

Original Article

Maximizing Procurement Efficiency through Purchase Requisitions Load Building

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Abstract - In the distributor business, optimizing procurement processes and reducing freight expenses are crucial, all while satisfying the requirements of our esteemed customers. However, the ever-changing landscape of customer demands poses challenges in accurately predicting inventory needs. This article examines implementing a purchasing requisition load-building approach that enables buyers to consolidate and organize purchase requisitions effectively while adhering to the vendor's minimum buying rules. By employing load-building techniques, transportation costs are minimized by efficiently utilizing transportation resources and leveraging the opportunity to secure favorable purchase prices, such as by ordering complete truckloads.

Keywords - SAP S/4 HANA, Procurement, Digital Transformation, Efficiency in Procurement, Vendor Minimum Buying Rules, Freight Cost.

1. Introduction

Effective procurement procedures [1-2] are essential for businesses looking to maximize resource allocation and simplify operations in today's fast-paced corporate environment. The SAP Purchase Requisitions Load Building functionality is a potent tool created to improve and speed up the procurement process, enabling organizations to satisfy their material requirements quickly and affordably.

The Purchase Requisition, a formal request for goods and services within an organization, is a crucial component of the procurement process. It is the first stage in the purchasing process, starting a chain of approvals, sourcing, and buying orders. Purchase requisitions rise along with an organization's expansion and increasingly sophisticated procurement requirements. Handling these requisitions to meet the vendor's minimum buying rules manually based on text/tag memos can be time-consuming and prone to errors, leading to delays and inefficiencies in the procurement process.

Purchase Requisitions Load Building functionality was built to overcome these difficulties. It automates and optimizes the processing of numerous purchase requisitions. It allows load-building functionality based on the six criteria:

- Net Value
- Gross Weight
- Volume
- Quantity
- Net Weight
- Prepaid Freight

Businesses that deal with high-volume procurement, such as manufacturing firms, wholesalers, retail chains that import trading goods, and huge corporations, are the target market for this capability. Organizations can easily manage large numbers of buy requisitions by utilizing automation, which enables quicker decision-making and enhanced procurement efficiency.

The major components of SAP Purchase Requisitions Load Building functionality, its implementation procedure, and the different use scenarios where it shows to be especially useful will all be covered in further detail in this article. Businesses can unleash their full potential to generate operational excellence and achieve procurement efficiency at scale by understanding this crucial component of the SAP ecosystem.

2. Literature Review

Enterprise Resource Planning, supply chain management, and procurement systems have all shown an interest in and research the Purchase Requisitions Load Building capabilities. This section evaluates the available literature on this crucial topic of procurement module while highlighting relevant studies, study findings, and expert perspectives.

- Procurement automation research and organizational effectiveness: Zhang et al.'s study [3] looked at the effects of procurement automation on organizational Effectiveness. The study found that using Purchase



Requisitions Load Building—improved procurement cycle timelines and saved much time. The study strongly emphasized optimizing the procurement process to improve supply chain performance.

- Scalability and Flexibility in Procurement Systems: Meiling Luo. [4] conducted a study on the scalability and flexibility of ERP systems in managing increasing procurement volumes. According to the report, capabilities for building purchase requisition loads are crucial for businesses dealing with fluctuating requirements. The system's capacity to effectively handle shifting demand quantities was a key benefit in a fast-paced commercial environment.
- Effect on Procurement Cost Savings: An analysis of the possible cost-saving opportunities made by leveraging procurement automation features was done in a white paper by a reputable consulting firm. The Load Building functionality was identified in the research as an essential tool for locating opportunities for bulk purchases, helping businesses improve suppliers' terms, and reducing procurement costs.

Finally, the literature that is now available on the Purchase Requisitions Load Building functionality repeatedly emphasizes its importance in boosting procurement efficiency, cutting processing times, and locating cost-saving opportunities. Adopting such automation capabilities is increasingly becoming a strategic priority as firms aim for operational excellence in their procurement operations. This literature review offers insightful information for companies using the Load Building feature to streamline their procurement processes and gain a competitive edge in the market.

3. Procurement Process Flow

- Demand Management: The process flow starts with understanding the demand for products or materials [5]. Demand can arise from various sources, such as customer sales orders (buy-to-order) or consumption-based planning. Additionally, demand can be forecasted based on historical data or market trends, resulting in planned independent requirements. Understanding the demand is crucial for effective planning and ensuring that the necessary materials are available when needed.
- Material Requirement Planning (MRP): Material Requirement Planning [6] is a systematic approach to managing the flow of materials within a production or manufacturing environment. It involves determining the quantities of raw materials, components, and assemblies required to meet production demands while minimizing inventory costs [15]. The primary objective of MRP is to ensure that materials are available at the right time, in the correct quantity, and of the right quality to support the

production process. MRP considers the demand, existing inventory levels, lead times, and other factors to create a procurement and production schedule.

- Monitoring Material Coverage [7][12]: After running the MRP process, buyers and planners review the results to ensure that the required materials are adequately planned and available. This step involves checking the material coverage and verifying that there are no stock-outs or shortages that could hinder the production process. If any issues are identified, they can be addressed by expediting orders or adjusting production schedules.
- Display Purchase Requisitions and Load Building [8-9]: In this step, buyers use an application called "Display Purchase Requisitions" to analyze the purchase requisitions generated by MRP [14]. This application also provides a "Load Building" functionality, which allows buyers to group purchase requisitions based on specific criteria. The load-building criteria can be:
 - Net Value: Group requisitions based on their net monetary value.
 - Gross Weight: Group requisitions based on their total weight.
 - Volume: Group requisitions based on their total volume.
 - Quantity: Group requisitions based on the total quantity required.
 - Net Weight: Group requisitions based on their net weight.
 - Prepaid Freight: Group requisitions based on the requirement for prepaid freight.
- Conversion of Purchase Requisitions into Purchase Orders [10-11]: Once the buyers are satisfied with the load-building process and have ensured that the material requirements are correctly grouped, they convert the purchase requisitions into actual purchase orders. Purchase orders are formal documents sent to suppliers to request the delivery of materials or goods according to the specified terms and conditions.

By following this detailed process flow, organizations can efficiently manage their material requirements, optimize inventory levels, and ensure that production demands are met promptly and cost-effectively.

4. Solution Strategy

- Standard SAP has T-code: ME5A [16-17], which is to display purchase requisition(s). The same t-code can be used by the buyer(s) to do purchase requisition(s) analysis.
- SAP has provided BADI: ME_CHANGE_OUTTAB_CUS [13], where we can include additional fields in the ALV layout.
- Below are the additional fields that are needed in the ALV layout:

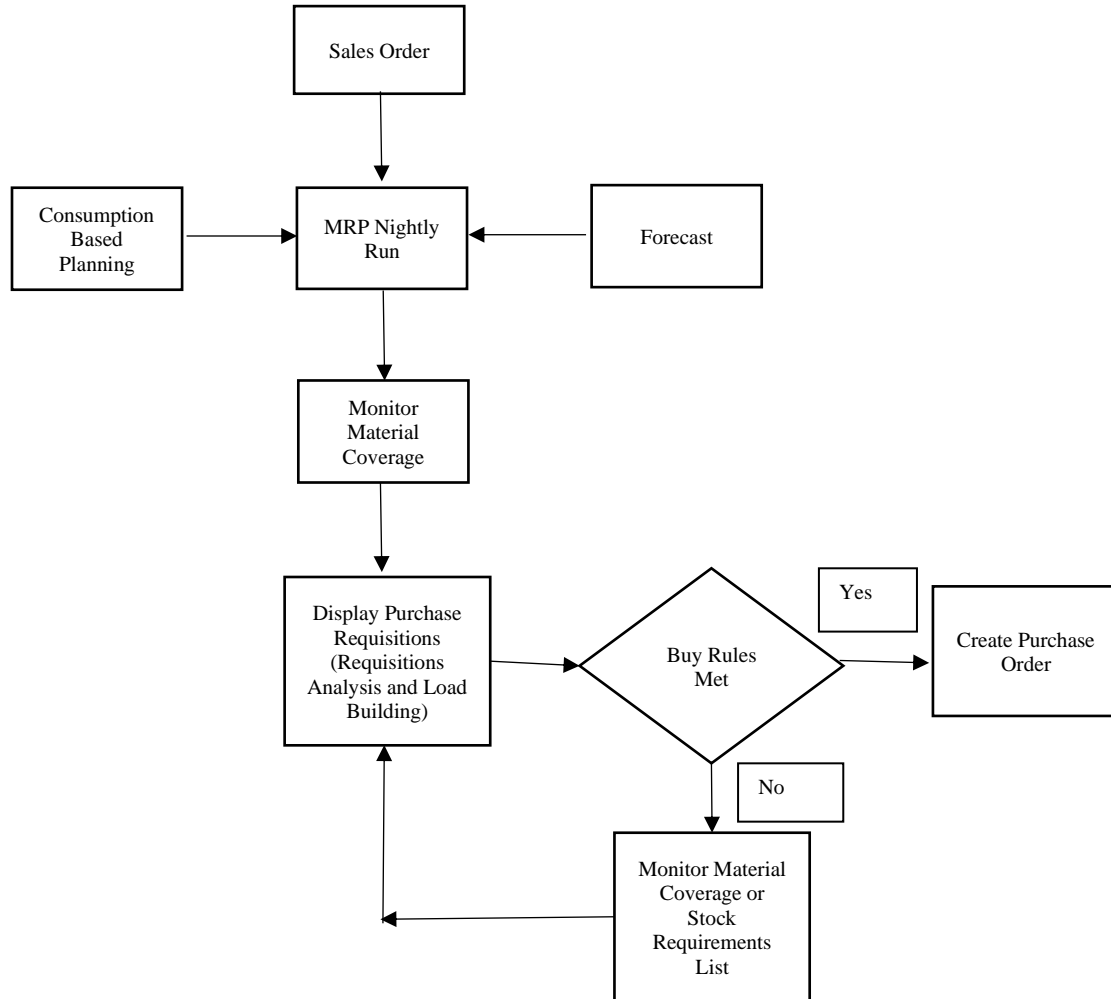


Fig. 1 Procurement process flow

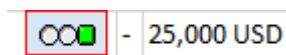
- Selection Screen: Add the selection checkbox.
 - Net Value – Min
 - Net Value – Max
 - Gross Weight – Min
 - Gross Weight – Max
 - Ordering Unit Quantity – Min
 - Ordering Unit Quantity – Max
 - Net Weight – Min
 - Net Weight – Max
 - Prepaid Freight – Min
 - Prepaid Freight - Max
- The buyer (s) will select one or more purchase requisition(s) for which load building needs to be performed.
 - Below is the validation once buyer(s) click on “Load Building”:
 - For selected purchase requisition(s), check if it has an “OA Vendor Restriction Profile.” If profiles differ, throw a pop-up error message saying, “Selected Purchase Requisition(s) does not have same restriction profile.”
 - For selected purchase requisition(s), check if the “OA Vendor Restriction” profile is initial. If it’s initial, then check “Fixed Vendor Restriction Profile.” If profiles differ, throw a pop-up error message saying, “Selected Purchase Requisition(s) does not have same restriction profile.”
 - For selected purchase requisition(s), if “OA Vendor Restriction” and “Fixed Vendor Restriction Profile” are initiated, then throw a pop-up error message that “Selected Purchase Requisition(s) does not have restriction profile.”
 - Once all the validation passes, the program will pick up the get the restriction profile from “OA Vendor Restriction” and pass it to the table TWBO1 and get the Internal Restriction (TWBO1-BORESTRI), Internal restriction category indicator (TWB01-BOTYPI).
 - If the “OA Vendor Restriction Profile” is initial, pass the “Fixed Vendor Restriction Profile” and fetch similar information.
 - Based on three values, map various columns for traffic lights.

Internal Restriction (TWBO1-BORESTRI)	Internal restriction category indicator (TWB01-BOTYPI)	Report Column
01 Value (net)	01 - Minimum	Net Value - Minimum
01 Value (net)	02 - Maximum	Net Value - Maximum
02 Weight (gross)	01 - Minimum	Gross Weight – Minimum
02 Weight (gross)	02 - Maximum	Gross Weight – Maximum
04 Units	01 - Minimum	Ordering Unit Quantity – Minimum
04 Units	02 - Maximum	Ordering Unit Quantity – Maximum
05 Weight (net)	01 - Minimum	Net Weight – Minimum
05 Weight (net)	02 - Maximum	Net Weight – Maximum
07 Prepaid Freight	01 - Minimum	Prepaid Freight – Minimum
07 Prepaid Freight	02 - Maximum	Prepaid Freight - Maximum

• Validation for each internal restriction:

❖ 01 Value (net):

- Compare all the PR(s) Ordering Currency with TWBO1-WAERS.
- If it does not match, show a message that “PO Currency does not match with restriction profile Currency.”
- If it matches, then Sum (Field: PO Values) all the selected PR(s) \$ and compare with TWBO1-TWBO1.
- If Value (Net) Minimum = Sum of (PO Values) > = TWBO1-TWBO1, then show a green traffic light or red traffic light.
- If Value (Net) Maximum = Sum of (PO Values) > TWBO1-TWBO1, then show red traffic light else green traffic light.
- Show the message as well (For example, as below).



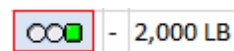
Or



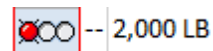
❖ 02 Weight (gross):

- Compare all the PR(s) “Gross Weight Unit for Ordering Unit” with TWBO1-GEWEI.
- If it does not match, show “PO Gross Weight Unit does not match with restriction profile Unit.”

- It matches, then Sum (Field: Gross Weight in Ordering Unit) all the selected PR(s) and compares with TWBO1-GEWEI.
- If Weight Gross Minimum: Sum of (Gross Weight in Ordering Unit) > = TWBO1-GEWEI, then show a green traffic light; otherwise, a red traffic light.
- If Weight Gross Maximum: Sum of (Gross Weight in Ordering Unit) > TWBO1-GEWEI, show red or green traffic lights.
- Show the message as well (For example. as below).



Or



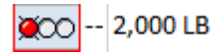
❖ 03 Units (Ordering Unit)

- Compare all the PR(s) “Ordering Unit” with TWBO1-MEINS.
- If it does not match, it shows a message: “PO Ordering Unit does not match with restriction profile Unit.”
- If it matches, Sum (Field: Open Ordering Unit) all the selected PR(s) and compare with TWBO1-BORESMNG.

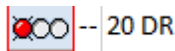
- If Units Minimum = Sum of (Open Ordering Unit) > = TWBO1-BORESMNG, show a green and red traffic light.
- If Units Maximum = Sum of (Open Ordering Unit) > TWBO1-BORESMNG, then show red traffic, light, or green traffic light.
- Show the message as well.



Or

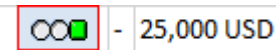


Or

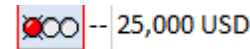


- ❖ 04 Weight (net)
 - Compare all the PR(s) “Weight Unit” with TWBO1-GEWEI.
 - If it does not match, show the message “PO Net Weight Unit does not match with restriction profile Unit.”
 - If it matches, then Sum (Field: Net Weight in Base Unit) all the selected PR(s) and compare with TWBO1-GEWEI.
 - If Weight (Net) Minimum = Sum of (Net Weight in Base Unit) > = TWBO1-GEWEI, then show a green traffic light; else red traffic light.
 - If Weight (Net) Maximum = Sum of (Net Weight in Base Unit) > TWBO1-GEWEI, then show a red traffic light or green traffic light.
 - Show the message as well (For example, as below).

- ❖ 05 Prepaid Freight
 - Compare all the PR(s) Ordering Currency with TWBO1-WAERS.
 - If it does not match, show the message “PO Currency does not match with restriction profile Currency.”
 - If it matches, then Sum (Field: PO Values) all the selected PR(s) \$ and compare with TWBO1-TWBO1.
 - It Prepaid Freight Minimum = Sum of (PO Values) > = TWBO1-TWBO1 then show green traffic light else red traffic light.
 - It Prepaid Freight Maximum = Sum of (PO Values) > TWBO1-TWBO1 then shows red traffic light else green traffic light.
 - Show the message as well (For example, as below).



Or



5. SAP Solution Evaluation and Confirmation

5.1. Display Purchase Requisitions [18].

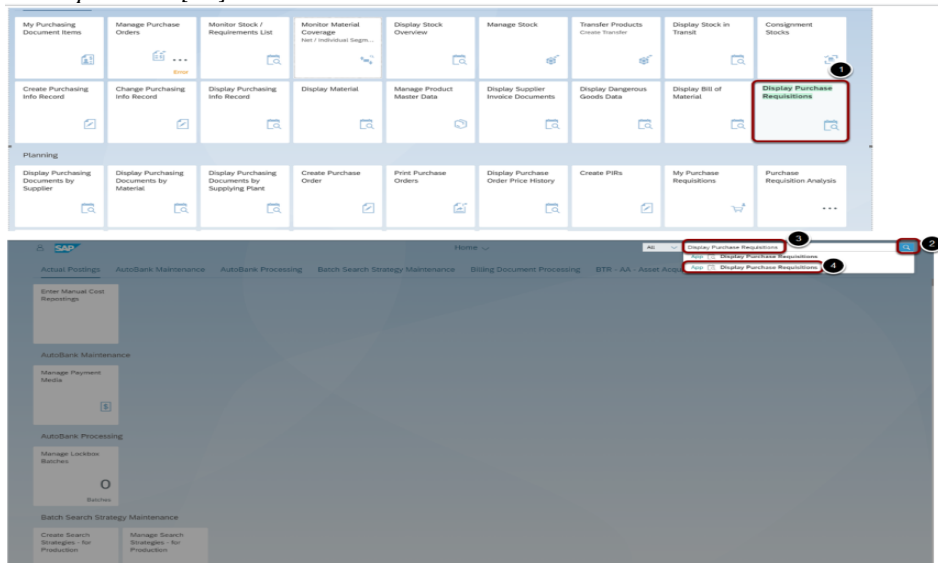


Fig. 2 Display purchase requisitions

5.2. List Display of Purchase Requisitions[19]

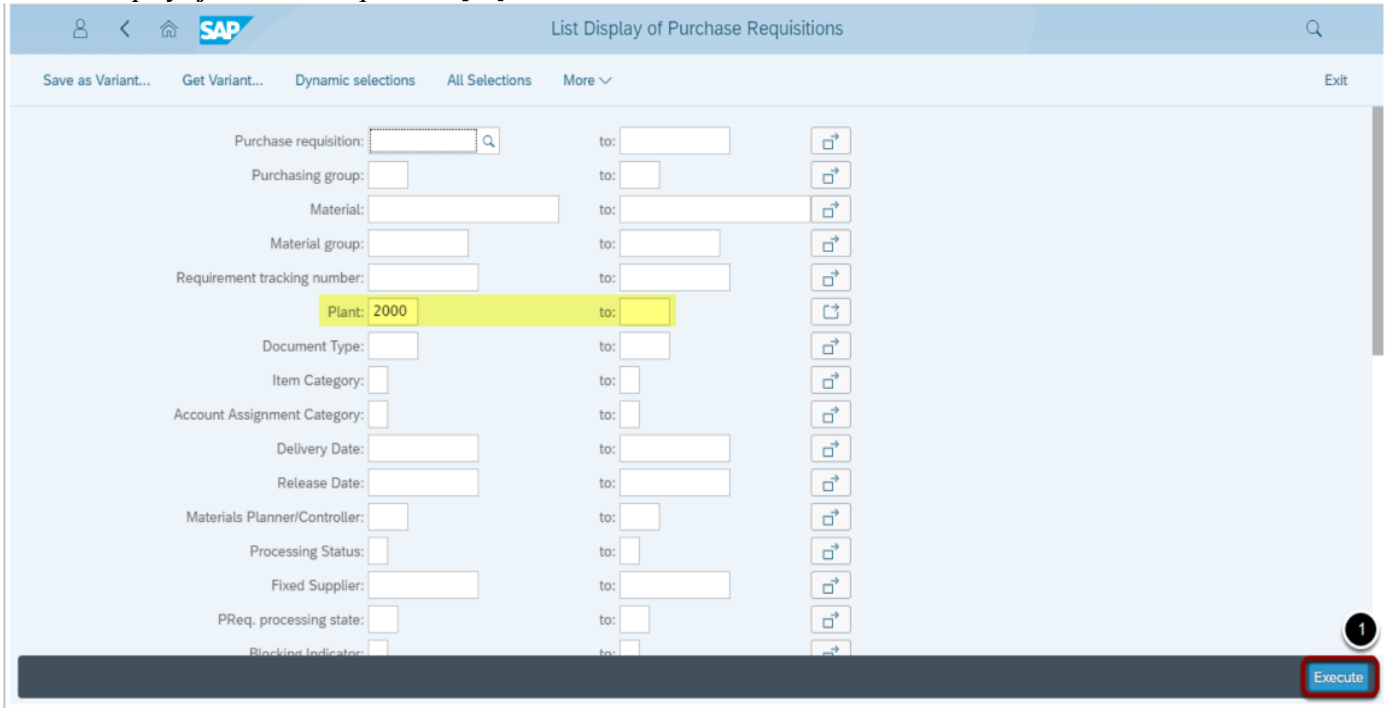


Fig. 3 Display purchase requisitions selection

5.3. List Display of Purchase Requisitions

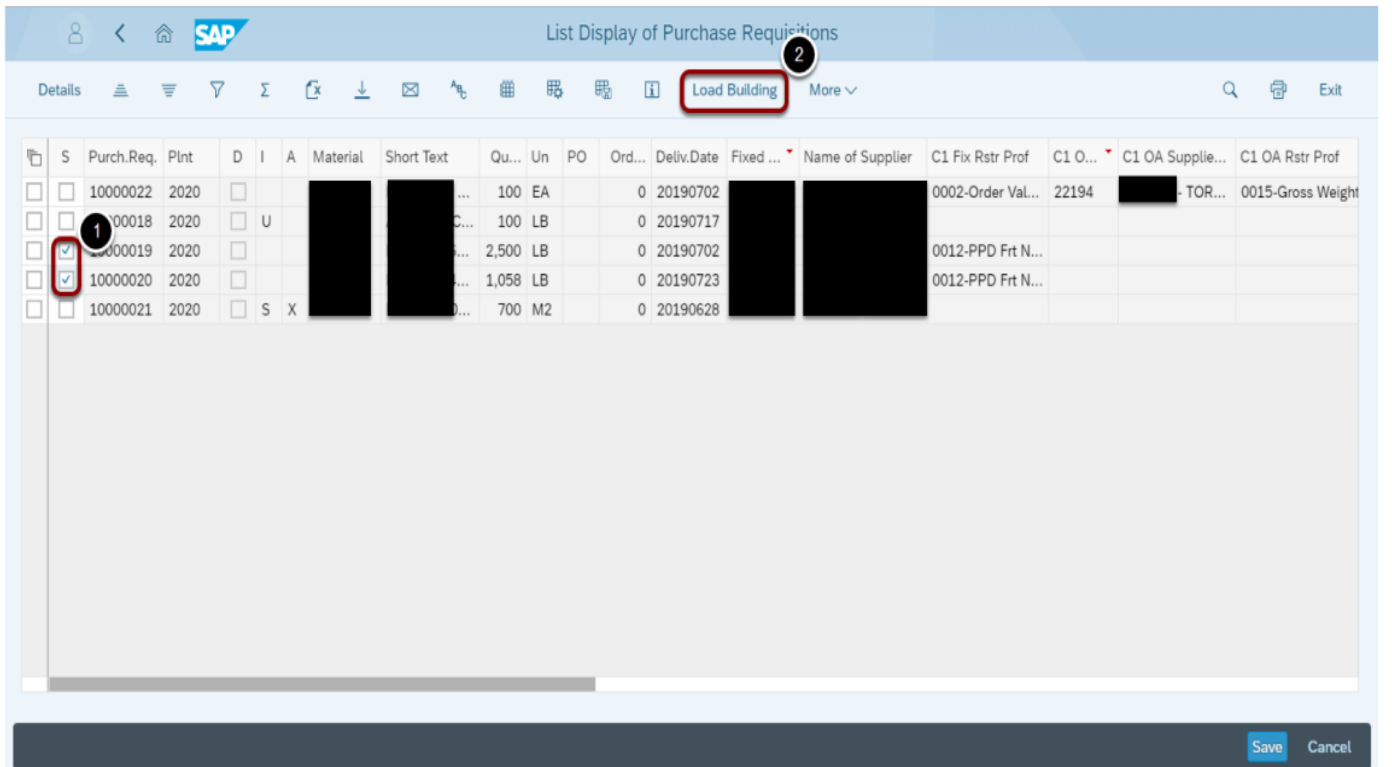


Fig. 4 Display purchase requisitions load building

5.4. List Display of Purchase Requisitions

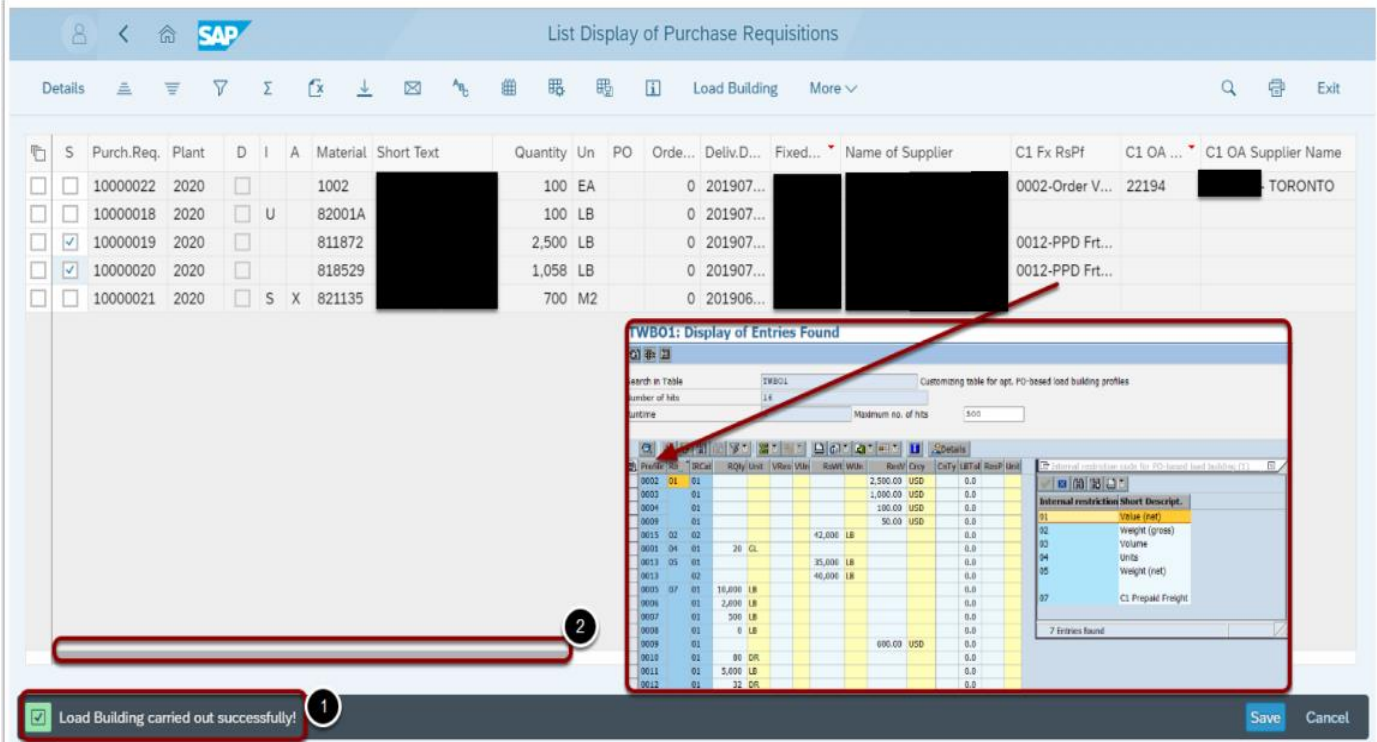


Fig. 5 Display purchase requisitions load building carried out

5.5. List Display of Purchase Requisitions[20]

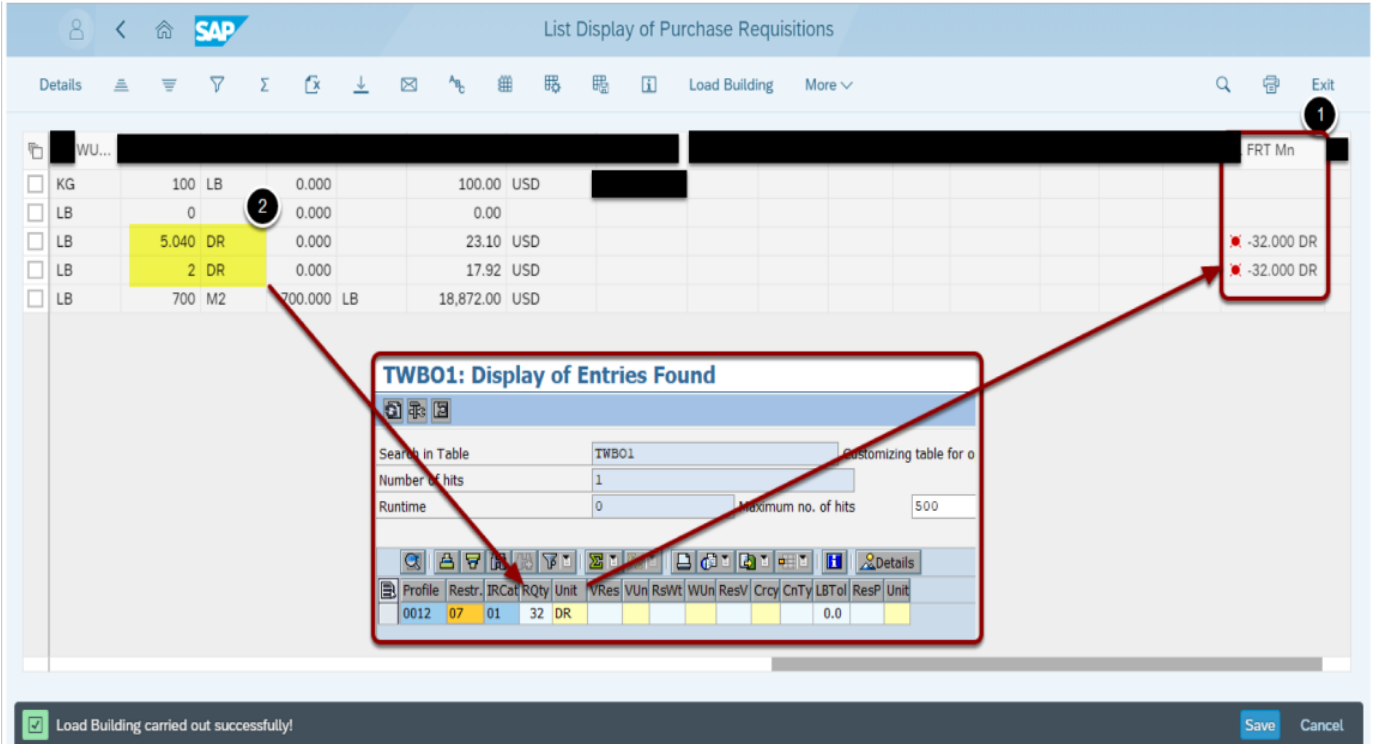


Fig. 6 Display purchase requisitions carried out successfully

6. Benefits

Key Benefits of SAP Purchase Requisitions Load Building:

- Time Savings: Manual processing of many purchase requisitions can be resource-intensive and time-

consuming. The load-building functionality automates this process, reducing the time required to handle requisitions and enabling procurement teams to focus on strategic tasks.

Company's Revenue	Time saved per purchase requisitions (In Minutes)	Total Purchase Requisition(s) processed annually	Total Minutes Saved	Total Hours Saved Per Buyer	Hourly Salary	Total Saving Per Year
\$800M - \$1B	5	50,000	250,000	4,167	\$36.06	\$150,250
\$1B - \$1.5B	7	65,000	455,000	7,583	\$36.06	\$273,455
\$1.5B - \$2B	10	100,000	1,000,000	16,667	\$36.06	\$601,000

- According to the study, an average of 5 minutes is saved per purchase requisition process, and organizations with revenue of \$800M to \$1B having 50,000 purchase requisitions annually turn to a total of 250,000 (5*50,000) minutes annually.
 - 250,000 minutes means 4,167 hours, which, if buyers have an average hourly salary of \$36.06, is a total savings of \$150,250 annually.
- Increased Efficiency: Automation eliminates the possibility of human errors that might occur during manual processing. This, in turn, minimizes the chances of incorrect data entry, redundant tasks, and delays, leading to greater overall efficiency.
- Streamlined Workflow: The load-building feature streamlines the entire procurement workflow. It consolidates multiple purchase requisitions into a manageable unit, simplifying the approval process and making it easier for procurement managers to oversee the entire operation.
- Prepaid Freight Cost Savings: By optimizing the procurement process and buying rules, organizations can identify potential cost-saving opportunities, negotiate better terms with suppliers, and reduce overall procurement expenses.

Company's Revenue	Total Numbers of PO Per Year	Total Freight Cost Before Load Building (In Millions)	Total Freight Cost After Load Building (In Millions)	Total \$ Saving (In Millions)
\$800M - \$1B	15,000	\$60	\$50	\$10
\$1B - \$1.5B	19,000	\$120	\$100	\$20
\$1.5B - \$2B	25,000	\$170	\$140	\$30

- Per reporting, we understood that the organization spent almost \$60M over the 15,000 purchase orders yearly.
 - Without load-building functionality for loads ranging from \$800M to \$1B, we lost approximately \$10M per year on prepaid freight.
- Enhanced Visibility: The load-building functionality provides real-time visibility into the status of purchase requisitions, enabling stakeholders to monitor progress, identify bottlenecks, and make informed decisions promptly.
- Scalability: As businesses grow, so does their procurement volume. SAP's load-building functionality is scalable and adaptable, ensuring it can handle increasing requisition loads without compromising performance.

7. Conclusion

In conclusion, developing and implementing the purchase requisition load-building functionality marks a significant milestone in streamlining and optimizing the procurement process. These innovative solutions empower organizations to enhance their efficiency, accuracy, and transparency in managing purchase requisitions, ultimately leading to better decision-making and cost control.

With the purchase requisition load-building functionality, the cumbersome and time-consuming manual processes have replaced a seamless and automated workflow. The system enables users to generate purchase requisitions effortlessly, ensuring that all necessary details are captured accurately and routed through the appropriate channels for approval. This, in turn, reduces the risk of errors, delays, and unnecessary back-

and-forth communication, saving valuable time and resources for the organization.

Moreover, the buyers' ability to consolidate and analyze requisition data provides valuable insights into procurement patterns, supplier performance, and expenditure trends. With this information, organizations can make data-driven decisions, negotiate better terms with suppliers, identify cost-saving opportunities, and align procurement strategies with overall business objectives.

Additionally, the built-in checks and balances within the system contribute to improved compliance and governance, ensuring that requisitions adhere to predefined policies and budgets. Data centralization fosters better stakeholder collaboration, fostering a more cohesive and coordinated procurement process across different departments and locations.

As we move into an era of increased digitization and data-driven decision-making, the purchase requisition load-

building functionality positions organizations to remain agile and responsive to market dynamics. By harnessing the power of automation, analytics, and collaboration, businesses can gain a competitive edge in their respective industries and achieve sustainable growth.

While the development of this functionality marks a significant achievement, it is essential to acknowledge that technology is ever-evolving. Continuous efforts to gather user feedback, adapt to changing business needs, and incorporate new advancements will ensure the system's long-term success and effectiveness.

In conclusion, the purchase requisition load-building functionality represents a remarkable step forward in optimizing procurement processes, boosting efficiency, and promoting informed decision-making. By embracing this innovation, organizations can drive cost savings, enhance productivity, and strengthen their procurement strategy in an increasingly competitive business landscape.

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