022.
4. Alhammadi A, *et al*. Redefining procurement paradigms: A critical review of buyer–supplier dynamics in the global petroleum and natural gas industry. The Extractive Industries and Society. 2013.
5. Chopra S, Meindl P. Supply chain management: Strategy, planning, and operation. Pearson Education Limited; 2019.
6. Darminta P, Susanty A. Penetapan strategi purchasing untuk kontrak kerja sama dengan metode Supply Positioning Model pada material drilling area Kamojang PT Pertamina Geothermal Energy. 2023.
7. Fitriasyach KP, Putri SI. Peran supplier relationship management (SRM) pada pemasok di PT. Krakatau Pipe Industries. Jurnal Manajemen dan Bisnis. 2024;4.
8. Fretes RA. Analisis penyebab kerusakan transformator menggunakan metode RCA (Fishbone Diagram and 5 Whys Analysis) di PT PLN (Persero) Kantor Pelayanan Kiandarat. 2022.
9. Haming M, Nurnajamuddin M. Operasi manufaktur dan jasa. PT Bumi Aksara; 2007.
10. Irawan MA, Pulansari F. Analisis pengendalian kualitas produksi kaleng PT XYZ dengan menggunakan metode RCA (Root Cause Analysis). 2024.
11. Prasetyo EB. Supplier relationship management berdasarkan indeks proses kapabilitas untuk multiple characteristic. 2018.
12. Sandy GF. Penilaian supplier relationship management maturity level: Studi kasus PT PJB Unit Pembangkitan Gresik. 2022.
13. Tasleem N, Raghav RS, Ansari MN. A decision intelligence framework: Integrating human intuition with AI models. Journal of Artificial Intelligence and General Science. 2024.
14. Ulkhaq MM, Pratiwi TN. Formulating purchasing strategies with Kraljic portfolio matrix: A case study in an investment management. Jurnal Sistem dan Manajemen Industri. 2024;8(2):119-28.
15. Widodo DS, Wulandari A. Penerapan metode 8D berbasis 5 Why dan fault tree analysis untuk mengurangi kecacatan dan komplain produk di CV. X. Journal of Industrial Engineering and Operation Management. 2024.
16. Wirasenjaya Z, Supriyanto H. Peningkatan performansi service supply chain dengan metodologi Lean Six Sigma pada CV Ekspedisi Aneka Logistik. 2014.

How to Cite This Article

Hapsari CAP, Fauziyah HM, Ulkhaq MM. Establishing purchasing strategy for collaboration contract strategy using Kraljic's supply positioning model and 5 Whys analysis (case study: PT Usaha Gedung Mandiri). Int J Multidiscip Res Growth Eval. 2025;6(6):887-92. doi:10.54660/.IJMRGE.2025.6.6.887-892.