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DESIGNING A MICROSOFT EXCEL-BASED COFFEE SALES RECORDING SYSTEM USING INDEX, MATCH, AND SUMIFS FUNCTIONS (Case Study Of PT. DEF)

PERANCANGAN SISTEM PENCATATAN PENJUALAN KOPI BERBASIS MICROSOFT EXCEL MENGGUNAKAN FUNGSI INDEX MATCH DAN SUMIFS (Studi Kasus PT. DEF)

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Abstract

PT. DEF is a company engaged in the sale of coffee, both wholesale and retail. Currently, the sales recording system is still carried out manually, which often leads to problems such as delays in reporting, data entry errors, and difficulties in retrieving historical information. This study aims to improve the efficiency and accuracy of the sales recording system by implementing the INDEX MATCH and SUMIFS functions in Microsoft Excel. The research method used is descriptive qualitative with a case study approach, involving observation, interviews, and documentation of the existing system. The results show that the use of INDEX MATCH and SUMIFS can accelerate the data retrieval process, improve the accuracy of sales reports, and reduce input errors. This study provides a practical solution for small and medium enterprises (SMEs) in implementing an efficient sales recording system without requiring significant investment in ERP software. However, the system still has limitations, such as dependence on Excel files that are vulnerable to damage or unintended changes, and the lack of advanced automation features such as receivables reminders or inter-departmental integration. Therefore, future research is expected to develop a web-based system with a centralized database.

Keywords : INDEX MATCH, SUMIFS, Microsoft Excel, Sales Recording, Data Efficiency, UMKM.

Abstrak

PT. DEF adalah perusahaan yang bergerak di bidang penjualan kopi, baik grosir maupun eceran. Saat ini, sistem pencatatan penjualan masih dilakukan secara manual, yang sering menimbulkan permasalahan seperti keterlambatan laporan, kesalahan input data, serta kesulitan dalam pencarian informasi historis. Penelitian ini bertujuan untuk meningkatkan efisiensi dan akurasi sistem pencatatan penjualan dengan mengimplementasikan fungsi *INDEX MATCH* dan *SUMIFS* dalam *Microsoft Excel*. Metode penelitian yang digunakan adalah deskriptif kualitatif dengan pendekatan studi kasus, melalui observasi, wawancara, dan dokumentasi terhadap sistem yang berjalan. Hasil penelitian menunjukkan bahwa penggunaan INDEX MATCH dan SUMIFS mampu mempercepat proses pencarian data,

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meningkatkan akurasi pelaporan penjualan, serta mengurangi tingkat kesalahan input. Penelitian ini berhasil menjadi solusi praktis bagi UMKM dalam menerapkan sistem pencatatan penjualan yang efisien tanpa memerlukan investasi besar pada software ERP. Namun, sistem ini masih memiliki keterbatasan seperti ketergantungan pada file Excel yang rentan terhadap kerusakan atau perubahan tidak sengaja, serta belum adanya otomatisasi tingkat lanjut seperti pengingat piutang atau integrasi antar departemen, diharapkan untuk penelitian berikutnya dilanjutkan dengan membuat sistem berbasis web dengan memiliki database terpusat.

Kata Kunci : *INDEX MATCH*, *SUMIFS*, *Microsoft Excel*, Pencatatan Penjualan, Efisiensi Data, UMKM.

1. INTRODUCTION

Technological development plays a very important role in supporting ease in carrying out various activities. Many applications have been created to facilitate business actors in collaborating and developing their businesses (Nurrahman et al., 2024). Micro, Small, and Medium Enterprises (MSMEs) have a crucial role in the Indonesian economy, both in terms of contribution to Gross Domestic Product (GDP) and employment absorption. However, many MSMEs still face challenges in managing sales and financial data, especially those that still use manual systems (Faturrahman et al., 2025). This can lead to delays in reporting, data entry errors, and difficulties in analyzing historical data. Based on observations and interviews conducted by the author, PT. DEF, as a coffee sales company, faces several problems, including:

a. The company still uses a manual sales recording method with basic Microsoft Excel spreadsheets without automatic formulas, resulting in relatively slow preparation of coffee sales reports.
b. This method causes the data retrieval process to take a long time and increases the risk of calculation errors in recapitulating total coffee sales.

These problems indicate that PT. DEF requires a fast, simple, and affordable solution to optimize coffee sales recording. One possible solution is the use of INDEX MATCH and SUMIFS functions in Microsoft Excel. These functions allow users to search for data based on specific criteria and organize it automatically in a more structured format (Nurrahman & Rusmanto, 2025), thereby facilitating decision-making within an organization or company (Nurrahman & Azzahra, 2025).

Several previous studies have demonstrated the effectiveness of Microsoft Excel in MSME financial recording.(Rahayu, 2022), in designing a sales accounting information system based on Microsoft Excel for Thrift Septian Ase MSME, showed that Excel can make the recording process easier, faster, and more accurate. (Hassan & Prasetya, 2024), in preparing MSME financial reports for Rosha Batavia using Microsoft Excel based on SAK EMKM, found that it improves financial transparency and supports better decision-making. In addition, Excel-based training has been conducted to improve financial recording skills for MSMEs. (Yuanita et al., 2025) conducted training on preparing MSME financial reports using Microsoft Excel in Padang City, showing positive responses from participants and improved understanding of proper manufacturing accounting practices. Furthermore, Wigunastuti (2026) demonstrated that Microsoft Excel implementation in designing an extracurricular registration system at SMPN 6 Babelan successfully improved integrated data management, faster data recapitulation, and automatic, easily analyzed reporting.

Although several studies have discussed the use of Microsoft Excel in financial data management and simple information systems, research that specifically optimizes INDEX MATCH and SUMIFS functions for sales data processing in coffee sales companies is still limited. Therefore, this study aims to design a coffee sales data processing system based on Microsoft Excel by utilizing INDEX MATCH and SUMIFS functions to make data retrieval and report preparation faster and more accurate. The objective of this study is to improve the efficiency and accuracy of the coffee sales recording system at PT. DEF through the use of INDEX MATCH and SUMIFS functions in Microsoft Excel.

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Literature Review

System Design

Define a system as a network of interrelated work processes that are organized to achieve a goal and perform activities (Ridho, 2021). According to (Nistrina & Rahmania, 2021), a system is a series consisting of two or more components that are interconnected and interact with each other to achieve a goal, usually divided into smaller subsystems that support a larger system. A system has certain characteristics or properties. In the context of coffee sales recording, an information system serves as a tool to manage sales transaction data in a structured manner, including recording product types, transaction quantities, selling prices, and generating periodic sales reports. The implementation of an information system allows data processing to be carried out faster and more accurately than manual methods, thereby reducing recording errors and facilitating the retrieval of historical data. Thus, information systems can help companies improve operational efficiency and support data-driven decision-making.

Coffee Sales Recording System

A recording system is the process of recording all business transactions carried out by a company, especially those related to sales and financial activities. A good recording system can help in preparing accurate financial statements (Rahayu, 2022). Sales are the main activity in trading companies that generate revenue. Well-recorded sales information becomes the basis for evaluating performance and designing marketing strategies (Hassan & Prasetya, 2024). Coffee is one of Indonesia's leading commodities with high economic value. The national coffee industry continues to grow in exports, franchises, and local MSMEs. PT. DEF operates in this sector as a distributor and retailer (Yuanita et al., 2025).

Microsoft Excel

Microsoft Excel is a program or application that is part of the Microsoft Office package(Nurrahman & Azzahra, 2025). It is spreadsheet software used to manage and analyze data. Features such as INDEX MATCH and SUMIFS allow users to perform automatic data retrieval, conditional calculations, and dynamic report generation (Microsoft Support, 2025).

INDEX MATCH & SUMIFS

In Excel formulas, the INDEX function is used to retrieve data from a range or array based on specified row and column information, while the MATCH function is used to determine the relative position of the searched data within a range. The SUMIFS function is used to perform conditional summation based on multiple criteria (one or more conditions).

In a coffee sales recording system, the INDEX MATCH function is used to recapitulate all sales on a monthly basis, while the SUMIFS function is used to calculate the total number of items sold in a given month and the total sales per customer within that month in the sales data (www.kelasexcel.id, 2025).

2. RESEARCH METHOD

Research Approach

This study uses a descriptive qualitative method with a case study approach at PT. DEF. The research involves numerical data (coffee sales data) and data processing.

Research Location

The study was conducted at PT. DEF, Pagedangan District, Tangerang Regency, from October to December 2025.

Data Collection Techniques

The following data collection methods were used:

a. **Direct Observation**

Observation of the existing sales recording system.

b. **Interviews**

Conducted with administrative staff and sales managers.

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c. **Documentation**
Collecting previous recording formats and sample sales reports.
d. **Literature Study**
Designing and documenting the sales system, as well as preparing sales reports using Microsoft Excel with INDEX MATCH and SUMIFS functions.

Implementation Steps
a. Analyze the existing manual recording system.
b. Design a new format using Microsoft Excel with INDEX MATCH and SUMIFS for data retrieval and sales data aggregation based on product codes, dates, total prices, and customer names.
c. Test the new recording system for two weeks.
d. Evaluate efficiency based on recording time, error rate, and ease of use.

Success Indicators
a. The time required to retrieve transaction data.
b. The number of input or reporting errors.
c. User satisfaction with the new system.

3. RESULT AND DISCCUSSION

a. Sales Recording Process (Current System)

Based on interviews conducted with the Finance & Accounting staff, the sales recording system currently used at PT. DEF is still carried out manually and does not follow a standardized format. Transaction data is typically recorded randomly in notebooks, receipts, or Microsoft Excel files without a consistent structure. As a result, the processes of daily recapitulation, monthly report preparation, and business performance analysis become difficult to perform quickly and accurately. Therefore, it can be illustrated as shown in the figure below.

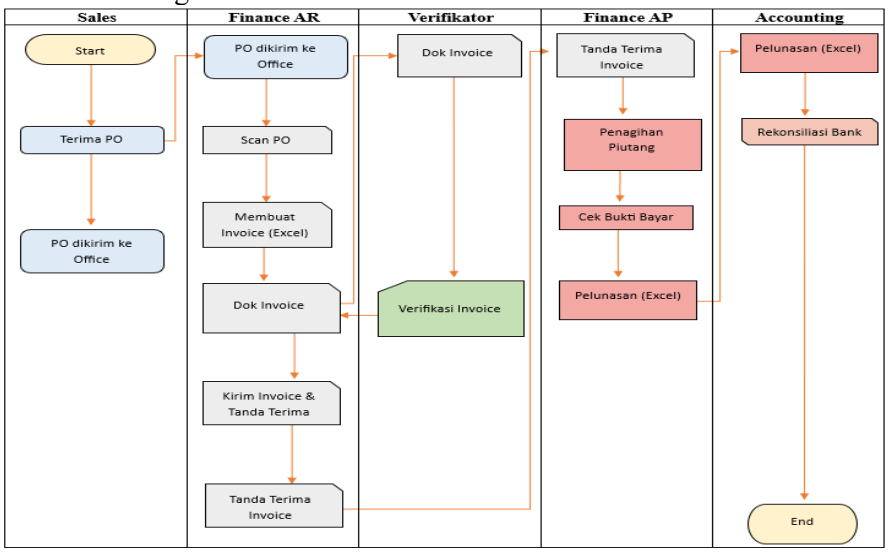

Figure 1. Document Flowchart of the Current Coffee Sales System at PT. DEF

Description of the Current Coffee Sales System Flow at PT. DEF:

1. Sales:
- **Start:** The process begins when the Sales team receives a Purchase Order (PO) from the customer.
- **Receive PO:** The PO is received in physical form or as a softcopy.
- **PO Sent to Office:** The Sales team submits the PO document to the Finance AR department for further processing.

2. Finance AR (Accounts Receivable):
- **PO Sent to Office:** Finance AR receives the PO document from Sales.
- **Scan PO:** The PO document is scanned for digital documentation (if necessary).

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- **Create Invoice (Microsoft Excel):** Finance AR manually creates an invoice using Microsoft Excel based on the PO details.
- **Invoice Document:** The created invoice is stored as an internal archive document.
- **Send Invoice & Receipt Acknowledgment:** The physical invoice (or via email) is sent to the customer along with a receipt acknowledgment form.
- **Invoice Receipt Acknowledgment:** Once the customer receives the invoice, they sign the acknowledgment and return it to Finance AR.

3. Verifier:
- **Invoice Document:** The verifier receives the invoice document from Finance AR.
- **Invoice Verification:** The verifier manually checks and matches the PO data with the invoice and receipt acknowledgment. If errors are found, the process is returned to Finance AR for correction.

4. Finance AP (Accounts Payable):
- **Invoice Receipt Acknowledgment:** Finance AP receives a copy of the customer's acknowledgment as a basis for billing.
- **Receivables Collection:** Finance AP performs collection activities based on the verified data.
- **Check Proof of Payment:** After the customer makes a payment, Finance AP verifies the transfer receipt or proof of payment.
- **Settlement (Microsoft Excel):** The settlement data is manually recorded in Microsoft Excel as a record of completed payments.

5. Accounting:
- **Settlement (Microsoft Excel):** Accounting receives the settlement data from Finance AP.
- **Bank Reconciliation:** The settlement data is manually matched with bank account statements to ensure that the payment has been received.
- **End:** After the settlement and reconciliation processes are completed, the sales reporting cycle is considered finished.

b. Sales Recording Process (Proposed System)

As a solution to the problems described above, the sales recording system is proposed to use an automated Excel template designed with the following features:

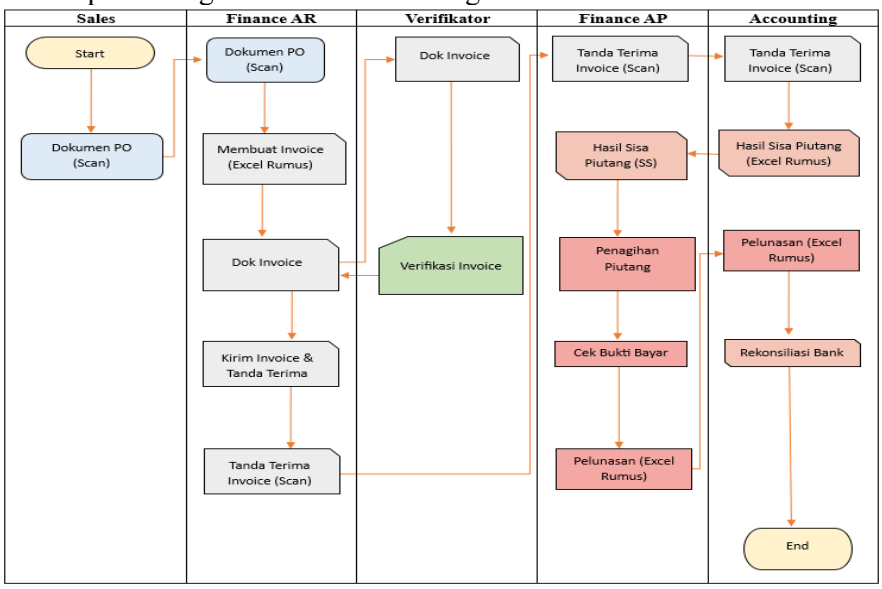

Figure 2. Document Flowchart of the Proposed Coffee Sales System at PT. DEF

Description of the Proposed Coffee Sales System Flow at PT. DEF

1. Sales
- **Start:** The process begins when the sales team receives and processes customer requests.

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- **PO Document (Scan):** The customer's Purchase Order (PO) is scanned and digitally documented before being forwarded to the Finance AR department.

2. Finance AR (Accounts Receivable)

- **PO Document (Scan):** Finance AR receives the scanned PO document from Sales.
- **Create Invoice (Microsoft Excel):** Based on the PO, Finance AR creates an invoice using a Microsoft Excel template.
- **Invoice Document:** The created invoice is documented and prepared for the verification process.
- **Send Invoice & Receipt Acknowledgment:** The invoice and receipt acknowledgment form are sent to the customer.
- **Invoice Receipt (Scan):** After the customer receives the invoice, the acknowledgment is scanned and archived.

3. Verifier

- **Invoice Document:** The verifier receives the invoice document from Finance AR.
- **Invoice Verification:** The verifier checks the consistency of the invoice with the PO, delivery proof, and initial agreement. If appropriate, the document is verified and returned to Finance AR.

4. Finance AP (Accounts Payable)

- **Invoice Receipt (Scan):** Finance AP receives a scanned copy of the invoice acknowledgment.
- **Outstanding Receivables Result (SS):** Finance AP calculates the customer's outstanding receivables using Microsoft Excel formulas based on sales and previous settlement data.
- **Receivables Collection:** Finance AP conducts collection activities for unpaid receivables.
- **Check Proof of Payment:** After the customer makes a payment, Finance AP receives and verifies the proof of payment.
- **Settlement (Microsoft Excel Formula):** Settlement data is recorded in Microsoft Excel using automated formulas to calculate paid receivables.

5. Accounting

- **Invoice Receipt (Scan):** Accounting receives the invoice acknowledgment document.
- **Outstanding Receivables Result (Microsoft Excel Formula):** Receivables data from Finance AP is used to calculate the ending receivables balance.
- **Settlement (Microsoft Excel Formula):** Settlement data is entered into the accounting journal template to be recorded as cash receipts/receivables.
- **Bank Reconciliation:** Accounting matches the settlement data with bank account statements to ensure there are no discrepancies or recording errors.

6. End of Process

After all processes are completed (from sales input to settlement and reconciliation), the sales reporting cycle is considered finished (End).

c. Design of a Coffee Sales Recording System Based on Microsoft Excel

Based on the problems identified in the current system, a coffee sales recording system based on Microsoft Excel is designed to improve the efficiency and accuracy of sales data recording by implementing the INDEX MATCH and SUMIFS functions. This system is designed by considering user needs and the technological literacy level of staff to ensure it is easy to use and understand. The system structure consists of several main worksheets, namely:

- Sheet Data Penjualan
- Sheet Rekap Penjualan
- Sheet Pelanggan
- Sheet Barang & Jasa
- Sheet Cetak Invoice

This system design aims to ensure that all data is integrated, so that any changes in transaction data will automatically affect the generated reports.

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d. Implementation of INDEX MATCH & SUMIFS Functions in Microsoft Excel

The following explains the stages of using the INDEX MATCH and SUMIFS functions in Microsoft Excel for the sales recording system.

Implementation of INDEX MATCH - Sheet Data Penjualan

Formula: =INDEX('Barang & Jasa'!$B$2:$B$5000, MATCH(H2, 'Barang & Jasa'!$A$2:$A$5000, 0)). This formula is used to recapitulate all sales transactions for each month.

J2 {=INDEX('Barang & Jasa'!$B$2:$B$5000;MATCH(H2;'Barang & Jasa'!$A$2:$A$5000;0))}

	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Item I	Nama Barang	Kuantit	@Harga	Diskon	Total	DPP Nilai Lai	PPN	Total + PPn	Payme	Ship Vi	Ship Dat	Note
2	00-GZ-	IZY SEA SALT POWDER 1KG	2	94,595	0	189,190.00	173,424.17	20,810.90	210,000.90	Transfer	JNE	03 Apr 2025	PENGIRIMAN URGENT!
3	00-GZ-	JASA SERVICE MESIN	1	600,000	0	600,000.00	550,000.00	66,000.00	666,000.00	Transfer	JNE	05 Apr 2025	PENGIRIMAN URGENT!
4	00-GZ-	SANTINO SUPER BAR 500 G	5	120,000	0	600,000.00	550,000.00	66,000.00	666,000.00	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
5	00-GZ-	SANTINO EXCLUSIVE BAR 5	2	145,000	0	290,000.00	265,833.33	31,900.00	321,900.00	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
6	00-GZ-	KAV BELGIAN DARK CHOCO	2	200,000	0	400,000.00	366,666.67	44,000.00	444,000.00	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
7	00-GZ-	KAV BELGIAN DARK CHOCO	2	200,000	0	400,000.00	366,666.67	44,000.00	444,000.00	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
8	00-GZ-	SANTINO SUPER BAR 500 G	1	120,000	0	120,000.00	110,000.00	13,200.00	133,200.00	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
9	00-GZ-	IZY CREAMER 1KG	1	41,480	0	41,480.00	38,023.33	4,562.80	46,042.80	Transfer	JNE	07 Apr 2025	PENGIRIMAN URGENT!
10	00-GZ-	IZY YOGURT SMOOTHIE 1KG	2	120,750	0	241,500.00	221,375.00	26,565.00	268,065.00	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
11	00-GZ-	IZY CREAMER 1KG	1	41,480	0	41,480.00	38,023.33	4,562.80	46,042.80	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
12	00-GZ-	SANTINO HERITAGE BLEND	2	130,000	0	260,000.00	238,333.33	28,600.00	288,600.00	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
13	00-GZ-	SANTINO HERITAGE BLEND	1	130,000	0	130,000.00	119,166.67	14,300.00	144,300.00	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
14	00-GZ-	IZY MILK TEA 1KG	1	120,750	0	120,750.00	110,687.50	13,282.50	134,032.50	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
15	00-GZ-	IZY SEA SALT POWDER 1KG	1	94,595	0	94,595.00	86,712.08	10,405.45	105,000.45	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
16	00-GZ-	KAV DARK CHOCOLATE (ART	1	155,000	0	155,000.00	142,083.33	17,050.00	172,050.00	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
17	00-GZ-	KAV VANILLA NON DAIRY 1 K	1	161,000	0	161,000.00	147,583.33	17,710.00	178,710.00	Transfer	JNE	08 Apr 2025	PENGIRIMAN URGENT!
18	00-GZ-	JASA SERVICE MESIN	1	600,000	0	600,000.00	550,000.00	66,000.00	666,000.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
19	00-GZ-	S.PART FAEMA GASKET DIA 7	2	150,000	0	300,000.00	275,000.00	33,000.00	333,000.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
20	00-GZ-	S.PART FAEMA KNOB (38311	1	400,000	0	400,000.00	366,666.67	44,000.00	444,000.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
21	00-GZ-	IZY SEA SALT POWDER 1KG	30	94,595	0	2,837,850.00	2,601,362.50	312,163.50	3,150,013.50	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
22	00-GZ-	IZY CHEESE FOAM TOPPING	60	55,000	0	3,300,000.00	3,025,000.00	363,000.00	3,663,000.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
23	00-GZ-	IZY SEA SALT POWDER 1KG	60	94,595	0	5,675,700.00	5,202,725.00	624,327.00	6,300,027.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
24	00-GZ-	IZY CHEESE FOAM TOPPING	60	55,000	0	3,300,000.00	3,025,000.00	363,000.00	3,663,000.00	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
25	00-GZ-	IZY SEA SALT POWDER 1KG	30	94,595	0	2,837,850.00	2,601,362.50	312,163.50	3,150,013.50	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!
26	00-GZ-	ALFAMIDI COFFEE TORAJA M	400	4,477.27	53,727.24	1,737,180.76	1,592,415.70	191,089.88	1,928,270.64	Transfer	JNE	09 Apr 2025	PENGIRIMAN URGENT!

Data Penjualan | Recap penjualan | Pelanggan | Barang & Jasa | Cetak Invoice

Figure 3. Sheet Data Penjualan - INDEX MATCH

Implementation of SUMIFS - Sheet Rekap Penjualan

Formula:

=SUMIFS('Data Penjualan'!$L$2:$L$4999, ' Data Penjualan '!$C$2:$C$4999, A3)

This formula is used to calculate the total sales per customer within a month in the Sales Data sheet.

B3 =SUMIFS('Data Penjualan'!$L$2:$L$4999;'Data Penjualan'!$C$2:$C$4999;A3)

	A	B	C	D	E
1	Total ----------	6,888,288,928.37		3,350,623,618.40	3,537,665,309.97
2	Nama Pelanggan	Total Penjualar	Tanggal Baya	Nilai Bayar	Piutang
3	AHMAD SANI	4,708,003.58	1/5/2025	4,708,003.58	-
4	AKBAR REZA JUNIANSYAH	669,281.00	3/5/2025	669,281.00	-
5	ALADIN MUTIARA BERKAT, PT	3,231,529.73	2/5/2025	3,231,529.73	-
6	ALI ABU NEGARA	9,615,728.39	4/5/2025	9,615,728.39	-
7	ALPHONSUS RODRIQUES SETO ADI WICAKSONO	2,039,032.27	5/5/2025	2,039,032.27	-
8	AMALGAM MAHA PRATAMA, PT	3,330,272.00	11/5/2025	3,330,272.00	-
9	AMIGO SHISHA CAFE & RESTO	1,200,000.00	12/5/2025	500,000.00	700,000.00
10	ANDRI MUBAROK	7,156,712.21	13/5/2025	5,000,000.00	2,156,712.21
11	ANDRI SUSWENDY	491,880.00	1/5/2025	491,880.00	-
12	ANEKA PETROINDO RAYA, PT.	2,399,827.00			2,399,827.00
13	ANJASMARA	1,207,520.72			1,207,520.72
14	ANTASIA SUKSES MAKMUR	41,325,851.42			41,325,851.42
15	APRIJANI	631,534.00	3/5/2025	300,000.00	331,534.00
16	ARNOL DHARMMA D	855,010.00	13/5/2025	855,010.00	-
17	ARTAKA GLOBAL MAKMUR, PT	1,250,538.29	13/5/2025	1,250,538.29	-
18	BALI BLESSINDO, CV	72,191,680.26			72,191,680.26
19	BANGUN CITRA HOTEL, PT	2,020,912.00	2/5/2025	2,020,912.00	-
20	BASTIAN GROUP INDONESIA, PT	50,540,520.00	5/5/2025	50,540,520.00	-
21	BENYAMIN DIMAS SYAUQI	414,800.00	4/5/2025	414,800.00	-
22	BERINGIN KULINER INDONESIA, CV	765,765.80			765,765.80
23	BOGAJAYA INTERNASIONAL SEJAHTERA, PT	3,410,289.00	1/5/2025	2,500,000.00	910,289.00
24	BOGAJAYA MAKMUR SENTOSA, PT	6,868,884.00	12/5/2025	6,868,884.00	-
25	BOGAJAYA SUKSES PERKASA, PT	3,427,054.00	12/5/2025	3,427,054.00	-
26	BORNEO BEVERAGES SUPPLY	298,799,099.00	12/5/2025	298,799,099.00	-

Data Penjualan | Recap penjualan | Pelanggan | Barang & Jasa | Cetak Invoice

Figure 4. Sheet Rekap Penjualan - SUMIFS

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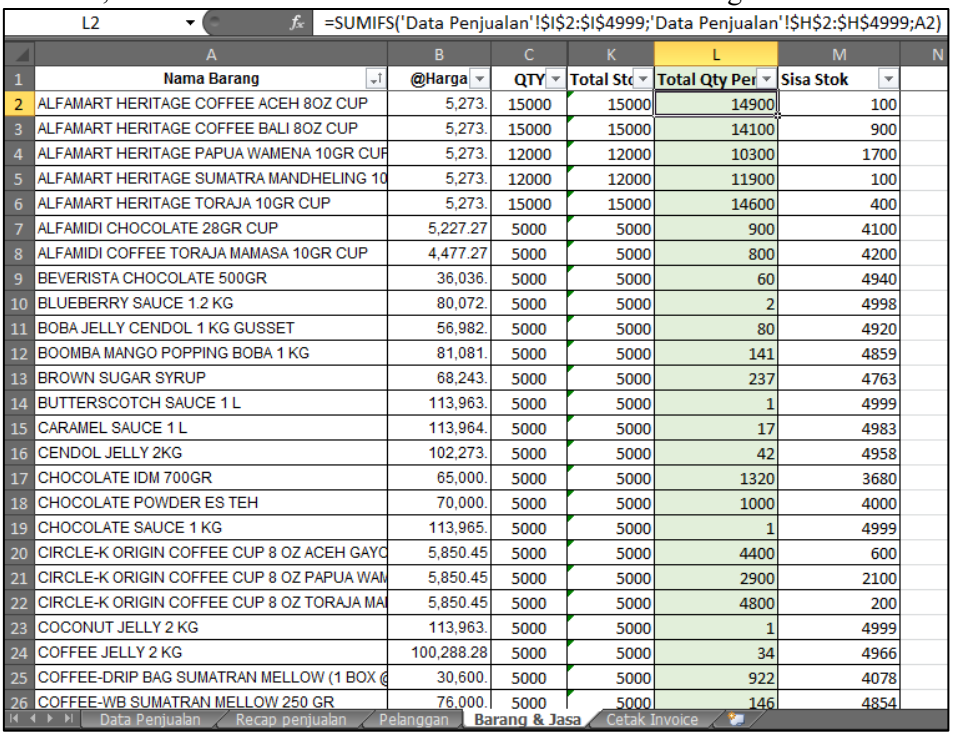
Implementation of SUMIFS - Sheet Barang & Jasa

Formula:=SUMIFS('Data Penjualan'!$I$2:$I$4999, ' Data Penjualan '!$H$2:$H$4999, A2)

In the sales column, this formula is used to calculate the total number of goods sold in that month.



	A	B	C	K	L	M
1	Nama Barang	@Harga	QTY	Total Stc	Total Qty Per	Sisa Stok
2	ALFAMART HERITAGE COFFEE ACEH 8OZ CUP	5,273.	15000	15000	14900	100
3	ALFAMART HERITAGE COFFEE BALI 8OZ CUP	5,273.	15000	15000	14100	900
4	ALFAMART HERITAGE PAPUA WAMENA 10GR CUP	5,273.	12000	12000	10300	1700
5	ALFAMART HERITAGE SUMATRA MANDHELING 10	5,273.	12000	12000	11900	100
6	ALFAMART HERITAGE TORAJA 10GR CUP	5,273.	15000	15000	14600	400
7	ALFAMIDI CHOCOLATE 28GR CUP	5,227.27	5000	5000	900	4100
8	ALFAMIDI COFFEE TORAJA MAMASA 10GR CUP	4,477.27	5000	5000	800	4200
9	BEVERISTA CHOCOLATE 500GR	36,036.	5000	5000	60	4940
10	BLUEBERRY SAUCE 1.2 KG	80,072.	5000	5000	2	4998
11	BOBA JELLY CENDOL 1 KG GUSSET	56,982.	5000	5000	80	4920
12	BOOMBA MANGO POPPING BOBA 1 KG	81,081.	5000	5000	141	4859
13	BROWN SUGAR SYRUP	68,243.	5000	5000	237	4763
14	BUTTERSCOTCH SAUCE 1 L	113,963.	5000	5000	1	4999
15	CARAMEL SAUCE 1 L	113,964.	5000	5000	17	4983
16	CENDOL JELLY 2KG	102,273.	5000	5000	42	4958
17	CHOCOLATE IDM 700GR	65,000.	5000	5000	1320	3680
18	CHOCOLATE POWDER ES TEH	70,000.	5000	5000	1000	4000
19	CHOCOLATE SAUCE 1 KG	113,965.	5000	5000	1	4999
20	CIRCLE-K ORIGIN COFFEE CUP 8 OZ ACEH GAYO	5,850.45	5000	5000	4400	600
21	CIRCLE-K ORIGIN COFFEE CUP 8 OZ PAPUA WAI	5,850.45	5000	5000	2900	2100
22	CIRCLE-K ORIGIN COFFEE CUP 8 OZ TORAJA MA	5,850.45	5000	5000	4800	200
23	COCONUT JELLY 2 KG	113,963.	5000	5000	1	4999
24	COFFEE JELLY 2 KG	100,288.28	5000	5000	34	4966
25	COFFEE-DRIP BAG SUMATRAN MELLOW (1 BOX @	30,600.	5000	5000	922	4078
26	COFFEE-WB SUMATRAN MELLOW 250 GR	76,000.	5000	5000	146	4854

Figure 5. Sheet Barang & Jasa - SUMIFS

e. Comparison of Workflow Between the Current System and Proposed Sales Recording System at PT. DEF

Table 1. Comparison of Workflow Between Current System and Proposed System

Process Stage	Current System (Manual)	Proposed System
Customer Data Input	Customer data is typed manually at each transaction	Customer data is automatically retrieved from the Customer sheet using INDEX MATCH
Product & Price Input	Product names, codes, and prices are manually input and often incorrect	Product data and prices are automatically retrieved from the master sheet using INDEX MATCH
Recording Quantity Sold	Quantity is written manually and total price calculated manually	Quantity is entered, total price calculated automatically, stock is reduced automatically using SUMIFS
Transaction Data Search	Searching data takes a long time because it must open manual notes or files	Transaction data can be searched automatically through sheet references
Daily Report Preparation	Sales data is manually calculated, taking ±20 minutes	Daily reports are automatically created in the recap sheet using SUMIFS
Customer Receivables Monitoring	Checking is done one by one from manual records	Total receivables are automatically calculated from transaction data

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Monthly Recap	Calculated manually and prone to errors	Monthly recap is automatically available in the recap sheet
Error Correction Time	Correction takes ±15 minutes	Faster correction ±3 minutes because data is interconnected
Data Error Risk	High due to manual input and calculations	Lower due to automated formulas
Time Efficiency	Recording and reporting processes are slow	Time efficiency increases by approximately 70–90%

Based on the comparison table, it can be seen that the proposed sales recording system provides improvements in several aspects, such as speed, accuracy, and ease of data processing. The current system has issues including slow transaction search, high risk of errors in calculations and recording, and time-consuming report preparation. The new system using Microsoft Excel with INDEX MATCH and SUMIFS significantly improves efficiency. Customer and product data can be automatically retrieved from master sheets, reducing input errors. Additionally, automatic calculations, sales reports, and daily recap sheets improve accuracy and efficiency. Thus, the new system not only speeds up data processing but also enhances recording accuracy and time efficiency by approximately 70%–90% compared to the previous manual system.

f. Results of Trial and Efficiency Analysis

Trial Process

A trial was conducted by implementing the Excel-based sales recording system equipped with INDEX MATCH and SUMIFS. The trial used sales transaction data from October–December 2025 totaling 1,200 transactions at PT. DEF. Steps in the trial:

- Migration of manual data into the Excel format.
- Implementation of INDEX MATCH to display customer, product, and unit price information based on transaction codes.
- Implementation of SUMIFS to calculate total sales per product and per customer.
- Data validation by comparing output results with previous manual reports.

g. Processing Time Before and After Implementation

Table 2. Processing Time Before and After Implementation

Process	Manual System (Minutes)	Excel + Formula (Minutes)	Time Efficiency
Transaction Recording	9–10	<1	90% faster
Daily Report Preparation	20	5	75% faster
Total Sales Calculation	10	2	80% faster
Input Error Correction	15	3	70% faster

Based on the comparison results between the manual recording system and the new system using Microsoft Excel with formulas, a significant improvement in time efficiency was found in every operational process of sales recording at PT. DEF.

1. Transaction data retrieval, which previously required about 8 to 10 minutes per transaction, now takes less than 1 minute. This indicates an efficiency improvement of over 90%.
2. Daily report preparation, which previously took around 20 minutes, now only requires 5 minutes with the new system. This means the reporting process is 75% faster.
3. The calculation of total sales has also accelerated, from 10 minutes using the manual system to only 2 minutes using Excel. The achieved time efficiency is 86% faster.
4. Meanwhile, for correcting input errors, the required time has decreased from 15 minutes to 3 minutes, resulting in a time saving of 70%.

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Overall, the use of Excel with formulas such as INDEX MATCH and SUMIFS has proven to have a significant impact in accelerating various administrative and sales recording processes within the company.

h. Reduction of Data Errors

During the trial period, a comparative analysis was conducted between the number of input errors in the manual system and the Excel-based system with automated formulas. The comparison results show that the implementation of the new system has a significant impact in reducing various types of errors that were previously common.

Table 3. Data Error Reduction

Category	Manual System	Excel + Formula	Reduction
Calculation Errors	15	1	93%
Product Code Errors	11	2	82%
Unsynchronized Reports	7	0	100%

There are three main categories of errors observed:

- Calculation errors, which frequently occurred in the manual system with 15 cases, were reduced to only 1 case using the Excel system. This represents a 93% decrease, thanks to the use of automated formulas that eliminate the need for manual calculations.
- Incorrect product code input, which initially occurred 11 times, decreased to 2 cases after implementing the Excel system. This 82% reduction was made possible through the use of data validation features, which restrict input to valid codes only.
- Unsynchronized reports, which previously occurred 7 times, were completely eliminated (0 cases) in the new system. This indicates a 100% reduction, as automatic referencing between Excel sheets ensures that data across sections remains connected and consistent.

Overall, the Excel system plays a major role in reducing input errors and report inconsistencies through:

- Consistent formulas, which prevent calculation errors.
- Automatic referencing, which maintains data integration.
- Data validation, which reduces the likelihood of invalid input.

i. User Response

Survey results from 3 staff members:

- 100% stated the system is easier to understand
- 2 out of 3 no longer use calculators for daily reports
- 1 staff experienced time savings of up to 2 hours per day

j. General Evaluation

Overall, the Excel-based system using INDEX MATCH & SUMIFS has advantages:

- High level of data accuracy
- Efficiency in time and effort
- Cost-effective (no need for ERP software)
- Flexible for further development (e.g., adding automated reports)

4. CONCLUSION

The implementation of a sales recording system based on Microsoft Excel utilizing the INDEX MATCH and SUMIFS functions has proven to improve efficiency, accuracy, and ease in managing sales data at PT. DEF. Compared to the previous manual method, which was time-consuming and prone to errors, the new system significantly reduces recording time by approximately 75% and minimizes input errors through the use of data validation. In addition, the processes of data retrieval, recapitulation, and reporting have become much faster and more structured. This system also provides added value in sales analysis, such as generating receivables reports, customer-based recaps, and automatic

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identification of best-selling products. The positive response from users indicates that the system is practical, easy to use, and capable of saving daily working time. Therefore, this Excel-based system can serve as an effective and economical solution, especially for MSMEs, and is worthy of recommendation and further development. The recommendation of this study is that the developed system should be continuously improved by adding features such as dashboards and automated reports, along with regular training for users to ensure optimal utilization. In addition, periodic data backup and security measures should be implemented, as well as system evaluations for continuous improvement. The company can also apply a similar system to other areas such as purchasing, inventory, and finance to enhance overall efficiency.

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