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A BPOMM-Driven Framework for Business Process Redesign using Product-based Design in Coffee-Processing SMEs

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Abstract

Business process plays an important role in strengthening organizational performance and preparing organizations for digital transformation, particularly within small and medium-sized enterprises (SMEs). In the coffee-processing sector, however, business processes are often still fragmented, process documentation is incomplete, performance indicators are not consistently applied, and information systems operate separately from one another. These conditions can make coordination difficult and reduce the organization's ability to monitor and improve its processes systematically. This study therefore proposes a Business Process Redesign framework that combines the Business Process Orientation Maturity Model (BPOMM) with Product-Based Design (PBD) through a Design Science Research (DSR) approach. The empirical investigation involved three coffee-processing SMEs and used interviews, observations, document analysis, BPOMM assessment, and Business Process Model and Notation (BPMN) analysis as the main sources of evidence. The assessment shows that the participating SMEs are situated within the Defined–Managed maturity range, while the most pronounced weaknesses concern process documentation, performance measurement, supplier orientation, and information-system support. On the basis of these maturity gaps, a Business Process To-Be was formulated through standardized workflows, integrated digital information, supplier evaluation, inventory control, customer relationship management, and business performance dashboards. The proposed redesign was subsequently examined through expert evaluation and member checking, and the results supported its conceptual validity and practical feasibility. The study extends the use of BPOMM from a diagnostic instrument toward a mechanism that can guide Business Process Redesign by connecting maturity findings with concrete process changes. In practical terms, the framework offers coffee-processing SMEs a structured pathway for improving process maturity, operational coordination, and preparedness for sustainable digital transformation.

Keywords: business process orientation maturity model, business process redesign, coffee-processing smes, design science research, product-based design

1 Introduction

The growing use of digital technologies has made the management of business processes increasingly dependent on integration, measurability, and adaptability. Business Process Management (BPM) offers an organizational perspective for designing, controlling, and improving end-to-end processes so that operational performance and customer value can be enhanced [1]. Nevertheless, the adoption of digital technology by itself does not automatically produce better processes. Organizations still need to understand the maturity of their current processes and determine which organizational capabilities limit integration and continuous improvement [2]. This issue is especially visible in Small and Medium-sized Enterprises (SMEs), where resource limitations, informal working procedures, incomplete documentation, and fragmented information systems are common. Recent literature also shows that BPM maturity research in SMEs has often remained descriptive, with fewer studies translating maturity findings into concrete improvement roadmaps [3].

The central issue examined in this study is the lack of a systematic pathway for converting the results of business process maturity assessment into a redesign that can actually be implemented by SMEs. The Business Process Orientation Maturity Model (BPOMM) offers a structured assessment of process-oriented organizational capabilities, covering areas such as process definition and documentation, measurement and management, organizational structure, customer orientation,

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supplier orientation, and information-system support [4]. Earlier empirical work has demonstrated that BPOMM is relevant for assessing SMEs; nevertheless, the resulting maturity profile generally describes the current organizational condition rather than explaining how identified gaps should be translated into redesigned processes [5]. A systematic review of business process maturity models likewise indicates that many models remain limited in their actionable or prescriptive character, leaving a continuing gap between diagnosing maturity and implementing process improvement [6], [7].

Business Process Redesign (BPR) provides a structured means of reconfiguring existing processes by removing unnecessary activities, improving the sequence of work, and strengthening organizational performance [8]. Traditional redesign, however, often takes the current process as its primary starting point and tends to emphasize operational efficiency. Product-Based Design (PBD) offers another perspective because the structure of a process can be derived from the characteristics, requirements, and dependencies of the product or service that must be delivered [9]. Reijers showed that PBD can assist BPR by decomposing a product into relevant informational elements and using their interdependencies to derive an improved process structure. Later research on product-based workflow design further positioned PBD as a formal means of generating alternative process designs from product specifications and process-design criteria [10] [11].

The use of Business Process Model and Notation (BPMN) is also important in SME process redesign because a common visual language is needed to communicate process structures among business users, process analysts, and technology implementers [12]. BPMN provides a standardized graphical notation for representing business processes and facilitates communication between business users, process designers, and technology implementers. In SME contexts, BPMN has been applied to document existing processes, identify process deficiencies, and formulate improvement opportunities. [13]. Despite these developments, three research gaps remain. First, BPOMM research has largely concentrated on measuring organizational maturity, while its potential as a diagnostic input for systematic Business Process Redesign remains insufficiently explored. Second, BPR research provides mechanisms for process improvement, but the connection between organizational maturity gaps and the design of future-state processes is not consistently established.[14]. Third, although PBD offers a structured way to derive process designs from product characteristics, its integration with BPOMM for SME process improvement remains limited. These issues are particularly relevant to SMEs because redesign initiatives must accommodate limited resources, informal structures, incomplete documentation, and fragmented digital applications [[15]. Accordingly, this study asks how BPOMM maturity assessment can be systematically converted into a validated Business Process Redesign framework for SMEs through the integration of Product-Based Design and BPMN. The study addresses the question by combining BPOMM, PBD, and BPMN within a Design Science Research (DSR) methodology [16]. BPOMM serves to locate organizational maturity gaps, BPMN represents and examines the current processes, PBD translates the identified gaps into redesigned To-Be processes, and the resulting artifact is subjected to expert evaluation and member checking.

The principal contribution of this research is the extension of BPOMM from an instrument for organizational maturity assessment into a mechanism that can support prescriptive Business Process Redesign. Instead of positioning maturity assessment and process redesign as two independent activities, the proposed framework connects maturity gaps with As-Is process analysis, redesign requirements, PBD-based To-Be processes, and subsequent validation. The framework is examined empirically in three coffee-processing SMEs in Jember, Indonesia, thereby illustrating how organizational diagnosis can be translated into standardized and digitally supported processes. This integration contributes to BPM research by establishing a clearer connection between organizational maturity assessment and process design. At the practical level, the framework provides SMEs with a structured route from identifying a maturity problem to defining the process changes required to address it.

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2 Literature Review

2.1 Business Process Management and Business Process Orientation

Business Process Management (BPM) can be understood as a strategic management approach in which end-to-end business processes are deliberately designed, managed, monitored, and improved to support organizational performance and customer value. In contrast to management based primarily on separate functional units, BPM brings together people, technology, information, and organizational resources within processes that can be standardized and measured. Such an orientation can strengthen operational efficiency, organizational adaptability, and readiness for digital transformation. Organizations that possess more mature BPM capabilities are generally better positioned to optimize operations, improve managerial decision-making, and sustain performance through continuous process improvement [17]. A closely related concept is Business Process Orientation (BPO), which views the organization through cross-functional processes rather than through isolated departments. Process-oriented organizations tend to demonstrate characteristics such as documented processes, explicit process ownership, integrated information systems, process-based performance measurement, customer orientation, and continuous improvement. A fundamental concept within BPM is Business Process Orientation (BPO), which emphasizes managing organizations through cross-functional business processes rather than isolated organizational units. Process maturity allows organizational resources to be coordinated more systematically, performance to be measured through clearer mechanisms, and improvement activities to be conducted on a continuing basis [18]. Previous studies have shown that Business Process Orientation positively influences organizational performance by improving strategic alignment, organizational collaboration, and operational effectiveness, making it a critical capability for supporting digital transformation and long-term organizational competitiveness [19]. Research on process maturity and organizational performance has consequently received increasing attention. Empirical findings generally indicate that organizations with more developed process capabilities tend to show stronger operational performance, customer satisfaction, organizational agility, and innovation capacity. Process maturity allows organizational resources to be coordinated more systematically, performance to be measured through clearer mechanisms, and improvement activities to be conducted on a continuing basis [20] The Business Process Orientation taxonomy proposed in earlier work also indicates that organizations can exhibit different maturity configurations and that higher-maturity configurations are associated with stronger strategic alignment, organizational integration, process documentation, and customer orientation. These observations support the view that process maturity represents an organizational capability with strategic relevance. In the context of digitalization, mature BPM capabilities can also facilitate technology integration, organizational learning, and automation [21]. Consequently, efforts to increase process maturity can form an important part of an organization's broader strategy for sustainable performance improvement

2.2 Business Process Redesign and Product Based Design

Business Process Redesign (BPR) refers to a systematic effort to improve organizational processes through actions such as removing activities that do not create value, standardizing workflows, and integrating information systems so that efficiency, flexibility, and customer value can be strengthened [22]. Product-Based Design (PBD) provides a complementary perspective by deriving process structures from the requirements and value characteristics of the product delivered to customers. By considering product architecture, information flows, quality requirements, and organizational capabilities together, PBD can strengthen traceability, cross-functional coordination, and value creation, particularly in organizations that are moving toward digital transformation [23].

2.3 Research Gap and Research Novelty

Although BPOMM, Business Process Redesign (BPR), and Product-Based Design (PBD) have each been examined in previous studies, their integration into one coherent framework remains limited. BPOMM research has generally concentrated on determining organizational maturity without translating the resulting profile into validated redesign strategies, whereas conventional BPR tends to emphasize operational improvement with less explicit attention to organizational maturity and customer value [24]. At the same time, the use of Product-Based Design within Business Process

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Management has not been widely explored. This study responds to these limitations by combining BPOMM, PBD, and Design Science Research (DSR) to construct and validate a Business Process Redesign framework. In the proposed framework, BPOMM is used to identify maturity gaps, while Product-Based Design converts those findings into standardized To-Be processes represented with BPMN. The resulting processes are oriented toward customer value, digital integration, and continuous improvement. The central novelty is therefore the expansion of BPOMM from a maturity-assessment instrument into a practical redesign framework that can provide a replicable route for improving business process maturity and supporting digital transformation in coffee-processing SMEs [25].

3 Research Method

This research adopted a Design Science Research (DSR) methodology and combined qualitative and quantitative forms of analysis to develop and validate a Business Process Redesign framework that integrates the Business Process Orientation Maturity Model (BPOMM) and Product-Based Design (PBD). DSR was selected because the research objective extends beyond describing the current maturity condition; it also requires the construction, demonstration, and evaluation of an artifact in the form of an integrated redesign framework [26]. The empirical study was conducted in three coffee-processing Small and Medium-sized Enterprises (SMEs) participating in the Go-Digital Program coordinated by the Integrated Business Service Center (PLUT) of Jember Regency, Indonesia. The participating organizations were PT RKS, PT FA Indonesia, and BC. The research sequence combined BPOMM assessment, qualitative process investigation, BPMN-based As-Is modelling, maturity-gap identification, PBD-based To-Be redesign, and artifact validation. The complete research flow is presented in Figure 1.

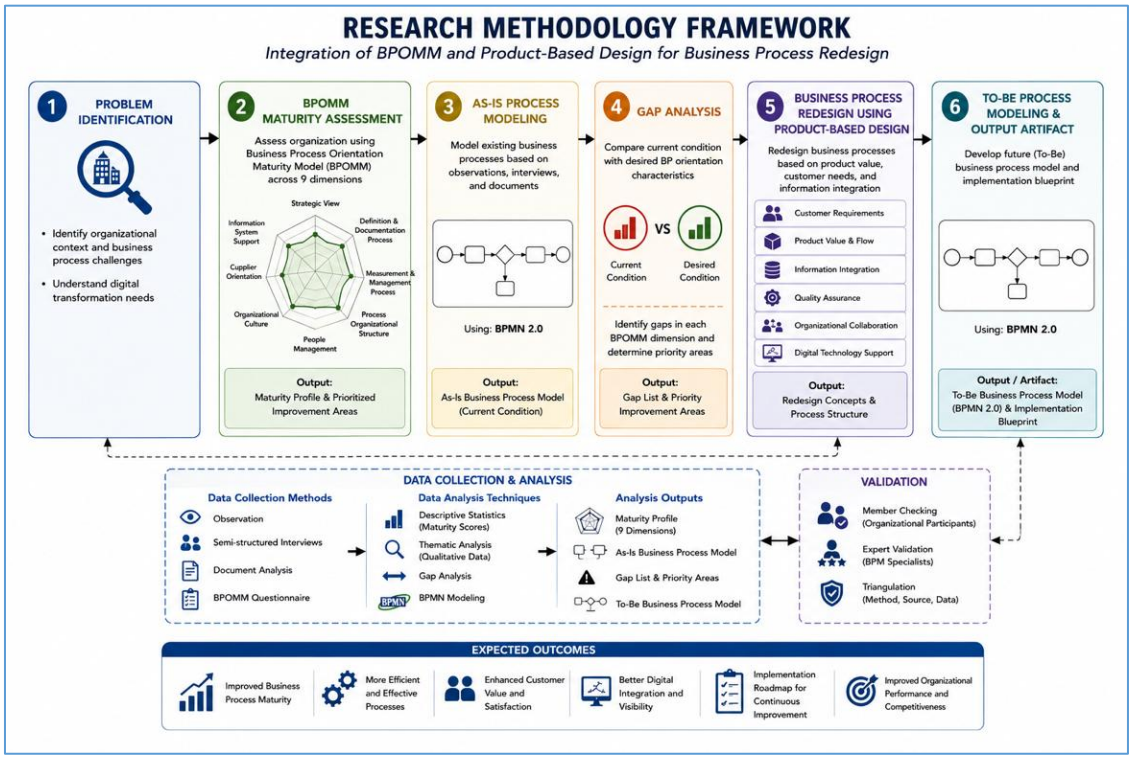


Figure 1 Research methodology framework

The research process comprised six connected activities: (1) identifying and motivating the problem, (2) specifying the objectives of the artifact, (3) assessing organizational maturity and analysing As-Is processes, (4) designing and developing the artifact, (5) evaluating and validating the artifact, and (6) communicating the research results. This sequence follows the general logic of DSR while adapting it to the specific requirements of business process redesign in coffee-processing SMEs. The methodological arrangement was intended to maintain traceability between organizational

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diagnosis and the resulting process redesign. BPOMM was first used to locate maturity gaps, after which BPMN As-Is models were used to show how those gaps appeared in actual operations. The gap analysis then converted the empirical findings into explicit redesign requirements. These requirements became inputs for the construction of the Business Process To-Be using Product-Based Design. Finally, the artifact was assessed through expert evaluation, member checking, and methodological triangulation. In this way, the procedure connects maturity assessment with an actionable and validated redesign artifact.

3.1 Data Collection and Informant Selection

Data were obtained through semi-structured interviews, direct observation, document analysis, and BPOMM questionnaires. The BPOMM assessment covered nine dimensions and used a seven-point scale, while BPMN 2.0 was applied to model the existing business processes (As-Is) [27]. Informants were chosen purposively on the basis of their direct involvement in, and knowledge of, the business processes under investigation. They included owners, managers, supervisors, and operational personnel responsible for procurement, production, inventory, sales, customer service, and supplier management. The selection criteria required informants to be directly involved in the relevant process, to understand how the process was actually implemented, and to be able to explain organizational practices, problems, and process requirements. This role-based strategy was intended to incorporate both managerial and operational viewpoints [28]. Interview and observation evidence was used to describe actual practices, whereas organizational documents were examined to corroborate process and operational information. Quantitative BPOMM scores were then compared with qualitative evidence and documentary findings [29]. The three SMEs were treated as multiple empirical cases, allowing cross-case comparison to identify recurring maturity gaps and process characteristics while retaining the context of each organization [30] [31].

3.2 Data Analysis

The analysis combined descriptive statistics, thematic analysis, BPMN As-Is examination, and gap analysis. First, responses from the BPOMM questionnaire were summarized using descriptive statistics, with mean scores calculated for each dimension to distinguish comparatively stronger and weaker areas of maturity. Second, interview, observation, and document data were examined thematically to identify recurring issues involving process documentation, performance measurement, organizational governance, people management, customer and supplier orientation, and information-system support. Third, BPMN As-Is models were analysed to locate manual activities, fragmented information flows, unclear responsibilities, bottlenecks, and other process-level weaknesses. The analysis covered procurement, production, inventory, sales and distribution, and customer service. Finally, the BPOMM results were integrated with qualitative evidence and BPMN findings through gap analysis. Each maturity gap was connected to its observable operational manifestation and then converted into a specific redesign requirement. These requirements served as the basis for constructing the Business Process To-Be through PBD. Product-Based Design offers a structured means of deriving workflow arrangements from product characteristics, information requirements, and process dependencies [32]. The resulting analytical chain was therefore: BPOMM Assessment → Maturity Gap → As-Is Process Problem → Redesign Requirement → To-Be Process.

3.3 Business Process To-Be Development

The Business Process To-Be was constructed using the Product-Based Design (PBD) approach, with the redesign guided by the maturity gaps and process problems identified during the preceding stages. PBD was applied to organize future-state processes in terms of activities, information flows, responsibilities, and outputs that provide inputs for subsequent activities. Five core processes were redesigned: procurement, production, inventory management, sales and distribution, and customer service. The resulting process models were represented with BPMN 2.0 [33]. The proposed design incorporates standardized workflows, digital process documentation, supplier evaluation, structured inventory management, customer relationship management, and integrated information systems. Each redesign element was linked to a maturity gap identified through BPOMM and to a process problem revealed by the As-Is analysis.

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3.4 Artifact Validation

The proposed Business Process Redesign artifact was assessed through expert evaluation, member checking, and methodological triangulation. Evaluation is a critical element of DSR because it provides evidence concerning the relevance, usefulness, and capacity of an artifact to address the problem for which it was developed [34]. Expert assessment considered five criteria: (1) process completeness, referring to the representation of all relevant core activities; (2) process integration, concerning the connection of activities and information across functions; (3) operational feasibility, concerning the applicability of the proposed process in the SME context; (4) digital transformation readiness, concerning the extent to which the design supports progressive digital integration; and (5) PBD implementation, concerning whether outputs are clearly specified and linked to subsequent activities.

A criterion was categorized as Valid when the reviewers concluded that the proposed process fulfilled the relevant requirement adequately and did not need fundamental redesign. The validation findings are presented in the Results section. Member checking was carried out with owners and managers representing the three participating SMEs. The proposed BPMN To-Be models were presented to these participants so that they could assess their accuracy, organizational relevance, and practical feasibility. Their feedback was then compared with the original interview, observation, and BPOMM evidence. Methodological triangulation was subsequently performed by comparing evidence obtained from interviews, observations, documents, BPOMM assessments, BPMN models, expert evaluation, and member checking. Convergence among these sources was used to strengthen the credibility of the identified maturity gaps and the redesign decisions derived from them. Thus, the validation process maintained a traceable connection between empirical evidence and the final Business Process Redesign artifact.

4 Results and Analysis

This section reports the findings from the empirical study of three coffee-processing small and medium-sized enterprises (SMEs) in Jember Regency, Indonesia. The presentation follows the logic of the Design Science Research (DSR) methodology, beginning with the organizational profile and the Business Process Orientation Maturity Model (BPOMM) assessment. It then examines the existing business processes through As-Is modelling, identifies maturity and process gaps, develops the To-Be processes using Product-Based Design, and evaluates the resulting artifact. The structure is intended to show how an assessment of organizational maturity can be translated into a validated Business Process Redesign artifact that supports continuous improvement and digital transformation [35] [36].

4.1 Organizational Profile

The study involved three coffee-processing SMEs (PT FA Indonesia, PT RKS, and BC). Table 1 summarizes their organizational characteristics.

Table 1 Interview results and organizational documentation

Organization	Employees	Main Products	Production Strategy	Digital Technology
PT. RKS	12	Roasted beans, ground coffee	Make-to-Stock	Marketplace, accounting application
PT FA	16	Coffee beverages, roasted beans	Make-to-Stock	Moka POS, AppSheet, Marketplace
BC	5	Roasted beans, ground coffee	Make-to-Stock	Website, social media

PT FA Indonesia showed the strongest level of digital adoption among the three SMEs through the use of Moka POS and AppSheet, although these applications were not yet connected with procurement, production planning, or customer-management activities. BC and PT RKS, by comparison, continued to depend more heavily on manual procedures, limited documentation, and

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informal coordination. Across the three organizations, several characteristics were shared: production generally followed a make-to-stock strategy, planning depended substantially on experience, relationships with suppliers and customers were managed informally, and digital applications had not been integrated into a single process architecture. These conditions indicate that digital transformation has begun within the participating SMEs but remains constrained by fragmented processes, incomplete documentation, and disconnected information systems. BPOMM was therefore applied to identify the most important maturity gaps and to provide a basis for the proposed Product-Based Design process redesign.

4.2 Business Process Orientation Maturity Assessment

The initial stage of the empirical analysis measured Business Process Orientation maturity through BPOMM in order to assess process capabilities and determine priorities for the subsequent Business Process Redesign. Nine BPOMM dimensions were examined using interviews, observations, and document analysis. The results indicate that the participating SMEs have introduced BPM practices, but the implementation of those practices is not yet consistent across organizational areas. Among the three organizations, PT FA Indonesia recorded the highest maturity, followed by PT RKS and BC. The differences appear to be associated with variation in managerial commitment, process documentation, and performance-management practices.

Table 2 BPOMM assessment results

BPOMM Dimension	PT FA Indonesia	PT RKS	BC
Strategic View (SV)	5.25	4.00	4.25
Definition and Documentation Process (DDP)	3.33	2.17	2.33
Measurement and Management Process (MMP)	4.17	3.00	2.33

The Strategic View dimension recorded the highest maturity values, with PT FA Indonesia scoring 5.25, BC 4.25, and PT RKS 4.00. These results indicate that strategic commitment to process improvement is relatively strong, although its implementation is still largely reactive. Lower scores were observed in Definition and Documentation Process and Measurement and Management Process, reflecting the limited availability of formal process documentation and the predominance of financial and production outcomes in performance evaluation rather than process-based indicators. Taken together, the BPOMM results place the three coffee-processing SMEs within the Defined–Managed maturity level. Although strategic awareness has been established, important weaknesses remain in documentation, performance measurement, governance, and information-system integration. These findings subsequently become the basis for a Business Process Redesign that emphasizes standardized workflows, integrated information systems, and stronger customer orientation.

4.3 Existing Business Process (As-Is Analysis)

After the BPOMM assessment, the current business processes of the three participating SMEs were modelled using Business Process Model and Notation (BPMN) 2.0. The As-Is models provide a visual representation of activities, actors, information flows, and decision points from the initiation of a customer order through product delivery. The purpose of this analysis was to identify process inefficiencies, activities that do not add value, communication bottlenecks, and organizational weaknesses that could inform the redesign. Despite differences among the organizations, the three SMEs displayed broadly similar structures covering procurement, production planning, production execution, inventory management, sales, distribution, and customer service. A number of activities, however, remained manual and depended heavily on the experience of owners or operational managers. This pattern is consistent with the BPOMM results, particularly the relatively low maturity in documentation, supplier orientation, and information-system support.

Figures 2–4 show the As-Is BPMN models for BC, PT FA Indonesia, and PT RKS. Although the extent of digital adoption differs, the three organizations follow broadly comparable sequences involving customer-order management, inventory checking, procurement, production, quality inspection, warehousing, and product distribution. PT FA Indonesia demonstrates a comparatively

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higher degree of digitalization through Moka POS and AppSheet, yet its sales, procurement, inventory, and production applications remain fragmented. BC and PT RKS rely more strongly on manual activities in inventory management, procurement, production scheduling, and customer-complaint handling, while documentation remains limited and many decisions are centralized. Supplier evaluation, customer relationship management, and information integration are also largely informal across the cases. As a result, data remain fragmented, process standardization is weak, and performance monitoring is limited. These observations reinforce the BPOMM findings and provide the empirical basis for the proposed redesign.

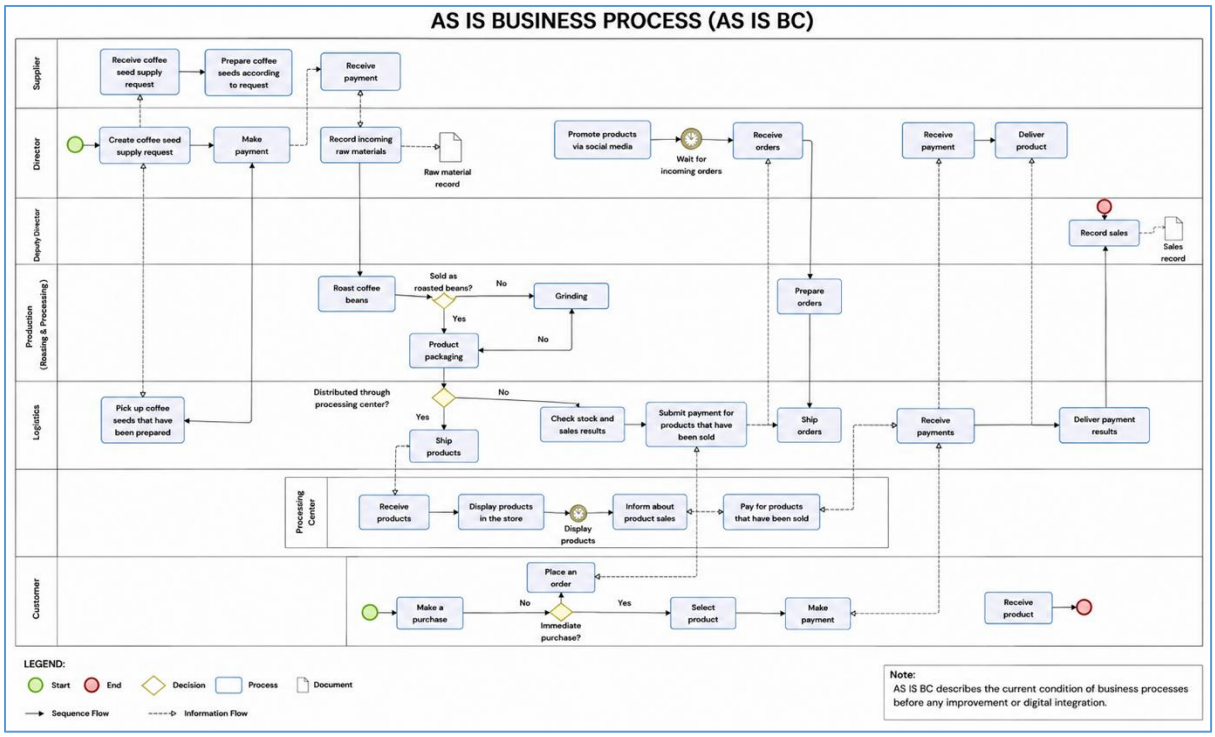


Figure 2 Existing business process of BC (As-Is)

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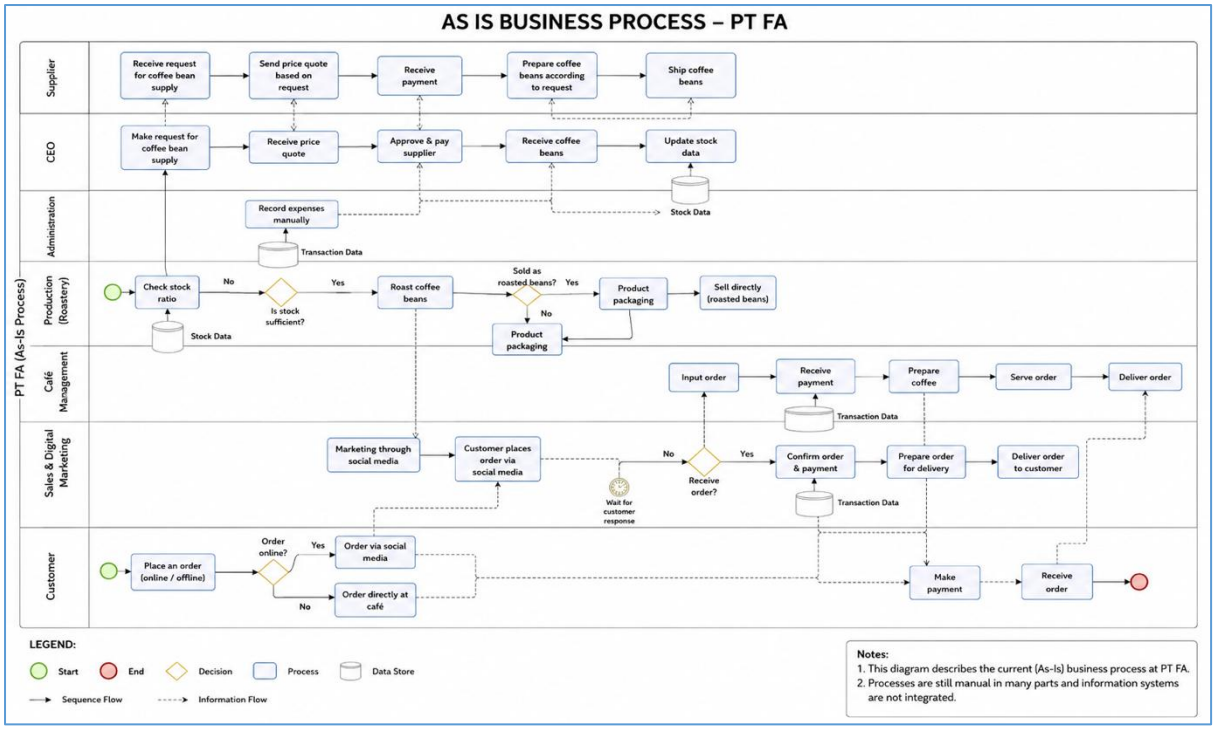


Figure 3 Existing business process of PT FA

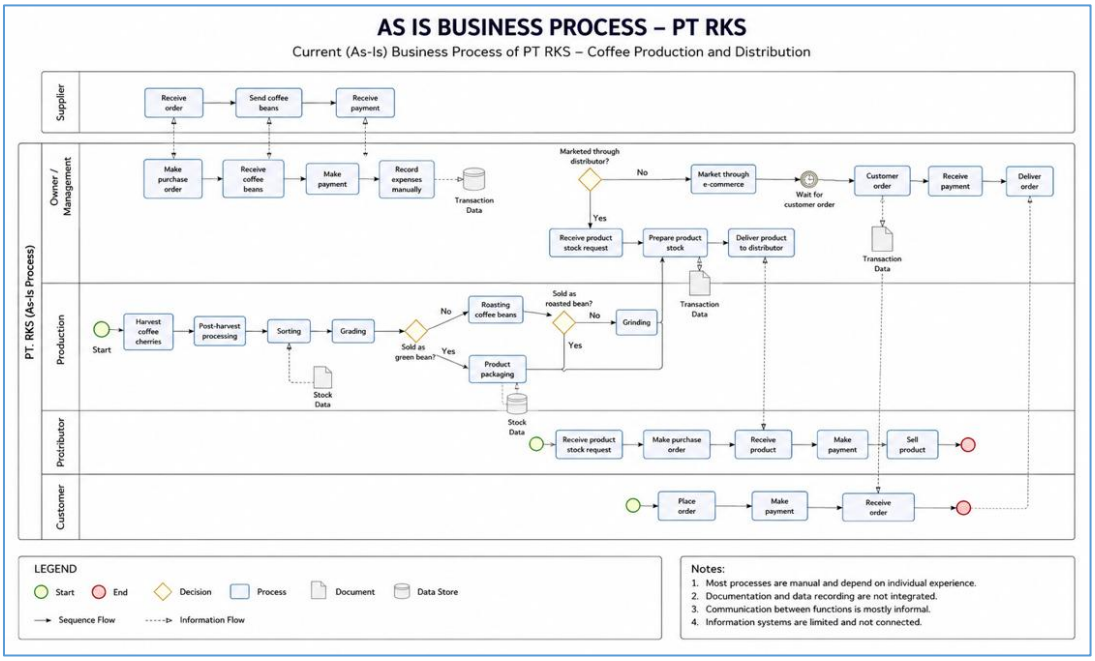


Figure 1 Existing business process of PT RKS (As-Is)

4.4 Comparative Analysis of Existing Business Processes

Comparison of the three BPMN models reveals a number of recurring characteristics. Customer orders are managed through several communication channels, which creates fragmented customer information. Procurement is generally initiated manually on the basis of production requirements and inventory availability, without a standardized mechanism for evaluating suppliers.

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Production scheduling is also largely dependent on operational experience rather than an integrated planning system. Inventory management remains partly manual even where digital applications are already available. In addition, customer complaints tend to be handled reactively and are not systematically recorded as inputs for continuous improvement.

Table 1 Comparison of existing business processes

Business Process	BC	PT FA	PT RKS
Customer Order	Manual	Digital & Manual	Manual
Procurement	Informal	Semi-digital	Manual
Production Planning	Experience-based	Inventory-based	Experience-based
Inventory Management	Manual	AppSheet	Spreadsheet
Quality Control	Final inspection	Final inspection	Final inspection
Customer Complaint	Informal	Informal	Informal
Information Integration	Low	Medium	Low

4.5 Gap Analysis

The gap analysis brought together the BPOMM assessment and the BPMN As-Is findings and compared them with the characteristics expected of a process-oriented organization. The analysis identified substantial weaknesses in process documentation, performance measurement, organizational governance, competency development, customer and supplier management, and information-system integration. These weaknesses contribute to fragmented workflows, manual information exchange, and limited visibility over the overall process. The proposed Business Process Redesign addresses these conditions through standardized BPMN documentation, digital SOPs, process-based KPIs, customer relationship management, supplier evaluation, integrated information systems, and clearer process ownership. The intention is to improve coordination, transparency, and the capacity for continuous process improvement.

Table 2 Gap analysis summary

BPOMM Dimension	**Current Gap**	**Proposed Improvement**
Strategic View	Process improvement is reactive and not periodically evaluated.	Continuous business process review and strategic performance dashboard.
Definition & Documentation	SOPs and business process documentation are incomplete and inconsistent.	BPMN-based documentation and digital SOPs.
Measurement & Management	Performance measurement focuses mainly on financial outcomes.	Process-based KPIs and Business Performance Dashboard.
Organizational Structure	Functional structure with unclear process ownership.	Business Process Owner and cross-functional governance.
People Management	Informal competency development and BPM knowledge.	BPM training and digital competency development.
Organizational Culture	Continuous improvement is not institutionalized.	Knowledge-sharing and continuous improvement programs.
Customer Orientation	Customer data and complaint handling are fragmented.	Integrated Customer Relationship Management (CRM).
Supplier Orientation	Supplier selection and evaluation are not standardized.	Approved Supplier Database and Supplier Performance Evaluation.

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Information System Support	Operational systems are fragmented and not integrated.	Integrated digital information system connecting procurement, production, inventory, sales, and customer service.

The gap analysis indicates that the central issue extends beyond isolated operational inefficiencies; the more fundamental problem is the absence of integrated business process management. The identified maturity gaps therefore become the direct foundation for constructing the Business Process To-Be through Product-Based Design. The redesigned process is intended to standardize workflows, strengthen digital integration, clarify organizational governance, and increase customer value creation. Through these changes, the framework seeks to improve business process maturity while also supporting a more sustainable trajectory of digital transformation.

4.6 Business Process Redesign (To-Be)

Using the BPOMM assessment and the resulting gap analysis as its starting point, the Business Process To-Be was designed through the Product-Based Design (PBD) approach. The redesigned architecture integrates five core processes—procurement, production, inventory management, sales and distribution, and customer service—within a standardized process structure supported by digital information. Major changes include automated procurement activities, Digital Production Work Orders, barcode-supported inventory control, centralized Digital Order Management, Customer Relationship Management (CRM), and integrated information systems. Following the logic of PBD, each process is designed to produce measurable outputs that can serve as inputs for subsequent activities. This arrangement is expected to strengthen process integration, traceability, operational efficiency, and organizational readiness for digital transformation.

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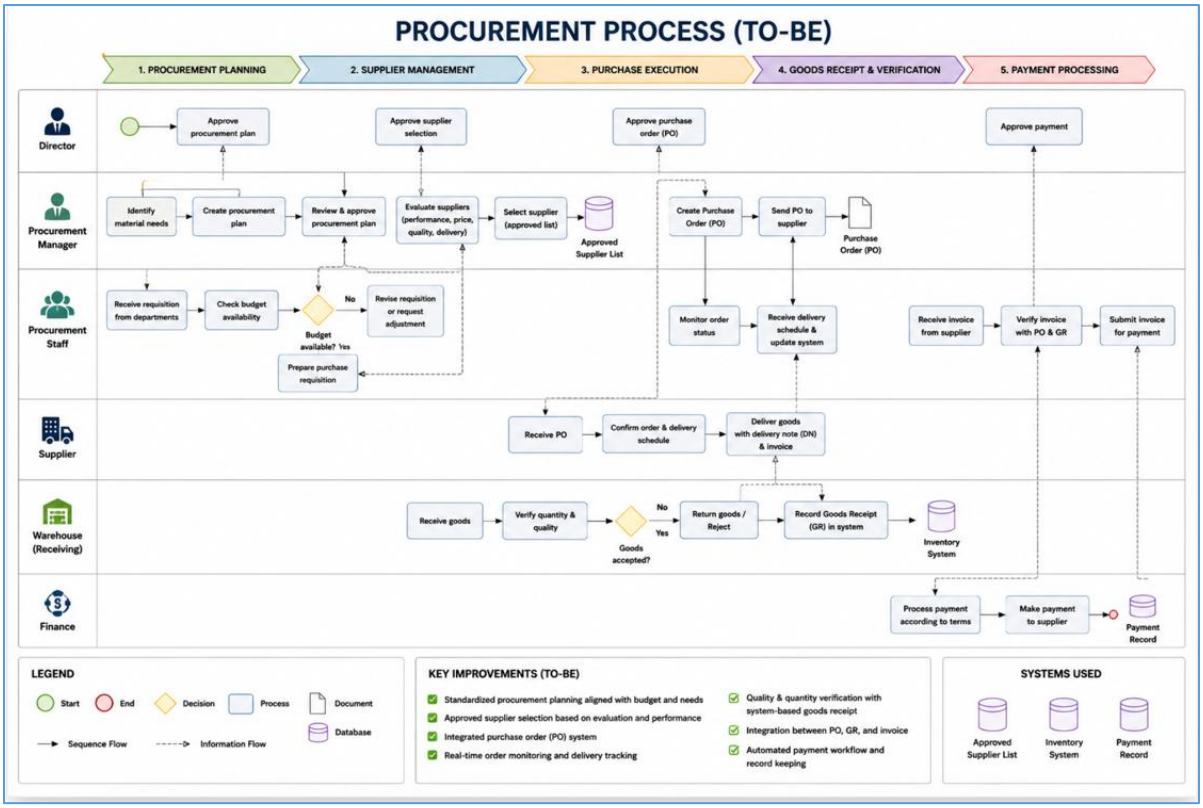


Figure 2 Procurement process (to-be)

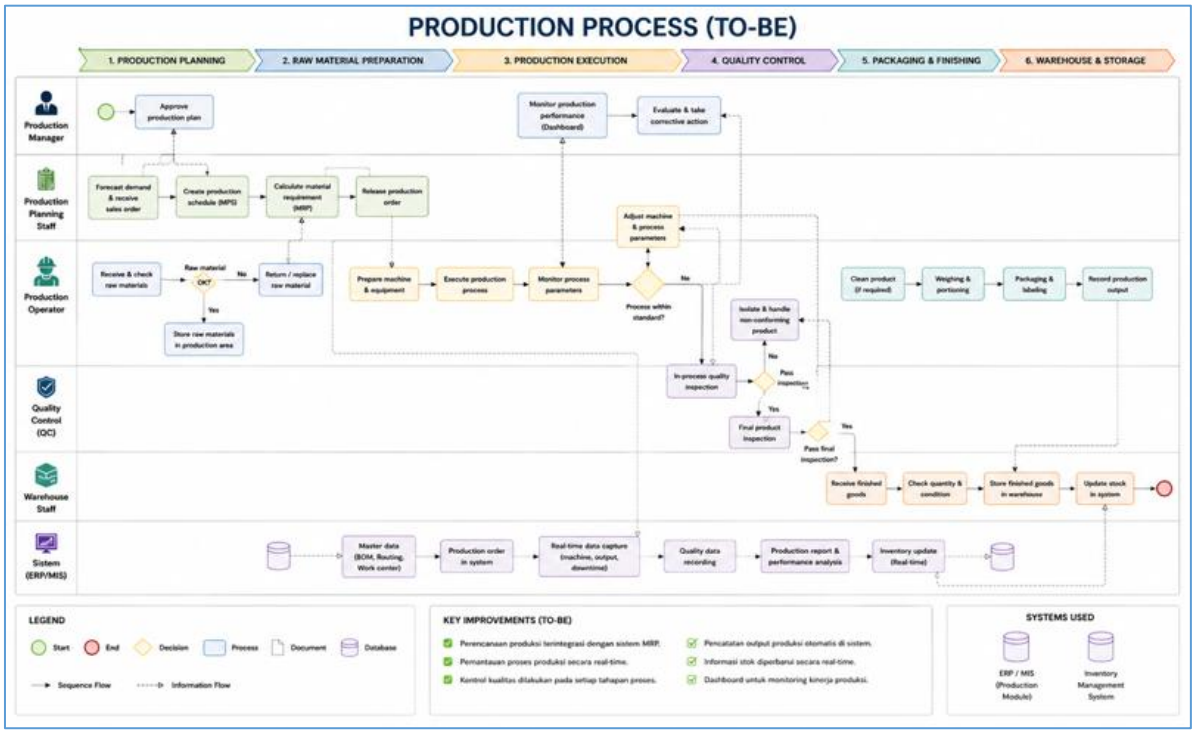


Figure 3 Production process (to-be)

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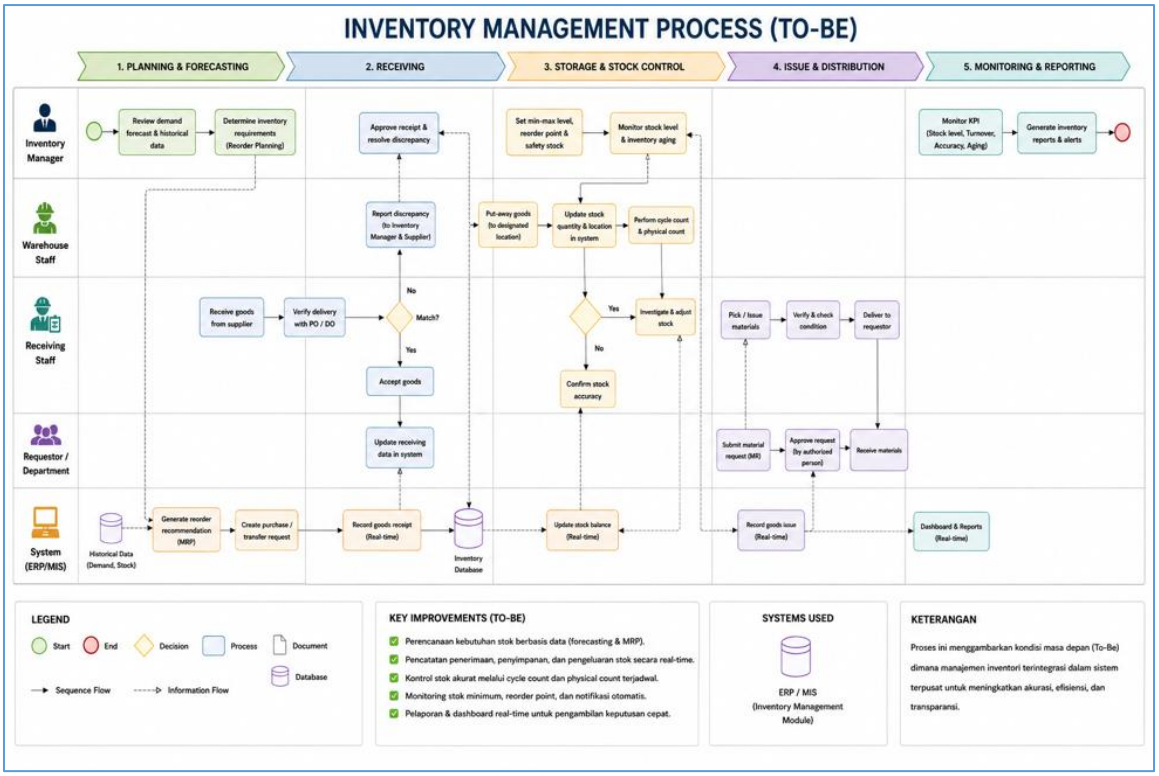


Figure 4 Inventory management process (to-be).

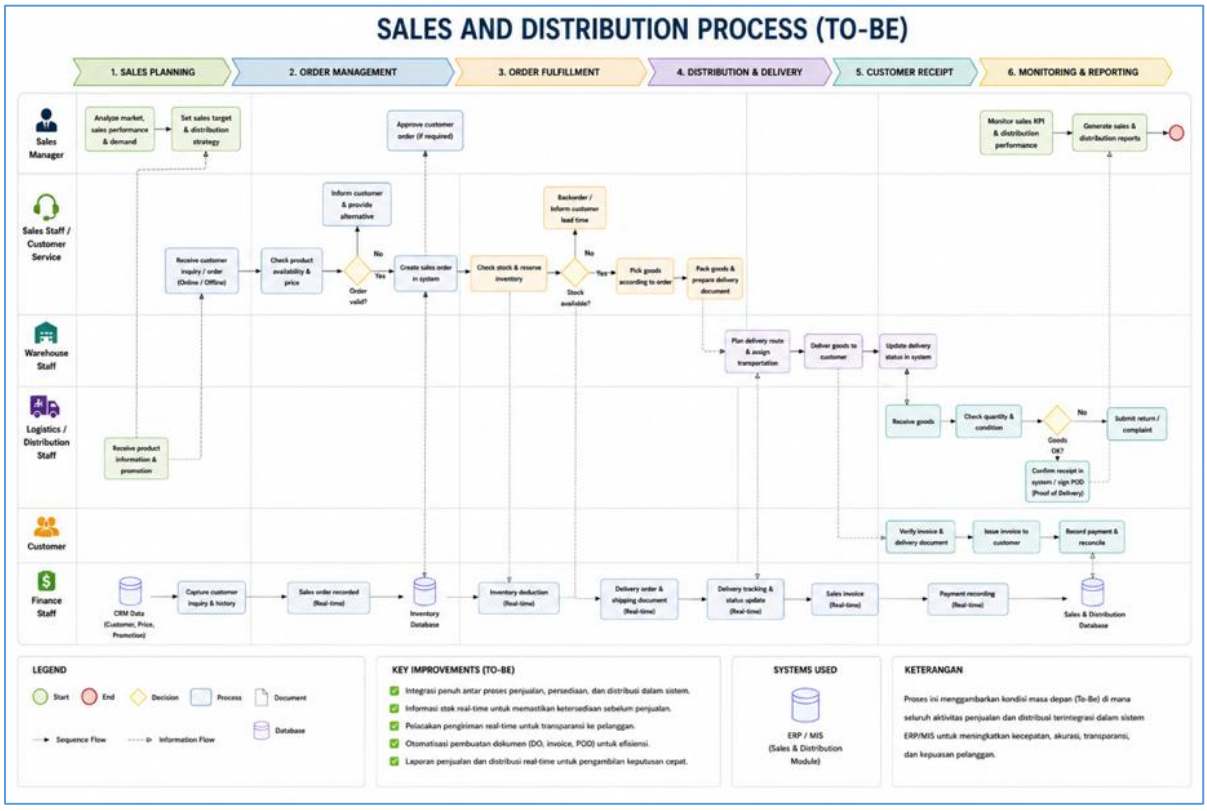


Figure 5 Sales and distribution process (to-be)

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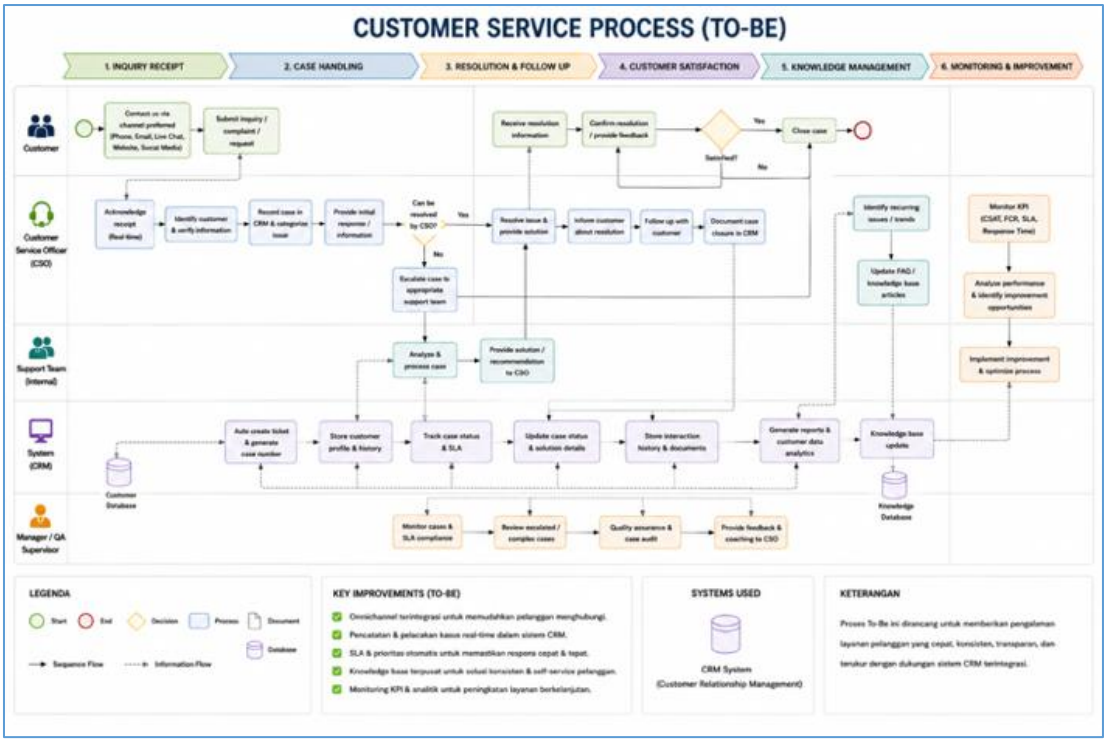


Figure 6 Customer service process (to-be)

4.7 Validation of the Proposed Business Process

The proposed Business Process To-Be was evaluated through expert review and member checking to examine its feasibility, applicability, and consistency with organizational requirements. The assessment covered process completeness, process integration, operational feasibility, readiness for digital transformation, and implementation of the Product-Based Design approach. Experts in Business Process Management and practitioners from SMEs reviewed the redesigned BPMN models, process flows, decision points, and digital integration. Their assessment indicated that the proposed redesign addressed the maturity gaps identified through BPOMM. Member checking with owners and managers from the three participating SMEs further indicated that the redesigned workflows reflected organizational practices and responded to important problems in procurement, production, inventory management, sales, customer service, and performance monitoring. Participants also indicated that standardized documentation, integrated information systems, and centralized digital information could improve operational coordination, reduce manual administrative work, and support managerial decision-making. Although implementation of several digital modules would require additional investment, the framework was regarded as feasible for gradual adoption in line with the resources available to each SME.

Table 3 Expert validation results

Evaluation Criteria	Validation Result	Remarks
Process completeness	Valid	All core business processes are represented.
Process integration	Valid	Information flow between business functions is integrated.
Operational feasibility	Valid	Suitable for implementation in SMEs.
Digital transformation readiness	Valid	Supports gradual digitalization.
Product-Based Design implementation	Valid	Process outputs are clearly defined at each stage.

Overall, the validation confirms that the proposed **Business Process Redesign** is conceptually valid, operationally feasible, and practically applicable for coffee-processing SMEs. The framework

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supports standardized business processes, integrated digital information management, and continuous business process improvement while providing a practical roadmap for sustainable digital transformation.

4.8 Member Checking

Member checking was conducted to examine the practical relevance of the proposed Business Process To-Be with representatives from all three participating SMEs. The redesigned BPMN models were presented to owners and managers, who were invited to assess whether the proposed workflows represented their organizational requirements accurately. The participants generally agreed that the redesigned processes reflected their operational activities while addressing several weaknesses found in the existing workflows. They considered the integration of procurement, production planning, inventory management, customer service, and performance monitoring useful for improving coordination and reducing manual administrative activities. Participants also noted that digital documentation and centralized information management could make communication among employees easier and strengthen managerial decision-making. Although implementation of some digital modules would require further organizational investment, the participants considered gradual implementation to be feasible within their respective resource conditions.

4.9 Comparison Between As-Is and To-Be

The validation evidence indicates that the redesigned process differs from the existing workflow primarily in terms of standardization, digital integration, organizational transparency, and customer value creation. The To-Be design replaces informal and fragmented arrangements with more clearly defined process structures and digital support. Procurement is linked to an approved supplier mechanism and digital purchase orders, production planning becomes integrated, inventory can be monitored in real time, customer information is managed through CRM, and performance evaluation incorporates process-based indicators. These changes provide a more connected process architecture than the As-Is condition.

Table 4 Comparison of as-is and to-be business processes

Aspect	As-Is	To-Be
Process Documentation	Limited and informal	Standardized BPMN and digital SOP
Procurement	Manual supplier selection	Approved Supplier List and digital purchase order
Production Planning	Experience-based	Integrated production planning
Inventory Management	Manual stock recording	Real-time inventory monitoring
Information System	Stand-alone applications	Integrated business information system
Customer Service	Manual complaint handling	CRM-based complaint management
Performance Evaluation	Financial indicators only	Process-based KPIs and dashboard

The redesigned process removes or reduces several non-value-adding activities identified during the As-Is analysis. Manual transfers of information are reduced through digital integration, supplier management becomes more systematic through supplier performance evaluation, and customer information is consolidated through Customer Relationship Management (CRM). These changes strengthen process transparency and coordination among organizational functions. The validation findings indicate that the proposed redesign responds to the maturity gaps identified by BPOMM by standardizing workflows and integrating procurement, production, inventory, sales, and customer service within a more unified process structure. Consistent with Product-Based Design, each process produces measurable outputs that can be used as inputs for the next stage, thereby improving traceability, organizational coordination, and customer value creation. Within the scope of this study,

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the Business Process To-Be is therefore considered conceptually valid, operationally feasible, and relevant to business process improvement and digital transformation in coffee-processing SMEs.

The findings indicate that the integration of BPOMM and Product-Based Design can provide a systematic basis for Business Process Redesign in coffee-processing SMEs. The combination of BPOMM assessment and BPMN As-Is analysis exposed important maturity gaps involving process documentation, performance measurement, supplier management, information systems, and workflow integration. The proposed Business Process To-Be responds to these conditions through standardized workflows, integrated digital systems, supplier evaluation, inventory management, customer relationship management, and performance dashboards. Expert evaluation and member checking supported the validity and practical applicability of the framework. By bringing together BPOMM, PBD, BPMN, and Design Science Research, the study expands the role of BPOMM from maturity diagnosis toward a practical redesign mechanism and provides SMEs with a structured route for improving process maturity and supporting sustainable digital transformation.

4.10 Research Contribution and Novelty

The contribution of the proposed framework is not limited to placing BPOMM and Product-Based Design within the same research design. Its principal contribution is the creation of a traceable mechanism through which organizational maturity gaps can be converted into requirements for process-level redesign. BPOMM supplies the initial organizational diagnosis by identifying weaknesses in areas such as process documentation, performance measurement, supplier management, and information-system support. The BPOMM results alone, however, do not specify how an existing workflow should be changed. BPMN-based As-Is analysis addresses this limitation by translating maturity gaps into observable operational problems, including manual activities, fragmented information flows, and insufficient process integration. These operational problems are then formulated as explicit redesign requirements and implemented through PBD-based To-Be process models.

This mechanism distinguishes the proposed approach from studies that employ maturity models mainly for assessment and from redesign studies that modify existing workflows without first establishing a maturity-based diagnostic foundation. The framework consequently provides a structured bridge between organizational diagnosis and operational process redesign. Its empirical application to coffee-processing SMEs also demonstrates how such a mechanism can be used in settings characterized by relatively limited process formalization and fragmented digital integration. The contribution is therefore both methodological, through the maturity-driven redesign sequence, and empirical, through its application in coffee-processing SMEs in Jember, Indonesia.

5. Conclusion

This study developed a Business Process Redesign framework that integrates the Business Process Orientation Maturity Model (BPOMM) and Product-Based Design (PBD) within a Design Science Research approach for coffee-processing SMEs. The findings indicate that the participating SMEs were at the Defined–Managed maturity level, with relatively stronger performance in the Strategic View dimension and remaining gaps in process documentation, performance measurement, supplier management, and information-system integration. These gaps were translated into redesigned To-Be processes for procurement, production, inventory management, sales and distribution, and customer service. The main contribution of the study is a traceable mechanism for translating BPOMM maturity gaps into BPMN-based process analysis and PBD-based redesign, thereby linking maturity assessment with process improvement rather than treating them as separate activities. Expert evaluation and member checking confirmed the validity and operational feasibility of the proposed artifact across all five predefined criteria. However, the findings do not yet demonstrate long-term performance improvement because the redesigned processes have not been implemented and evaluated longitudinally. Given the study's focus on three coffee-processing SMEs in Jember Regency, future research should examine the framework across a broader range of SMEs and sectors

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and assess its impact through longitudinal measures of process performance and organizational maturity.

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