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FROM TRADITIONAL TO DIGITAL: AN EXAMINATION OF THE EVOLUTION OF E-COMMERCE AND E-COMMERCE ACCOUNTING		
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ABSTRACT

This article explores the historical evolution of commerce and its transformative effect on accounting systems. It begins by discussing the classical definitions of trade by thinkers like Ibn Khaldun and Adam Smith to establish the core principles of traditional commerce. The study then analyzes the historical development of e-commerce, from its early steps with technologies like Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) in the 1970s, to the rise of online marketplaces like Amazon and eBay in the 1990s, and to the emergence of mobile and social commerce in the 2000s. The primary focus of the article is on the innovations e-commerce has brought to traditional accounting models. These include a shift to a more flexible accounting framework, the adoption of digital documents, the complexity of revenue recognition processes, and the increased role of automation. It also addresses the new challenges of international taxation and currency fluctuations. In conclusion, the article argues that e-commerce has become more than just a sales channel; it has created a new paradigm for the field of accounting, setting the stage for future research.

Keywords: E-commerce, Accounting, Commerce, Global Trade

1. INTRODUCTION

Trade has played a central role in the development of human civilizations throughout history and has always been a key driver of economic growth (Maddison, 2007). Evolving from a barter economy to international trade and ultimately to a digital environment, this concept has remained a fundamental area of study for disciplines like business and accounting (Acemoğlu & Robinson, 2012). The most significant reflection of this transformation, which deeply influences the dynamics of the modern business world, is the rise of e-commerce (electronic commerce) over traditional commercial activities. E-commerce is not just a shopping method; as part of digital transformation processes, it also plays a critical role in helping businesses achieve their strategic goals (Sharma, Srivastva, & Fatima, 2023)

This article will focus on the birth and historical development of e-commerce, starting from the classical definitions of trade by thinkers like Ibn Khaldun. It will conduct a comprehensive analysis of the innovations and challenges this transformation—accelerated by the COVID-19 pandemic (Pavić, 2024)—has brought to traditional accounting models, to fill gaps in the existing literature. The study seeks to demonstrate what this transformation means for the accounting profession and businesses, arguing that it represents a paradigm shift rather than a simple adaptation, and supporting this claim with

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scholarly work. Current global trade reports show that the volume of e-commerce is growing exponentially each year, shifting a significant portion of the traditional retail sector to digital platforms (UNCTAD, 2023). In this context, the new dynamics brought by e-commerce, such as complex transaction structures, the valuation of virtual assets, multi-currency transactions, and cross-border taxation, necessitate a re-evaluation of existing accounting principles and practices (Krugman, Obstfeld, & Melitz, 2018). This article aims to address the driving forces behind this transformation, its implications for accounting processes, and potential future research areas from an interdisciplinary perspective.

With the widespread adoption of e-commerce, businesses are now required to analyze not only physical products but also digital data (such as website traffic, customer behavior, digital ad revenue, etc.). This has transformed traditional sales processes into a data-driven and complex ecosystem. A sale is no longer just a billing transaction; it is also part of the data that reflects digital marketing performance. In this context, Customer Lifetime Value (LTV) analysis enables businesses to integrate both physical and digital data to develop more comprehensive marketing strategies (Detscher & Würtenberger, 2025).

This article examines the impact of e-commerce on accounting not only from a technical standpoint but also from operational and strategic perspectives. The main idea of the study is the challenges brought by digitalization and the integration of automation into accounting processes. The article argues that e-commerce is fundamentally changing the accounting profession, and in the future, accountants will take on roles such as data analysis and strategic consulting instead of just record-keeping. In conclusion, this research provides important insights into how e-commerce is transforming accounting and auditing processes (Darmiono & Pratiwi).

2. THE CONCEPT OF COMMERCE, ITS DEFINITION, AND TRADITIONAL APPROACHES

2.1. The Historical Development of Commerce: From Simple Exchange to a System of Wealth Creation

The concept of commerce has been interpreted according to different economic and social conditions throughout various periods. Initially viewed as little more than a simple buying and selling process, it has gained a much more comprehensive meaning over time. The Islamic scholar Ibn Khaldun defined commerce as a “profit”-oriented activity that comes from acquiring goods and services at a low price and selling them at a high one. However, in Ibn Khaldun’s view, labor is the source of all value and profit. In his seminal work, *Muqaddimah*, he explained that a commodity’s true value originates not just from its raw materials but from the human effort applied to it. In this context, the profit a merchant earns is essentially the value of the labor they “command” to acquire goods in one place and sell them in another. This concept which is often seen as a precursor to Adam Smith’s “labor theory of value,” elevates commerce from a simple act of exchange to a fundamental driver of wealth creation. This perspective highlights that commerce is a productive economic activity, not just a matter of price arbitrage (Khalil, 2007).

In Adam Smith's work “The Wealth of Nations,” trade is much more than a simple buying and selling transaction. According to Smith, trade is a dynamic and complex system that operates on principles such as division of labor and personal interest, which are vital for a nation’s prosperity. This system not only involves the exchange of goods but also encompasses many processes such as information sharing, marketing, payment, and logistics. Smith’s broad definition illustrates how trade can trigger economic development and social progress at the macro level, laying the foundations for today’s economy (Smith, 1776).

In the ever-evolving tapestry of global society, economic principles play a critical role in the survival and advancement of humanity. Understanding economic principles is not just an academic pursuit but a necessity for addressing the world’s most pressing challenges (Rafiyya & Kraiwanit, 2024).

2.2. The Rise And Definition Of E-Commerce

Electronic commerce (e-commerce) transforms traditional commercial activities into a digital format, encompassing the entire lifecycle of products and services, including production, promotion, sales, distribution, and payment. Its operational structure consists of advertising and market research, ordering and payment through payment gateway integration, and product delivery with advanced logistics management. This transformation has reduced fixed costs and increased investment in digital channels, with data analysis playing a crucial role in developing personalized marketing strategies and enhancing customer experiences. However, e-commerce has also introduced new legal and regulatory challenges, such as protecting consumer rights, complying with online privacy regulations like GDPR, and managing withdrawal rights. Additionally, robust cybersecurity protocols, including SSL/TLS encryption, are now mandatory for securing digital transactions (Erdoğan, 2010).

Despite high internet usage and knowledge of information technology, there are significant gaps in consumers' understanding of personal data protection measures. While the GDPR has increased trust among middle-aged users, many do not consistently follow the recommended security practices. As a result, this study emphasizes the need for effective implementation of regulations and ongoing consumer education to create a secure e-commerce environment. It also advocates for collaboration between regulatory agencies and e-commerce businesses to enhance compliance and consumer trust (Morić, Dakic, Djekic, & Regvart, 2024)

3.THE HISTORICAL DEVELOPMENT OF E-COMMERCE

3.1. The Evolution of Digital Commerce: A Historical Perspective

The evolution of e-commerce is a gradual process that represents the transformation from localized physical exchanges to a global digital ecosystem. The foundations of modern e-commerce were established in the 1970s with the development of computer networks and data communication. During this period, the digitization of business-to-business (B2B) processes was achieved through Electronic Data Interchange (EDI) systems, enabling the secure and automatic exchange of important documents. These developments facilitated supply chain operations and reduced costs. The adoption of corporate digital transaction systems was a critical precursor to internet-based e-commerce, proving that trust and value could be established through digital transactions. Ultimately, this process laid the groundwork for the broader e-commerce ecosystem that expanded with public access to the internet (Wigand, 1997)

The development of Electronic Funds Transfer (EFT) was a significant step in the evolution of commerce, facilitating the transition from the digital exchange of documents to the transfer of money itself. In the 1980s, the adoption of automated systems, such as the Automated Clearing House (ACH), enabled transactions like payroll deposits, ATM withdrawals, and point-of-sale (POS) purchases to be conducted without physical checks or cash. These systems significantly increased the speed of payments while also enhancing security. The principles of EFT provided the necessary infrastructure for online businesses and evolved further with the rise of mobile technologies. Modern EFT expanded from inter-bank transfers to mobile payment systems and peer-to-peer platforms, laying the groundwork for today's digital payment landscape. These advancements are based on the use of electronic data processing for financial transactions (Kraemer & Colton, 1979).

3.2. The Spread of the Internet and the E-commerce Boom (1990s)

The 1990s marked a significant turning point in the history of e-commerce; with the public release of the internet, online platforms were established, and consumers began shopping in a digital environment. This process, known as the "dot-com boom," was accelerated by two main developments: the internet becoming accessible and the creation of commercial infrastructures. Pioneering companies like

Amazon.com and eBay transformed e-commerce by redesigning traditional retail models. Additionally, SSL (Secure Sockets Layer) encryption was developed to ensure secure financial transactions; this technology helped protect user data and facilitated the widespread adoption of online shopping. The 1990s are remembered as a critical period for the public introduction of e-commerce and the securing of online payments (Hassan et al., 2020; Wang et al., 2017).

3.3. The Rise of Mobile Commerce (M-commerce) and Social Commerce (2000s-2010s)

The early 2000s marked the birth of mobile commerce (m-commerce) with the widespread adoption of mobile devices. This period offered consumers new freedom by making shopping independent of desktop computers. Early smartphones and PDAs allowed consumers to carry internet-connected devices in their pockets, enabling product browsing, ordering, and payment to become portable. M-commerce also introduced the power of context and location; consumers could receive discount notifications while passing by physical stores or compare prices on the go. Mobile apps provided a more seamless and personalized experience compared to traditional websites, enhancing customer engagement. As a result, m-commerce emerged as a dominant force in the global retail landscape (Dholakia & Dholakia, 2004).

The 2010s marked a significant turning point in e-commerce history with the powerful integration of social media. Businesses shifted from merely maintaining an online presence to actively engaging with customers on platforms like Facebook and Instagram. This process led to the birth of social commerce, transforming social media into a direct sales channel. Consumers could now complete product discovery and purchasing processes directly within social apps. Influencer marketing leveraged the trust of social media personalities, allowing brands to promote their products effectively. Additionally, live shopping and shoppable posts accelerated the purchasing process. This decade was characterized by a shift from brand-centric communication to a more dynamic, social, and user-driven shopping experience (Zak & Hasprova, 2020).

3.4. The Accelerating Effect of the Pandemic and Future Trends

The COVID-19 pandemic, which began in 2020, unexpectedly acted as a catalyst for the rapid growth of e-commerce. Quarantine and social distancing measures drove consumers away from physical stores and toward online shopping, leading to a significant increase in e-commerce volume. Even those who had previously been hesitant began to adopt online shopping for everything from groceries to household goods. This digital transformation made e-commerce a vital engine of the global economy and permanently altered consumer habits. The rapid changes in consumer behavior during the pandemic heightened the importance of interdisciplinary fields such as behavioral economics and neuromarketing (Gedik, 2020).

E-commerce businesses leveraged fields like neuroeconomics and neuromarketing to understand customer behavior better. These methods allowed them to analyze consumers' brain responses and subconscious motivations, enabling the development of more effective marketing strategies. By understanding how factors such as fear, uncertainty, and convenience influence purchasing decisions, businesses optimized their platforms to enhance customer satisfaction. The pandemic accelerated the adoption of digital payment technologies due to the need to avoid physical contact, leading to a significant increase in the use of mobile wallets and contactless payment options. This process transformed e-commerce from merely a logistics platform into a complex ecosystem centered on human psychology and behavioral science (Pavić, 2024).

4. E-COMMERCE ACCOUNTING AND ITS DIFFERENCES FROM TRADITIONAL ACCOUNTING

4.1. The Transformation of Modern Accounting: Challenges and Changes in the E-commerce Era

The dynamic nature of e-commerce has transformed accounting processes from a paper-based structure to an automated and digital approach. E-commerce activities, occurring in online environments, have made accounting subjects more fluid and less defined, while automation has become a fundamental necessity. Businesses now use cloud-based software that integrates with sales channels and payment systems for real-time data tracking, reducing manual errors. This transformation has made accounting an interdisciplinary field intersecting with technology and operations, demonstrating that e-commerce is far more than just a logistics platform (Jiao Ying, 2022).

With the rise of e-commerce, traditional accounting's paper-based documents have been replaced by electronic ones. This digitalization has made accounting processes more efficient, but has also introduced challenges regarding authenticity and security. Electronic documents offer advantages in storage and access, simplifying audits and enabling real-time transaction tracking. However, the ease of altering digital files makes it difficult to verify the authenticity of transactions. To address these issues, e-commerce businesses have developed new security protocols, including digital signatures, certificates, and are exploring Blockchain Technology. Additionally, Secure Payment Gateways that utilize encryption play a crucial role in protecting sensitive data (Wang Lu, 2019).

The rise of e-commerce has complicated accounting processes and the revenue recognition principle. New sales models, particularly pre-orders and high return rates, make it difficult to determine when revenue should be recognized. In pre-orders, cash flow occurs before product delivery, meaning the payment cannot be booked as revenue immediately and must be recorded as a liability. High return rates require companies to estimate potential returns and use new approaches to report net revenue accurately. This situation has forced accountants to adopt more dynamic and analytical methods (Ye Runlin, 2020; Wu Sidan, 2025).

4.2. Changes in the Accounting Process

The e-commerce accounting process is an effective four-stage cycle that leverages technology to provide up-to-date financial information.

Transaction Data Collection: This stage occurs automatically; specialized software records every transaction (sales, refunds, fees) in real time.

Accounting Processing: Collected data is processed according to accounting principles; the software automatically updates debits and credits, inventory, and costs.

Account Closing: This stage is also automated; the software reconciles bank and payment statements to verify transactions and generates adjusting entries.

Report Preparation: In the final stage, financial data is transformed into actionable reports, enabling business owners to make quick, data-driven decisions.

In summary, the e-commerce accounting process automates manual tasks, providing financial clarity and control(Xue, 2023).

4.3. Expansion of Accounting Objects and Content

The proliferation of e-commerce has expanded the scope of accounting from traditional physical assets to include intangible assets and digital resources. The value of companies now increasingly comes from

non-physical elements such as intellectual property rights, customer databases, and website traffic. This shift challenges the core principles of traditional accounting and requires accountants to use new approaches, such as the income method. As a result, e-commerce has transformed accounting into a more complex and strategic field, highlighting the importance of new skills for future accountants (Furu, 2020).

The impact of computerization on accounting records, combined with the dynamic nature of e-commerce, significantly enhances the accuracy and reliability of financial reporting. Automation reduces data entry errors while speeding up accounting processes, providing managers with faster and more accurate information. As a result, e-commerce businesses can monitor their financial status in real time and become more responsive to market conditions. This strengthens the role of accountants in strategic decision-making processes and enhances the competitive power of companies (Türegün,2020)

The rise of e-commerce has expanded accounting information to include data derived from digital activities. Now, information such as transaction data, user behaviors, and the results of digital marketing go beyond traditional financial records. Detailed transaction data helps track the customer journey, while user behavior data aids in analyzing the effectiveness of the business's online presence. Additionally, the results of digital marketing campaigns are linked to revenue, allowing for the calculation of critical metrics like ROAS and CAC. This shift transforms accounting into a more strategic and analytical function (Jiamei, 2020).

As digital transformation reshapes industries, marketing strategies increasingly rely on data-driven insights, making metric tracking a cornerstone of effective marketing efforts. The research examines the most frequently used metrics in digital marketing and evaluates their relevance for contemporary business needs, especially for companies adapting to an evolving technological landscape (Mamontova, Myronchuk, Denysenko, & Levchenko, 2024).

4.4. Global Transactions and Taxation Challenges

The global scale of e-commerce has increased the challenges faced by traditional accounting systems. Cross-border transactions involve complex factors such as foreign exchange rate fluctuations, customs tariffs, and varying taxation processes. This requires accounting professionals to be knowledgeable in both local and international tax laws. Accounting systems need to have the capability to monitor real-time exchange rates and manage international taxation accurately. This situation has transformed accounting from a local discipline into a global field, making it more dynamic and specialized (Ning, 2024).

CONCLUSION

This study provides an in-depth analysis of the historical evolution of the concept of commerce, examining how the emergence and development of e-commerce have introduced innovative paradigms to the field of accounting. E-commerce has transformed from a classical focus on profit and arbitrage into a multidimensional ecosystem driven by digitalization and globalization, fundamentally reshaping the core principles of accounting. This transformation has not only altered the manner in which commercial activities are conducted but has also significantly impacted the processes of recording and reporting financial information.

Traditional accounting systems, characterized by manual, paper-based, and static structures, have transitioned to a digital, automated, and real-time model with the adoption of e-commerce. This radical transformation has accelerated accounting processes and enhanced efficiency. For instance, automated data processing and reporting systems enable accounting tasks to be carried out much more swiftly, thereby expediting decision-making processes within businesses. Furthermore, the scope of the

accounting profession has broadened, transforming accountants from passive record-keepers into active business partners.

Accounting professionals are now tasked not only with the accounting of tangible assets but also with complex issues such as the valuation of intangible assets, the financial impacts of digital marketing campaigns, and the taxation of international transactions. These new responsibilities necessitate that accountants possess skills in digital literacy and data analysis, in addition to financial literacy. Particularly, the innovative tools and software brought about by digital transformation have contributed to making the accounting profession more dynamic.

This article comprehensively illustrates the critical contributions of e-commerce to accounting science and its practical implications for businesses. However, this transformation remains a dynamic process, and further research is required to explore ongoing changes. Future studies could focus on the potential impacts of disruptive technologies such as blockchain and artificial intelligence on e-commerce and accounting. Blockchain technology, with its decentralized and immutable structure, can enhance the transparency and security of transaction records, simplifying auditing processes and minimizing the risk of fraud. Meanwhile, AI-based algorithms have the potential to analyze large datasets, make more accurate predictions, automate financial reporting processes, and provide stronger support for businesses in their strategic decisions.

In conclusion, as e-commerce becomes an inseparable part of global economic life, the effects of this digital transformation on accounting processes will continue to be explored in depth within both academic and practical domains. This ongoing evolution indicates that the future of the accounting profession will not only involve adapting to existing regulations but also necessitate taking on roles that generate innovative solutions and provide strategic consulting. In this way, accounting will transition from being merely a tool for financial record-keeping to a vital strategic decision-support mechanism for sustainable growth and competitiveness.

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