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## **ERP IMPLEMENTATION – OVERCOMING ISSUES LINKED WITH THE PROCUREMENT PROCESS**

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### **ABSTRACT**

*This research aims to identify issues faced by an Enterprise Resource Planning (ERP) vendor in implementing an ERP system at a client company and to propose solutions. These issues have been a barrier to reengineering the procurement process and integrating it with the ERP system. The main issue encountered during the implementation was the absence of unique item identification for goods which impacted the entire procurement process. To address this critical issue, a comprehensive hierarchical item identification system was devised, introducing four levels for categorization and unique identification. Further, to streamline the procurement process, a user manual was developed. This user manual offers clear and concise guidance on utilizing various forms related to procurement, ensuring accurate and error-free data input and retrieval. This research emphasizes the critical role of a systematic item identification system and an integrated ERP system in enhancing procurement processes, promoting efficiency, and ensuring long-term operational sustainability for the client company.*

**Keywords:** ERP Systems, Procurement Process, Process Reengineering, Unique Item Codes, User Manual

### **1. Introduction**

Over the past decade, many companies have implemented ERP systems to replace functional systems with standardized, company-wide solutions. Successful ERP implementation requires continuous interaction between the system, organizational groups, and external entities like vendors and consultants (Akron, Shao, & Owusu, 2022) where ERP systems have evolved to integrate various enterprise processes (Kumar & Hillegersberg, 2000). Thus, ERP systems support multiple functional areas such as planning, manufacturing, sales, and

accounting (Rashid, Hossain, & Patrick, 2002) aiming to provide a comprehensive business process overview (Klaus, Rosemann, & Gable, 2000).

A successful ERP system implementation will generate benefits such as faster processing, improved resource management, competitive differentiation, business flexibility, and enhanced communication (Shang & Seddon, 2000). However, firms will experience many challenges with ERP system implementation. By conducting a systematic literature review on ERP implementation challenges, Akrong et al. (2022) identify a lack of top management support, poor quality of business process reengineering, poor IT infrastructure, inadequate training/education of end users, and poor communication between ERP team and organization members as the key challenges. Notably, business process reengineering (BPR) has been identified as one of the key challenges (Newman & Zhao, 2008; Javidroozi, Shah, & Feldman, 2020). Companies need to analyze, redesign, and improve existing processes to successfully implement ERP systems (Javidroozi et al., 2020). It is argued that best practices embedded in legacy ERP systems can be used to redesign and improve processes, but the situation can be different when SMEs try to implement local ERP solutions (Liang & Xue, 2004). In that context, ERP vendors need to assist SMEs with process reengineering. While the literature is mainly revolving around challenges of ERP implementation or process reengineering (e.g. Akrong et al., 2022; Javidroozi et al., 2020) this study focuses on a specific local ERP vendor and showcases how that firm assisted the client firm to reengineer procurement process to enable ERP implementation.

In this background, this applied research aims to,

1. map the existing procurement process of the case organization;
2. identify and prioritize key issues in the procurement process that prevent ERP implementation;
3. propose solutions to overcome the key issues;
4. map the improved procurement process.

## **2. Literature Review**

This literature review briefly provides an overview of ERP systems, implementation challenges, business process reengineering, and procurement processes.

### **2.1. ERP Systems and Implementation Challenges**

ERP systems are integrated software solutions designed to unify data and processes across departments, promoting efficiency and reducing redundancies. However, given the complex, organization-wide nature of ERP systems, implementation often requires significant adjustments in both technology and business processes (Akrong et al., 2022). The difficulties associated with ERP implementation have been well-

documented across studies. Mahmood, Khan, and Bokhari (2020) identify several major challenges, including technical issues, organizational resistance, and budgetary concerns. Technical challenges arise when integrating ERP systems with client's business processes with extensive customizations. Organizational resistance arises as employees are reluctant to adopt new systems with improved / new processes. Finally, any ERP implementation can be associated with unexpected costs and time overruns jeopardizing the success. Therefore, it is vital to identify the key issues related to ERP implementation and solve those issues prior to implementation.

## **2.2. Business Process Reengineering**

BPR is a transformative approach aimed at fundamentally rethinking and redesigning an organization's processes to achieve significant improvements in performance metrics such as cost, quality, service, and speed (Park, 2018). As organizations increasingly adopt technology in their operations, ERP systems have emerged as critical tools for streamlining business processes. Successful process reengineering initiatives typically follow structured methodologies, including process identification, analysis, redesign, and implementation (Javidroozi et al., 2020). However, attempting to concurrently implement an ERP system and reengineer processes can overwhelm SMEs (Newman & Zhao, 2008), and therefore, it is recommended that SMEs perform ERP implementation after completing process reengineering (Yang, Wu, & Tsai, 2007).

## **2.3. Procurement Process**

Procurement encompasses the processes of obtaining supplies, services, or construction, whether through purchase, rental, lease, or other means. These processes encompass a range of activities, including purchasing, inventory management, transportation coordination, receiving and inspecting goods, storing them, and managing salvage and disposal operations (Prier & McCue, 2009). Procurement efficiency is essential for financial success and overall organizational effectiveness. Efficient procurement process-related practices reduce unnecessary spending, despite challenges like market operations, regulations, and political pressures (Carpineti, Piga, & Zanza, 2006). Key factors for successful procurement practices include investment in training and technology, a culture of continuous improvement, and the smart application of advanced technology (Fitzgerald, 2002). In this context, ERP systems can enable organizations to adopt efficient procurement practices by reengineering the process.

## **3. Methodology**

An exploratory research design was selected to delve into the

complexities of the implementation process, identify issues, and gain deeper insights. Therefore, a single case study methodology was adopted in this study. A local ERP vendor has been selected because their ERP systems are implemented at SMEs and the system doesn't have optimized processes as in legacy ERP systems (Lianga & Xue, 2004). The local ERP company was established in 2017 and develops ERP systems tailored for various industries. Their ERP systems are known for user-friendly interfaces, modular design, and flexibility to accommodate diverse business processes.

The client organization is a medium-scale education provider in Sri Lanka with a school branch network around the country. To facilitate the functioning of these schools, they have established departments such as warehouse, day-care, legal, human resources, accounting, printing, and construction. The warehouse handles procurements related to schools and other departments. Thus, the case study was conducted in the warehouse department focusing on the procurement process.

### **3.1. Data Collection Methods**

Data was collected from both the ERP vendor and the client company using primary and secondary methods.

#### **3.1.1. Primary Data Collection Methods**

##### **Unstructured Interviews:**

Unstructured interviews were conducted with both the ERP vendor and the client company. The interviews lasted for 30-45 minutes with several rounds of follow-up interviews.

- Interviews with the ERP vendor: Included the CEO, General Manager, two employees, and the research team. Interview questions were mainly related to issues they face at the client's company with the ERP implementation.
- Interviews with the client company: Included the procurement manager, purchasing assistants, store managers, store assistants, storekeepers, and construction department managers. Interview questions were mainly related to the procurement process and issues faced daily.

##### **Unstructured Observations:**

The team visited the client company over several weeks to observe procurement processes and to identify current issues in them. Observations helped the team to identify process steps and issues that were not highlighted during the interviews.

#### **3.1.2. Secondary Data Collection Methods**

The research team spent two months studying the client's existing ERP system referring to the existing user manual. The team reviewed several modules such as inventory, procurement, finance, sales, and production.

Further, the research team reviewed documents including store requisitions, purchase orders, invoices, quotations, goods received notes, material requisitions, project files, budgets, and item lists to gain insights into the client's current system of operations.

### **3.2. Data Analysis Methods**

Collected data was analyzed using (1) process mapping to map the process and identify key issues and (2) brainstorming to prioritize the issues and identify solutions.

#### **3.2.1. Process Mapping**

The process mapping method was used to map as-is and improve procurement processes. While mapping the existing procurement process, issues were identified.

#### **3.2.2. Brainstorming Session**

A collaborative session was held at the ERP vendor's premises with key stakeholders, including the CEO and General Manager of the ERP vendor, the client's procurement manager, the construction department manager, the warehouse manager, the store assistant, and the research team. Lasting 3 to 4 hours, the session enabled the research team to prioritize the main challenges for ERP implementation and identify feasible solutions.

## **4. Results and Discussion**

### **4.1. The As-Is Procurement Process**

As depicted in Figure 1, the process begins with receiving store requisitions, which must be manually compared with department-wise budgets prepared quarterly and distributed monthly via Excel spreadsheets. This manual comparison is time-consuming and prone to errors. If items are in stock, they are issued, but the Excel sheet used to track issuance often shows inaccurate remaining quantities. When items are not in stock, a purchase requisition [PR] is generated, but the system cannot differentiate between approved and non-approved PRs, requiring manual entry of PR numbers. Materials are distributed from a central warehouse, but PRs must be entered twice as they do not appear in the system. Suppliers are contacted manually for quotations, and then purchase orders [PO] are created manually, where quotation amounts are manually entered into the PO. Delays occur in item inspection due to slow processes in the accounting department. Goods received notes [GRN] do not list quantities, making it difficult to track received items, and manual notes for item verification cause inaccuracies. Issue notes are created without quantities, and returns are recorded only in gate passes, leading to discrepancies between physical and system amounts. These issues result in a lack of integration, reliance on manual processes,

and poor visibility and tracking, disrupting the ERP implementation and hindering the overall efficiency of the procurement process.

#### **4.2. Key Issues Related to the Procurement Process**

The following key issues in the procurement process were identified.

- Budget management:

Budgets are tracked in Excel, making it hard to manage as items increase. They aren't linked to the procurement system, preventing real-time monitoring.

- Purchase requisition and order management:

Item issuance is tracked in Excel, risking missing items and transparency. PRs and approved PRs require manual searches. Quotations are entered manually, increasing error risk. PR information isn't linked to POs, requiring manual data entry. The system doesn't distinguish between approved and unapproved POs, confusing.

- Goods receiving note and invoice processing:

The accounting department's inspection delays account for 3-4 days. GRNs lack essential information like item and quantity, necessitating manual entry.

- Inter-departmental transfers:

The system lacks functionality for departmental item transfers, requiring separate PRs and POs, causing duplication. Purchasing for other locations isn't integrated with the central system, requiring extra manual processes for PR and PO creation.

- Lack of unique item identification:

Different departments use varying item codes for the same item, leading to data inconsistency and inventory management challenges. This finding emerged from the interviews, highlighting the need for a standardized and unique item identification system.

- Storage and inventory control:

Inventory management was complicated due to insufficient storage capacity and lack of individual item identifiability on shelves. Bin cards lack item location information, hindering efficient stock tracking and retrieval. Discrepancies between physical stock levels and system records suggest inventory control issues.

##### **4.2.1. Impact and Effort Analysis Chart**

A brainstorming session was conducted to prioritize issues and identify solutions. The issues were grouped based on impact and effort analysis to assess the potential impact of each issue on ERP implementation and the effort required to rectify each issue.

The chart utilized two axes: the horizontal axis (X-axis) represents "Impact on ERP Implementation," divided into "High Impact" and "Low Impact" sections, while the vertical axis (Y-axis) represents "Effort,"

divided into “High Effort” and “Low Effort” sections (see Figure 2).

- **Top-Right Quadrant (High Impact, High Effort):**

Issues that have a significant impact on ERP implementation and require significant effort to address. These issues should be prioritized.

- **Top-Left Quadrant (Low Impact, High Effort):**

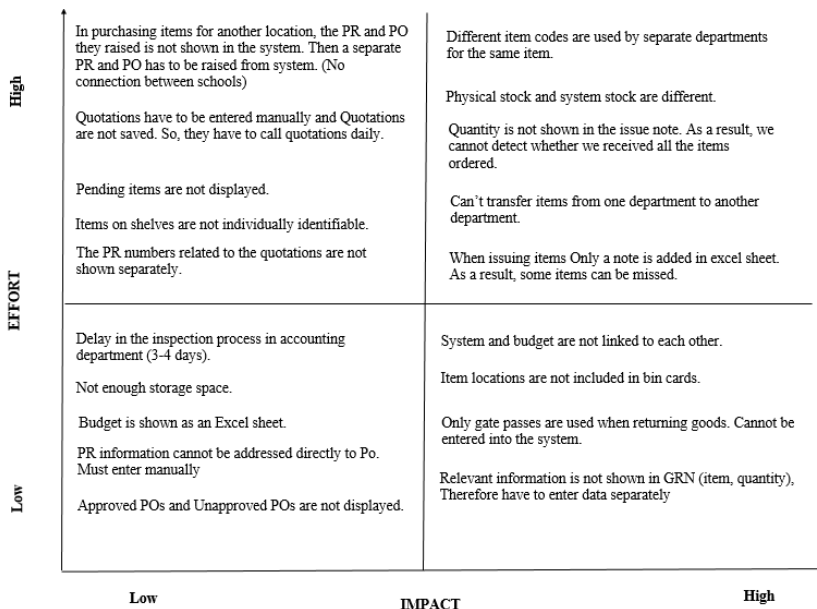
Issues that have a significant impact but can be addressed with relatively low effort.

- **Bottom-Right Quadrant (Low Impact, Low Effort):**

Issues that require considerable effort but have a low impact on ERP implementation.

- **Bottom-Left Quadrant (High Impact, Low Effort):**

Issues that have a low impact and require minimal effort to resolve. These issues are of lower priority.



**Figure 2: Impact and Effort Analysis Chart.**

Finally, challenges related to item identification were prioritized as the most critical issue due to the high impact and relatively high effort requirement. An expert evaluation was conducted to identify the root cause of issues related to item traceability. Experts from the client company, including the procurement, construction, and warehouse managers, confirmed the absence of unique item identifiers. Different departments and schools use various methods for item identification. Our team validated this issue by examining the item list, finding multiple codes for the same item and the same code used for different items.

Experts from the ERP provider, including the CEO and General Manager, confirmed that the absence of unique item identifiers

prevented the ERP implementation. The ERP system requires a unique item code, item name, item unit, item type, and item category for each item. Without these unique identifiers, the system cannot function properly. Through impact and effort analysis, expert evaluation, and examination of the ERP system, it was established that the lack of a unique item identification system at the client company was the primary impediment to successful ERP implementation, forming a critical foundation for the entire system.

### 4.3. Proposed Solutions

#### 4.3.1. Create a Unique Mechanism to Increase Item Traceability

The following steps were taken in setting up item codes.

1. Item Categorization: Items were divided into two categories: Consumable and Fixed Asset.
2. Code Levels: Decided on a four-level code system for item identification, ensuring it is easy to understand and memorize.
3. First Level Classification: Items classified as Consumable (C) or Fixed Asset (F).
4. Second Level Classification: Items are further classified into main categories.

**Table 1:** Category Code of the Second Level.

Name	Academic	CCTV/IT	Construction	General	Kitchen	Stationary
Code	Aca	ICT	Con	Gen	Kit	Sta

5. Third Level Classification: Classified items according to the sub-categories based on the main categories. We used a code with three characters to represent the sub-categories.

**Table 2:** Sub-Category Code for Construction Items.

Sub-Category	Civil	Safety	Tools and Machinery	Spare part	Oil
Code	Civ	Saf	Tlm	Spp	Oil

**Table 3:** Sub-Category Code for Academic Items.

Sub-Category	Leaf School	Badges	Letter Heads	Library
Code	Les	Bdg	Lhd	Lib

**Table 4:** Sub-Category Code for Stationary Items.

Sub-Category	Board	Books	Envelop	Flags	Glue	Paper	Glitter
Code	Brd	Bks	Evp	Flg	Glu	Ppr	Glt

6. Fourth Level Classification: Added a unique four-digit number to each item.
7. Final Code: Combined all levels to create an 11-character item code.  
Example:



**Table 5:** Item Codes.

1 <sup>st</sup> Level	2 <sup>nd</sup> Level	3 <sup>rd</sup> Level	4 <sup>th</sup> Level	Item Code
C	Sta	Wri	0001	CStaWri0001
C	Sta	Tps	0001	CStaTps0001

#### 4.3.2. Implement Procedures to Streamline the Procurement Process via User Manual

To eliminate other issues identified in the 'high impact, high effort' quadrant, we created a comprehensive user manual for handling procurement activities via the ERP system. This manual ensures the long-term sustainability of the ERP system by providing users with clear and concise instructions. For example, the procurement process includes the following forms, and the proposed user manual gives clear instructions on how to use each form:

- Inward Bill

Purpose: An Inward Bill is used to record the purchase of goods or services from a supplier.

Form Navigation: Search on the smart search option by typing "Inward Bill".

Usage: The client has the option to select either a relevant Fixed Assets Goods Received Note, GRN, or Supplier Return Note to convert into an Inward Bill or the client can manually add the Inward bill by adding the goods or services the client has purchased without the Fixed Assets GRN or GRN or SRN.

- Material Receive

Purpose: Material Receipt involves recording details of materials received from a supplier to an inventory location.

Form Navigation: Search on the smart search option by typing "Material Receive" or Use the Menu Bar on the left and navigate to Inventory Management >> Received and Return >> Material Receive.

Usage: This option is used to receive the client's materials against the purchase order. The client will be able to pick the relevant Purchase Order and convert it to a Material Receive, or the client can manually add the Material Receive Note by adding the materials the client has received without the PO.

- Material Return Note

Purpose: When the materials that are required for a purpose are not fully consumed or are drawn over requirements, the excess quantity is returned to the stores.

Form Navigation: Search on the smart search option by typing "Material Return Note" Or use the Menu Bar on the left and navigate to Inventory Management >> Received and Return >> Material Return Note.

Usage: This option is used to return materials against the Material

Receive. The client will be able to pick the relevant Material Receive and convert it to a Material Return Note, or the client can manually add the Material Return Note by adding the items the client has received without the Material Receive.

- **Import Costing by Item**

Purpose: If a company owns a business that is involved in global trade, the company might have some added costs, and charges involved when importing the products.

Form Navigation: Search on the smart search option by typing “Import Costing by Item” or Use the Menu Bar on the left and navigate to Inventory Management >> Received and Return >> Import Costing by Item.

Usage: The import cost or the landed cost is the final cost of products along with all associated shipping and logistics costs required to get the goods delivered to a final location. Import costs include the cost of the products, international freight & logistics charges, currency conversion costs, import charges, port charges, customs clearance fees, import duties & taxes, and local delivery.

- **Goods Received Note**

Purpose: This option is used to receive the client’s goods against the purchase order.

Form Navigation: Search on the smart search option by typing “Goods Received Note” or use the Menu Bar on the left and navigate to Inventory Management >> Received and Return >> Goods Received Note.

Usage: The client will be able to pick the relevant Purchase Order and convert it to a GRN, or the client can add the GRN manually by adding the items that the client has received without the PO. Goods received will be added to the client’s stocks in the hands of the particular items received.

- **Purchase Return**

Purpose: Purchase Returns or return outwards is the process where goods are returned to the supplier. This purchase return could be due to many reasons such as defects in the goods, lack of quality, or excessive stocks.

Form Navigation: This form can be opened using two ways, Search on the smart search as Purchase return. Or use the menu bar on the left side and navigate to Inventory Management >> Received and Return >> Purchase Return.

Usage: The client can directly generate a PR from the GRN. Alternatively, they can manually add the items that need to be returned to the Purchase Return form.

#### **4.4. Improved Procurement Process**

The procurement process was reengineered by implementing unique identifiers and the user manual. Thus, the ERP vendor could successfully

implement the system at the client company.

As depicted in Figure 3, the process begins with the warehouse receiving a materials request, which the manager ensures falls within budget. If within budget and available, materials are issued immediately, and goods received note and invoice are created. If not within budget, approval is sought for non-budgeted items. If materials are unavailable, a purchase order is raised and approved. The manager checks the central warehouse for availability, consolidates similar requirements, and assesses pre-approved pricing levels. If items are available at the pre-approved price, a consolidated purchase order is issued; if not, quotations are called for and added to the order. Upon receiving materials, the manager checks their quality, returns low-quality items, and creates goods received notes and invoices for good-quality items, completing the process.

## **5. Theoretical and Practical Implications**

From a theoretical perspective, this paper contributes to ERP systems literature by highlighting how BPR can facilitate the successful implementation of ERP systems. Process reengineering has been identified as a key challenge in ERP implementation (Newman & Zhao, 2008; Javidroozi et al., 2020). Authors have discussed the difficulties in parallel implementation of BPR and ERP where it is recommended that BPR initiatives should be done first and then ERP implementation (Yang et al., 2007). This study contributes to this discussion by showing how a local ERP vendor assisted the client company with reengineering its procurement process before implementing the ERP system. By streamlining the procurement process with item codes and user manuals, the client company overcame many inaccuracies and inefficiencies associated with the as-is process. Hence, this study highlights the importance of tackling ground-level problems faced by ERP vendors in implementing ERP systems.

From a practical perspective, this research offers solutions for ERP vendors struggling with ERP system implementation. It provides a step-by-step approach to address common issues like the lack of unique item identification. By categorizing items into consumables and fixed assets and further classifying them into main and sub-categories, organizations can develop a structured and intuitive item coding system, enhancing inventory tracking and decision-making processes. Thus, this research developed an item code mechanism and a user manual for an ERP system, enhancing performance, efficiency, data security, and reporting accuracy while reducing human errors in data entry. The item code mechanism aids in calculating material requirements and improving coordination among departments, while user manuals provide correct and uniform system usage. These solutions emphasize the iterative nature of ERP implementation, where understanding,

addressing, and sustaining change are key components of successful ERP implementation.

From a client's perspective, they often face challenges such as learning time, errors due to lack of understanding, and frustration from unclear instructions. Implementing a unique item identification system improves procurement processes by streamlining material requisition, budget allocation, and inventory tracking. This leads to greater efficiency, reduced risk of stockouts or overstocking, and optimized resource use. The user manual for the ERP system's inventory module ensures employees can use the system effectively, minimizing errors and maintaining data accuracy.

## **6. Conclusion**

This research aimed to identify issues faced by an ERP provider in implementing an ERP system at a client company and then propose solutions. The main issue encountered during this implementation was the absence of unique item identification for goods which impacted the entire procurement process. To address this critical issue, a comprehensive hierarchical item identification system was devised, introducing four levels for categorization and unique identification. Further, to streamline the procurement process, a user manual for the ERP system's inventory module was developed. This user manual offers clear and concise guidance on utilizing various forms related to the procurement process, ensuring accurate and error-free data input and retrieval.

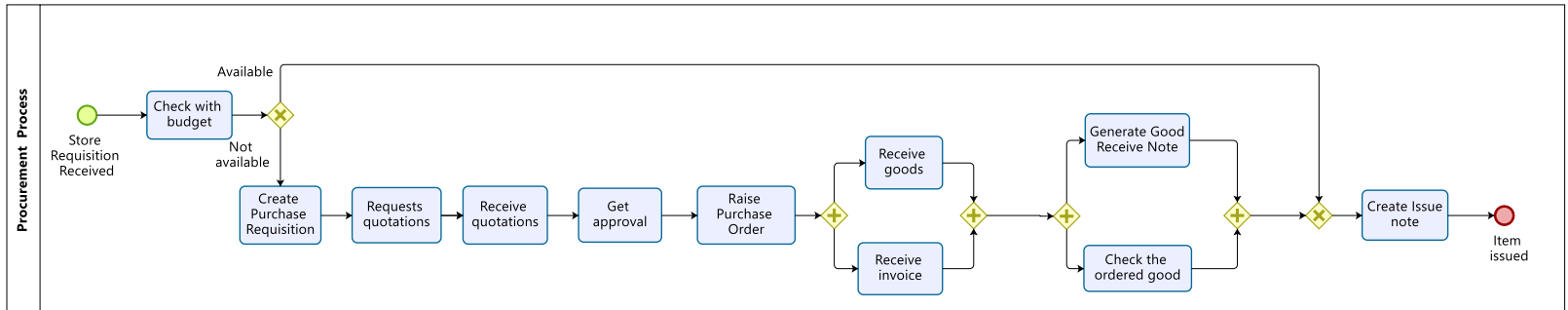


Figure 1: As-Is Process.

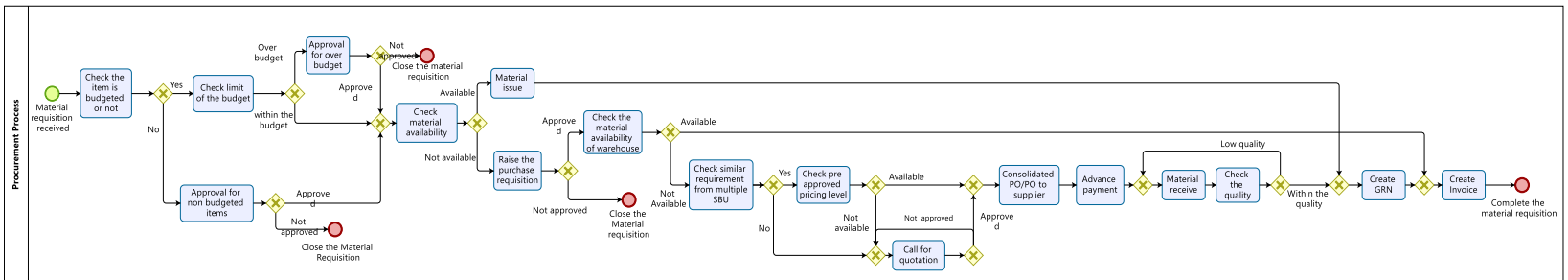


Figure 3: Improved Process.

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