

# Three-Way Match Automation in IT Audits: Enhancing Control Testing in Financial Audits

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## Abstract

The Three-Way Match (TWM) procedure, a fundamental technique in financial auditing, involves reconciling purchase orders, invoices, and receipts to guarantee accuracy and compliance. In the field of IT audits, automating the TWM process represents an important potential to improve control testing and streamline audit processes. Organizations may efficiently spot errors and manage financial transaction risks by using modern data analytics and machine learning approaches. This automation not only avoids human error but also improves the accuracy of financial reports. Also, real-time monitoring enables continuous oversight of transactions, allowing auditors to concentrate on higher-risk areas and strategic decision-making. The work examines the application of TWM automation in IT audits, emphasizing the benefits, challenges, and best practices for organizations. Working to improve their audit procedures. Finally, TWM automation promotes a proactive audit environment by increasing the accuracy of financial audits and strengthening organizational controls.

**Keywords:** Three-Way Match, Automation, IT Audits, Accuracy And Compliance, Financial Audits, Data Analytics, Machine Learning.

## I. INTRODUCTION

The concept of a three-way match, which usually involves verifying three important documents Purchase orders, receipts, and invoices has gained ground in the field of IT audits, particularly financial auditing. This procedure is intended to improve control testing by ensuring that transactions are consistent and accurate across several records. Automation of the three-way match process offers a dramatic potential to speed audits, reduce contradictions and increase overall efficiency. Existing research indicates that automation can dramatically reduce the manual workload involved with traditional audits, allowing auditors to focus on more strategic activities rather than routine data verification. Existing research indicates that automation may significantly decrease the manual workload involved with traditional audits, allowing auditors to focus on more strategic activities rather than routine data verification. According to research, integrating automated systems allows for real-time data analysis, which improves the accuracy and dependability of financial reports. Furthermore, emerging technologies such as Artificial Intelligence (AI) and Machine Learning (ML) can provide predictive insights in the three-way match process, allowing auditors to more efficiently identify potential abnormalities and areas of risk. Several studies show that firms that use automated three-way match systems have better compliance with regulatory standards, as these systems may provide detailed audit trails and promote quicker reporting.[1],[3],[4],[6]

Furthermore, the automation of the three-way match process helps to improve internal controls by reducing the possibility of human error and fraudulent actions. Organizations can avoid financial issues by confirming that all three documents match before payment is executed. Losses due to inaccuracy or fraud. In addition, the ability to connect automated systems with existing enterprise resource planning (ERP) systems

increases the overall audit workflow, resulting in a smooth flow of information and better decision-making.[2],[5]

In general the research emphasizes the significance of three-way match automation in modern auditing processes, citing its role in strengthening control testing, increasing financial correctness, and encouraging organizational accountability. As financial audits evolve with technology, the use of automated processes is likely to become common practice, paving the way for more efficient and effective audit methodologies. The findings from numerous studies highlight the importance of firms investing in automation tools to remain competitive and compliant in a continuously changing financial market.[7],[9],[10]

## II. LITERATURE REVIEW

**K. McCarthy (2021)** The impact of audit automation on financial control performance, highlighting a significant shift in the auditing landscape. They argue that automation streamlines control testing processes, reducing manual errors and enhancing accuracy. The authors provide a comprehensive analysis of various automated tools and techniques that facilitate real-time monitoring and reporting, which, in turn, bolster the effectiveness of financial audits. Furthermore, the research discusses how automation allows auditors to focus on high-risk areas, improving overall audit quality. McCarthy and Goldstein also address potential challenges, including the need for skilled personnel to operate advanced auditing technologies and the importance of maintaining robust data security measures. Their findings underscore the necessity for organizations to embrace automation to remain competitive in an increasingly digital world, while also ensuring that proper training and safeguards are implemented to maximize the benefits of these technologies. Overall, this study serves as a valuable resource for understanding the evolving role of automation in enhancing financial control audits.

**C. A. Kauffman (2021)** In "Automation in Auditing: The Role of Information Technology in Internal Control Testing," Kauffman investigates the transformative effects of information technology on internal control testing procedures. The report underlines how automation enables more efficient and reliable inspections of internal controls, reducing auditors' time spent on human testing. Kauffman emphasizes the use of modern analytical techniques that enable continuous monitoring of controls, providing real-time insights into potential vulnerabilities. The study also highlights the change to a risk-based auditing strategy, which is facilitated by automated tools that can identify areas that require more inspection. However, Kauffman recognizes the challenges of automation, such as the necessity for auditor training in new technology and the risk of over-reliance on automated operations. The findings highlight the importance of balancing technology innovation in created auditing procedures to improve overall audit effectiveness. This paper advances our understanding of how IT innovations are transforming the auditing landscape, with real-world implications for both practitioners and researchers in the area.

**J. S. McKeen (2021)** The role of automated controls in increasing the efficiency and efficacy of financial audits. The authors argue that automation not only streamlines audit operations but also improves audit outcomes by reducing human error. They propose a methodology for incorporating automated control mechanisms into the auditing process, demonstrating how these technologies enable extensive testing of financial statements and internal controls. Additionally, the benefits of real-time data analysis, which allows auditors to spot anomalies and hazards faster than previous approaches. The report also covers potential implementation challenges, such as the requirement for organizational change management and audit methodology adaption in order to effectively include automated controls. The authors conclude that adopting automation is critical for auditors. They aim to improve their procedures in an instantly evolving

financial climate. Their findings are helpful for audit professionals and organizations trying to improve their financial audit processes using technology.

**M. A. Ali(2020)**"The Role of Automation in Improving Audit Quality: Evidence from Financial Institutions," how automation improves audit quality in the context of financial organizations. The authors present actual evidence proving that integrating automated technologies results in more precise and reliable audit outcomes. They examine several automated techniques that help with data analysis, risk assessment, and compliance checks, allowing auditors to focus on crucial areas that demand professional judgment. The report emphasizes the importance of real-time monitoring capabilities provided by automation, which enable auditors to discover anomalies and probable fraud more efficiently. The limitations of automation, such as the initial investment expenditures and the necessity for auditors to learn new skills in order to run modern instruments properly. Their findings reveal that, while automation has a major impact on audit quality, organizations must also spend in training and change management to fully realize its benefits. Overall, the study highlights the importance of technology in changing auditing methods and improving the overall integrity of financial audits in the financial industry.

**T. Albrecht (2021)**The practical considerations and benefits of using an automated auditing system in financial environments. The report stresses the efficiency improvements made possible by automation, which decreases time spent on regular audit procedures while improving the accuracy of financial control assessments. Albrecht explores the architecture of an ideal automated audit system, with a focus on incorporating data analytics, machine learning, and continuous monitoring capabilities that enable real-time anomaly identification and risk assessment. Additionally, the author emphasizes how automation can improve audit coverage by analyzing larger datasets and allowing for more extensive control testing. Albrecht, however, cites concerns, such as the necessity for effective cyber security measures to preserve sensitive financial data and the importance of skilled personnel to manage and analyze. Automated processes. The findings indicate that, when implemented effectively, automated financial audit systems can greatly increase audit reliability and efficiency; however, organizations must address infrastructure and training requirements to fully realize the potential of these systems. This report provides a complete overview of the requirements and implications of audit automation in the banking industry.

**F. H. H. B. Noor(2021)**The Automated auditing procedures are intended to improve control testing in accounting and finance. The authors look at a variety of tools and strategies for streamlining the auditing process, including robotic process automation (RPA), machine learning, and data analytics. These technologies allow auditors to conduct extensive data analysis more quickly and accurately, focusing on high-risk areas while lowering the possibility of human error. Noor and Carbo underline that automated procedures make continuous control testing easier, allowing for real-time insights and timely responses to irregularities. However, the assessment addresses some of the issues, such as the necessity for high-quality data and the ability to analyze complicated outputs from automated systems. The authors conclude that, while automation offers significant benefits, its deployment depends on an organization's commitment to offering the required infrastructure and training. This literature review is an essential tool for auditors and financial institutions looking to use technology to improve control testing operations.

**R.K. D. Nayak(2021)**The structured strategy to integrating automation into control testing in financial audits, with the goal of improving both efficiency and audit quality. The framework describes the major components of an automated control testing system, including data integration, real-time monitoring, and anomaly detection., the use of machine learning techniques to uncover trends and anomalies that may reveal control flaws or fraud threats. The report also emphasizes the importance of automation in conducting continuous control evaluations, which improve the speed and accuracy of audit findings. Despite these

benefits, points out that effective adoption necessitates resolving a number of hurdles, including data security problems and the requirement for auditors to become proficient in using complicated automated technologies. Furthermore, the framework proposes processes for system calibration and oversight to assure reliability results. The research emphasizes the revolutionary power of automation in financial auditing and offers practical advice for auditors and companies looking to improve control testing through technology.

### III. OBJECTIVES

According to prior research, below are some key objectives of three-way match automation in IT audits targeted at improving control testing in financial audits are

- **Improving Accuracy:** Automating the three-way match process ensures that data from invoices, purchase orders, and receipts are properly aligned, reducing errors that can occur during manual checks
- **Increasing Efficiency:** By automating repetitive processes in control testing, auditors can considerably reduce the time necessary for the audit process, freeing up time to focus on higher-risk areas and complicated analysis.
- **Strengthening Internal Controls:** The use of automated technologies in the three-way match process improves internal controls by assuring consistent rule application and allowing for real-time monitoring of inconsistencies.
- **Reducing Operational Risks:** By automating the matching process, firms can reduce operational risks such as human error, fraud, and supervision, hence improving the overall integrity of the financial audit.
- **Supporting Real-Time Reporting:** Automation enables real-time data processing and reporting, allowing for timely decisions and immediate remedial steps in the event of errors
- **Enhancing Audit Quality:** The combination of automation and advanced analytics improves audit quality by offering deeper insights and a more thorough assessment of control effectiveness.
- **Training and Skill Development:** Research emphasizes the need of providing proper training for auditors to effectively use automated systems, including the ability to evaluate automated results and incorporate them into audit tactics
- **Fostering Innovation:** The transition to automation promotes the use of innovative auditing methodologies and tools, setting the path for the future evolution of audit procedures.

These objectives illustrate three-way match automation's enormous potential for increasing the effectiveness and dependability of financial audits, as well as the overall audit process.

### IV. RESEARCH METHODOLOGY

The research methodology for analyzing three-way match automation in IT audits and its function in improving control testing in Crucial audits take a multifaceted approach, using both qualitative and quantitative evaluations from previous studies. Initially, a thorough literature review was undertaken to discover existing frameworks and practices related to three-way match processes, audit automation, and control testing methodologies. This review focused on important factors that influence audit effectiveness, such as automation's impact on accuracy, efficiency, and risk management. Following that, a survey was established for audit professionals and IT specialists to collect empirical data on their experiences with automation in three-way match systems. The poll includes questions about perceived efficacy, implementation issues, and the overall influence on audit results. The survey data was analyzed using Statistical tools for identifying trends and correlations.[2],[3],[5],[7]

## V. DATA ANALYSIS

three-way match automation in IT audits show substantial advances in control testing approaches and their implications for financial audits. Many studies show that automating the three-way match process, which compares purchase orders, receipts, and invoices, improves accuracy and eliminates errors associated with manual checks. For example, experts have highlighted that automated systems can handle transactions at a higher volume and speed, allowing for more rapid detection of inconsistencies. Furthermore, data demonstrates that implementing automation minimizes the risk of fraud by requiring all three papers to match before payment is permitted. The incorporation of sophisticated analytics and machine learning algorithms has also been emphasized as a method for detecting trends and anomalies that may suggest control flaws. Furthermore, the literature reveals that firms are using three-way match automation. Automated processes ensure adherence to defined control frameworks, resulting in increased regulatory compliance. Despite these advantages, several studies highlight obstacles, such as high initial installation costs and the necessity for a strong IT infrastructure. Overall, the statistics indicate that three-way match automation is an important advancement in IT audits, significantly enhancing the effectiveness and reliability of control testing in financial audits.

**Table 1: The Applications of Real-Time Data Analysis and Three-Way Match Automation In It Audits Across Various Sectors**

S.No	Field	Application of Real-Time Data Analysis	Application of Three-Way Match Automation in IT Audits
1	Medical	Patient monitoring systems with real-time data for immediate interventions.	Automation of supply chain and inventory audits for medical supplies, drugs, and equipment.
2	Banking	Fraud detection systems with real-time transaction analysis to prevent cyber fraud.	Automated reconciliation between transactions, invoices, and payment records for compliance.
3	Software	Performance monitoring of software applications for stability and user analytics.	Automated testing for software licenses, expenses, and project deliverables.
4	Finance	Market analysis using live financial data for investment and trading strategies.	Reconciliation of expenses, income, and financial statements for audit accuracy.
5	Industry	Equipment monitoring to optimize maintenance schedules and reduce downtime.	Validation of purchase orders, invoices, and receipts to prevent errors and unauthorized spending.

Table-1 Represents Real-time data analysis improves responsiveness and decision-making, while three-way match automation in IT audits improves compliance, accuracy, and fraud protection in a variety of fields.

**Table 2: Impact of Three-Way Match Automation On Audit Effectiveness**

Reference	Audit Effectiveness (%)	Error Rate Reduction (%)	Time Saved (Hours)
McCarthy and Goldstein[1]	85	30	20

Kauffman[2]	80	25	15
Ali and Al-Rabadi[4]	78	28	18
Cheng and Cheung[5]	82	32	22
Noor and Carbo[7]	83	35	25
Smith and Jones[11]	87	30	21

Table-2 Represents the impact of three-way match automation on audit effectiveness with various real time values and from different references

**Table 3: Benefits of Real-Time Data Analysis In Financial Audits**

Reference	Decision-Making (Minutes)	Speed	Cost Savings (%)	Stakeholder Satisfaction (%)
Hofmann[8]	10		20	90
Thirunavukarasu[13]	8		15	85
Wong[10]	12		18	88
Chen[15]	9		22	92
Joseph[18]	11		17	89
McKeen and Smith[3]	10		19	91

Table-3 Represents the benefits of real-time data analysis in financial audits with various real time values and from different references

**Table 4: Challenges in Implementing Three-Way Match Automation**

Reference	Year	Technical Challenges (%)	Staff Resistance (%)	Training Needs (%)
Albrecht[6]	2021	40	30	25
Huang[12]	2021	35	25	30
Ahmed[16]	2021	30	20	28
Chan[15]	2021	45	35	33
Smith and Jones[11]	2021	32	28	22

Table-4 Represents the: challenges in implementing three-way match automation and with various real time values from different references

**Table 5: Applications of Three-Way Match Automation In It Audits**

Application Area	Description	Reference
Invoice Verification	Automating the matching of purchase orders, receipts, and invoices to ensure accuracy and reduce discrepancies.	Kauffman [2]
Risk Assessment	Utilizing automated systems to identify and assess risks in financial transactions through consistent matching processes.	Cheng & Cheung [5]
Fraud Detection	Enhancing fraud detection capabilities by comparing records in real time to flag inconsistencies.	McCarthy & Goldstein [1]
Compliance Monitoring	Streamlining compliance checks by automating the three-way match process to ensure adherence to regulatory standards.	Smith [9]
Cost Control	Reducing operational costs by minimizing manual checks and increasing transaction processing speed.	Noor & Carbo [7]
Reporting Accuracy	Improving the accuracy of financial reports through automated validation of transaction data.	Ali & Al-Rabadi[4]
Performance Evaluation	Evaluating auditor performance and efficiency in real-time by analyzing matching outcomes.	Albrecht [6]
Data Analytics Integration	Integrating data analytics tools with the three-way match process to provide deeper insights into financial operations.	Huang [12]

**Table 6: Impact of Real-Time Data Analysis On Control Testing**

Impact Area	Description	Reference
Enhanced Decision Making	Facilitating timely decisions by providing real-time insights from matched data.	Smith & Jones [11]
Improved Audit Quality	Elevating the quality of audits through immediate identification of errors and anomalies.	Hofmann [8]
Increased Efficiency	Streamlining the audit process by automating repetitive tasks, leading to faster completion of audits.	Nayak[14]
Real-Time Risk Management	Allowing auditors to adjust strategies based on real-time data, leading to more proactive risk management.	Chan & Chan [15]
Better Resource Allocation	Optimizing auditor resources by focusing efforts on areas identified as high risk through automation.	Ahmed [16]
Enhanced Client Trust	Building trust with clients through transparent and accurate auditing processes.	McKeen & Smith [3]
Continuous	Enabling continuous audit processes rather	Wong [10]

Monitoring	than periodic reviews, leading to ongoing assurance.	
Increased Accountability	Ensuring accountability in financial transactions through thorough automated tracking and matching.	Thirunavukarasu[13]

Table 5 & 6 Represents the automation of the three-way match process in IT audits improves control testing in financial audits. Real-time data analysis can help firms improve decision-making, improve audit quality, and build a proactive risk management environment. The applications listed in this review demonstrate an opportunity for automation to speed audit processes, save costs, and improve the overall efficacy of financial audits. Future study could look into additional aspects of auditing automation, such as machine learning and artificial intelligence, in order to progress in this field.

## VI. CONCLUSION

The application of three-way match automation in IT audits greatly improves the control testing procedure in financial audits. By incorporating this technology, organizations may verify that information from purchase orders, receipts, and payments are accurate, decreasing errors and the risk of fraud. This technology not only accelerates the audit process, but also allows auditors to focus on more complicated areas of risk assessment, resulting in higher audit quality. Moreover, the ability to analyze massive quantities of data effectively enables more complete and timely audits, increasing trust in financial reporting. As businesses rely more on digital transactions and data-driven decision-making, three-way match automation is becoming not only useful, but also necessary for maintaining strong internal controls. The future scope

Moving in advance, the future of three-way match automation in IT audits is very promising. As artificial intelligence and machine learning technologies mature, they can be integrated into automation systems to improve predictive analytics and anomaly detection. This interface will enable auditors to discover abnormalities in real time, resulting in more proactive risk management. Furthermore, broadening the scope of automation to include new controls, such as two-way match systems and reconciliation processes, will strengthen the auditing framework. Furthermore, as firms transition to cloud-based solutions, the ability for remote audits and real-time data access will transform traditional auditing procedures, making them more flexible and responsive. Finally, continued research and development in this field will play a critical role in creating the future.

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