INFORMATION TECHNOLOGY EDUCATION AS A CATALYST FOR DATA ANALYSIS TOOL COMPETENCE IN RETAIL AND INDUSTRIAL CONTEXTS: A LITERATURE REVIEW

Zaskia Fitri Ramadhani[1], Angga Syahputra[2], Fitra Ramadhan Akbar[3], Nadia Nadawina[4]

[1,2,3,4]*Sekolah Tinggi Keguruan dan Ilmu Pendidikan Amal Bakti*
E-mail : [1]kiaafitrii98@gmail.com, [2]anggaasyahputra39@gmail.com,
[3]fitraramadhan5973@gmail.com, [4]nadianadawina273@gmail.com

ABSTRACT

In the era of digital transformation, proficiency in data analysis tools has emerged as a strategic competency within Information Technology Education to address the evolving demands of industrial sectors. This study aims to examine the effectiveness of a broad spectrum of data analysis tools ranging from fundamental spreadsheet applications to advanced intelligent algorithms in enhancing operational efficiency and improving the accuracy of business decision-making. A systematic literature review was conducted, encompassing empirical studies on the implementation of Microsoft Excel, Business Intelligence platforms (Power BI and Google Data Studio), and data mining algorithms. The findings indicate that Microsoft Excel remains a foundational and effective tool for administrative digitalization and Exploratory Data Analysis (EDA), particularly within micro, small, and medium-sized enterprises (MSMEs). Meanwhile, the adoption of Business Intelligence platforms and K-Means clustering algorithms offers a competitive advantage through interactive data visualization and the identification of complex consumer patterns in large-scale datasets. In conclusion, the integration of multi-level data analysis tools is essential for developing accurate analytical systems that support business sustainability in the digital era.

Keywords : *Data Analysis Tools, Microsoft Excel, Power BI, K-Means Clustering, Retail Business, Literature Review.*

INTRODUCTION

Amid the rapid acceleration of digital transformation across various industrial sectors, business organizations are increasingly required to abandon conventional manual record-keeping systems. Such manual practices have been shown to possess a high vulnerability to human error, which may result in inaccuracies in critical corporate data. Consequently, the transition toward data-driven systems has become an inevitable necessity for organizations seeking to sustain their competitiveness through integrated digitalization (Kristanto & Winarsih, 2025). For students of Information Technology Education, mastery of data processing software extends beyond technical proficiency; it represents the development of strategic competence in selecting appropriate tools to transform raw data into valuable information that supports informed decision-making. In line with the literature review conducted by Nadawina and Novianto (2022), technology-based learning in the 21st century requires the integration of digital media and visual approaches that enhance learners' conceptual understanding, particularly in technical and analytical domains.

Empirical conditions indicate that many retail businesses and micro, small, and medium-sized enterprises (MSMEs) continue to face significant challenges in inventory monitoring and financial analysis. In the food business sector, for instance, the preparation of manual financial reports is often time-consuming, making the utilization of Visual Basic for Applications (VBA) macros in Microsoft Excel a critical solution for developing automated and stable accounting systems (Darmawan et al., 2025). Furthermore, the digitalization of basic administrative processes through Excel has been proven to reduce the risk of calculation errors in MSME financial reporting (Permatasari et al., 2024).

At a broader scale, such as in the automotive industry, the high diversity of product variants necessitates analytical tools capable of distinguishing performance across models in real time (Juliawan, 2024). In this context, Exploratory Data Analysis (EDA) plays a vital role in systematically understanding business profiles through revenue-based metrics (Kurniawan, 2024). Additionally, the application of dynamic visualization techniques within spreadsheet environments has been shown to assist small business units in identifying hidden trends and customer purchasing patterns in a more communicative and interpretable manner (Ariansyah, 2024).

However, as data volume and complexity continue to increase, more advanced tools such as Business Intelligence (BI) technologies become indispensable. The implementation of platforms such as Power BI and Google Data Studio enables organizations to present information efficiently through interactive dashboards, thereby facilitating inventory monitoring for key stakeholders (Indrawan & Desmayani, 2025; Wanda, 2024). The effectiveness of such advanced visualizations is further enhanced when supported by well-structured data warehouse designs that integrate complex transactional datasets (Bukhari et al., 2024).

On the other hand, the growing demand for large-scale accuracy has driven the adoption of intelligent algorithms. The application of K-Means clustering algorithms provides deeper insights into product segmentation based on customer transaction behavior patterns (Hidayat et al., 2025). Moreover, to achieve more scientific inventory management, forecasting methods such as the Semi Average Method have begun to be integrated to assist retailers in determining future purchase quantities objectively (Saryanti & Sidhiantari, 2020). This article reviews the effectiveness of these tools and techniques through a literature review approach, offering a comprehensive perspective for information technology students in addressing the challenges of data-driven industries.

METHOD

This study employs a systematic literature review approach to examine the effectiveness of various data analysis tools applied in the retail and industrial sectors. The research process was conducted by identifying, evaluating, and interpreting findings from selected case studies relevant to the topic of data analysis tools. This approach aims to synthesize an in-depth understanding of how information technology can be implemented to address managerial and operational challenges within business environments. Technically, the literature analysis in this article is classified into three main categories of analytical tools and techniques, as described below:

1. Optimization of Spreadsheet Tools (Microsoft Excel)

This section reviews literature that emphasizes the use of Microsoft Excel not merely as a static data recording tool, but as a dynamic analytical instrument. The review focuses on the application of Exploratory Data Analysis (EDA) techniques to understand business profiles through revenue-based metrics (Kurniawan, 2024). In addition, the selected studies examine the utilization of automation features such as formulas, basic computations, and dynamic visualizations to transform MSME financial reports from manual (paper-based) formats into digital systems, thereby reducing the potential for calculation errors or human error (Permatasari et al., 2024; Ariansyah, 2024). The analysis also includes studies that explore the use of Excel for processing online sales data to obtain timely and actionable insights into organizational performance (Rianti & Harahap, 2021).

2. Implementation of Business Intelligence (Power BI and Google Data Studio)

This research method further investigates case studies employing advanced Business Intelligence (BI) tools. The reviewed literature includes studies on data warehouse design using the Kimball nine-step methodology, encompassing the Extract, Transform, and Load (ETL) processes through tools such as Pentaho (Bukhari et al., 2024). The review process focuses on how platforms such as Power BI and Google Data Studio transform complex transactional data into interactive dashboards that support managerial decision-making (Indrawan & Desmayani, 2025). Furthermore, evaluations based on User Acceptance Testing (UAT) reported in the literature are used as parameters to assess the effectiveness of visualizations in helping stakeholders understand sales dynamics and business performance (Wanda, 2024).

3. Application of Intelligent Algorithms and Data Mining

To provide a broader analytical spectrum for Information Technology students, this study incorporates a review of computational algorithm implementations. The primary focus is on the application of K-Means Clustering algorithms to large-scale sales datasets for segmenting products or consumers based on transaction behavior patterns (Hidayat et al., 2025). In addition, the literature review includes forecasting methods using the Semi Average Method, which are integrated into inventory management application designs to provide a more scientific and objective basis for demand prediction (Saryanti & Sidhiantari, 2020).

4. Data Collection and Analysis Techniques

The data reviewed in this study were collected from 20 scientific articles published between 2020 and 2025, as listed in the reference section. The data analysis process followed four main stages:

(1) organizing the literature based on tool categories;

(2) comparing findings across different tool implementations;

(3) synthesizing the analytical results into a comprehensive conclusion regarding tool effectiveness; and
(4) identifying competency gaps that need to be addressed within the Information Technology Education curriculum.

RESULTS AND DISCUSSIONS

Results

A summary of the evaluation of the twenty selected reference articles is presented in Table 1 to provide a comprehensive overview of prevailing trends, methodological approaches, and the contributions of previous studies to the transformation of learning and data utilization practices in the digital era.

Table 1. Evaluation of Reference Articles (Literature)

No.	Author(s) & Year	Article Title	Research Method	Key Findings	Conclusion
1	Bukhari et al. (2024)	Business Intelligence Analysis of Sales Data at PT Ambulance Pintar (2021)	Nine-Step Kimball & Power BI	Power BI visualization provides more practical and accessible sales information.	Business Intelligence improves the efficiency of strategic decision-making.
2	Hidayat et al. (2025)	Sales Data Analysis Using K-Means Clustering Algorithm at Superindo Store	K-Means Clustering (Data Mining)	Product items were clustered based on popularity levels.	Intelligent algorithms support management strategies for inventory and discount planning.
3	Indrawan & Desmayani (2025)	Visualization of Stationery Sales Data at Bagus Stationery Using Google Data Studio	ETL & Google Data Studio	UAT results show 81% of users strongly agree that the system is easy to use.	Google Data Studio offers more interactive visualization than static Excel tables.
4	Permatasari et al. (2024)	Utilization of Microsoft Excel in Financial Reporting: Improving Grocery Store Management	Training & Excel Implementation	Manual bookkeeping was transformed into automated digital records.	Excel reduces the risk of human error in financial calculations.
5	Kristanto & Winarsih (2025)	The Role of the "SI MANIS" Store Information System in Sales Data Analysis	Quantitative & Information System	Accelerated presentation of daily and monthly sales reports.	Digitalization strengthens competitiveness in modern retail businesses.

No.	Author(s) & Year	Article Title	Research Method	Key Findings	Conclusion
6	Kurniawan (2024)	Analysis and Visualization of Electric Motorcycle Sales Data in Indonesia Using Excel	Exploratory Data Analysis (EDA)	Identification of variable correlations affecting revenue metrics.	Excel visualization supports understanding of electric vehicle market dynamics.
7	Juliawan (2024)	Analysis and Visualization of Motorcycle Sales Data (2016–2019)	Descriptive & Excel Visualization	Mapping of annual sales growth and decline trends.	Facilitates stakeholders' understanding of macroeconomic trends.
8	Saryanti & Sidhiantari (2020)	Design Analysis of a Simple Inventory Forecasting Application	Semi-Average Method	Forecasting formulas successfully predicted future stock requirements.	Scientific methods are more objective than intuition-based decision-making.
9	Ferianto et al. (2021)	Data Warehouse Design for Sales Data Management: A Case Study of UD HF Bersaudara	Kimball 4-Step & MySQL	Fact and dimension tables were created for complex product categories.	Data warehouses enable structured management of large-scale data.
10	Ariansyah (2024)	Dynamic Visualization of Sales Data at "Warung Si Kembar" Using Microsoft Excel	Qualitative Descriptive	Previously undetected customer purchasing patterns were identified.	Excel is highly effective as an initial tool for micro-business optimization.
11	Rianti & Harahap (2021)	Processing Online Sales Data Using Microsoft Excel	Quantitative Experimental	Automation of profit–loss calculations from e-commerce transaction data.	Excel serves as a primary bridge for MSME operational digitalization.
12	Wanda (2024)	Analysis and Visualization of Grocery Sales Data at Toko Jaya Abadi Using Power BI	Power BI Visualization	Interactive dashboards with filtering by product categories.	Power BI provides faster and more intuitive insights for management.

No.	Author(s) & Year	Article Title	Research Method	Key Findings	Conclusion
13	Mahrifan (2024)	Analysis and Visualization of Honda Motorcycle Sales Data Using Microsoft Excel	Observation & Data Visualization	Comparison of sales performance across product variants (automatic vs. manual).	Visualization supports marketing focus on best-selling products.
14	Safira (2025)	Visualization of Cosmetic Store Sales Data Using Excel	Descriptive Analysis	Daily graphical reports improved display stock accuracy.	Simple analytical tools enhance administrative accuracy in retail stores.
15	Guntara (2023)*	Visualization of Sales Reports Using a Data Science Approach	Google Colab & Python	Code-based data processing enabled advanced-level visualization.	Data science approaches expand traditional analytical capabilities.
16	Wibowo et al. (2022)*	Dashboard System Design for Sales Monitoring	Dashboard System	Easier visual monitoring of corporate KPI performance.	Dashboard systems accelerate responses to sales-related issues.
17	Saputra & Tony (2023)*	Development of a Sales Dashboard at PT XYZ Using Power BI	System Development	Integration of transaction data into real-time visualization.	Power BI strongly supports enterprise-level data scalability.
18	Tumini (2023)*	Implementation of Business Intelligence for Sales Data Analysis Using Power BI	Descriptive & Power BI	Identification of sales team performance through achievement visualization.	BI tools assist in evaluating marketing team effectiveness.
19	Ariandi & Puteri (2022)*	Data Visualization Analysis Using Tableau Public	Tableau Visual Analysis	Geographic mapping of sales distribution by region.	BI tools support spatial-based data analysis.
20	Hakim & Toresa (2021)*	Development of 2D Visualization Using the Treemap Method	Treemap Method	Hierarchical data presented efficiently within dashboard space.	Appropriate visualization methods determine the speed of data interpretation.

Discussion

A review of the twenty selected scholarly articles indicates that the effectiveness of data analysis is not solely determined by the sophistication of the tools employed, but is equally influenced by the users' level of digital competence. Empirical findings by Nadawina et al. (2023) emphasize that proficiency in information and communication technology is significantly associated with improved learning outcomes, thereby positioning digital literacy and data visualization skills as core competencies in technology-based learning and professional practice. Based on this premise, the analytical results of this study are structured into three primary pillars of data analysis competency.

1. Effectiveness of Spreadsheet Applications (Microsoft Excel) in Business Digitalization

The first pillar of the literature review confirms that Microsoft Excel remains the most fundamental and widely applicable analytical tool, particularly for micro, small, and medium-sized enterprises (MSMEs) and mid-scale retail sectors. Within the Information Technology Education curriculum, Excel is no longer perceived merely as a computational or static tabulation tool, but rather as a powerful and flexible instrument for Exploratory Data Analysis (EDA) in business data management (Kurniawan, 2024).

Structured Digitalization of Administrative and Accounting Processes

One of Excel's most significant contributions to digital transformation lies in its ability to standardize financial records that were previously managed through conventional manual systems. Empirical evidence demonstrates that Excel implementation successfully converts handwritten financial reports in small businesses, such as grocery stores, into systematic digital accounting systems, thereby reducing the risk of human error in profit–loss calculations (Permatasari et al., 2024). Furthermore, in small-scale production businesses such as cake and cookie enterprises, the utilization of advanced features including Visual Basic for Applications (VBA) macros enables the development of more stable and automated Accounting Information Systems capable of accurately processing daily transactions (Darmawan et al., 2025). This form of digitalization establishes a critical foundation for businesses to maintain valid and reliable datasets for future analysis (Pratiwi & Putranto, 2025).

Performance Analysis and Multi-Channel Sales Monitoring

Excel's effectiveness is also evident in its capacity to support real-time sales monitoring across both physical retail outlets and online sales platforms (Rianti & Harahap, 2021). Through EDA techniques, business owners can perform in-depth data exploration to understand business profiles using revenue metrics disaggregated by product categories (Kurniawan, 2024). This analytical capability provides a competitive advantage by enabling accurate monitoring of daily performance targets without requiring costly or complex software infrastructure.

Dynamic Visualization and Consumer Pattern Identification

The core strength of Excel in data analysis lies in its dynamic visualization features. Numerous case studies indicate that the use of simple charts and dashboards in Excel substantially assists business owners ranging from small roadside vendors (Ariansyah, 2024) and stationery shops to automotive dealerships in identifying hidden trends that are not readily observable in static numerical tables. In the automotive sector, for instance, sales data visualization facilitates clearer identification of seasonal demand fluctuations for motorcycles (Juliawan, 2024; Mahrifan, 2024). A similar pattern is observed in cosmetic retail, where interactive visualizations support the identification of high-demand products and inform inventory prioritization decisions (Safira, 2025).

More specifically, the application of Excel-based EDA in automated systems such as vending machines demonstrates that spreadsheets can deliver in-depth insights for increasing sales volume by optimizing stock allocation according to customer peak hours (Yulianto & Riansyah, 2025). Overall, the reviewed literature consistently positions Excel as an effective bridge for digital transformation, converting raw transactional data into strategic information that supports business sustainability across diverse industrial sectors.

2. Transformation through Business Intelligence (Power BI and Google Data Studio)

The second pillar of the literature review highlights a fundamental shift toward Business Intelligence (BI) platforms for processing larger, more complex datasets that require a high level of interactivity. From the perspective of Information Technology Education, mastery of BI tools represents an advanced level of competency, in which students are not only capable of analyzing data but are also able to design information architectures that support business scalability and sustainability.

Interactive Dashboard Development and Strategic Communication

The limitations of spreadsheets in managing centralized and highly dynamic visualizations are effectively addressed by platforms such as Power BI and Google Data Studio. The implementation of these tools enables the transformation of large and complex transactional datasets into intuitive visual dashboards that can be readily interpreted by managerial stakeholders who may not possess technical expertise (Bukhari et al., 2024). For instance, within the office supplies distribution sector, Google Data Studio has been shown to convert thousands of rows of sales data into visual reports that facilitate efficient inventory monitoring (Indrawan & Desmayani, 2025). These dashboards function as business navigation instruments that support fast and accurate strategic decision-making across diverse organizational contexts (Jabar et al., 2025).

Operational Efficiency and User Acceptance Validation

User acceptance constitutes a critical factor in the successful implementation of information technology systems. Evidence from multiple studies employing User Acceptance Testing (UAT) indicates a high level of user satisfaction with BI tools, primarily due to their ability to simplify information presentation without compromising data granularity (Wanda, 2024). In highly dynamic industrial environments, such as the telecommunications sector, real-time performance monitoring is indispensable. The use of BI platforms ensures that fluctuations in performance targets can be detected within seconds, thereby directly enhancing organizational operational efficiency (Wibowo et al., 2022).

Simplified Data Warehouse Architecture as a Foundational Component

Advanced visualization capabilities in Power BI and Google Data Studio cannot operate effectively without a well-structured data foundation. The reviewed literature consistently demonstrates that Data Warehouse (DWH) integration serves as a critical bridge in managing heterogeneous sales data. By applying the nine-step Kimball modeling approach or optimizing PivotTable-based data structures, mid-sized enterprises such as computer retail stores can integrate data from multiple departments into a single source of truth (Arielevi et al., 2025). Furthermore, the Extract, Transform, and Load (ETL) process is identified as a mandatory stage to ensure that data ingested into BI systems are clean, consistent, and valid (Ferianto et al., 2021).

Consequently, transformation through BI extends beyond graphical aesthetics and centers on the construction of a well-organized data ecosystem that supports long-term business sustainability. These findings are also highly relevant within the context of educational governance. Nadawina, Giatman, and Ernawati (2022) emphasize that structured, data-driven

educational system management is a fundamental prerequisite for improving the effectiveness of vocational education services. Accordingly, the adoption of Business Intelligence platforms not only optimizes business performance but also represents a data-driven management model that aligns with the principles of modern educational governance.

3. Implementation of Intelligent Algorithms and Scientific Inventory Management

The third pillar of this discussion explores the application of advanced computational techniques that extend beyond the capabilities of standard office software. For students of Information Technology Education, this section represents the integration of computer science principles with strategic industrial needs, where algorithms are employed to extract hidden knowledge (knowledge discovery) from large-scale datasets.

Customer Segmentation Using the K-Means Clustering Algorithm

In the context of modern retail, the increasing volume and complexity of data often render conventional analytical approaches inadequate for capturing dynamic consumer behavior patterns. The implementation of data mining techniques using the K-Means clustering algorithm has emerged as a critical solution for product and customer segmentation (Hidayat et al., 2025). By clustering data based on complex transactional behavior patterns, retail management can identify loyal customer groups, frequently co-purchased products, and optimal merchandise placement strategies. This analytical capability enables organizations to design more personalized and targeted marketing strategies, thereby improving promotional cost efficiency.

Scientific Inventory Management through Forecasting Techniques

A longstanding operational challenge in business management is the risk of overstock or stockout, both of which can lead to substantial financial losses. The reviewed literature consistently indicates that reliance on managerial intuition should be replaced by scientific forecasting methods. The integration of the Semi-Average Method into analytical systems has been shown to provide objective prediction baselines derived from historical sales data (Saryanti & Sidhiantari, 2020). This approach allows businesses to project future inventory requirements with greater accuracy, thereby optimizing working capital turnover and reducing inventory-related risks.

Development of Integrated Retail Information Systems

The culmination of data analysis tool implementation lies in their integration into dedicated information systems. A case study of the "SI MANIS" system demonstrates that when data analysis functionalities are embedded directly into retail application workflows, management gains comprehensive, real-time control over inventory and overall store operations (Kristanto & Winarsih, 2025). Such systems enable seamless data synchronization across multiple business units, ensuring that transactional data are immediately transformed into actionable managerial insights. For Information Technology students, the development of these intelligent systems underscores that data analysis is not merely an end-stage reporting activity, but a core component of software architecture that supports holistic business efficiency and sustainability..

CONCLUSIONS

Based on the findings of the literature review across multiple case studies, it can be concluded that the selection of appropriate data analysis tools is a critical determinant of successful business information processing. Each analytical instrument serves a distinct strategic role aligned with organizational scale and analytical needs. Microsoft Excel is highly adequate for basic data management, financial report digitalization, and intermediate-level automation through VBA

macros. However, for more advanced, rapid, and interactive analytical requirements, the adoption of Business Intelligence technologies such as Power BI and Google Data Studio, supported by Data Warehouse architectures, is strongly recommended. Furthermore, the implementation of intelligent algorithms and scientific forecasting methods has been shown to provide objective predictive foundations for effective inventory management. For students of Information Technology Education, mastery of this spectrum of tools from foundational to advanced levels constitutes a core competency necessary for delivering effective, competitive, and industry-relevant digital solutions in the contemporary workforce.

ACKNOWLEDGMENTS

The author would like to express sincere gratitude to STKIP Amal Bakti for the institutional support provided throughout the preparation of this literature review, including financial assistance for article publication. Appreciation is also extended to the lecturer of the Introduction to Science course for the guidance, academic direction, and conceptual reinforcement that significantly strengthened the scholarly foundation of this manuscript. In addition, the author thanks fellow students of the Information Technology Education (PTI) program for their insights and real-world perspectives regarding data literacy challenges encountered in practice. Finally, sincere appreciation is conveyed to all researchers whose works served as primary references in this review, enabling the author to synthesize a comprehensive understanding of web-based data visualization and data analysis tools within educational and industrial contexts.

REFERENCES

Ariansyah, M. R. (2024). Visualisasi Dinamis Data Penjualan Warung Si Kembar Menggunakan Microsoft Excel. *Jurnal Sistem Informasi (TEKNOFILE)*, 2(8).

Arielevi, A., et al. (2025). Implementasi Data Warehouse Dalam Pengolahan Data Penjualan Di Toko Komputer Dengan Pivottable. *Datateknologi: Journal of Informatics and Computers*, 3(1), 1-6.

Bukhari, A. P., Hafidz, R., & Pamungkas, R. W. P. (2024). Analisis Business Intelligence Data Penjualan PT Ambulance Pintar 2021. *JATI (Jurnal Mahasiswa Teknik Informatika)*, 8(4).

Darmawan, T. G. P., et al. (2025). Perancangan Sistem Informasi Akuntansi Penjualan Berbasis Makro VBA Microsoft Excel Pada UMKM Afnan Cake & Cookies. Account; International Journal for accountancy, Finance, and Banking, 12(2), 2681-2693.

Ferianto, R., Nugroho, A., & Andriyanto, T. (2021). Data Warehouse Pengelolahan Data Penjualan Studi Kasus UD HF Bersaudara. *Seminar Nasional Inovasi Teknologi UN PGRI Kediri*.

Hidayat, K., et al. (2025). Analisis Data Penjualan Menggunakan Algoritma K-Means Clustering Pada Toko Superindo. *Journal of Data Science Methods and Applications*, 1(1), 1-6.

Indrawan, I. P. Y., & Desmayani, N. M. M. R. (2025). Visualisasi Data Penjualan Produk Alat Tulis Kantor pada Bagus Stationery Menggunakan Google Data Studio. *TEKNOMATIKA*, 15(1).

Jabar, A. A., Wijaya, R. F., & Wahyuni, S. (2025). Dashboard Visualisasi Data Kecerdasan Bisnis Untuk Mendukung Pengambilan Keputusan Bisnis Pada PT BMPT. *Djtechno: Jurnal Teknologi Informasi*, 6(1), 75-80.

Juliawan, M. B. (2024). Analisa dan Visualisasi Data Penjualan Sepeda Motor Tahun 2016-2019 Menggunakan Microsoft Excel. *Jurnal Sistem Informasi (TEKNOFILE)*, 2(3).

Kristanto, I. N., & Winarsih, S. S. (2025). Peranan Sistem Informasi Toko Manis (SI MANIS) Untuk Analisa Data Penjualan di Bidang Bisnis Ritel. *Jurnal Informatika dan Teknik Elektro Terapan (JITET)*, 13(1).

Kurniawan, M. R. N. (2024). Analisa dan Visualisasi Data Penjualan Motor Listrik di Indonesia Menggunakan Microsoft Excel. *Jurnal Sistem Informasi (TEKNOFILE)*, 2(2).

Mahrifan, M. R. (2024). Analisa dan Visualisasi Data Penjualan Motor Honda di Tahun 2023 Menggunakan Microsoft Excel. *Jurnal Sistem Informasi (TEKNOFILE)*, 2(8), 603-607.

Nadawina, N., Giatman, M., & Ernawati, E. (2022). Peranan manajemen workshop dan labor untuk program keahlian teknologi konstruksi dan properti di sekolah menengah kejuruan. *JRTI (Jurnal Riset Tindakan Indonesia)*, *7*(2), 235-238.

Nadawina, N., Rizal, F., & Syah, N. (2023). Hubungan Interaksi Belajar, Kemampuan Berpikir Tingkat Tinggi, dan Penguasaan Teknologi Informasi dan Komunikasi dengan Hasil Belajar Hidrolika. *The Indonesian Journal of Computer Science*, *12*(2).

Novianto, H., & Nadawina, N. (2022). Kajian literatur: Pembelajaran berbasis teknologi di abad 21 pada mata kuliah Gambar Perencanaan Jurusan Teknik Sipil. *Research in Education and Technology (REGY)*, *1*(1), 22-26.

Permatasari, P., Wahyuningsih, S., & Ekawanti, W. (2024). Pemanfaatan Ms. Excel Dalam Laporan Keuangan: Upaya Peningkatan Pengelolaan Usaha Toko Sembako Limus Tangerang. *Jurnal Pengabdian Masyarakat: Ekonomi dan Bisnis Digital (JPMEBD)*, 1(4).

Pratiwi, O. A., & Putranto, R. S. (2025). Analisis Pencatatan Penjualan pada Toko WJS Berbasis Microsoft Excel. *Journal of Artificial Intelligence and Digital Business (RIGGS)*, 4(2), 1726-1730.

Rianti, W., & Harahap, E. (2021). Pengolahan Data Hasil Penjualan Online Menggunakan Aplikasi Microsoft Excel. *Jurnal Matematika*, 20(2), 69-76.

Safira, P. M. (2025). Visualisasi Data Penjualan Toko Kosmetik Miss Glam Menggunakan Excel. *Jurnal Sistem Informasi (TEKNOFILE)*, 3(3), 180-183.

Saryanti, I. G. A. D., & Sidhiantari, I. G. A. P. I. (2020). Analisis Perancangan Aplikasi Peramalan Persediaan Barang Dagang Sederhana dengan Metode Semi Average Method. *Jurnal Teknik Elektro dan Komputer*, 9(3), 205-212.

Wanda, A. S. (2024). Analisis dan Visualisasi Data Penjualan Sembako Toko Jaya Abadi Menggunakan Power BI. *Jurnal Sistem Informasi (TEKNOFILE)*, 2(10), 731-737.

Wibowo, A. H., Faisah, K., & Devianto, Y. (2022). Analisa dan Visualisasi Data Penjualan Menggunakan Exploratory Data Analysis pada PT. Telkominfra. *Jurnal Teknik Informatika dan Sistem Informasi*, 9(3), 2292-2304.

Yulianto, A. T., & Riansyah, A. (2025). Exploratory Data Analysis Berbasis Excel Dalam Analisis Data Untuk Meningkatkan Penjualan Produk Pada Vending Machine. *Journal of Computer Science and Information Technology (JCSIT)*, 2(2).