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Digital Transformation in Accounting Systems: Comparison between Service, Merchandising, and Manufacturing Company

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Abstract: The rapidly growing digital transformation is driving fundamental changes in the company's accounting system, especially through the integration of technologies such as ERP, cloud computing, IoT, and digital transaction platforms. This study aims to analyze the forms of digital transformation in the accounting system and compare the patterns of change that occur in three companies from different sectors, namely PT Telkom Indonesia (Persero) Tbk, PT Matahari Department Store Tbk, and PT Astra Otoparts Tbk. Using a qualitative approach through the analysis of the content of the annual report and sustainability for 2024, this study compiles data reduction, data display, and cross-case synthesis based on the Miles and Huberman framework to identify areas of digitalization, transformed processes, and their implications for accounting practices. The results of the study show that the three companies have a similar transformation pattern despite operating in different sectors, service, retail, and manufacturing The transformation takes place through the integration of digital systems, automation of accounting processes, digitization of transaction channels, strengthening digital governance, and improving human resource capabilities. The difference appears in the level of digital maturity, where PT Telkom Indonesia (Persero) Tbk and PT Astra Otoparts Tbk are at a high level of digitalization, while PT Matahari Department Store Tbk shows a medium level of digitalization. This research makes a theoretical contribution to understanding the mechanism of accounting transformation in the digital era and offers practical recommendations for companies to integrate technology, digital governance, and human resource competency development as a sustainable digital strategy.

Keywords: digital transformation, accounting, service, merchandising, manufacturing, digitization, ERP, cloud computing

INTRODUCTION

Digital transformation is a process of end-to-end change that integrates digital technologies into all aspects of an organization to improve performance, create new value, and transform operations through continuous digital capabilities (1). This transformation has become the main driver of changes in business processes and accounting systems in various industries in Indonesia. (2) emphasized that digitalization has the potential to create economic value up to USD 150 billion by 2025, primarily through process automation, improved connectivity, and real-time data utilization. However, Indonesia is still in the early stages of digitalization, which is characterized by inequality in technology adoption among business sectors, weak ICT infrastructure, and low data integration across corporate functions (2). Frontier technologies such as generative AI, cloud computing, advanced connectivity, and digital trust are the main drivers of global industrial transformation and are key factors in increasing the efficiency and capabilities of organizations in managing financial information

(3). These findings show that there is a gap between the potential of Indonesia's digital economy and organizational readiness, especially in the context of the digital transformation of the accounting system.

Digital transformation is also reflected in the annual report that display narratives about digital strategies, technology investments, and the impact of innovation on reporting and governance systems (4). However, the form and level of disclosure vary between industry sectors, so it needs to be understood through document-based qualitative analysis. In the service sector, PT Telkom Indonesia (Persero) Tbk emphasized that digital modernization is the company's strategic foundation, including system integration, network optimization, and digital capacity building to support more accurate financial operations and reporting. In the manufacturing sector, PT Astra Otoparts Tbk demonstrate the application of technology Industry 4.0, supply chain digitization, and operational data integration that directly affect cost recording efficiency, production accuracy, and internal reporting quality. Meanwhile, in the retail sector, PT Matahari Department Store Tbk strengthening the digitalization of operational and sales processes through POS system modernization, omnichannel integration, and increased utilization of customer data for decision-making. Although all three companies have adopted various digital transformation initiatives, an academic study that explores how digital transformation is impacting accounting systems across sectors, services, manufacturing, and merchandising are still limited.

Research on digital transformation in accounting and finance shows that technologies such as big data analytics, cloud accounting, artificial intelligence, and digital platforms have improved the quality of management, operational efficiency, and organizational decision-making processes. For example (5) affirms that Big Data Analytics plays an important role in improving management control through more accurate internal and external data processing. (6) states that the use of data analytics improves the quality of business decisions through mediation knowledge sharing. In the banking sector, (7) found that data mining and big data being an important factor for security, CRM (Customer Relationship Management), and process efficiency. In addition, (8) proving that digital transformation enhances cost efficiency bank through text mining on annual reports. (4) also only highlights aspects of digital disclosure without examining its integration with internal accounting systems. While the various studies emphasize the benefits of digital technology, most of them focus on the organizational performance, cost efficiency, banking or control management, not on how digital transformation specifically changes accounting system, especially the recording process, internal control, and quality of financial statements across industry sectors.

Furthermore, research related to digital transformation in accounting is still dominated by macro or conceptual approaches. (9), for example, discussing the opportunities and challenges of accounting digitalization at the national level but does not explore how these transformations occur in accounting processes in companies with different characteristics such as services, trade, and manufacturing. Meanwhile, research on digital transformation disclosure (4) highlight DT disclosure practices without attributing such changes to the company's internal accounting system. Even research (10) regarding the influence of digital transformation on ESG decoupling has not touched on how accounting systems have changed in support of such transparency.

The novelty of this research lies in a comparative qualitative approach that directly explores the digital transformation process in the context of the organization by comparing three different sectors; services, retail, and manufacturing. This study not only identifies how these large companies implement and disclose digital transformation in their Annual Reports and Sustainability Reports, but also takes an in-depth look at the forms of digital transformation implemented in accounting systems, including record-keeping automation, ERP integration, revenue management digitization, and data governance strengthening. Furthermore, this study specifically maps the impact accounting digitalization as well as examining the attached risks. By comparing how digital accounting is applied across sectors, this study fills a gap in the literature that has tended to focus on only one industry. Thus, this research makes a new contribution in the form of a comprehensive understanding of the variations in the implementation of digital transformation of accounting between the service, retail/trade, and manufacturing sectors.

LITERATURE REVIEW

The Resource-Based View (RBV) framework explains that an organization's ability to leverage Valuable, Rare, Inimitable, and Non-substitutable resources (VRIN) is a key foundation in the creation of competitive advantage (11). In the context of the digital accounting system, digital technologies such as cloud accounting, data analytics, artificial intelligence, and system integration become strategic digital resources that are able to increase the effectiveness of financial recording, processing, and reporting. (13) shows that system security, technology integration, and the use of the cloud as an accounting platform are key factors that strengthen digital-based financial management capabilities. Cloud accounting not only adds technical efficiency, but also strengthens the organization's ability to manage financial data in real-time and integrated, thereby improving the quality of managerial decisions. In line with that, (14) found that technologies such as Big Data and AI have transformed managerial accounting practices through automation, large-scale data processing, and analytics capacity building, which in turn strengthens companies' strategic capabilities in digital information-driven decision-making.

In addition to enriching the company's internal capabilities, digital transformation also changes the configuration of resources between functions through data integration across business processes. (15) in the context of digital supply chains shows that the ability to share data, integrate systems, and utilize digital platforms creates collective resources that strengthen information accuracy and operational efficiency. In accounting systems, this integration results in automated record-keeping, reduced transaction errors, and stronger internal controls through real-time visibility, digital trail audits, and strengthening digital data governance mechanisms. Thus, the literature shows that digital transformation in the accounting system is not only the adoption of technology, but is a process of strengthening the organization's digital capabilities in line with RBV where technology becomes a strategic resource that enlarges the organization's ability to produce high-quality, responsive, and highly competitive accounting information in a digital business environment.

The level of digital transformation of accounting can be analyzed by referring to 3-level frameworks of digital maturity (16), as well as the holistic model of digital transformation from (1). These two studies consistently show that the digital transformation of accounting moves through the stages of automation, integration, and full transformation.

At the highest level, namely the higher digital maturity (16), and transformer stage (1), organizations have achieved comprehensive system integration, real-time accounting process automation, and mature data governance and cybersecurity. The mid-level describes partial integration conditions, such as the adoption of a partial POS or ERP, while the low-level is characterized by limited digitization in operational areas without significant changes to the core accounting processes. This narrative is the basis for determining the position of each company in cross-sector analysis

Table 1: Digital Transformation Maturity Level

Reference	Level/Category	Short Description
Deloitte Insights (2019)	Lower Digital Maturity	Organizations benefit minimally from digital initiatives; Digital pivots are implemented in a limited and non-integrated manner.
	Median Digital Maturity	Some digital pivots have been implemented and are starting to provide benefits, but they have not been consistently scaled and have not yet been enterprise-wide.
	Higher Digital Maturity	Seven digital pivots are implemented consistently across functions; organizations gain significant business and financial benefits.
Aras & Büyüközkan (2023)	Intent	The initial stage with ad hoc digital activities without structure and without a roadmap.
	Beginner	Early commitment; The pilot project started running but has not yet produced any value.
	Adopter	The basic digital structure is formed and the organization has already begun to generate limited value.
	Performer	Digitalization is mature and evenly distributed across various processes, demonstrating operational efficiency and effectiveness.
	Transformers	Organizations achieve high levels of digital innovation and generate new business value, including digital business models.

Source: Deloitte (2019) and Aras & Büyüközkan (2023)

RESEARCH METHOD

Research Approach

This study implements case study qualitative approach deeply understand how companies from the three sectors (services, retail, and manufacturing) are expressing digital transformation and how it impacts the accounting system. The qualitative approach was chosen because it allows researchers to capture the meaning, context, and patterns that emerge from official company documents such as Annual Report (AR) and Sustainability Report (SR). According to (17), qualitative research is particularly relevant for accounting because it is able to explain accounting processes, practices, and changes that cannot be captured by quantitative approaches. (18) also applies a qualitative approach to understand

the digitalization of accounting and work competency needs through an in-depth analysis of participant perceptions and supporting documentation.

This study chooses three companies as samples from different industries; PT Telkom Indonesia (Persero) Tbk, PT Matahari Department Store Tbk, and PT Astra Otoparts Tbk. The selection of samples was carried out through purposive sampling based on the principle of maximum variation and the availability of comprehensive data. The three companies represent the services, merchandising, and manufacturing sectors that have comprehensive digital transformation disclosures in the annual reports. PT Telkom Indonesia (Persero) Tbk reflects a service organization with advanced digitalization, especially related to ERP, cloud accounting, and data governance. PT Matahari Department Store Tbk demonstrates the digitalization of retail operations through the integration of POS–inventory, omnichannel, and customer data protection. PT Astra Otoparts Tbk, as the National Lighthouse Industry 4.0, describes the digitalization of manufacturing through IoT, automation, and digital supply chains. The official websites of the companies briefly informed the digitalization and detailly confirmed in Annual Report and Sustainability Report. The combination of these three cases provides adequate contextual variation while maintaining analytical comparability, thereby strengthening interpretive rigor in cross-sectoral qualitative analysis.

Type and Source of Data

The secondary data of digital transformation is identified from the 2024 Annual Reports and Sustainability Reports as the updated sources. The reports can be downloaded from the official websites; https://www.telkom.co.id/, https://matahari.com, https://www.astra-otoparts.com. All documents are analyzed to identify information related to digital transformation, technology implementation, digitization of accounting processes, digital-based internal controls, and data integration.

Data Analysis

We employs the Milles & Huberman model to analyze the data. [17] (19) explained that with this method, the presentation of the results of the analysis is made in a thematisc table at each stage which includes data reduction, data display, and drawing conclusions. [18] (20) also using a qualitative approach to analyze digital strategies by integrating contextual interpretation and data processing processes following the Miles & Huberman model.

DATA ANALYSIS AND DISCUSSION

Data Identification: Digital Transformation Disclosure

Disclosure of Digital Transformation of PT. Telkom Indonesia (Persero) Tbk

PT Telkom Indonesia's digital transformation in 2024 is reflected through various strategic initiatives that directly change the structure of infrastructure, business models, organizational competencies, and data and technology governance. Based on the Sustainability Report (SR) and Annual Report 2024, it can be seen that PT Telkom Indonesia (Persero) Tbk is carrying out a transformation that touches on aspects of digital

infrastructure, digital platforms, human resource capabilities, digital services, data security, and strategic technology investments. Disclosure of PT. Telkom's digital transformation in 2024 are shown in the following Table 2.

Table 2: Disclosure of Digital Transformation PT Telkom Indonesia (Persero) Tbk

Digital Transformation Areas	Narrative Text in AR/SR	Source
Fiber Infrastructure Reorganization (Fiber InfraCo)	"In 2024, Telkom formally transferred the management of Telkom Group's fiber network infrastructure operations to its subsidiary, PT Telkom Infrastruktur Indonesia (TIF). TIF now provides wholesale fiber connectivity services through a shared network to telecommunications operators."	SR 2024, pp.22–23
Digital Business Domains (Connectivity–Platform–Service)	"Telkom operates across three primary digital business domains... Digital Connectivity... Digital Platform... Digital Service."	SR 2024, p.22
Green & Hyperscale Data Center (NeutraDC)	"Neutral... is developing green data centers in Cikarang and Batam with capacities of 121.5 MW and 51 MW, respectively... designed to enhance energy efficiency through the implementation of high-density racks, specialized cooling systems, and optimized data distribution."	SR 2024, pp.52–53
Digital Talent Transformation (Digital Talent Readiness)	"Until the end of 2024, Telkom Group has 4,480 digital talents, or equivalent to 20.6% of the total employees."	SR 2024, p.86
Digistar Program	"To build synergy to accelerate digital transformation, Digistar Community and Digistar Connect serve as collaboration platforms with communities engaged in educational technology (edu-tech), digital skills, and youth..."	SR 2024, p.107
Digitalization of SMEs (Go Modern – Go Digital – Go Online – Go Global)	"SMEs Business Capacity Strengthening program, which includes the Go Modern and Go Digital initiatives as well as penetration into digital and global markets through the Go Online and Go Global programs."	SR 2024, p.108
Digital Connectivity Coverage (3T & Broadband)	"Our infrastructure covers 99% of Indonesia's population and supports access to data (internet) services in underdeveloped, remote, frontier (3T) areas, and border regions."	SR 2024, pp.13–14
Renewable-Energy-Based Telecom Infrastructure	"Telkomsel has utilized 9,559 GJ of energy from solar panels and microhydro sources... 274 BTS units powered by solar panels and one BTS unit utilizing microhydro energy."	SR 2024, p.53
Electric Vehicle Adoption	"Telkom Group has expanded its use of electric vehicles (EVs)... 17% of Telkom's total operational vehicle fleet consists of EVs... Telkom Property has also deployed 418 electric motorcycles for operational use."	SR 2024, p.56

Cybersecurity & Data Privacy	"Telkom has implemented policies related to data privacy protection and information security... establishment of a Data Protection sub-department and the appointment of a Data Protection Officer (DPO)... and significant data breaches..."	SR 2024, pp.14–15
Five Bold Moves (5BM)	"This year is also a testament to the Five Bold Moves initiative, with a focus on B2C business synergies (FMC) and improving B2B capabilities."	AR 2024, p.61
Capex for Digital Connectivity, Platform, Services	"The strategy and purpose of determining capital goods investment is to expand and maintain business growth in the digital era based on digital connectivity, digital platforms, and digital services."	AR 2024, p.164
Capex Digital Infra (Data Center, Cloud, IoT, IT)	"Data Center, Cloud, IoT, IT (smart platform, solution, and services)"	AR 2024, p.164–165
Development of Submarine Cable & Satellite Infrastructure	"Building a national submarine cable system project... as well as the international submarine cable system... Building a high-throughput satellite (HTS) at the 113 BT orbit point through Telkomsat to strengthen terrestrial network infrastructure."	AR 2024, p.165

Source: AR and SR PT Telkom Indonesia (Persero) Tbk 2024

Disclosure of Digital Transformation of PT. Matahari Department Store Tbk

Digital transformation of PT Matahari Department Store Tbk in 2024 is reflected in a series of initiatives that focus on modernizing customer experience, expanding digital sales channels, strengthening data security, and improving information governance. The Annual Report (AR) and Sustainability Report (SR) 2024 show that this digital transformation process is sustainable and touches on the technology dimension, business operations, and data governance. The Table 3 below shows the disclosure of PT. Matahari Department Store Tbk in 2024.

Table 3: Digital Transformation Disclosure PT Matahari Department Store Tbk

Digital Transformation Areas	Naration Text of DT in AR/SR	Source
Omnichannel Strategy	"Revitalized omnichannel strategy."	AR 2024, p.74
Online Channels for Customer Access	"As of 2024, Matahari serves customers through 142 stores... supported by online channels..."	SR 2024, p.18
Digital Platforms (matahari.com, Shop & Talk, marketplace partners)	"Matahari's extensive presence is further enhanced by its digital platforms, including matahari.com, the social commerce platform 'Shop & Talk,' and partnerships with third-party marketplaces."	AR 2024, p.37–38
Digital Transformation Efforts (Explicit Statement)	"The Company's digital transformation efforts are ongoing, both in sales and operational processes."	AR 2024, p.189

Cybersecurity Strengthening	"We strengthened personal data protection by enhancing cybersecurity capabilities, protocols, and establishing a dedicated task force."	SR 2024, p.7
Personal Data Protection Function	"Establishment of a Personal Data Protection Function."	SR 2024, p.13
Data Privacy & No Significant Data Breaches	"No significant data breaches..."	SR 2024, pp.14–15
Cybersecurity Penetration Testing & DR Test	"the Company actively assesses data/information security and cybersecurity risk, through series of penetration tests and vulnerability assessments... conducts a Disaster Recovery (DR) Test at least once a year..."	AR 2024, p.189
Customer Grievance Channels (Digital Touchpoints)	"Customer grievance channels, including Suara Matahari, Halo Matahari, e-mail..."	SR 2024, p.19
Transformation Statement (General Transformation)	"In 2024, Matahari continues its transformation..."	AR 2024, p.37

Source : AR and SR PT Matahari Department Store 2024

Disclosure of Digital Transformation of PT. Astra Otoparts Tbk

PT Astra Otoparts' digital transformation in 2024 is clearly seen through various strategic initiatives aimed at increasing productivity, operational efficiency, and the company's readiness to face the dynamics of the automotive industry. This transformation step takes place comprehensively, covering aspects of manufacturing, trade, after-sales services, energy, and information technology governance. This all is summarized in this below Table 4 .

Table 4: Disclosure of Digital Transformation PT Astra Otoparts, Tbk 2024

Digital Transformation Areas	**Narrative Text in from AR/SR**	**Source**
Digitalization & Automation (Operational Excellence)	"We are consistently focused on increasing productivity through automation and digitalization, supported by the Workshop for Industrial Equipment (Winteq) Division."	AR 2024, p.35–36
Industry 4.0 Enablement	"The Winteq Division plays an important part in supporting the Company for the implementation of Industry 4.0 by leveraging the most appropriate technology to improve operational excellence..."	AR 2024, p.35–36
AstraOtoshop Digital Commerce Platform (B2B & B2C)**	"The Company continues to expand AstraOtoshop.com as the official digital platform for Business to Business (B2B) and Business to Consumers (B2C) customers."	AR 2024, p.35–36
Seamless O2O (Online-to-Offline Integration)	"On the trading line, we will continue implementing the Seamless O2O (Online-to-Offline) strategy, ensuring a smooth integration between the Astraotoshop.com digital platform and the physical experience..."	AR 2024, p.38

Growth thru Digitalization and Excellence Strategy	"We will focus on carrying out the strategy of 'Growth thru digitalization and excellence'... With the support of digitalization advances, we will strengthen the implementation of industry 4.0..."	AR 2024, p.38
Digitalization as Future Growth Enabler	"The Company will also continue to accelerate digitalization as future growth enabler..."	AR 2024, p.38
AstraOtopower EV Charging Network (Digital/Smart Infra)	"the company has developed Astra Otopower, a battery electric vehicle (BEV) charging network... 37 charging machines unit available... across 32 locations..."	SR 2024, p.117
IoT-based Digitalization for Environmental Management	"Reduce, reuse and recycle water ... Digitalization with IoT."	SR 2024, pp.55–56
Future Investment Focus on Automation & Digitalization	"Going forward, investments will be directed towards accelerating automation and digitalization, both in the manufacturing and trading sectors."	SR 2024, pp.117–118
Digital Medical Devices Expansion	"there are 24 products, of which 5 were launched in 2024, namely Digital Column Scale, Baby Incubator, Blood Pressure Monitor Lite, Electrocardiography, and Infant Warmer."	SR 2024, pp.117–118
IT & Cybersecurity Strengthening	"In the course of implementing Industry 4.0 and digitalization, the role of IT and strengthening the cybersecurity system is crucial..."	AR 2024, p.126–127

Source: AR and SR AUTO 2024

Data Reduction: Implementation of Digital Accounting in PT Telkom Indonesia (Persero) Tbk, PT Matahari Department Store Tbk, dan PT Astra Otoparts Tbk

The digital transformation of the accounting system at PT Telkom Indonesia (Persero) Tbk, PT Matahari Department Store Tbk (MDS), and PT Astra Otoparts Tbk (AUTO) shows a paradigmatic shift from traditional accounting mechanisms to an integrated information ecosystem, based on real-time data, and supported by the company's digital capabilities. In all three companies, digital infrastructure modernization and system integration are the main foundations of transformation. Telkom is strengthening Fiber InfraCo and building a hyperscale data center as a basis for faster and more consistent financial data consolidation, a process that according to (21) will be crucial as the move of accounting systems to cloud computing increases flexibility and ensures financial data is always up-to-date. Meanwhile, PT Matahari Department Store Tbk builds ERP, CRM, Business Intelligence, and cloud infrastructure as discovered by (22). PT Astra Otoparts Tbk adopts Industry 4.0 infrastructure through IoT and manufacturing automation to build a cost-measurement and inventory control system based on real-time sensor data.

At the process level, the three companies show the digitization of accounting in line with the principle of evolutionary transformation as described by (23). Telkom integrates ERP, reconciliation automation, and digitalization of billing which makes the financial recording and reporting process more cohesive and minimal manual input. MDS implements POS–inventory–ERP integration that enables automatic and real-time multichannel revenue recording, as well as billing automation on marketplace partners. AUTO automates

production cost recording, inventory valuation, and digital invoicing through the AstraOtoshop platform that connects the B2B and B2C ecosystems. In the logic of (23), these systems produce *integrated information flows* that reduce data fragmentation and gradually change accounting practices through new, more digitized routines.

The digital transformation of the three companies also includes significant changes in the mechanism of recording transactions and the consolidation of financial information. Telkom and AUTO have developed new forms of recording such as digital asset accounting, digital-based cost measurement, and digital service-based revenue recording (e.g. EV charging on AOP). At MDS, omnichannel digitization modifies the way revenue is recorded, marketplace commissions, and branch revenue consolidation. The consistency of real-time data generated by ERP and IoT strengthens the reliability of financial statements and speeds up the consolidation process. As (23) emphasize, this kind of change is not only technical, but also epistemic, because it changes the way organizations understand, produce, and use accounting information as the basis for managerial decision-making.

The dimensions of digital governance and data security are integral parts of the transformation in the three companies. Telkom strengthens cybersecurity, data privacy, and digital trail audits to maintain the integrity of financial information, a need that according to (21) is the main challenge in the digitalization of modern accounting. MDS complements this transformation with penetration testing, disaster recovery testing, and the establishment of a Personal Data Protection Function to ensure the stability and reliability of customer and transaction data. AUTO strengthens IT-based internal controls to protect accounting data amid the digitalization of manufacturing and trade. The three companies show that the digital transformation of accounting is not only oriented towards efficiency, but also on legitimacy, security, and risk control through a mature digital governance structure.

Finally, organizational capabilities are a key element that enables the successful digitization of the accounting system. Telkom is developing the digistar program and increasing the number of digital talents as a prerequisite for ERP and data analytics operations, as emphasized by (21) that the readiness of human resources determines the effectiveness of accounting automation. MDS and AUTO also strengthen human resource capabilities through digital training, the use of BI, and adaptation to new technology-based business models. The summary of accounting digital transformation Telkom, MDS, and AUTO is reported in this below table.

Table 5: Digital Accounting Implementation

Digital Transformation Area	Subtheme/Focus of Digitalization	Digital Accounting Implementation	Company
Infrastructure & Digital Platform Integration	Network reorganization and digital connectivity	Integration of transaction data across units; billing automation; Platform-based digital revenue recognition	Telkom
	Cloud migration & data center	Faster consolidation of financial statements; Cloud-based accounting data processing	Telkom

	Omnichannel integration	POS–inventory–ERP integration; Real-time online–offline sales recording	MDS
	O2O synchronization	Real-time sales–inventory–accounting synchronization	AUTO
Digitization of Business & Operational Processes	ERP & analytic capability	Recording automation; system-based reporting; Improving the accuracy of accounting analytics	Telkom, AUTO
	Industry 4.0 (IoT monitoring)	Sensor/IoT-based production cost assessment; Digital Inventory Valuation	AUTO
	Operational digitalization (sales & cost)	Digitization of sales flows; Accounting Expense Reporting Automation	MDS, AUTO
	Digital invoicing & payment automation	Automatic payment reconciliation; Platform-based revenue recording	AUTO
Digitalization of Customers & Front-End Systems	E-commerce & digital platforms	Multi-platform transaction integration; Marketplace Commission/Fee Registration; Digital Sales Consolidation	MDS, AUTO
	Digital grievance channels	Integration of complaint data into the service fee system; Cost-to-serve evaluation	MDS
	UMKM digital payment systems	Billing automation; Real-time digital transaction reconciliation	Telkom
Digital Governance & Data Security	Cybersecurity & data privacy	Strengthening access control of the accounting system; digital trail audits; Customer Data Protection	Telkom, MDS, AUTO
	Data protection function	Stability of the accounting system; Improved reliability of financial databases	MDS
	Disaster recovery readiness	Sustainability of accounting systems during disruption (digital continuity)	MDS
Digital Asset & Capital Expenditure Transformation	Capex digital (cloud, IoT, data center)	Digital asset accounting; Technology Capex Recording Automation and Digital Asset Amortization	Telkom, AUTO
	EV charging ecosystem	Accounting system for charging services; Digital Filling Session Recording	AUTO

	Energy & utility digital monitoring	Digital recording of energy costs; Automation of overhead cost charging	Telkom, AUTO
Organizational Capability & Strategic Alignment	Digital talent readiness	Utilization of advanced ERP, analytics, and accounting systems; Reduction of manual logging	Telkom
	Digitalization as strategic growth enabler	Adjustment of the account structure; Development of accounting modules for digital assets and transactions	AUTO
	Transformation alignment statement	Adjustment of accounting processes with digital business models	MDS, Telkom

Source: Analyzed Data

This data reduction table shows that the digital transformation of accounting systems at PT Telkom Indonesia, PT Matahari Department Store (MDS), and PT Astra Otoparts (AUTO) takes place through six main domains: (1) digital infrastructure integration, (2) business process digitization, (3) customer digitalization, (4) digital governance, (5) digital asset transformation, and (6) strengthening organizational capabilities. In the first domain, transformation occurs through the integration of infrastructure and digital platforms that enable cross-unit data synchronization. Telkom excels through network reorganization, cloud migration, and data center that accelerates the consolidation of financial statements, while MDS and AUTO develop omnichannel integration and O2O synchronization to ensure that sales, inventory, and accounting records take place in real-time.

In the domain of digitizing business and operational processes, the three companies adopted integrated systems such as ERP, IoT, and reporting automation. Telkom and AUTO use ERP to automate record-keeping and improve the accuracy of accounting analytics. AUTO developed a sensor-based Industry 4.0 system and IoT for production cost assessment and inventory valuation. Meanwhile, MDS and AUTO are driving the digitization of sales flows and cost reporting, and AUTO is strengthening digital invoicing and payment reconciliation automation on its platform ecosystem. This transformation shows that digitalization has modified the core mechanisms of accounting, from transactional record-keeping to an automated process based on real-time data.

The domain of customer digitization and front-end systems shows how customer interaction also affects accounting systems. MDS and AUTO leverage e-commerce platforms to integrate multi-platform transactions and record marketplace commissions and digital sales consolidation. MDS developed digital grievance channels to enter complaint data into the service fee system as the basis for cost-to-serve evaluation. Telkom strengthens the digitalization of MSMEs through a digital payment system that automates billing and transaction reconciliation. This shows that digitalization on the customer side results in a richer, faster, and more integrated flow of financial information. Furthermore, the domains of digital governance and data security show that the three companies prioritize the security and integrity of financial information through strengthening access controls, digital trail

audits, and customer data protection. MDS specifically has data protection functions and disaster recovery procedures to maintain the sustainability of the accounting system. In the digital asset transformation domain, Telkom and AUTO conduct digital asset accounting, technology capex recording, and digital asset amortization. AUTO also develops revenue recording based on EV charging services as well as digital energy and utility monitoring. Finally, in the domain of organizational capability, transformation is strengthened by the readiness of digital human resources and adjustments to account structures and accounting processes to align with digital business models. Thus, this table illustrates that the digital transformation of accounting in the three companies is comprehensive and includes aspects of technology, processes, governance, and organizational readiness.

Data Display: Impacts and Risks of Accounting Digitalization

The digitization of the accounting system has a positive impact on aspects of the accounting system. However, there are risks inherent in the implementation of digitalization. The impact and risks of accounting digitization are summarized in the following table.

Table 6: Impacts and Risks in the Accounting System Digitization

Digital Transformation Areas	Impact	Risks	Company
Infrastructure & Digital Platform Integration	Faster data consolidation; the accuracy of the report is increased; process efficiency (in line with Stender et al., 2025).	Reliance on cloud & IT; downtime; potential for data leakage (Hanfy et al., 2025).	Telkom
	Real-time sales–inventory integration; Improved consistency of transactions.	Risk of data mismatch & API errors.	MDS
	O2O synchronization strengthens stock–sales accuracy.	Risk of transaction timing differences.	AOP
Process & Operational Digitization	Recording automation; reduction of errors; accelerate the reporting cycle (Quinn & Murphy, 2023).	Risk of algorithm errors; system integration failure.	Telkom, AOP
	IoT improves costing accuracy & inventory valuation.	Risk of sensor malfunction; invalid data.	AOP
	Digitizing sales flows improves reporting reliability.	Risk of digital transaction mismatches.	MDS, AOP
Digitalization of Customers & Digital Channels	Consolidation of multichannel transactions; increased revenue accuracy.	Fraud marketplace; API errors; Customer data leakage.	MDS, AOP
	Automated billing & real-time reconciliation improve efficiency (Stender et al., 2025).	Risk of gateway failure; dependency of digital platforms.	Telkom

Digital Governance & Security	Digital trail audits are more robust; improved data integrity; support transparency (Hanfy et al., 2025).	Cyberattacks, malware, and internal misuse threats.	Telkom, MDS, AOP
	Data protection improves system stability.	A single point of failure is when the DR mechanism is weak.	MDS
Digital Asset & Capex Technology	Digital asset accounting; amortization technology is more precise.	Digital asset valuation risk; IT vendor dependency.	Telkom, AOP
	Digital energy & EV charging strengthens the accuracy of digital costs & revenues.	Risk of sensor damage & security of digital energy infrastructure.	AOP
Organizational Capability & Alignment	digital HR enhances ERP & analytics capabilities; supporting a shift in accounting roles (Quinn & Murphy, 2023).	The risk of competence & human error in the digital system.	Telkom
	Adjustment of the account structure for new digital transactions.	The risk of unpreparedness for digital revenue models.	AOP

Source: Analyzed Data

Digital transformation in the three companies shows that the integration of digital infrastructure, whether through cloud computing, omnichannel systems, or O2O synchronization, has a relatively similar impact, namely accelerating data consolidation, increasing accuracy, and reducing manual errors. This is in line with the findings of (24) that digital accounting improves the efficiency and quality of information because data is processed faster and more consistently. However, on the risk side, this area of transformation presents the same threat patterns: high reliance on IT infrastructure, the risk of system downtime, and the potential for data leakage due to the centralization of information on the cloud and digital platforms. (25) emphasized that large system integration without strong governance actually increases the risk of data disruption and systemic errors, especially when data flows involve multiple digital channels such as omnichannel and platform integration.

In the area of digitizing business and operational processes, the positive impacts that have emerged across the company include recording automation, improved costing accuracy, reduced manual workload, and real-time reporting capabilities. These findings are consistent with (26), who stated that digital accounting is shifting the role of accounting from administrative record-keeping to data-driven information processing mechanisms. However, process digitization also presents cross-company risks in the form of reliance on algorithms, the risk of sensor misreading (in IoT technology), the risk of integration between systems, and the potential for automatic errors that have a direct impact on the reliability of financial statements. (24) warn that automation does increase speed, but at the same time magnify the impact in the event of an error because the error will be duplicated throughout the system in real-time.

In the area of customer digitization and front-end channels, the three companies have the same impact pattern: transaction data volume is increasing rapidly, the granularity of customer data is higher, and the company's ability to analyze margins, service costs, and customer behavior has become stronger. However, the biggest risks in this area are also similar, namely digital fraud, API errors, mismatch of multichannel transactions, and customer data leaks. This risk is consistent with the digital commerce and financial reporting literature that says that the expansion of transactional channels increases exposure to data integrity risks and cyberattacks. (27) confirms that the greater the complexity of digital data flows, the higher the likelihood of systemic errors that can affect the quality of financial information if not supported by effective internal controls.

The areas of digital governance and cybersecurity show a very consistent pattern of impact across the three companies. Digital transformation strengthens audit trails, improves data integrity, and supports reporting transparency. At the same time, however, the risk of cyberattacks, including malware, social engineering, and illegal access, is a risk that the entire company experiences. (25) emphasize that governance is directly related to the quality of digital reporting: when controls are weak, digitalization actually increases the risk of data manipulation and distortion of reports. Therefore, strengthening control mechanisms, data protection, and disaster recovery is a must for all companies that digitize accounting.

Finally, the area of digital asset transformation and strengthening organizational capabilities gives rise to the same impact pattern at the strategic level. Digitalization introduced new forms of recording such as digital asset accounting, technology amortization, and sensor-based cost assessment. Companies gain greater flexibility in business innovation and the ability to analyze costs with precision. However, (24) states that this transformation requires new human resource competencies; Lack of digital skills is actually a source of operational risk. This risk is universal: unprepared HR can lead to misinput, misconfiguration of the system, or failure to understand algorithm logic, so that technical errors can transform into accounting errors.

CONCLUSION AND DISCUSSION

Based on the stages of data reduction and display, as well as the determination of the level of digitization referred to in [1] and [15], conclusions can be drawn as listed in the following table.

Table 7: Conclusion Across Companies

Key Conclusion Aspects	Conclusion Across Companies (Telkom – MDS– AUTO)
Common Patterns of Digital Transformation	All three companies show a consistent pattern of transformation: the move from manual and separate accounting systems to an integrated information ecosystem through ERP, cloud computing, IoT, and digital platforms.
Accounting Process Transformation	Modernization occurs across the entire accounting cycle (record-keeping, reconciliation, costing, and reporting) through real-time data automation

	and integration. Accounting functions as *a strategic information system*, not just a recording tool.
Technology Integration & Digital Platform	Even though they come from different sectors, the three companies apply similar technology integrations, such as ERP, cloud, omnichannel/O2O systems, and IoT-based accounting. This strengthens data cohesion and improves the accuracy of information across units.
Changes in the Role of Accountants	Accountants in all three companies are facing a shift in role from *transaction recorders* to *data analysts*, with a focus on digital data interpretation, sensor/automation understanding, and the use of reporting dashboards.
Strengthening Digital Governance	All three companies place cyber governance as the main foundation. Strengthening cybersecurity, data privacy, disaster recovery, and digital trail audits are the key to maintaining the reliability of technology-based financial reporting.
Organizational Capabilities and Readiness	Digital transformation requires increasing digital talent, analytical skills, IT literacy, and organizational adaptation readiness. Third, companies develop human resource competencies to ensure that digital operations run effectively.
Cross-Case Synthesis (Final Conclusion)	The level of digitalization varies but shows a similar trend: Telkom and AUTO are at a high level of digitalization (cloud, IoT, automation), while MDS is at the intermediate level focusing on omnichannel and POS-ERP integration. However, all three show the character and direction of digital transformation of accounting that are relatively in line.

Source: Analyzed Data

The cross-case synthesis shows that despite coming from different sectors, the three companies are experiencing a relatively similar pattern of accounting digital transformation, namely a shift from a conventional accounting system to an integrated, automated, and digital technology-based information architecture. The integration of ERP, cloud computing, IoT, omnichannel, and digital platforms is the main foundation of change. This transformation not only modernizes the recording and reporting process, but also results in a financial information system that is real-time, cohesive, and capable of handling large volumes of data. This pattern of uniformity shows that accounting digitization has become a structural need across industries, no longer just an individual company's technology choice.

Furthermore, the synthesis shows that the automation of accounting processes and digitization of transaction channels have similar implications for the three companies, namely increasing data accuracy, consistency across channels/units, operational efficiency, and shifting the role of accounting to an analytics-based strategic function. Technology integration also encourages the strengthening of digital governance through cybersecurity, trail audits, and data protection, so that accounting not only functions to produce reports, but also maintains the integrity and legitimacy of financial information in the digital ecosystem. However, the similarity of these patterns also points to equal challenges, such as the risk of system dependency, the need for stronger digital controls, and the demands of higher human resource competencies to operate digital technology effectively. Finally, the cross-case synthesis confirms the difference in the level of digital maturity, where

Telkom and AUTO are at a higher level of digital maturity through the use of cloud, IoT, manufacturing automation, and the integration of more complex digital platforms. Meanwhile, MDS is at the medium/median level of digitalization with a focus on omnichannel and POS–ERP integration. Nonetheless, the direction of the third transformation is consistent: all companies are moving towards a strategic accounting model that relies on real-time data, cross-system integration, and process automation to support faster and more accurate decision-making. This shows that accounting digitization is no longer just a technical modernization, but a structural change that reconstructs the accounting function in modern organizations.

IMPLICATIONS, RECOMMENDATIONS, AND SUGGESTION

Cross-case findings show that the digital transformation of accounting has resulted in significant structural changes for all three companies, especially in terms of data integration, process automation, and strengthening digital governance. The theoretical implication is that digitalization not only accelerates the accounting process, but also transforms the role of accounting into a data-driven strategic function, thus demanding the development of new accounting models that are more adaptive to cloud computing, IoT, and multichannel integration. Practically, companies need to ensure that digital infrastructure, governance mechanisms, and HR competencies go hand in hand as a systemic unit; If any of the components are weak, the quality of financial information and the stability of the accounting process may be compromised. Therefore, accounting digitization must be understood as a long-term effort that simultaneously encompasses technology, organizational, and data policy aspects.

Based on these implications, this study recommends that companies strengthen HR capabilities through data analytics training, understanding ERP system algorithms, IoT utilization, and cybersecurity literacy to minimize systemic risks related to digitalization. In addition, organizations are advised to establish more stringent digital governance, including digital trail audit procedures, periodic security testing, and standardized disaster recovery mechanisms to maintain the integrity of accounting information. Companies at the intermediate level of digitalization, such as PT Matahari Department Store Tbk, are encouraged to gradually increase system integration and adoption of sensor-based technologies, while companies that are already at a high level of digitalization need to expand the use of real-time data to support strategic decision-making. Thus, this recommendation is expected to strengthen organizational readiness to face the evolving dynamics of digital transformation.

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