

Improving The Business Process Recording And Digital Archiving Model At PT Advantis Energy Persada

ABSTRACT

Disorganized recording and digital archiving processes can lead to fragmented operational data, delayed information, difficulties in document retrieval, and an increased risk of human error. This study aims to analyze the problems in the recording and digital archiving processes at PT Advantis Energy Persada and to design an improved model that aligns with the company's operational needs. A qualitative approach with a case study design was employed through observations, interviews, and document analysis involving the administration, finance, and project divisions. Data were analyzed using the Miles and Huberman model, the Fishbone Diagram, and the 5 Whys Analysis to identify the root causes of the problems. The findings indicate that the main issues include fragmented data across multiple files, the absence of standardized recording and archiving procedures, limited project monitoring capabilities, and poor document traceability. This study proposes an improved model, visualized through a Microsoft Excel-based prototype consisting of a master database, transaction log, material tracking, document tracking, and a monitoring dashboard as an initial validation of the company's system requirements.

Keywords: Digital Archiving; Digital Recording; Business Process Improvement; Prototype; Microsoft Excel.

INTRODUCTION

The increasing complexity of operational activities in fabrication and contracting companies requires a more structured recording and digital archiving system. Project activities in this type of company generally involve recording operational expenditures, procuring materials, coordinating with suppliers, and managing various transaction documents. These processes require integrated information management to support cost control, document traceability, and timely decision-making. For small and medium-sized enterprises (SMEs), business process digitalization has also become an essential strategy for improving operational effectiveness and organizational competitiveness. Research by (Sijabat 2022) showed that business digitalization and knowledge management practices positively influence SME performance, while (Fitriani and Nugroho 2023) emphasized that an appropriate information technology strategy enables organizations to manage business processes more effectively. However, limited resources, the absence of standardized operating procedures, and low digital readiness often result in fragmented recording and archiving processes that are difficult to trace and manage.

These conditions were also identified at PT Advantis Energy Persada, a fabrication and general contracting company located in Batam City. Preliminary observations revealed that project expenditure records were maintained in multiple Microsoft Excel files separated

by project, resulting in fragmented operational data and making comprehensive project cost monitoring difficult. In addition, transaction documents, such as invoices, purchase orders, and purchase receipts, were stored in manually organized digital folders without a standardized document-tracking mechanism. Consequently, retrieving documents for transaction validation and reporting required considerable time and increased the risk of misplaced or difficult-to-trace digital files. Initial interviews with personnel from the administration, finance, and project divisions also revealed data inconsistencies, delays in identifying project cost overruns, and weak document traceability due to the lack of an integrated recording and digital archiving system. These findings are consistent with (Mintah et al. 2022), who argued that poorly managed business records and archives hinder business growth, reduce administrative efficiency, and weaken operational information control.

From the perspective of process improvement, Business Process Improvement (BPI) has been widely adopted as an approach for analyzing, evaluating, and redesigning business processes to improve their effectiveness and efficiency. Harrington (1991) explained that BPI involves identifying problematic processes, analyzing the existing (*as-is*) process, investigating the root causes of problems, and designing an improved (*to-be*) process that better aligns with organizational needs. (Wirasari and Budi 2022) demonstrated that BPI helps organizations identify inefficient processes, eliminate non-value-added activities, and develop more structured business process models. These findings are supported by (Moreira, Mamede, and Santos 2024), who emphasized that business process improvement, particularly in small and medium-sized organizations, plays a significant role in improving process consistency, information management quality, and organizational readiness for business process automation. Furthermore, (Mahendrawathi and Nurmawati 2021) argued that successful business process management in growing companies depends not only on process design but also on the adoption of information technology that matches the organization's capabilities.

In addition to business process improvement, digital recording and archiving play a crucial role in maintaining well-organized operational data. Digital archiving extends beyond document storage to include document classification, standardized storage formats, file naming conventions, and efficient information retrieval mechanisms. (Moreira et al. 2024) and (Chen et al. 2021) explained that business process digitalization in developing organizations should be implemented gradually while considering organizational resources and operational requirements. In the context of digital recording, (Afif and Nawirah 2020) demonstrated that Microsoft Excel can be utilized to develop a more structured and accurate recording system, while (Nuar, Mohammad, and Yahya 2021) showed that Excel can serve as an organizational improvement framework and an initial digital transition tool before implementing more sophisticated systems. These studies indicate that simple applications such as Microsoft Excel remain relevant as an initial solution for supporting standardized recording practices, information integration, and document management in organizations

that are not yet prepared to adopt cloud-based systems or Enterprise Resource Planning (ERP) solutions.

Nevertheless, previous studies have generally examined business process improvement, digital recording, and digital archiving as separate topics. Research on BPI has primarily focused on business process mapping and redesign, whereas studies involving Microsoft Excel have mainly emphasized administrative recording and reporting functions. Likewise, research on digital transformation in developing organizations has largely addressed general technology adoption strategies without specifically integrating root cause analysis, the design of digital recording and archiving models, and prototype visualization as an initial system validation within the context of contracting companies that simultaneously manage projects, materials, and transaction documents. In companies such as PT Advantis Energy Persada, the primary challenges extend beyond transaction recording to include fragmented data across departments, weak document tracking, limited project monitoring, and the absence of standardized digital archiving practices that ensure comprehensive document traceability.

Based on these research gaps, this study aims to analyze the recording and digital archiving processes at PT Advantis Energy Persada, identify the root causes of existing problems using the Fishbone Diagram and the 5 Whys Analysis, and design an improved model that better supports the company's operational requirements. The proposed model is then visualized through a Microsoft Excel-based prototype as an initial validation of the company's system requirements. This study is expected to provide practical contributions by proposing a more structured recording and digital archiving model for the company, while also offering a limited conceptual contribution regarding the application of Business Process Improvement, root cause analysis, and gradual digitalization in a growing contracting company.

RESEARCH METHOD

This study employed a qualitative approach with a case study design. A qualitative approach was selected because the study aimed to obtain an in-depth understanding of the recording and digital archiving problems encountered in the company's operational context and to develop an improvement model that addresses the organization's actual operational needs.

The research informants were selected based on their involvement in administrative activities, transaction recording, document management, and project operations. Accordingly, the study involved three key informants representing the administration, finance, and project/operations divisions.

The research stages are presented in Figure 1. The study began with the identification of problems related to the recording and digital archiving processes at PT Advantis Energy Persada through preliminary observations and document reviews. Data were subsequently collected through interviews, observations, and document analysis. The collected data were

analyzed to map the existing (*as-is*) process and identify the main operational problems. Root causes were then identified using the Fishbone Diagram and the 5 Whys Analysis. Based on the findings, an improved (*to-be*) process model was designed and visualized through a Microsoft Excel-based prototype as an initial validation of the company's system requirements.

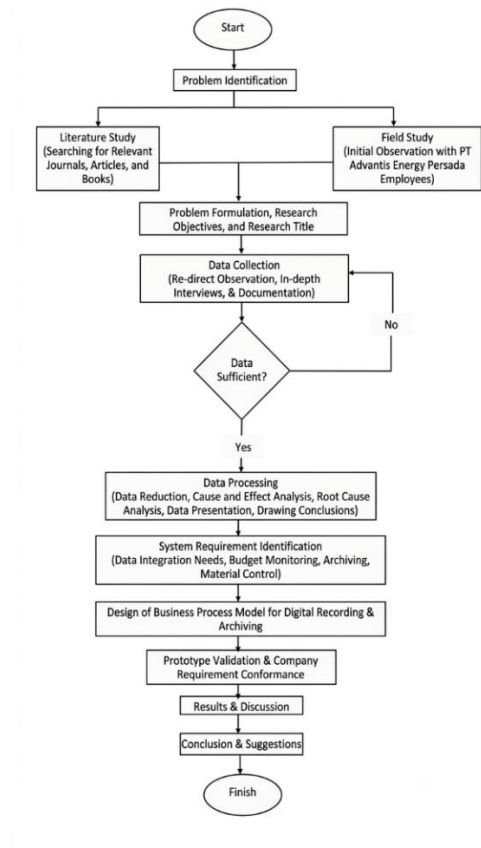


Figure 1 Research Framework

The research procedure consisted of the following stages: problem identification → data collection (observations, interviews, and document analysis) → analysis of the existing (*as-is*) process → root cause identification using the Fishbone Diagram → root cause exploration using the 5 Whys Analysis → development of the proposed (*to-be*) process model → development of a Microsoft Excel-based prototype → initial prototype validation.

Data were analyzed using the interactive model proposed by Miles and Huberman, which consists of data reduction, data display, and conclusion drawing. The data obtained from observations, interviews, and document analysis were reduced according to the research objectives and subsequently presented in the form of the existing (*as-is*) process and the identified operational issues.

Root cause analysis was conducted using the Fishbone Diagram and the 5 Whys Analysis to identify contributing factors and determine the underlying causes of the

identified problems. The results of this analysis served as the basis for developing the proposed business process improvement model.

Based on the analysis, a proposed (*to-be*) process model was developed and visualized through a Microsoft Excel-based prototype as an initial validation of the company's system requirements. The prototype consists of a master database, transaction log, material tracking, document tracking, and a monitoring dashboard. It was positioned as an initial artifact for validating the proposed business process improvement model rather than as a final system supporting cloud integration and multi-user functionality.

To ensure the trustworthiness of the findings, data validity was established through source triangulation and methodological triangulation by comparing information obtained from interviews, observations, and document analysis involving the administration, finance, and project divisions. This approach ensured data consistency and strengthened the credibility of the research findings.

RESULT AND DISCUSSION

Existing Process and Problem Identification

Based on the results of observations, interviews, and document analysis conducted at PT Advantis Energy Persada, the processes of project transaction recording, material management, and document archiving were still performed using a semi-manual approach through multiple separate Microsoft Excel files. This condition resulted in fragmented operational data that were difficult to integrate, making project cost monitoring, data reconciliation, and supporting document retrieval less efficient.

The identified problems were evident in three main activities. First, transaction records were maintained using different formats across projects and suppliers, resulting in inconsistent data recording. Second, material usage at project sites was often recorded after the work had been completed, limiting the effectiveness of material monitoring. Third, transaction documents, including invoices, purchase orders, purchase receipts, and supplier receipts, were archived without standardized folder structures or file-naming conventions, causing document retrieval to rely on manual searches.

To illustrate these conditions, the study mapped the current process for transaction recording, material management, and document archiving, as presented in Figure 2.

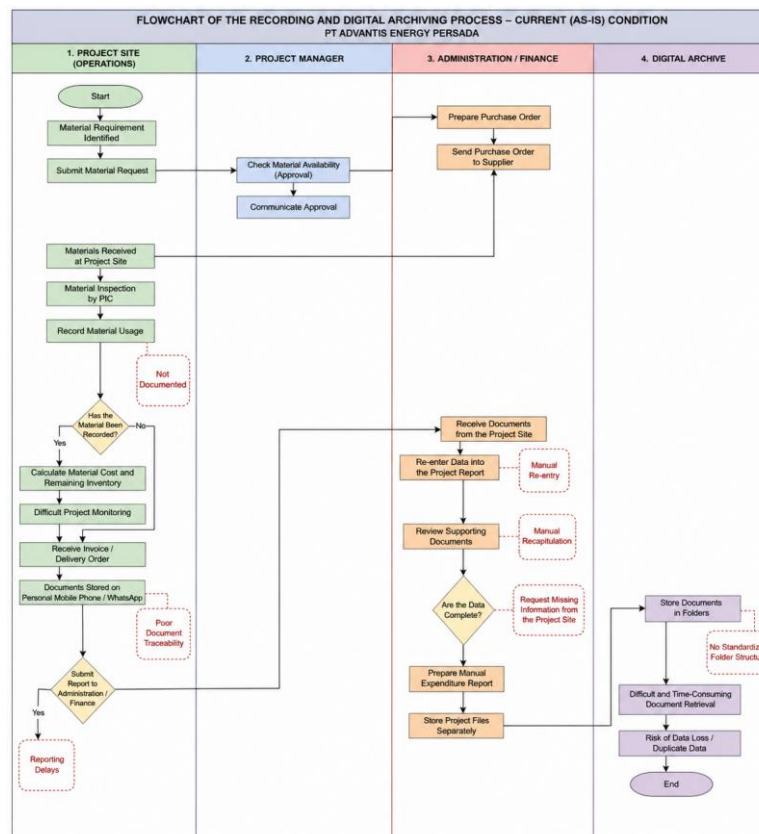


Figure 2 Existing Business Process at PT Advantis Energy Persada

Source: Data analysis results of PT Advantis Energy Persada, prepared by the authors (2026)

Based on Figure 2, the project administration process was still carried out through separate workflows, resulting in project data, transaction records, material information, and supporting documents not being integrated into a unified administrative process. Consequently, the administration and finance divisions were required to access multiple files and manually search archived folders to obtain project cost information and supporting documents.

These findings were supported by the interview results. The finance informant stated that transaction data were often inconsistent because different recording formats were used across projects, while the project informant explained that material usage was not always recorded immediately because field operations were prioritized. This situation increased the risk of delays in project cost monitoring, discrepancies in material inventory records, and prolonged document retrieval processes.

Based on these findings, five major problems were identified: (1) recording procedures were not standardized, (2) material monitoring was not optimal, (3) operational data were fragmented across multiple files, (4) digital archiving practices were not systematic, and (5) formal Standard Operating Procedures (SOPs) for recording, digital archiving, and project monitoring had not yet been established. These five problems were

subsequently analyzed using the Fishbone Diagram and the 5 Whys Analysis to identify their root causes as the basis for developing the proposed solutions.

Root Cause Analysis Using the Fishbone Diagram and the 5 Whys Analysis

Based on the problems identified in the recording and digital archiving processes, a root cause analysis was conducted using the Fishbone Diagram and the 5 Whys Analysis. The Fishbone Diagram was used to categorize the contributing factors into five dimensions: Man (People), Method, Materials/Documents, Machine (Technology/Tools), and Environment. Subsequently, the 5 Whys Analysis was applied to investigate the underlying causes of each identified problem in greater depth.

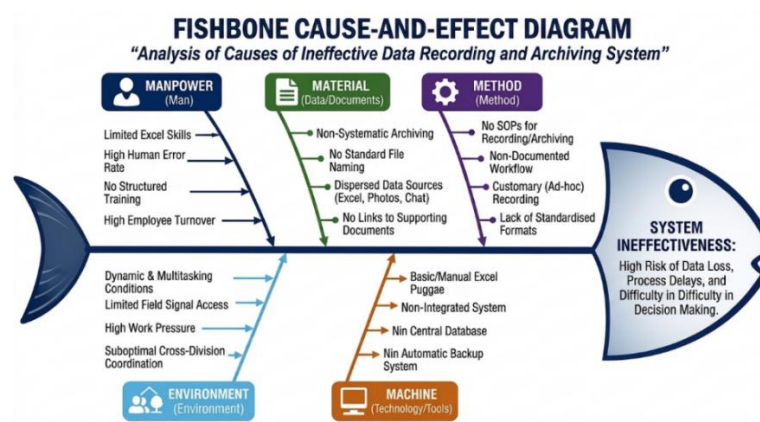


Figure 3 Fishbone Diagram of Problems at PT. Advantis Energy

Source: Data analysis results of PT Advantis Energy Persada, prepared by the authors (2026)

The analysis revealed that the identified problems were not solely caused by technical factors but were also influenced by the absence of standardized recording procedures, fragmented document management practices, limited project monitoring, and the lack of formal Standard Operating Procedures (SOPs) governing administrative processes in a structured manner.

To further investigate these issues, each problem was subsequently examined using the 5 Whys Analysis until its underlying root cause was identified.

Table 1 5 Whys Analysis

5 WHYS STAGE	ANALYSIS RESULTS
WHY 1 Why was there data inconsistency across departments?	Data was inconsistent across departments because each department used different recording formats and documentation media.
WHY 2 Why did each department use different formats and media?	There was no standardized recording format and shared documentation media used across all departments.
WHY 3 Why was there no standardized recording system?	The company had not established Standard Operating Procedures (SOPs) for transaction

	recording, reporting, and digital document archiving.
WHY 4 Why had the company not established clear SOPs?	Administrative processes were primarily performed based on habitual work practices and had never been comprehensively evaluated.
WHY 5 (Root Cause) Why were administrative processes still based on habitual work practices?	There was no standardized and integrated recording and digital archiving system that met the company's operational requirements.

Source: Data analysis results of PT Advantis Energy Persada, prepared by the authors (2026)

The results of the 5 Whys Analysis indicated that data inconsistencies across departments were not solely caused by the use of different recording media but also stemmed from the absence of a standardized and integrated recording and digital archiving system. These findings served as the basis for developing the proposed (*to-be*) process model, the Standard Operating Procedures (SOPs), and the prototype as solutions for improving the company's business processes.

Design of the *To-Be* Process Model

Based on the results of the problem identification and root cause analysis, this study developed a *to-be* process model as a proposed improvement for the recording and digital archiving processes at PT Advantis Energy Persada. The model was designed using the Business Process Improvement (BPI) approach to integrate recording activities across departments, enhance project and material monitoring, strengthen document traceability, and standardize the company's administrative processes.

The proposed model integrates a master database, transaction log, monitoring dashboard, material tracking, and document tracking into a unified administrative workflow. The master database serves as the central repository for project, supplier, and material reference data, while the transaction log is used to record all transactions in a standardized manner. Together, these components form the proposed business process, as illustrated in Figure 4.

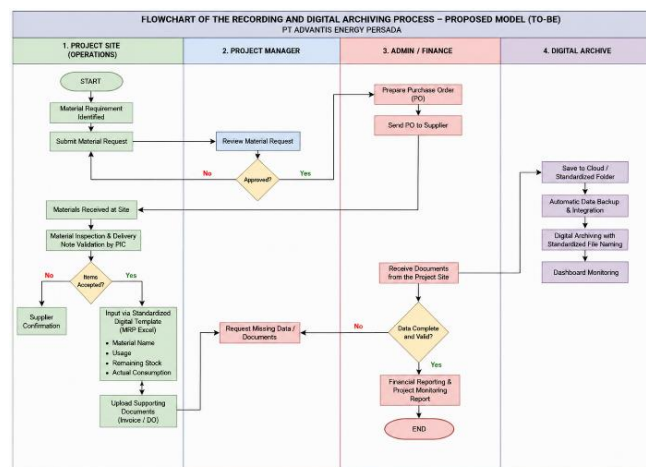


Figure 4 Proposed To-Be Business Process Model for PT. Advantis Energy Persada

Source: Data analysis results of PT Advantis Energy Persada, prepared by the authors (2026)

Based on Figure 4, project, supplier, and material data are managed through the master database as the central reference repository and subsequently processed within the transaction log to support integrated project monitoring, material control, and document archiving. Through this design, administrative processes no longer rely on separate files but are connected within a more systematic and integrated workflow.

The *to-be* process model serves as the conceptual blueprint for the proposed business process, while its initial implementation was realized through a Microsoft Excel-based prototype as a Minimum Viable Product (MVP). The developed prototype was limited to the priority components, namely the master database, transaction log, material tracking, document tracking, monitoring dashboard, and the digital archiving structure. Therefore, it does not yet support cloud integration or multi-user functionality.

In addition to the redesigned workflow, the proposed model was supported by the development of Standard Operating Procedures (SOPs) for transaction and material recording, digital archiving, and project monitoring and reporting. These SOPs were developed to address the identified root cause related to the absence of standardized administrative procedures while promoting process consistency and facilitating the onboarding of new employees.

Overall, the *to-be* process model was designed to address the four major issues identified during the analysis stage: the absence of a centralized database, inconsistent recording and digital archiving practices, inadequate project and material monitoring, and poor document traceability. These issues were translated into a proposed administrative process that served as the foundation for the development of the prototype.

Prototype Development as the Initial Implementation of the *To-Be* Model

As the initial implementation of the *to-be* process model, this study developed a Microsoft Excel-based prototype as a Minimum Viable Product (MVP). Microsoft Excel was selected because it was already widely used by the company for administrative activities, allowing the prototype to serve as a digital transition tool without requiring substantial technology investment. The prototype was positioned as an initial artifact for validating the proposed process improvements rather than as a final system.

Master Database and Transaction Log Prototype

The first components developed were the master database and transaction log, which serve as the central repository for recording project, supplier, material, and transaction data. These components were designed to standardize recording practices and reduce data fragmentation across multiple separate files. The prototype interface is presented in Figure 5.

MASTER DATA LIST PROJECT													
NO	PROJECT CODE	PROJECT NAME	START DATE	END DATE	SPV PROJECT	STATUS	BUDGET PLAN	NOMINAL SPK	ACTUAL EXPENDITURE	REMAINING BUDGET	MARGIN	PERSENTASE	DOC STATUS
1	PRJ01/MRS/MTM/PC084027	MEZZANINE RANDOM ROOM	26/01/2026	25/03/2026	HARD WILLIAM	FINISH	Rp 163.750.000	Rp 245.090.000	Rp 15.520.000	Rp 148.230.000	Rp 229.570.000	9,5%	24
2	PRJ02/RNR/CPV/PC15196	RENOVASI RUANGAN	16/03/2026	20/04/2026	TEDDY ALTRIARA	ON GOING	Rp 75.100.000	Rp 115.000.000	Rp 13.112.000	Rp 61.988.000	Rp 101.888.000	17,5%	19

MASTER DATA LIST MATERIALS SUPPLIER						MASTER DATA LIST PROJECTS MATERIALS					
NO	SUPPLIER NAME	SUPPLIER CODE	SPV NAME	ADDRESS	NO. HP/CONTACT	CATEGORY	NO	MATERIAL NAME	MATERIAL CODE	CATEGORY	UNIT
1	PT Sri Indah Mandiri	SUPP001/PTSM	CANDRA	Komplek tarah mas, blok m1 - m4, Sungai Panas, Batam Kota, Batam City, Riau Islands 29444		MATERIAL ALAM & DASAR	1	BESI HOLLOW	HLW-0001	BESI HOLLOW	BATANG
2	PT Sinar Bangunan Batam	SUPP002/SBB	DEVI	Komp. Nagoya Gateway, J. Raden Patah No 3A (Blok B No 3, Kampong Pelita, Lubuk Baja, Batam City, Riau Islands 29444		MATERIAL ALAM & DASAR	2	BESI HOLLOW 1 1/4" X 1 1/4" X 1.6MM (BS)	HLW-0002	BESI HOLLOW	BATANG
3	PT Sri Batam	SUPP003/PTSB	MERI			MEKANIS, ELETRIKAL, FINISHING	3	BESI HOLLOW (BS) 4" X 4" X 2.3MM	HLW-0003	BESI HOLLOW	BATANG
4	Usaha Baru Jaya	SUPP004/PTBUJ	PUTRI			MATERIAL ALAM & DASAR	4	BESI HOLLOW HITAM 1 1/2" X 1 1/2" X 1.6MM	HLW-0004	BESI HOLLOW	BATANG
5	UD. Mitra Karya Sukses	SUPP005/UDKKS	RYANTO			ARISTEKTURA L & FINISHING	5	BESI HOLLOW HITAM 1 1/2" X 1 1/2" X 2MM	HLW-0005	BESI HOLLOW	BATANG
6	PT Tritama Karya Pratasa	SUPP006/PTTKP	HENDRI			LOGAM & BESI	6	BESI HOLLOW HITAM 2" X 2" X 1.6MM	HLW-0006	BESI HOLLOW	BATANG
7	Toko Prostest Hardware Indonesia	SUPP007/TKPHI	KELVIN			MATERIAL ALAM & DASAR	7	BESI HOLLOW HITAM 3" X 2" X 2.3MM	HLW-0007	BESI HOLLOW	BATANG
8	PT Perkasa Beton Batam	SUPP008/PTPB	GUNTUR			MATERIAL ALAM & DASAR	8	BESI HOLLOW HITAM 5" X 2" X 1.6MM	HLW-0008	BESI HOLLOW	BATANG
9	PT CSK Insulation Engineering	SUPP009/PTICE	ADMIN			MATERIAL ALAM & DASAR	9	BESI HOLLOW HITAM 5" X 2" X 3MM	HLW-0009	BESI HOLLOW	BATANG
10	Jaya Mas Bangunan	SUPP010/TJMB	EM			ARISTEKTURA L & FINISHING	10	HOLLOW GALVANS 1" X 1" X 1.6MM	HLW-0010	BESI HOLLOW	BATANG
							11	HOLLOW GALVANS 2" X 2" X 1.6MM	HLW-0011	BESI HOLLOW	BATANG
							12	HOLLOW GALVANS 4" X 4" X 1.6MM	HLW-0012	BESI HOLLOW	BATANG
							13	HOLLOW GALVANS 4" X 4" X 1.6MM	HLW-0013	BESI HOLLOW	BATANG
							2	BESI ALUMINIUM & PROFIL	BAP-0000	BESI ALUMINIUM & PROFIL	
							1	ALUM PTN BIG M PARTISI 6.00 (NA)	BAP-0001	BESI ALUMINIUM & PROFIL	BATANG
							2	ALUM PTN DOOR JAMB PARTISI 5.35M (NA)	BAP-0002	BESI ALUMINIUM & PROFIL	BATANG
							3	BESI PETAK 2" X 3" X 2.3MM X 6MTR	BAP-0003	BESI ALUMINIUM & PROFIL	BATANG
							4	BIG M / GLASS HOULD 0.00 M (NA)	BAP-0004	BESI ALUMINIUM & PROFIL	BATANG
							5	CHAUQUARE PLAT BESI HITAM TEBAL 3MM	BAP-0005	BESI ALUMINIUM & PROFIL	LEMBAR
							6	EKA FURING BESARTERIAL	BAP-0006	BESI ALUMINIUM & PROFIL	BATANG
							7	FLAT BAR 2" X 3MM X 6MTR	BAP-0007	BESI ALUMINIUM & PROFIL	BATANG
							8	FLAT 700 X 320	BAP-0008	BESI ALUMINIUM & PROFIL	LEMBAR
							9	PLAT STRIP 1.5" X 3MM	BAP-0009	BESI ALUMINIUM & PROFIL	LEMBAR
							10	PLAT STRIP 2" X 3MM	BAP-0010	BESI ALUMINIUM & PROFIL	LEMBAR

TRANSAKSI LOG																
ALL TRANSACTIONS																
DATE	NO	KEY	SUPPLIER	PRODUCT CODE	QUANTITY	UNIT	PRICE	DESCRIPTION	ORIGINAL COST	QTY	UNIT	SALE PRICE	CST	STATUS	LOW INVENTORY	LOW INVENTORY
2026-01-26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2026-01-26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2026-01-26	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2026-01-26	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2026-01-26	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2026-01-26	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
2026-01-26	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
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2026-01-26	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
2026-01-26	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58
2026-01-26	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
2026-01-26	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
2026-01-26	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
2026-01-26	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
2026-01-26	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
2026-01-26	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
2026-01-26	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
2026-01-26	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
2026-01-26	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67	67
2026-01-26	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
2026-01-26	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69
2026-01-26	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
2026-01-26	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
2026-01-26	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
2026-01-26	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73
2026-01-26	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
2026-01-26	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
2026-01-26	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76
2026-01-26	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
2026-01-26	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
2026-01-26	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
2026-01-26	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
2026-01-26	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
2026-01-26	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
2026-01-26	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
2026-01-26	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
2026-01-26	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
2026-01-26	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86
2026-01-26	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
2026-01-26	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88
2026-01-26	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89
2026-01-26	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
2026-01-26	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
2026-01-26	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92
2026-01-26	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
2026-01-26	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
2026-01-26	95	95	95	95	95	95										

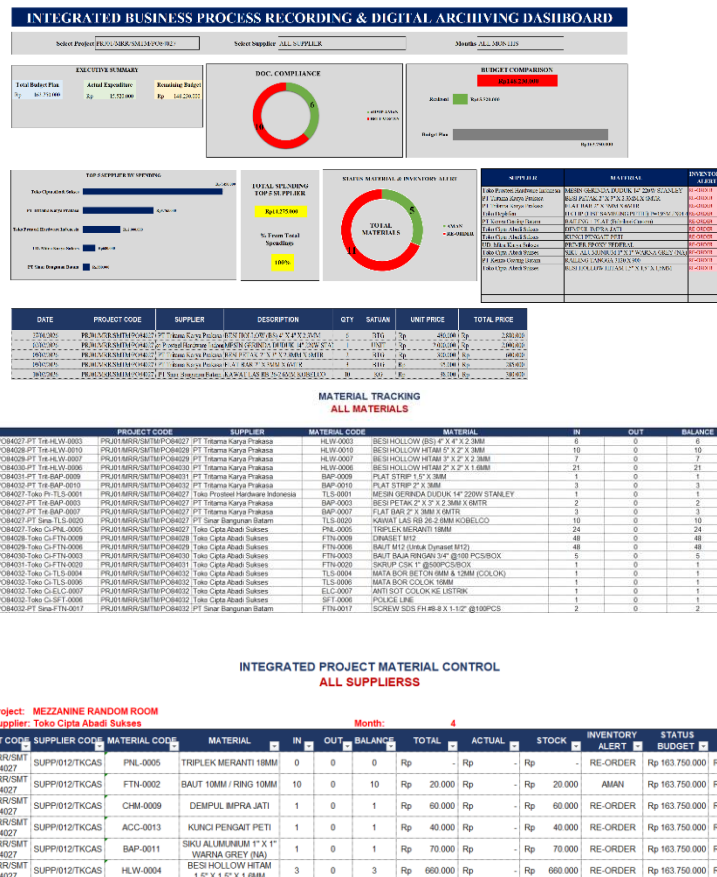


Figure 6 Prototype Dashboard And Material Tracking Prototype
Source: Developed by the Author (2026)

Based on Figure 6, the monitoring dashboard provides a concise overview of project information, while the material tracking feature supports the recording of incoming materials, outgoing materials, and inventory balances. These features enhance the monitoring process, which was previously performed manually.

These findings are consistent with the study by (Moreira et al. 2024), which reported that business process digitalization improves the visibility of operational information, thereby supporting more effective monitoring and decision-making. In the present study, the monitoring dashboard provides a concise overview of project status, enabling the company to monitor project costs and progress more efficiently without manually retrieving information from multiple separate files.

Document Tracking and Digital Archiving Prototype

The next component developed was the document tracking feature, which was integrated with the digital archiving structure to improve the traceability of transaction documents. This feature links transaction records with their supporting documents through

PROPOSED DIGITAL ARCHIVING STRUCTURE

GOOGLE DRIVE / SHARED DRIVES
PT. ADVANTIS TEKNOLOGI PERSADA

01. PROJECTS ACTIVE (ACTIVE PROJECTS)
02. PROJECTS FINISHED (FINISHED PROJECTS)
03. PROJECTS FINISHED (FINISHED PROJECTS)
04. PROJECTS FINISHED (FINISHED PROJECTS)

BASED ON PROJECT CODE

PRJ01 PROJECT 01
PRJ02 PROJECT 02
PRJ03 PROJECT 03

01. PURCHASE ORDER
All Physical PO Documents

02. INVOICE
Invoice Documents
Suppliers/Vendors

03. DELIVERY ORDER
Material Delivery Order Documents

04. PURCHASE RECEIPT
Invoice Receipt/Proof of Payment Documents

05. PROJECT DOCUMENTATION
Project Documentation

06. FINANCIAL REPORTS
Financial Reports

07. OTHER DOCUMENTS
Other Documents

ALL DOCUMENTS

NO. DOC	DOKUMEN	PROJECT CODE	DATE	STATUS	LINK FILE
CR-TKP/01/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	27/01/2026	BELUM SCAN	BELUM LINK
CR-TKP/01/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	27/01/2026	BELUM SCAN	BELUM LINK
CR-TKP/01/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	27/01/2026	BELUM SCAN	BELUM LINK
CR-TKP/01/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	27/01/2026	BELUM SCAN	BELUM LINK
CR-TKP/01/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	27/01/2026	BELUM SCAN	BELUM LINK
CR-PH/02/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	02/02/2026	BELUM SCAN	BELUM LINK
00117CR-TKP/02/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	09/02/2026	ARISP AMAN	SUKA NOTA
00120CR-TKP/02/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	09/02/2026	ARISP AMAN	SUKA NOTA
00226CR-SBB/02/2026	PEMBELIAN	PRJ01MRR/SMT/MP084027	10/02/2026	ARISP AMAN	SUKA NOTA
6014	PEMBELIAN	PRJ01MRR/SMT/MP084027	26/02/2026	BELUM SCAN	BELUM LINK
6014	PEMBELIAN	PRJ01MRR/SMT/MP084027	26/02/2026	BELUM SCAN	BELUM LINK
6014	PEMBELIAN	PRJ01MRR/SMT/MP084027	26/02/2026	BELUM SCAN	BELUM LINK
6014	PEMBELIAN	PRJ01MRR/SMT/MP084027	26/02/2026	BELUM SCAN	BELUM LINK
6014	PEMBELIAN	PRJ01MRR/SMT/MP084027	26/02/2026	BELUM SCAN	BELUM LINK
6035	PEMBELIAN	PRJ01MRR/SMT/MP084032	01/03/2026	ARISP AMAN	SUKA NOTA
6035	PEMBELIAN	PRJ01MRR/SMT/MP084032	01/03/2026	ARISP AMAN	SUKA NOTA
6039	PEMBELIAN	PRJ01MRR/SMT/MP084032	02/03/2026	ARISP AMAN	SUKA NOTA
0007ACR-SBB/03/2026	PEMBELIAN	PRJ01MRR/SMT/MP084032	04/03/2026	ARISP AMAN	SUKA NOTA
0007ACR-SBB/03/2026	PEMBELIAN	PRJ01MRR/SMT/MP084032	04/03/2026	ARISP AMAN	SUKA NOTA

Google Drive Screenshot:

drive.google.com/drive/folders/1Gw-s1WvRlJagGcnFnDp3n16Cjdyf587N4-ID

(03) DELIVERY ORDER > SUPPLIER CIPTA ABADI ...

Nama	Pemilik	Tanggal diub...	Ukuran file
PRJ01_DO_270426_DO6642CAS.jpg	👤 saya	8 Jun	311 KB
PRJ01_DO_200426_DO669CAS.jpg	👤 saya	8 Jun	322 KB
PRJ01_DO_140426_DO489CAS.jpg	👤 saya	8 Jun	326 KB
PRJ01_DO_150426_DO600CAS.jpg	👤 saya	8 Jun	291 KB
PRJ01_DO_160426_DO6378CAS.jpg	👤 saya	8 Jun	334 KB

Following the development of the prototype, a limited validation was conducted involving seven internal validators representing the administration, finance, and project divisions. The validation was carried out through a prototype review and usage simulation, followed by the collection of feedback regarding functional suitability, ease of use, relevance to the company's operational requirements, and the improvements considered necessary. The validation results were classified into three categories: appropriate, appropriate with minor improvements, and appropriate with implementation adjustments.

The validation focused on the prototype components developed in this study, namely the master database, transaction log, monitoring dashboard, material tracking, document tracking, and standardized input templates. A summary of the validation results is presented in Table 2.

Table 2 Validation Results

No	Validation Aspect	Key Validation Results	Validator Findings / Comments	Conclusion
1	Master Database & Transaction Log	All validators agreed that the organization of project, supplier, and material master data was well-structured and standardized. The transaction log was also considered effective in supporting centralized project data recording and improving transaction traceability.	No validator identified any non-conformities for this aspect.	appropriate
2	Monitoring Dashboard	Most validators agreed that the dashboard provided faster and more concise project information, supporting more effective monitoring of project expenditures.	Validators suggested adding additional visual indicators, such as automatic alerts when actual project costs approach the allocated budget. One validator noted that the budget monitoring feature still requires further refinement.	appropriate with minor improvements
3	Material Tracking & IPMC	All validators agreed that the workflows for recording material inflows and outflows were clear. The balance stock calculation and inventory alert features were considered useful for monitoring project material requirements.	Although the system was considered appropriate, successful implementation depends on the project team's discipline in recording material transactions consistently and as close to real time as possible.	appropriate

4	Document Tracking & Digital Archiving	Validators agreed that the document tracking system, folder structure, and digital archiving improved the traceability of company transaction documents.	One validator noted that the standardized file naming convention would require an initial adaptation period, as administrative staff were accustomed to using simpler naming formats.	appropriate with Implementation Adjustments
5	Input Templates & System Suitability	All validators agreed that the automated formulas, input validation, and standardized recording templates helped minimize potential human error and maintain consistency across departments. The prototype was also considered relevant to the company's operational requirements and feasible for gradual implementation.	No validator identified any non-conformities for this aspect.	appropriate

Source: Validation Results from PT. Advantis Energy Persada Employees, Processed by the Author (2026)

Based on the validation results, all prototype components were considered appropriate for the company's operational requirements. The master database and transaction log were found to improve the consistency of recording practices, while the monitoring dashboard, material tracking, and document tracking enhanced project monitoring, material control, and document traceability. The feedback provided mainly involved minor improvements, including refinements to the dashboard interface, adjustments to the implementation of standardized document naming conventions, and the need for consistent material recording practices by users.

The validation results also indicated that the proposed solution addressed most of the root causes identified through the Fishbone Diagram and the 5 Whys Analysis, particularly those related to fragmented data, the absence of a centralized database, inadequate project monitoring, and poor document traceability.

These findings are consistent with the study by (Afif and Nawirah 2020), which demonstrated that the use of Microsoft Excel as a standardized recording tool improves the consistency of administrative data management. Furthermore, the findings support the study by (Nuar et al. 2021), which suggested that spreadsheets can serve as an initial digital transition tool before organizations implement more advanced information systems. Therefore, the Microsoft Excel-based prototype developed in this study functions not only as a recording tool but also as an initial step toward a more integrated administrative process.

Meanwhile, issues related to user discipline, adaptation to the new recording format, proficiency in using Microsoft Excel, and limited internet connectivity at project sites were not fully resolved by the prototype. Instead, these challenges were mitigated through the

development of Standard Operating Procedures (SOPs), standardized input templates, data validation features, and a phased implementation approach. In this context, the prototype was not designed to support real-time recording; rather, it functions as an administrative recapitulation tool that can be updated after field data have been received by the project administrator, making it suitable for operational environments with limited internet access.

Implications of the Research Findings

The results of the limited implementation indicate that the proposed *to-be* process model and the developed prototype can support improvements in transaction recording, project monitoring, material control, and document archiving at PT Advantis Energy Persada. From a practical perspective, this study provides a digital administration blueprint that can serve as a transitional solution before the company develops more advanced systems, such as web-based applications or systems that support multi-user integration.

In addition to its practical contribution to PT Advantis Energy Persada, this study also contributes to the academic literature on Business Process Improvement (BPI) in small and medium-sized contracting companies. The findings demonstrate that the Business Process Improvement approach can be integrated with root cause analysis using the Fishbone Diagram and the 5 Whys Analysis to develop a more systematic business process improvement model. Furthermore, this study shows that a Microsoft Excel-based prototype can be utilized as an initial validation tool for proposed business process designs before organizations invest in more sophisticated information systems. These findings are expected to provide a useful reference for future studies on gradual digital transformation in organizations with limited resources and evolving technological readiness.

Nevertheless, the successful implementation of the proposed model depends on the company's commitment to implementing Standard Operating Procedures (SOPs), maintaining consistent recording practices, standardizing digital document archiving, and improving user competency. Therefore, the proposed model should be regarded as an initial step toward administrative transformation rather than as a final solution to all operational challenges.

CONCLUSION

This study found that the problems related to transaction recording, material management, and document archiving at PT Advantis Energy Persada were primarily caused by the absence of standardized administrative procedures, fragmented operational data, limited project monitoring, and the lack of a structured digital archiving system. By applying the Business Process Improvement (BPI) approach, this study developed a *to-be* process model and a Microsoft Excel-based prototype as a more integrated digital administration solution.

The validation results obtained from seven internal validators indicated that the prototype was appropriate for the company's operational requirements, particularly in

improving recording consistency, project monitoring, material control, and document traceability. These findings suggest that the proposed model has the potential to serve as a practical digital transition tool for organizations that are in the early stages of digital transformation and have limited resources and technological infrastructure.

This study has several limitations. The validation was conducted only within the company, the prototype does not yet support cloud integration or multi-user functionality, and its successful implementation depends on users' consistency in applying the proposed procedures and Standard Operating Procedures (SOPs). Therefore, future research may extend the proposed model into a web-based or cloud-based information system, evaluate its implementation in organizations with different characteristics, and examine its long-term impact on business process effectiveness and organizational operational performance.

REFERENCES

- Afif, Ifa Rosania, and Nawirah Nawirah. 2020. "Design of Financial Statement Preparation Based on SAK EMKM Using Microsoft Excel." *Journal of Islamic Accounting and Finance Research* 2(1):141. doi:10.21580/jiafr.2020.2.1.5156.
- Chen, Chun Liang, Yao Chin Lin, Wei Hung Chen, Cheng Fu Chao, and Henry Pandia. 2021. "Role of Government to Enhance Digital Transformation in Small Service Business." *Sustainability (Switzerland)* 13(3):1–26. doi:10.3390/su13031028.
- Fitriani, Leni, and Heru Nugroho. 2023. "Information Technology Strategy for Micro, Small, and Medium Enterprises in the Era of Industry 4.0." *IJAIT (International Journal of Applied Information Technology)* 06(02):111. doi:10.25124/ijait.v6i02.5975.
- Mahendrawathi, E. R., and Dita Nurmawati. 2021. "Analysis of Business Process Management Capability and Information Technology in Small and Medium Enterprises in the Garment Industry (Multiple Case Studies in East Java, Indonesia)." *Electronic Journal of Information Systems in Developing Countries* 87(1):1–21. doi:10.1002/isd2.12154.
- Mintah, Clement, Mohamed Gabir, Felicia Aloo, and Elvis Kwame Ofori. 2022. "Do Business Records Management Affect Business Growth?" *PLoS ONE* 17(3 March):1–21. doi:10.1371/journal.pone.0264135.
- Moreira, Silvia, Henrique S. Mamede, and Arnaldo Santos. 2024. "Business Process Automation in SMEs: A Systematic Literature Review." *IEEE Access* 12:75832–64. doi:10.1109/ACCESS.2024.3406548.
- Nuar, Almalin, Musli Mohammad, and Mohd Shahir Yahya. 2021. "A Microsoft Excel Spreadsheet for Selecting Organisational Improvement Initiatives Based on Malaysia Business Excellence Framework and Industrial Revolution 4.0." *Research Progress in Mechanical and Manufacturing Engineering* 2(1):145–51. <https://doi.org/10.30880/rpmme.2021.02.01.016>.
- Sijabat, Rosdiana. 2022. "The Effects of Business Digitalization and Knowledge Management Practices on Business Performance: Findings from Indonesian Micro, Small, and Medium Enterprises." *BISNIS & BIROKRASI: Jurnal Ilmu Administrasi Dan Organisasi* 29(2). doi:10.20476/jbb.v29i2.1350.
- Wirasari, I., and I. Budi. 2022. "Perancangan Model Bisnis Usaha Kecil Menengah Menggunakan Metode Business Process Improvement (Studi Kasus: UKM Ardelicious

Kitchen Bandung).” *Jurnal Sositologi* 21(1):31–37.