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# Transformative Impact of AI and Digital Technologies on the FinTech Industry: A Comprehensive Review

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## ABSTRACT

This paper examines the impact of artificial intelligence (AI) and digital technologies on the financial technology (FinTech) industry and demonstrates how AI-enabled strategies are increasing the ability of businesses not only to grow, but also to better serve their customers through operational efficiencies. But as immersive as the technological advancements may be, they present challenges in connection with increasingly complicated licensing regulations and a constantly evolving technological landscape. We examine the way AI and algorithms are streamlining workflows, enhancing productivity and expanding access to financial resources for traditionally under-served populations. The paper also discusses the macroeconomic implications of AI, and examines the implications -especially related to employment environments and consumer behavior. Finally, this paper examines the influence of strong digital leadership on organizational success, to prepare organizations for AI in the financial services sector, and recognizes the possibilities that technology can generate for economic development. We also touch on blockchain applications that could potentially impact both consumers and behavioral adaptation in financial systems; the implications of digital transformation on economic efficiency; and the policy-related legal implications and frameworks that exist around electronic payment systems. In sum, this paper highlights the significant transformational possibilities that AI and digital technologies can create for FinTech, and has potential relevance for future academic researchers and policy considerations.

## **Introduction**

This manuscript examines the influence of artificial intelligence (AI) and digital technologies on financial technology (FinTech). FinTech is undergoing major changes spurred by AI adoption and digital technology advancements. [2]. This systematic review looks into the importance of AI-enhanced strategies in developing successful business and growth in FinTech. There are considerable problems that the sector needs to overcome, such as the regulatory complexities and the challenge of adopting new technology [5]. There are great opportunities to use AI and algorithmic approaches to automate processes, enhance productivity and advance financial inclusion [4].

One of the main challenges faced by FinTech firms lies in the dual necessity of adopting advanced technologies while also navigating complex legal and regulatory environments [6]. This paper proposes solutions through the adoption of AI and algorithmic techniques, which are shown to automate processes and significantly enhance organizational productivity. This approach not only addresses the immediate needs of businesses but also promotes financial inclusion by broadening service accessibility [8]. The effectiveness of these strategies is underscored by the implementation of comprehensive commodity distribution management systems [15], electronic payment solutions, and a unified billing gateway, all while optimizing resource use [11]. The paper suggests future enhancements could be achieved by refining AI models to improve decision-making and operational efficiencies [2], especially for clients with limited access to technology.

Financial decision-making is a critical area of interest within the FinTech sector [3]. Characterized as the gathering and use of assets over time, financial decision-making reflects how individuals manage their budgets, determine payment methods, finance purchases, and plan for short- and long-term savings [3]. This review presents progress in studying financial decision-making in the marketing field and identifies opportunities for further exploration. Core topics in financial decision-making research are overviewed, along with a proposed framework for understanding consumer financial decision-making [3].

The rise of AI applications in contemporary economies, societies, and technologies is undeniable [4]. Smart FinTech, through the use of data science and AI (DSAI) methods, is innovating modern finance and economic systems by creating intelligent, automated, and tailored financial services [4]. Research studies related to DSAI in FinTech have addressed multiple issues across BankingTech, TradeTech, LendTech, InsurTech, WealthTech, PayTech, RiskTech, cryptocurrencies, and blockchain [4]. This paper discusses the DSAI methodologies of deep learning, privacy-preserving computing, and optimization in the finance domain, and aspects of the importance of an AI-driven framework of integration in existing financial practices. Future research may discuss the development of stronger algorithms of AI that can be tailored to the needs of the area of finance.

Digital leadership also holds a crucial role in attaining high organizational performance, especially in the banking sector. The effect of digital leadership on organizational success and client satisfaction is analyzed, emphasizing the importance of banks organizing training sessions and workshops for staff on the effective use of digital tools [8]. The results of this study reveal a substantial influence of digital leadership on boosting customer contentment, generating data-driven understanding, enhancing operational productivity, and cultivating a culture of workforce excellence. Technological change significantly impacts Workplace efficiency and client contentment [8]. An examination of manufacturing facilities indicates that technological change positively influences both organizational productivity and customer satisfaction [8]. Factors such as age, job position, place of work, and employee experience significantly influence the perceived impact of technological change [8]. Electronic trading systems are essential in facilitating the link between dividend distributions and banking liquidity [9]. The research demonstrates enduring relationships between banking liquidity and dividend strategies, with the digital platform notably influencing these dynamics [9]. Technological advancements enhance banking liquidity by encouraging international investments, thus boosting overall bank performance [9].

The impact of AI on digital transformation within banking institutions is analyzed [9]. The present landscape of AI integration, including its motivators and obstacles, is investigated [13]. Financial organizations are encouraged to allocate resources towards AI and create strategic approaches for its deployment to maximize its advantages [25].

This section delves into the relationships between NFTs, DeFi tokens, and leading cryptocurrencies. The analysis reveals minimal spillover effects between these digital assets and conventional financial markets, indicating that NFTs and DeFi tokens present distinct opportunities for portfolio diversification [18]. Additionally, the study examines the connections among Non-Fungible Tokens (NFTs), Decentralized Finance (DeFi) tokens, and cryptocurrencies, focusing on risk transmission and diversification possibilities within blockchain markets, employing advanced methods such as the quantile connectedness approach [19]. It also addresses the integration of blockchain technology, cryptocurrencies, and artificial intelligence (AI) in the financial sector, assessing blockchain's potential to decentralize and democratize financial services and AI's evolving role in banking, lending, and asset management [21]. Furthermore, the review touches on the debates surrounding central bank digital currencies (CBDCs) and their effects on market liquidity and stability. These insights are crucial for grasping the transformative impact of these technologies on the finance industry [21].

The economic impact of AI is significant [39], especially regarding employment markets and consumer behavior [26]. This review examines the expanding body of research on the diverse economic consequences of recent AI advancements, with a particular focus on machine learning applications. It investigates AI's influence on businesses, including its effects on the workforce, productivity, skill requirements, and innovation, as well as its role in shaping consumer behavior and market dynamics. The review concludes by addressing how public policies can manage the transformative changes currently underway and expected in the future for both businesses and consumers [26].

A key area of emphasis is the application of alternative and big data in finance [40]. The incorporation of machine learning and AI in analyzing large datasets allows for more precise forecasts, risk evaluations, and tailored financial products, greatly improving the efficiency and effectiveness of financial decision-making [40]. Additionally, the review explores FinTech lending, focusing on the enhancement of interest rate optimization through AI technologies [39]. It underscores how personalized interest rates can optimize total expected revenue while complying with total loan capacity limits, illustrating the critical role of data and technology in FinTech lending [39].

The article indicates the remarkable potential for AI to initiate disruptive progress, future technology transformations, and implications for the Financial Technology (FinTech) sector., while simultaneously discussing future research possibilities and policy implications. A review of the role of AI to change consumer behavioral performance and market competition highlights critical discussion areas. This review article is important as it provides an understanding of potential organizational progress and innovation within the FinTech industry based in AI mechanics.

## **Section1: AI and Consumer Behavior in Fintech**

### **1.1: AI, businesses, and consumer behavior**

Recent developments in AI have gained attention for their substantial economic effects and are anticipated to present new trade-offs thereby creating another set of challenges for policymakers [1]. The impacts of these technologies on the labor market and businesses are now being studied which has prompted questions about how algorithms influence biases in consumers and market competition. This review will review the more extensive literature on the complicated economic impacts of AI in its latest forms, with emphasis on machine learning systems. The review describes the impacts of AI on businesses through the upside of employment, productivity, skills, innovation, one of AI's effects on consumer behavior, and potential economic outcomes of the application of AI on consumer market

behavior[1]. The review concludes with some reflections on how public policy can address the ongoing changes and those we can expect in the future had effects on firms and consumers [1].

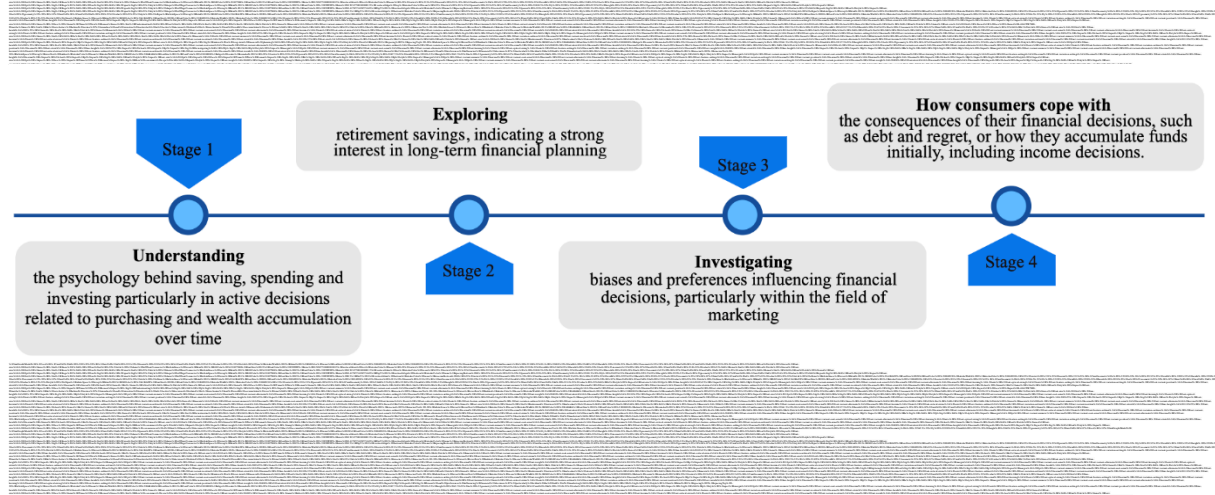
### 1.2: AI-Enhanced Strategies for Business Success in FinTech

In the realm of the digital transformation revolution, the integration of AI-enhanced strategies is explored as a pivotal element for fostering business success and expansion in the financial technology (FinTech) sector [2]. It is identified that the main challenge faced by FinTech firms lies in the dual necessity of adopting cutting-edge technologies while also navigating the complex legal and regulatory landscape [2]. A solution is proposed through the adoption of artificial intelligence and algorithmic techniques, which are shown to automate processes and significantly enhance organizational productivity. This approach not only addresses the immediate needs of businesses but also promotes financial inclusion by broadening service accessibility [2]. The effectiveness of these strategies is underscored by the conclusion, which reveals that customer business outcomes are markedly improved through the implementation of comprehensive commodity distribution management systems, electronic payment solutions, and a unified billing gateway, all while optimizing the use of resources. The paper suggests that future enhancements could be achieved by further refining AI models to improve decision-making and operational efficiencies, especially for clients with limited access to technology [2].

### 1.3: Consumer Financial Decision-Making: Past Insights, Future Directions

This special issue of the Journal of Association of Consumer Research investigates financial decision-making, which is defined as acquiring and spending resources over time. Consumer behavior is exhibited in how they budget, pay for products and services, finance their purchases, or plan their spending in the near or distant future through saving. Financial decision-making literature has always attracted the interest of some marketing scholars for study in some form, but has only more recently been interested in marketing and consumer research. A particularly powerful special issue in 2011 published at the Journal of Marketing Research elevated the notion of financial decision-making to the forefront of consumer behavior studies. The current introduction will consider an overview of progress related to studies in financial decision-making in marketing, highlight potential research domains, and offer a general review of a sampling of the articles in this special issue with a proposed framework for understanding the subject area.

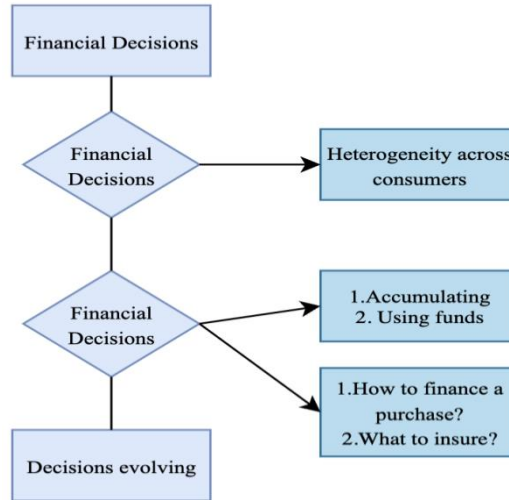
**Figure1:** Proactive choices related to buying and managing wealth over time [3]



The graph shows four steps in financial decision-making. In Step 1, it is all about understanding the mind processes of saving, spending, and investing. Step 2 introduces retirement savings and the financial planning of the long term. Step 3 is about biases and our preferences which affect financials decisions,

which occur especially in marketing. Step 4 discusses the consumption of financial decisions with the example of debt and income accumulation[3]

**Figure2** : Understanding the decision makers [3]

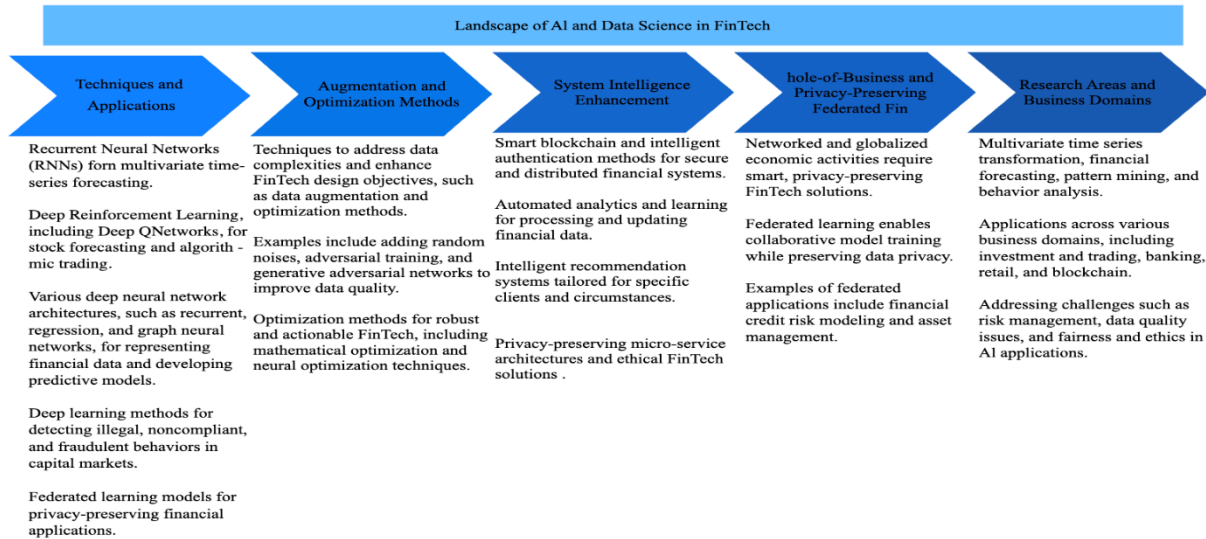


This graph illustrates the complexity of financial decisions and how they vary among consumers. It shows the differentiation in financial choices based on consumer heterogeneity, involving the accumulation and use of funds, decisions on financing purchases, and determining what to insure. It highlights the evolving nature of these decisions as consumers' needs and circumstances change[3].

#### 1.4: Data Science and AI in FinTech

Financial technology (FinTech) is increasingly pivotal in shaping contemporary economies, societies, and technological advancements. Advanced FinTech solutions, powered by data science and artificial intelligence (DSAI), are revolutionizing finance and economic systems through intelligent, automated, and personalized services [4]. Research on DSAI in FinTech addresses a range of challenges across areas like BankingTech, Trade-Tech, LendTech, InsurTech, WealthTech, PayTech, RiskTech, cryptocurrencies, and blockchain. This paper specifically examines how AI integration into financial systems can enhance operational efficiency and effectiveness [4]. It explores DSAI methods such as deep learning, privacy-preserving techniques, and optimization strategies[4]. The study provides a comprehensive overview of smart financial services and their associated challenges, highlighting the significance of AI-driven integration approaches. Future research could focus on developing more sophisticated AI algorithms tailored to the specific requirements of the financial sector [4].

**Figure3:**Overview of AI and Data Science in FinTech[4]



This graph illustrates the landscape of AI and data science in FinTech, focusing on key areas such as techniques and applications, augmentation and optimization methods, system intelligence enhancement, business-wide privacy-preserving solutions, and research domains. It highlights the integration of advanced AI methods, the importance of data privacy, and the application of AI across various financial sectors, addressing challenges like risk management and ethical considerations[4].

## Section 2: Digital Leadership and Transformation

### 2.1: The Impact of Digital Leadership on Attaining Organizational Success in Banking Sector

This study investigated the role of digital leadership in achieving organizational success within banking sector. A survey research was utilized, targeting all employees and customers of banks [5]. Due to limited individual data on bank staff and customers, a theoretical population was used. The sample size of 163 was determined using the Cochran method [5]. A structured questionnaire was the primary research tool, and both descriptive and inferential statistics were used for data analysis. The findings, presented in tables, demonstrated a significant impact of digital leadership on organizational success and customer satisfaction in Jordanian banks [5]. Digital leadership was shown to improve customer satisfaction, drive data-driven insights, enhance operational efficiency, and create a culture of employee excellence. The study recommended that banks implement additional training and workshops to help employees effectively use digital tools to enhance job effectiveness [5].

### 2.2: The Impact of Artificial Intelligence Techniques on the Digital Transformation of Banking Systems

This study investigates the significance of artificial intelligence (AI) in the digital transformation of some listed banks. It explores the current state of AI adoption within financial sector, including the drivers and challenges associated with this technology [6]. Using a deductive research methodology, the study examines the impact of AI on various financial functions such as risk management, fraud detection, and customer service. The findings indicate that some financial industry is still in the early stages of AI adoption, with limited awareness of its potential benefits [6]. Financial institutions are encouraged to invest in AI and create a strategic plan for its implementation to fully leverage its advantages. The study also highlights that Robo advisors, blockchain, and AI methods are contributing to the digital transformation of Jordan's banking system, while the second null hypothesis was rejected due to its lower relevance [6].

### 2.3 The Impact of Digital Accounting Systems on the Quality of Financial Information within Digital Transformation

This qualitative analysis seeks to assess the current implementation of digital accounting solutions by

interviewing financial managers and reviewing existing studies and relevant research. An in-depth examination of the collected data was conducted [7]. The study found that digital accounting solutions will significantly influence future accounting practices. The most accurate and comprehensive datasets available for practical accounting use will provide analytics for digital accounting, enhancing compliance and decision-making [7]. Additionally, digital accounting solutions are expected to save both time and money. A major challenge associated with these systems is security threats. Expanding training within organizations will better equip financial managers to handle the digital transformation of their companies and effectively use digital accounting technology [7]. The study also highlights the importance of training in managing digital accounting systems and offers managerial guidance for optimal investments in technology and data assets [7].

### **Section 3: Technological Change and Productivity**

#### **3.1: The Effect of Technological Advances on Organizational Efficiency and Customer Satisfaction**

This study aimed to assess the effect of technological change on organizational productivity and customer satisfaction within manufacturing facilities [8]. A sample of 220 employees was surveyed using a questionnaire developed by researchers, which had a Cronbach's alpha value of 0.803 [8]. The findings demonstrate a notable impact of technological change on both organizational efficiency and customer satisfaction as perceived by the employees. Statistical analysis indicates that factors such as age, job role, work location, and employee experience significantly affect perceptions of technological change's impact on productivity [8]. Specifically, employees with fewer than 10 years of experience report a greater influence on productivity and satisfaction compared to those with more experience. For future improvements, a deeper understanding of these factors can help develop better strategies for implementing AI-driven technologies to enhance organizational performance and customer satisfaction in manufacturing settings [8].

#### **3.2: The Influence of Electronic Trading Platforms and Dividend Policies on Bank Liquidity**

This paper explores how electronic trading platforms mediate Granger causalities between dividend policies and banks' liquidity, using various financial indicators to measure their impact. Given the pivotal role of digital financial services in influencing bank performance and investor behavior [9], the study analyzed monthly time series data from January 2010 to December 2020. It uncovered long-term correlations between banks' liquidity and dividend policies, with digital platforms playing a significant mediating role in these relationships. Short-term effects were also noted, particularly in relation to monthly changes in the EPS ratio [9]. Overall, the findings suggest that digital transformation contributes to improving banks' liquidity by stimulating cross-border investment, thereby enhancing banks' performance [9]. Moving forward, a more comprehensive understanding of these dynamics can inform AI-enhanced integration strategies, optimizing the role of electronic-trading platforms in driving banks' liquidity and performance [9].

### **Section 4: Digital Services and Economic Studies**

#### **4.1: Digital Services Trade: A Quantitative Analysis of the Link Between Income and Service Imports**

This study analyzed the relationship between Gross Domestic Product (GDP) and service imports in Jordan from 2005 to 2021, recognizing service imports as a key economic activity that supports commodity trade [10]. The quantitative analysis revealed a positive long-term impact of GDP on service imports, with a significance level below 1%, indicating that the relationship is relatively inelastic over the long term. Specifically, a 1% increase in GDP is associated with a 0.776% rise in the volume of service imports [10]. The study also found that the transition from short-term to long-term effects occurs rapidly, underscoring the dynamic nature of the GDP-service imports relationship [10]. Moving forward, enhancing AI-enhanced integration strategies can offer a more comprehensive understanding of these dynamics, optimizing policies and practices to further leverage the relationship between GDP growth and services imports [10].

#### **4.2: The Impact of Technological Innovation on Economic Growth**



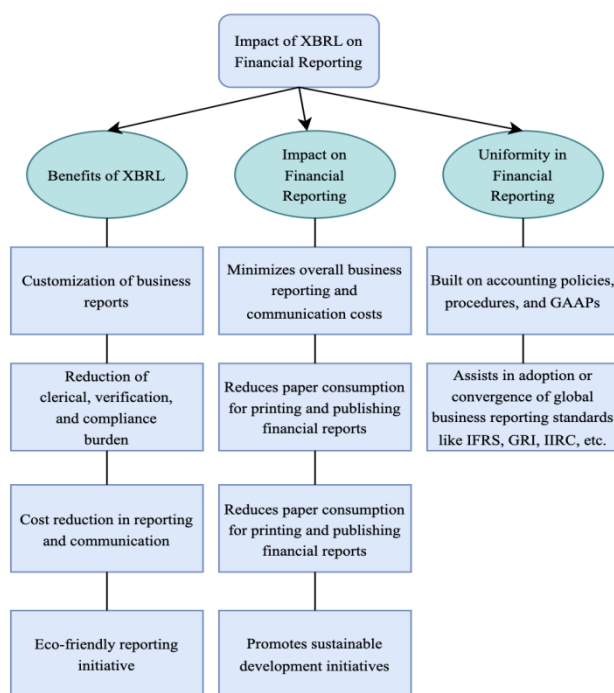
The expected influence of technological innovation on economic growth across various sectors is significant. Historically, advancements in technology have played a crucial role in driving economic progress since the industrial revolution [11]. A systematic review of existing literature indicates a moderately weak but significantly positive correlation between the use of technological innovation and job creation, which helps reduce unemployment rates [11]. However, the labor-intensive nature of technological innovation in contrasts with trends observed in other nations, possibly due to relatively lower expenditures on research and development (R&D) and innovation outputs. Policymakers are encouraged to prioritize investments in R&D and educational initiatives. Additionally, creating supportive environments for innovators through government-backed incubation centers and fostering collaborations between industry and educational institutions is advised. Strengthening intellectual property protection mechanisms could also enhance the positive effects of innovation on economic growth [11].

## Section 5: Financial Reporting and Audit Quality

### 5.1: The Effect of XBRL Technology on Financial Data Quality: Mediation Through Various Reporting Dimensions

As technology quickly evolves, business functions are undergoing significant transformations to manage and communicate transactions efficiently, from procurement to dividend distribution. XBRL, a global standard for business reporting, facilitates this process by enabling organizations to effectively report and communicate both financial and non-financial information [12]. This study examines the impact of XBRL on the quality of financial reporting, focusing on the perceptions of chartered accountants in India. Using a structural equation model, the study reveals that XBRL and its features significantly affect various dimensions of financial reporting, thereby improving reporting quality. These findings offer valuable insights for policymakers developing financial reporting standards through XBRL, highlighting its importance in refining reporting practices [12]. Future efforts should focus on enhancing AI-driven integration strategies to further streamline financial reporting processes, ensuring increased efficiency and transparency in business communication [12].

Figure 4: Impact of XBRL on Financial Reporting [12]





This graph details the influence of XBRL (eXtensible Business Reporting Language) on financial reporting, highlighting its benefits, impacts, and role in promoting uniformity [12]. It shows how XBRL streamlines business reporting, reduces costs, and supports sustainable practices. Additionally, XBRL aids in adopting global reporting standards, enhancing the overall efficiency and eco-friendliness of financial reporting processes [12].

## **5.2: The Influence of Digital Audit Instruments on Chartered Accountants' Report Precision**

The purpose of this study was to examine the self-reported effects of digital auditing on the precision of chartered accountants' reports. A descriptive analytical design was used to gather quantitative data through a questionnaire instrument [13]. The population for this study was the total of 460 chartered accountants in Jordan, with this study first distributing 250 electronic questionnaires randomly, later analyzing 210 as a valid response. Statistical analysis using the Statistical Package for Social Sciences (SPSS) reported on scales, while likewise determining a factor of a significant influence of digital audit (DA) tools on chartered accountants' reports [13]. In fact, the author's conclusion demonstrates the necessity of digital transformation, in the case, of audit as a practice Discipline to enhance precision in reporting. Also, the author recommended providing training on the DA techniques that were just introduced and in addition, to continue the research the recommendation to explore developing methods to enhance reporting precision of chartered accountants. Advances to integrated data can refine future auditing leveraging or essentially advancing AI, in turn benefitting reporting efficiency and precision [13].

## **Section 6: Digital Transformation and Economic Outcome Impact**

### **6.1: The Effect of Digital Transformation on Income Distribution and Employment**

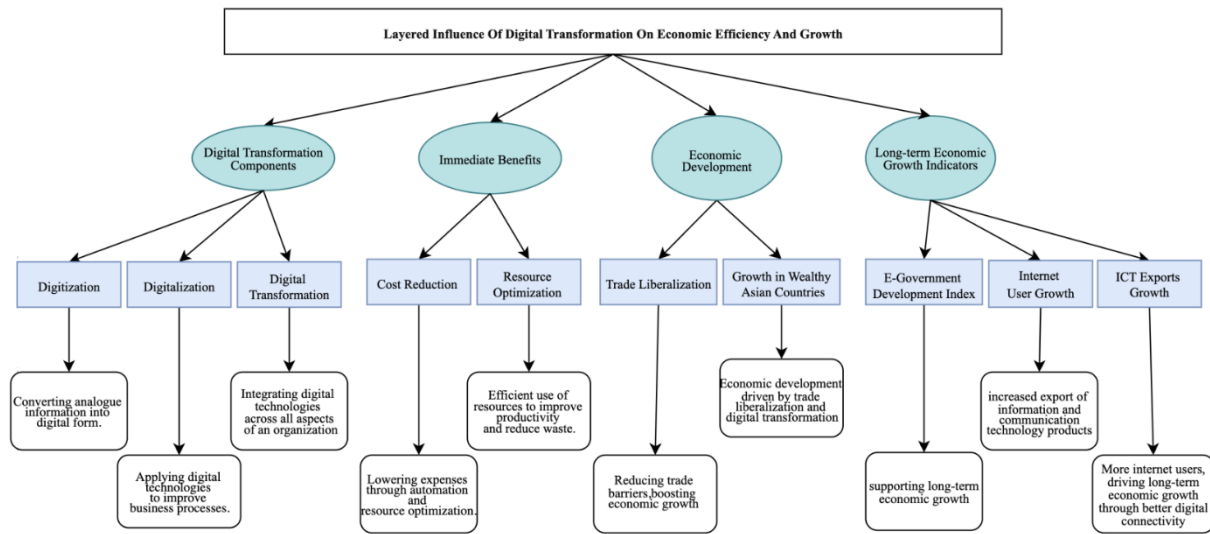
#### **Opportunities**

The impact of digital transformation on both income distribution and employment opportunities is proposed using systematic literature review methodology in this paper into our [14]. The evidence in reviewed literature was collected from journals, volume journals or equivalently robust journals, useful, the scholars discuss through the various chapters concerns attributed to employment factor and income allocation, mustered by data. It is proposed considered a direct result of digital development that essentially creates better paid positions benefiting the respective economies where the government often builds digital opportunity [14]. Furthermore, studies stemmed with an economic environment highlight a position known as digital transformation propulsion for having impact bottom lines; how to proceed and continue forward, requires time, but it also required similar manners to the positive factor it had an impact on income and change to employment was to develop a model predicate on skill development programs equally important was to ensure everyone had access to the digital quality goods or services or potential good or services, also be available [14].

### **6.2: The Relationship between Digital transformation and Economic Performance: New Evidence across Countries**

This study investigated the impact of digital transformation on economic efficiency from 2018 to 2022 in several European, East Asian, Middle Eastern, African, and US countries [15]. Using cross-sectional data, the study utilized the nonparametric Data Envelopment Analysis (DEA) method to analyze the efficiency of each country. Efficiency scores were generated using both BCC and CCR and technical efficiency was the main focus. As previously identified, digital transformation raises new business models and increases efficiency within national economies. Agreeing with the previous literature, this study concluded that digital transformation matters in the efficiency of economy across tariffs [15]. Among the 58 identified countries included to analyze relative efficiency, six countries discovered 100% relative efficiency, and 21 countries had reasonable efficiency as high/moderate efficiencies, with the balance of countries showing lower relative efficiencies. Additionally, digital knowledge, digital technology, and future-readiness all played substantial roles on technical efficiency as well. Because of the importance of raising awareness among leaders of the significance and increased adoption of digital transformation processes, due to the positive impact on economic efficiency, the study makes urgent calls to action [15].

**Figure 5:** Layered Influence of Digital Transformation On Economic Efficiency And Growth



This graph captures digital transformation elements of digitization, digitalization, and digital transformation, which deliver immediate value by lowering costs and collecting resources [15]. These supports to high economic efficiencies help to boost economic development and long-term economic growth, due to trade liberalization, e-government development, ICT exports, and number of individuals of users of the internet growth. [15].

## Section 7: Digital Currencies and Blockchain Technology

### 7.1: Mechanisms of Digital Currencies

Mechanisms of Digital Currencies Currency is a central component of economic relations, and it changes in its form and how it is handled depending on technological advancements. Electronic cards appeared but changes from metals and paper occurred, to something more efficient[16]. This innovation in commerce and the advent of internet "normal" business models also created the need for payment tools that accommodated the technological shift into the economy. This paper investigates how technological advances affect currency and methods of transacting business; there is a necessity for providing payments solutions that align with current and future business practice [16]. In conclusion, the findings illustrate the need to embrace new payment technologies to enhance the ease of transaction and to keep pace with the realities of business practice, and to even further improve efficiencies, ongoing research and development should focus on adapting payments technology into the digital realm that can satisfy the needs of business practice [16].

Figure 6 : Impact of Digital Currencies on Financial System [16]

Title: Impact of Digital Currencies on Financial Systems

Key Points	Digital currencies reshape traditional financial systems by introducing decentralized, peer-to-peer transaction mechanisms. Blockchain technology, the backbone of digital currencies, ensures security, transparency, and decentralization. Challenges and opportunities arise for central banks, governments, and users in adopting and regulating digital currencies. Digital currencies offer benefits such as reduced transaction costs and increased financial freedom but also pose risks due to their irreversible nature and regulatory uncertainties.
Illustrations	Utilize icons or symbols to represent key concepts mentioned in the paper, including: Digital currency icons (e.g., Bitcoin logo) to symbolize the emergence of new forms of money. Blockchain symbols to visually depict the decentralized and secure ledger technology underlying digital currencies. Central bank logos to represent the involvement of regulatory authorities in the adoption and regulation of digital currencies.
Connections and Relationships	Use arrows or lines to illustrate the connections between key points, emphasizing how digital currencies disrupt traditional financial systems and interact with regulatory frameworks. Show the flow of information from the emergence of digital currencies to their impact on central banking policies and user behavior.

In figure 6 the impact of digital currencies is discussed in terms of impact on the financial system. Decentralizing transaction mechanisms and blockchain technology are transforming how all transactions occur [16]. It shows the full range of potential benefits with the types of decentralizing transaction mechanism cryptocurrencies, NFT's, and smart contracts to draw the appropriate line in regard to risks associated with their use as a regulatory paradigm has barriers to adoption. The figure uses symbols to articulate important concepts, making use of a visual depiction of the relationships between digital transactions, regulatory infrastructure, and relevant banking policy, in the market, and ultimately by consumers' behavioral context [16].

### 7.2: Emerging Currencies and Values in Professional Sports: Blockchain, NFTs, and FinTech from a Stakeholder Perspective

The paper highlights the disruptive impact of blockchain technology and emerging fintech culture on the professional sports industry. The impact of cryptocurrencies, nfts, and smart contracts on the sports ecosystem is categorized and analyzed [17]. The purpose of the investigation was to identify and categorize the impact of blockchain and fintech applications on sports while considering the stakeholder dynamic and technological determinism in a comprehensive manner [17]. The outcome of the investigation contributes to the literature on blockchain applications with a theoretical synthesis, making connections to earlier importantly related concepts and structures. The results reveal that blockchain, fintech, and NFTs can drastically change stakeholder relationships and operations in the sports landscape, disrupting values and advancing athlete rights and fan engagement [17]. However, there needs to be work done to better inform research trajectories and analytical perspectives to optimize the incorporation of these technologies into a coherent analysis of their meanings for the sports ecosystem [17].

**Table 1:** Key Impacts of Blockchain Technology on the Sports Ecosystem

Key Impact	Description
Fan Engagement	Fan tokens providing voting rights and exclusive access
Athlete Monetization	Athlete tokens representing earnings, traded on decentralized exchanges
Organizational Monetization	Loyalty programs, smart contracts for sponsorship deals, ticket sales
Broadcasting	Tokenized advertising system rewarding viewers

New Revenue Streams	Unique digital assets such as NFTs
Regulatory Issues	Lack of clear guidance and existing regulations
Security Concerns	Risks of hacking and security threats
Resistance from Traditional Stakeholders	Potential resistance from established sports organization

The table provided above reviews the implications of blockchain technology on the sports ecosystem, which includes benefits for fans, athletes, organizations, and broadcasters, as well as concerns such as regulation and security issues [17].

**Table 2:** Challenges and Limitations of Blockchain Implementation in Sports

Challenge	Description
Regulatory Issues	Lack of clear guidance on how to implement blockchain within existing regulatory frameworks
Security Concerns	Vulnerability to hacking and other security threats
Resistance from Traditional Stakeholders	Potential resistance from established sports organizations and stakeholders

This table lists the challenges and limitations associated with implementing blockchain technology in the sports industry, Emphasizing the necessity for clear regulatory frameworks, strong security protocols, and strategies to overcome resistance from traditional stakeholders [17].

### **7.3: The Rise of NFTs in Financial Markets and Its Relationship With DeFi and Other Cryptocurrencies.**

The article examines NFTs in conjunction with DeFi tokens and the well-known cryptocurrencies such as Bitcoin and Ethereum [18]. The analysis is based on daily price data from January 15, 2021 to December 6, 2021 and applies two analysis methodologies, namely the volatility spillover matrix and a quantile connectedness method. The overall conclusion of the study is that NFTs, DeFi tokens, and traditional financial markets do not co-move without minimal spillover effects. Specifically, the results suggest that deFi assets may be fairly disconnected from cryptocurrency assets [18]. Overall, NFTs and DeFi tokens have the potential for portfolio diversification and offer lower correlations with traditional cryptocurrencies, purchased to provide greater opportunities or possibilities for portfolio diversification across these asset classes. However, more warranted analyses and research is needed for developing future diversification or risk management strategies inductively [18].

### **7.4: Analyzing the Interconnections Between NFTs, DeFi Tokens, and Cryptocurrencies**

7.4: Investigating the Interconnections of NFTs, DeFi Tokens and Cryptocurrencies. Investors looking to evaluate diversifying opportunities in a blockchain market, are also assessing opportunities in NFTs, DeFi Tokens and Cryptocurrencies, because of the extreme volatility in these markets [19]. The study employs a quantile connectedness approach to assess extreme transmission risk, finding significant risk spillovers among blockchain markets while demonstrating disassociation with NFTs. There is a distinct nature to each of these various unstable economic conditions [19]. In conclusion, NFTs offer excellent diversification based on the amount of risk and risk-taking due to the currently volatile nature of other media related to blockchain technologies in general. Thus, NFTs provide a buffer with this investment eliminating extreme risk, however it is suggested to continuously monitor and analyze the shifting phenomenon among blockchain markets to explore appropriate risk management strategies [19].

### **7.5: FinTech and Blockchain**

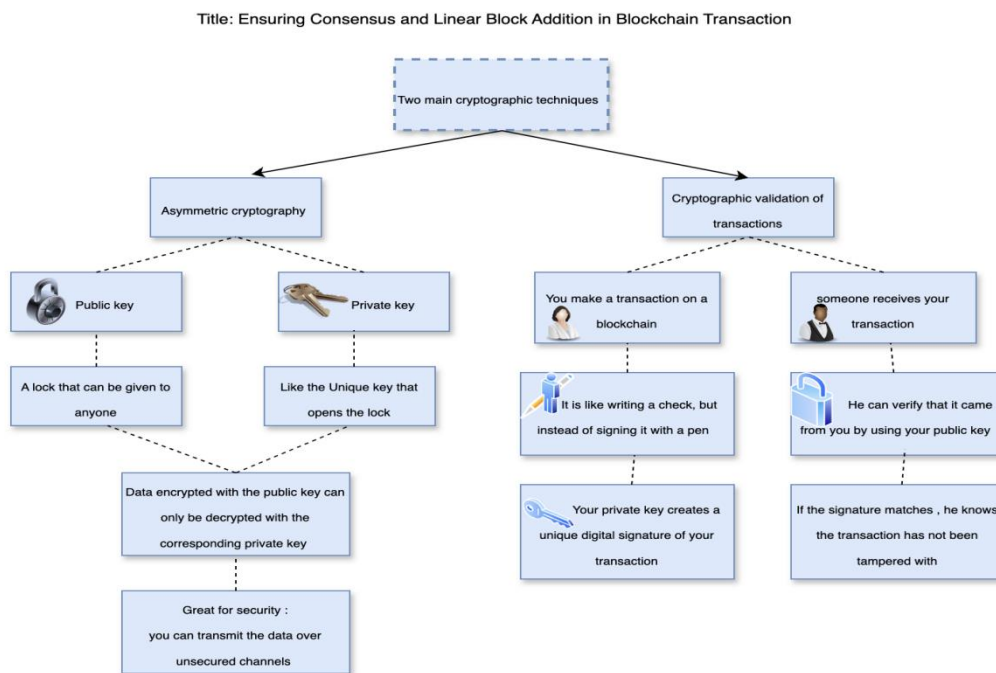
Since bitcoin's introduction as a new technological model of evolution in a financial transaction and global world, published and popular interest has increased study and practice on the development of a revolutionary technology called blockchain to reshape the communication between humans and

machines [20]. The financial industry has taken notice of blockchain's operating model to adopt it and have presently transformed key principles in finance. Better solutions are in active development in the fintech module of the financial industry and researchers have commented that blockchain technology could bring transparency, efficiency, integrity, and, most important, end-user data protection to the financial industry[20]. This thesis investigates a cashless implementation of blockchain in a fintech moded industry by considering instances such as the Integration of Cryptocurrency and the Rise of Innovations [20] like Non-Fungible Tokens and the Metaverse. The implementation of blockchain into fintech industries provides a potential framework to disrupt the banking industry, and in the future, will adapt, as it currently is both threatening and disruptive to bank institutions. Currently, regulation is challenged by employing a homogenized regulatory framework from top-down to adoption and/or implementation in the blockchain-based applications[20].

### 7.6: Blockchain, Cryptocurrency, and Artificial Intelligence in Finance

This chapter introduces the theoretical underpinnings of blockchain and cryptocurrency; as well as, artificial intelligence (AI) and their applications to the financial sector [21]. The examination of blockchain is and certainly cryptocurrency was an extreme examination on whether cryptocurrencies can be considered either currency or asset and whether they provide a new safe haven asset. The investigation as well looks closely at discussions surrounding the issuance of central bank digital currencies (CBDCs). The case is made that currencies that are digital had the capacity to provide liquidity to the economy in times of as much as market conditions [21]. The perceived real advantages surrounding blockchain applications; are the recognized benefits surrounding its applications especially decentralization and consensus; are offered as democratizing banking services, governance in corporations, and the real estate industry[21]. The benefits and burdens are highlighted regarding the use of AI technology in banking, question whether advancements in other AI social finance uses can come to bear in finance. It enriches the literature with theoretical concepts and applications of technology development of blockchain; as well as inclusive, an examination of the effect of AI techniques, and weaknesses in financial considerations. The following is an exploration of contemporary studies concerning the ongoing COVID-19 pandemic, Central Bank Digital Currencies (CBCD) and alternate sources of data [21].

**Figure 7 : Ensuring Consensus and Linear Block Addition in Blockchain Transaction**



The figure "Ensuring Consensus and Linear Block Addition in Blockchain Transaction" highlights the two primary cryptographic methods for consensus in blockchain technology: asymmetric cryptography and the cryptographic verification of transactions. The asymmetric table consists of two parts: [22;24]. Asymmetric cryptography uses public and private keys; a public key operates like a lock that anyone can employ and the private key acts as a lock that can only be used by one specific individual[21]. The value of the cryptographic keys lies in how data can be distributed over unsecured channels in a secure manner. Secondly, the point about cryptographic validation involves creating a unique digital signature for every transaction that is validated with the private key. The end-user can then confirm the validity of the transaction by validating the signature with the public key ensuring that the transaction is verifiable and has not been altered [21].

## **Section 8: Business Intelligence and Economic Transformations**

### **8.1: The Role of Business Intelligence on Digital Economic Transformations**

The information technologies have fundamentally modified organizations operating environments including government agencies [22]. The developed nations have adopted e-government services that have created electronic transactions and centralized data management processes within their public sector[23]. Developing nations remain slower in their adoption of these services. Advanced economies have advanced their public sector through sophisticated technologies including big data analytic and business intelligence (BI) systems to improve government processes and services. BI systems can help to rapidly analyze large datasets in a way that produces options for decision-makers [24]. Unfortunately, there is very limited application of business intelligence in many government organizations in developing nations[23]. In order to fill the gap, this research suggests a framework for integrating BI with e-government services, seeking to improve the performance of government entities...The framework serves as a useful guide for the public sector and assists agencies in understanding the implications of business intelligence in order to enhance efficiencies and make better decisions [22].

### **8.2: Big Data and the Metaverse: Altering the Future of FinTech.**

Disruption is an ongoing theme in the Fintech industry, which is experiencing ongoing transformation due to developing technology, including, but not limited to, big data and the metaverse[23]. Finance companies are transforming traditional functions of providing products or services into innovating all forms of the virtual fintech industry, quickly capitalizing on emergent developments. Big data is playing a key role in changing the manner in which financial institutions interact with information, as they collect, analyze, and utilize data while creating an array of insight to better understand their customers and operations. Predictive models, which are developed from big data, will permit the identification of emerging patterns in customer behavior, transactional activity, and all things related to making decisions across organizational disciplines[23]. And from the metaverse perspective, it's clear that the service opportunities are endless. In fact, the capacity to provide a means for organizations to deliver virtual goods and services without being limited to a physical store has extreme potential value to disrupt in the Fintech sector. Moreover, such scalability allows for organizations to scale geographically to serve a wider set of potential customer need for financial services[23]. Furthermore, the use of a digital currency; for example, Bitcoin, opens a doors to other possibilities depending on its applicability within the context of providing or receiving financial services[24].

## **Section 9: Legal and Regulatory Aspects**

### **9.1: The Legal Characteristics of Electronic Payment Cards**

With the progression of trade towards a digital paradigm, the need arose for a secure method to facilitate transactions and mitigate the risk of financial loss or theft during transfers[24]. Consequently, banks

devised electronic payment cards, a sophisticated system governed by trust and mutual credit agreements among involved parties—banks, cardholders, and merchants. Each contractual agreement delineates distinct legal obligations, necessitating the establishment of a dedicated legal framework to govern these relationships and their legal ramifications[24]. The efficacy of electronic payment cards hinges on the robustness of these contractual relationships, as their usage often gives rise to disputes. Thus, this study was undertaken to ascertain the legal framework governing the relationships between parties to these contracts and identify adaptable laws for regulating electronic payment cards[24].

## **9.2:A Study on the Legal Safeguards for Cryptocurrency Investors: A Comparative Legal Analysis**

Millions of individuals, corporations, and other entities globally have invested substantial amounts in various cryptocurrencies[25]. Regulatory reports from numerous countries reveal a significant gap in understanding the legal status of cryptocurrency products and the regulatory safeguards available in local markets. Some regions mandate regulatory approval for crypto asset-related products prior to their market introduction, while others allow regulated financial institutions, such as banks, to endorse cryptocurrency approvals [25] . However, many areas lack comprehensive regulatory frameworks, leaving investors without the protections afforded to traditional financial products. The proliferation of crypto assets across borders complicates the enforcement of specific regulations and the establishment of effective monitoring systems[25]. Cryptocurrency firms often establish their headquarters in jurisdictions with lenient regulations, favorable taxation, and flexible legal systems, which further complicates regulatory oversight. This paper provides a critical analysis of the legal risks faced by cryptocurrency investors, evaluates the global regulatory and monitoring frameworks, and assesses the level of legal protection and enforcement for cryptocurrency investors in various jurisdictions[25].

## **Section 10: Marketing and Consumer Behavior**

### **10.1: E – Promotion Tools and Its Effect on Consumers Purchase Decisions**

In the case of Carrefour, a prominent supermarket chain in Jordan, this study explores the effects of e-promotion tools on consumer purchasing choices [26]. The research targeted a convenience sample of 425 Carrefour shoppers, with 33 incomplete questionnaires removed, resulting in a final sample size of 392 for analysis. Through multiple regression analysis, the study evaluates the impact of social media, email marketing, website design, and digital advertising on consumer buying decisions [26]. The results reveal that social media and website design significantly influence consumers' purchasing behavior, while email marketing and digital advertising do not show a notable effect. These insights offer Carrefour and other retail businesses in Jordan opportunities to refine their marketing strategies by more effectively utilizing e-promotion tools [26].

### **10.2: The Effect of Digital Advertising Through Social Media Platforms on the Purchasing Behavior of Fast Food Consumers**

This study investigates the influence of digital advertising via social media on the purchasing behavior of fast-food consumers [27]. It considers a single independent variable across six dimensions: attributes of digital advertising, stimuli, message content, interaction, ease of access, and credibility [27]. Using a descriptive-analytical approach, the research analyzed data with appropriate statistical tools. Out of 465 distributed questionnaires, 416 were completed, resulting in an 89% response rate. The findings reveal a significant statistical effect of digital advertising on consumer buying behavior, showing a positive influence on fast-food purchasing decisions [27]. Digital advertising accounts for 75% of the variance in purchasing behavior [27]. Among the dimensions, advertising incentives have the strongest positive impact, while credibility has the least effect. The study suggests that fast-food restaurant owners should improve the credibility of their advertising by ensuring punctuality and delivering on promises, and by employing experts to create high-quality content with varied appeals [27].

## **Section 11: Intellectual Capital and Financial Performance**



**11.1: The Role of Intellectual Capital in Production Systems and Economic Strength Amidst Digital Transformations**

The study aims to investigate production dynamics within the expanding realm of knowledge and the transformation of intellectual capital into an economic asset driven by digital advancements[28]. It seeks to clarify the relationship between production dynamics and economic strength by defining property elements in the context of the effects of digital transformation on economic activities, using a descriptive methodology[28]. The study revealed several key findings, including a shift in the roles of physical capital and labor, where the rise of knowledge workers challenges existing ownership structures and contributes to the ambiguity in property definitions. It highlights the need for a cultural shift toward promoting creativity through education focused on learning, stressing the importance of moving beyond traditional educational models to achieve qualitative improvements in social interactions[28].

**Table3:** Property Rights and Economic Relations

<b>Property Rights</b>	<b>Description</b>
Right to Property	Ownership of resources
Right to Use	Utilization of resources
Right to Management	Control over resource operations
Right to Income	Entitlement to profits from resources
Right of Sovereignty	Authority over resources
Right to Security	Protection of resources
Deferred Right of Product Property	Future ownership rights
Right to Transfer Property by Inheritance	Passing ownership to heirs
Right to Prohibit Use	Restricting resource utilization
Right of Responsibility	Accountability for resources
Right to Implement Procedures	Enforcing regulations on resources

This table presents a summary of the different property rights outlined by Ronald Coase[28]. Each property right entails a different degree of control and obligation over the good, and all function to support the flexibility and efficiency of the property relations system as a whole. The system of obligations and rights materially structures the economy and influences the pattern of transaction costs and the stability of market economies[28]. These property rights afford different methods and means to govern and take advantage of resources and so respond to different economic conditions they are put to use and thus lead to a state of maximum productivity[28].

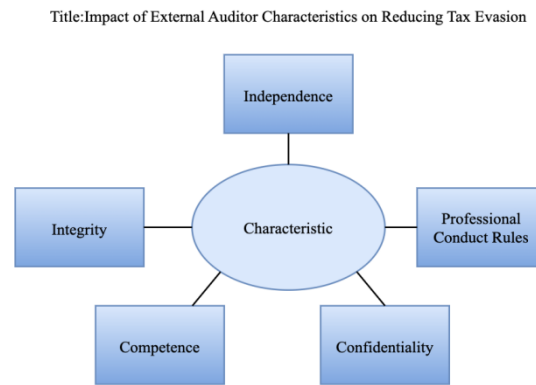
**11.2: The Result of Implementing Electronic Internal Auditing on the Efficiency of Financial Performance at Commercial Banks**

This study examined the "effect" of "implementation of" electronic internal auditing on financial performance efficiency in commercial banks[29]. This quantitative researcher utilized an analytical descriptive methodology by distributing a 19-item questionnaire to a sample of 168 internal auditors and accountants with a total of 137 usable responses (81.5%) recorded[29]. Financial performance (specifically, Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS)) was examined across 13 banks, from 2015 to 2021 (regarded as a sample, or period) of reported financial performance. The results reported a high utilization of electronic internal auditing and showed a positive "effect" of increased financial performance (ROA, ROE, and EPS) at  $\alpha \geq 0.05$  statistical significance level[29]. Recommendations included regular workshops and specialized training for auditors and accountants on electronic internal audit systems, helping maintain their knowledge of evolving electronic internal audit systems to continue to improve financial performance of commercial banks[29].

### 11.3: The Influence of the External Auditor's Professional Code of Conduct on Mitigating Tax Avoidance

This study sought to assess the influence of the professional code of conduct—covering aspects such as independence, confidentiality, integrity, and professional competence—on mitigating tax avoidance [30]. A questionnaire with 37 questions was crafted for this investigation. The research targeted all external auditors in Jordan, from which a simple random sample was drawn, resulting in the distribution of 209 questionnaires [30]. Out of these, 167 valid responses were analyzed, reflecting a 71.1% response rate. Findings indicated a high level of adherence to the professional code of conduct among external auditors, alongside a notable incidence of tax avoidance [30]. The study also highlighted a significant effect of the professional code of conduct on reducing tax avoidance. Recommendations include creating a formal guideline that outlines the professional code of conduct for external auditors in Jordan to enhance their impartiality, integrity, and effectiveness in identifying and addressing instances of tax avoidance [30].

**Figure8** : Impact of External Auditor Characteristics on Reducing Tax Evasion



This diagram represents the essential attributes of the external auditor that help to reduce tax evasions[30]. These attributes of the auditor include integrity, independence, competence, confidentiality, and, adherence to the regulations of professional conduct, Each attribute in works to enable an auditor to identify tax evasion activities, and to prevent further incidence from occurring. According to the study, all elements of external auditors were statistically significant in reducing tax misreporting[30].

### 11.4: The Impact of IFRS 15 "Revenue from Contracts with Customers" on Accounting Conservatism and the Mediating Effect of Net Assets

This study aims to delve into the impact of adopting an international financial reporting standard (IFRS 15) on accounting conservatism by comparing the pre- (2015-2017) and post-adoption (2018-2020) periods. Using an analytical-descriptive methodology and path analysis using software for structural modeling (Smart PLS), this research found that IFRS 15 impacts accounting conservatism in alignment to the Basu (1997) model. IFRS 15 impacts net assets as well, however does not directly change accounting conservatism, Additionally, IFRS 15 acts as a mediator in its effect on accounting conservatism at Telecom Company. Furthermore, this research suggests management revises policy, further develops accounting systems and technology, improves internal controls, and provides employee

training to align with IFRS 15 standards when the decision is made to implement [31].

**Section 12: Financial Inclusion and Market Factors**

**12.1: The Impact of Financial Accessibility on the Cost of Capital and Net Income of Medium-Sized and Small Firms**

The research sought to assess the influence of the national strategy for financial accessibility on the capital expenses and net earnings of small and medium-sized enterprises (SMEs) [32]. The study examined 50 small businesses and 48 medium-sized businesses located in some governorates. Financial accessibility was evaluated based on credit facilities extended to SMEs, while capital expenses and net earnings were analyzed using the financial statements of the companies under review [32]. Utilizing the descriptive analytical method with E-Views software, the study assessed the stability of the time series data for the study variables and confirmed the absence of unit roots. The multiple regression analysis revealed a statistically significant effect of credit facilities on both capital costs and net earnings, though the effect was more pronounced for medium-sized companies compared to small enterprises [32]. The study advocates for increasing the volume of financing available to small businesses, which make up 90% of some countries private sector companies [32].

**Table 4 :** National Billing System

Category	Description
Purpose	Facilitate taxpayer services, ensure justice, reduce costs, enhance taxpayer-state relationship
Implementation Benefits	<ul style="list-style-type: none"> <li>- Modernizes tax culture</li> <li>- Simplifies transactions</li> <li>- Accelerates refund processes</li> <li>- Provides technological solutions for invoicing</li> </ul>
System Features	Integrated computerized system <ul style="list-style-type: none"> <li>- Supports all companies</li> <li>- Ensures regular invoicing for consumers</li> <li>- Electronic invoicing with multiple submission methods</li> </ul>
Support and Assistance	Technical support available <ul style="list-style-type: none"> <li>- Registration through the Income and Sales Tax Department website</li> </ul>
Concerns and Awareness	Reservations from commerce chambers and trade unions <ul style="list-style-type: none"> <li>- Need for educational materials to raise awareness</li> </ul>

The table provides a concise summary of the key aspects of the National Billing System [32]. It outlines the primary purpose of the system, which is to facilitate taxpayer services and ensure justice in tax application. Legal requirements for invoicing are specified, particularly for transactions of one dinar or more and for lawyers with significant annual revenues [32]. The implementation of the system brings numerous benefits, such as modernizing the tax culture, simplifying transactions, and accelerating refund processes [32]. The system features an integrated computerized framework that supports both companies with existing billing systems and those without, ensuring flexibility and regular invoicing for consumers [32]. Technical support and assistance are available, with registration facilitated through the Income and Sales Tax Department's website. Finally, the table highlights concerns from trade unions and the importance of raising awareness through educational materials [32].

**12.2: Impact of Marketing Macro Factors on Foreign Investment Inflows**

The research intends to explore the impact of marketing macro factors on foreign investment inflows,

recognizing the significance of technological changes in attracting Foreign Direct Inflows (FDI) [33]. Through a sample of 190 respondents working in FDI at Free Zones, it was found that factors such as political stability, administrative structure, and economic conditions are key drivers for FDI attraction[33]. Additionally, the study highlights the importance of infrastructure and rejects the null hypothesis, affirming the positive relationship between various macro factors and FDI attraction. The findings underscore the need for the government to concentrate on maintaining political stability, fostering economic growth, improving infrastructure, and enhancing transparency in governmental institutions to further encourage FDI inflows[33]. Thus, implementing these strategies can better position Jordan to attract and retain foreign direct investment, thereby contributing to its economic development and growth[33].

## **Section 13: Cost Leadership and Profitability**

### **13.1: The Impact of Cost Leadership & Product Distinctions on Profitability in the Industrial Companies Listed on the Stock Exchange (ASE)**

We seek to illustrate how cost leadership and product differentiation influence financial performance in industrial firms listed on the ASE[34]. To address the research aims, a descriptive-analytical approach is utilized. The study covers all 33 ASE-listed industrial companies, excluding two due to data limitations, resulting in a final sample of 31 companies[34]. Data is gathered from the published reports of ASE-listed industrial firms from 2017 to 2021. Statistical analysis is performed using the Smart-PLS program to evaluate the effects of cost leadership and product differentiation (independent variables) on financial performance (dependent variable)[34]. The results reveal a significant impact of cost leadership and product differentiation on financial performance metrics, including return on assets, return on equity, and return on invested capital in ASE-listed industrial companies. This indicates that management strategies in these firms focus on reducing production costs while enhancing product quality[34]. The article recommends fostering a culture of differentiation across all administrative levels within industrial companies and suggests further research into other sectors, such as banking and services[34].

## **Section 14: Central Banking and Regulatory Compliance**

### **14.1: Central Banking and Fintech**

The paper addresses the exact problem of how fintech will alter central banking over the next generation, focusing on three innovations: virtual currencies, new financial intermediation models, and artificial intelligence[35]. The solution offered entails exploring the potential impact of these innovations on economic policies and financial systems. In conclusion, the paper emphasizes the need to anticipate and adapt to the evolving landscape of central banking, suggesting that fostering greater collaboration between human expertise and AI technologies could lead to better solutions for future challenges[35]. Further enhancements in AI integration strategies could improve decision-making processes and policy formulation in central banking[35].

### **14.2: Toward automated regulatory compliance**

Increasing regulatory burdens pose significant challenges for businesses, with compliance becoming a top concern at both board and CEO levels due to the risk of heavy fines and reputational damage[36]. The existing method of regulatory compliance, which is largely based on paper documents and dependent on human expertise, struggles to keep pace with the complexity and scale of modern enterprises, particularly those operating across multiple geographies[36]. To address these challenges, the paper introduces an AI-aided model-driven automated approach to regulatory compliance, aiming to improve correctness, responsiveness, and scalability. This solution leverages technology infrastructure to streamline compliance processes and enhance efficiency.

The literature review outlines the implementation of this approach in real-world industry settings and

highlights the potential for further improvements and advancements in the future[36].The <sup>Main Hypothesis</sup> summarizes the overall findings with key statistical values, including R, R<sup>2</sup>, and the F-test. <sup>Sub-Hypotheses</sup> detail the impact of electronic internal auditing on each financial performance metric, specifically Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS) [36]. The <sup>Metric</sup> refers to the specific financial performance measure being tested, while the <sup>Impact Level (B Value)</sup> indicates the percentage change in the metric due to electronic internal auditing[36]. The <sup>T-test Value</sup> for ROA is provided in the summary, highlighting its statistical significance. <sup>Statistical Significance</sup> is assessed through the p-value, which indicates whether the results are statistically significant. Finally, the <sup>Conclusion</sup> for each hypothesis indicates whether the impact is significant based on the findings[36].

**Table 5** : Overview of Model Validation and Verification Techniques in Regulatory Compliance

Key Concept	Description	Benefits
Model Verification	Ensuring the model performs as expected through techniques like inconsistency checking and scenario generation.	Captures inconsistency and ensures comprehensive testing.
Model Validation	Certifying that the model accurately represents the problem space by having SMEs review generated scenarios.	Ensures the model is a faithful representation of the problem domain.
SBVR	Fact-oriented modeling notation encoding rules as logical formulations over fact types.	Provides a structured and logical representation of regulations.
ASP	Logic programming paradigm used for automated verification, aligning with SBVR's model.	Facilitates powerful, expressive automated verification.
DLV System	Solver for ASP programs, performing consistency checks and generating minimal answer sets.	Identifies conflicting rules and generates valid scenarios for SME review.
Automation in Compliance	Transforming SBVR models into executable specifications (e.g., DR-Prolog, Drools) for compliance checking.	Ensures consistency, reduces errors, and maintains traceability.
Schema Mapping & Text Mining	Techniques used to populate rule variables from structured and unstructured data.	Enables accurate and efficient data population for compliance checking.
Compliance Hygiene Use Case	Centralized obligation library creation for a US insurance company.	Comprehensive coverage, high accuracy, cost savings, reduced SME burden.
Change Impact Management	Automation of regulatory intelligence and policy/control lineage for a large EU bank.	Evidence of compliance, seamless integration, AI-driven automation.
Compliance Checking Use Case	Automated compliance checking for a large bank using SBVR and ARC.	Enhanced monitoring, auto-generation of code, significant effort savings.
Change Management Use Case	Identifying impact of regulatory changes on internal policies for a large MEA bank.	Efficient change management and policy updates.

The table presents a detailed overview of various key concepts, descriptions, and benefits related to the validation and verification (V&V) of models within a regulatory compliance context[36]. Model Verification focuses on ensuring models perform as expected through methods like inconsistency checking and scenario generation, capturing inconsistencies, and enabling comprehensive testing. Model Validation, on the other hand, involves Subject Matter Experts (SMEs) certifying that the model accurately represents the problem space, ensuring it is a faithful representation[36]. Using SBVR (Semantics of Business Vocabulary and Rules) provides a structured, logical representation of regulations by encoding rules as logical formulations over fact types. ASP (Answer Set Programming) facilitates powerful and expressive automated verification, aligning with SBVR's model[36]. The DLV System is employed to perform consistency checks and generate minimal answer sets for SME review. The Automation in Compliance section highlights transforming SBVR models into executable specifications, ensuring consistency, reducing errors, and maintaining traceability. Techniques like Schema Mapping & Text Mining are used to populate rule variables accurately and efficiently[36]. Use cases like Compliance Hygiene demonstrate the creation of a centralized obligation library, offering comprehensive coverage, high accuracy, and significant cost savings[36]. Change Impact Management emphasizes automating regulatory intelligence, providing evidence of compliance, seamless integration, and AI-driven automation[36]. Finally, Compliance Checking showcases automated checking, enhanced monitoring, and significant effort savings, while Change Management efficiently manages policy updates due to regulatory changes[36,43].

### **14.3: Personalization of Optimal Interest Rates in FinTech Lending**

In numerous countries, FinTech lending has become a notable innovation in the landscape of big data and the digital economy, serving as a critical complement to conventional bank lending[37]. FinTech providers utilize machine learning technologies for automated credit evaluations, allowing them to deliver personalized lending services with tailored interest rates[37]. This paper introduces an analytical framework aimed at exploring the dynamics of personalized interest rate setting, a key issue in the FinTech lending business model[37]. The goal is to establish the optimal interest rate for each borrower based on their credit evaluation, with the aim of maximizing total expected revenue while staying within constraints on total loan capacity[37]. The precision of credit evaluation, represented as the posterior distribution of a borrower's credit status given relevant data, relies on the effectiveness of the credit assessment system and the quality of the data[37]. The study presents a solution approach within a broad framework and provides insights into refining the credit evaluation process[37]. A crucial finding is that, in an effective loan market, loan approvals should only be granted if the accuracy of the credit assessment surpasses a dynamic threshold linked to the predicted credit status, underscoring the vital role of data and technology in FinTech lending. The proposed optimization model could be incorporated into automated systems to enhance lending efficiency[37].

### **14.4: Virtual Advisory Services: An Empowerment Perspective**

The virtual world, increasingly popular and rich with cutting-edge technologies, has become a focal point for numerous innovative applications by both public and private organizations[38]. This study explores the emerging role of virtual advisors designed to help users achieve their objectives within these virtual environments[38]. The areas of advisory covered include commerce, health (both physical and mental), education, ethics, and travel. The research develops a systematic framework to identify best practices in delivering virtual advisory services, encouraging reflective discussions on the current landscape and future directions of virtual advisory roles in the virtual world[38].

**Table 6 :** Various Domains:

Aspect	Key Points
Virtual Advisors and Social Presence	Enhance customer experience on e-commerce sites. Presence of human-like elements increases social presence.
Social Presence	Creates a warm, personal, and sociable atmosphere. Enhanced by human features, personalized greetings, audio, and video.

Trust in Virtual Advisors	<p>Critical in online advisory situations.                      - Enhanced by human elements (e.g., facial pictures) and 3D agents.                      Increased by personalization and transparency.</p>
ITEAS Framework	<p>Empowerment Consequences:                      Trust - Commitment                      Personal satisfaction                      Perceived connectedness                      Empowerment Antecedents:                      Transparency                      Personalization                      Scenario-based advisory</p>
Virtual Advisors in Various Domains	<p>Commercial Advisors:                      Improve customer experience in virtual environments.                      Current Practices:                      Use of real advisors with avatars.                      Limited use of fully automated advisors.                      Research Trends:                      Development of greeting agents and personalized try-on facilities.</p>

The table compares different aspects of virtual advisors, including frameworks, current practices, and social presence. The table highlights how human-like elements and personalization enhance customer experience and trust in various domains such as e-commerce, health, and academia[38].

#### 14.5: Trust Frameworks in Fintech and Insurtech: The Impact of Artificial Intelligence and Contextual Factors

The objective of this section is to investigate the transformation within the finance and insurance sectors through the integration of Artificial Intelligence (AI), emphasizing consumer trust as a pivotal element of this change[39]. It develops and contrasts trust models for Fintech and Insurtech to evaluate their similarities[42]. Using Multigroup Structural Equation Modeling, the study assesses the robustness of these trust models across both fields[39]. The results show that trust in both Fintech and Insurtech is shaped by individual psychological factors, social influences, confidence in the financial institution or insurer, and trust in AI technologies[39]. The study confirms that the trust model is equally applicable to both sectors, proving its effectiveness in analyzing consumer trust dynamics in AI-enhanced financial and insurance services. To further boost consumer confidence, it is recommended to refine AI integration strategies within these services[39].

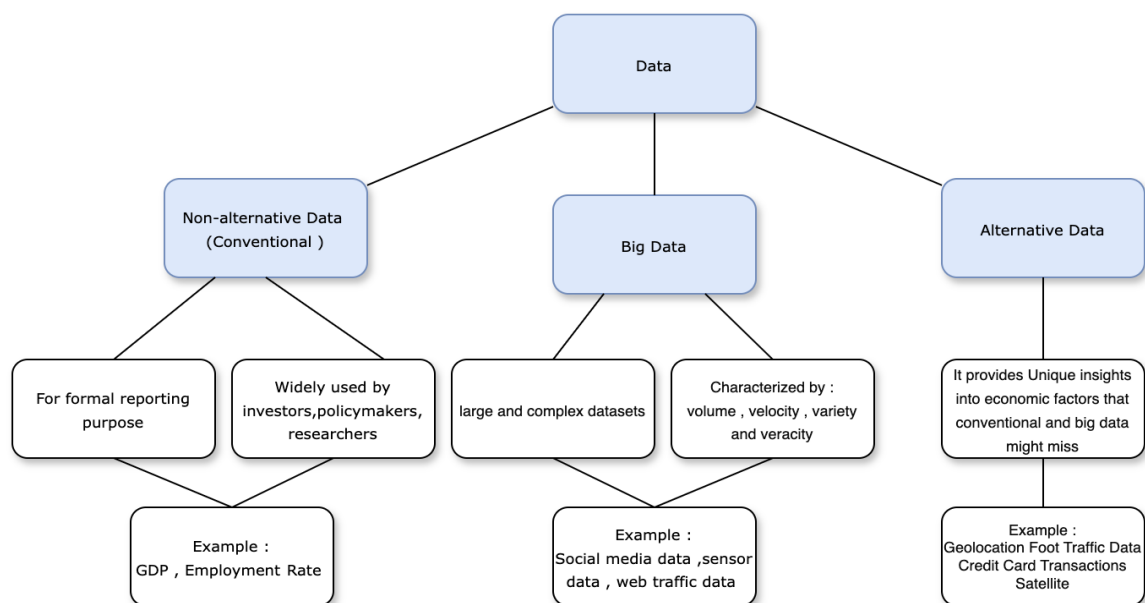
#### 14.6: Alternative Data, Big Data, and Applications to FinanceBen

The paper delves into the revolutionary potential of financial technology, particularly focusing on big and alternative data, alongside concepts like cloud computing, smart contracts on the blockchain, and machine learning AI [40]. It explores the meaning and applications of big and alternative data across various domains, including quantitative trading, macroeconomic measurement, credit scoring, corporate social responsibility, among others[40]. The exact problem addressed revolves around harnessing the potential of big and alternative data to enhance financial services and decision-making processes[40]. The solution offered involves exploring innovative applications of big and alternative data in different financial domains, aiming to improve efficiency, accuracy, and effectiveness[40]. In conclusion, the paper emphasizes the significant role that big and alternative data can play in revolutionizing financial services and highlights the importance of continued exploration and innovation in this area. Improving the problem involves further research and development to refine algorithms and methodologies for analyzing and utilizing big and alternative data more effectively in financial contexts[40].

Figure 9 :



Title: 3 Concepts of Financial Technology



The illustration , presents three different kinds of data that are important to financial analysis: Non-alternative Data, Big Data, and Alternative Data [40]. Non-alternative Data, or conventional data, is used for formal reporting and is used by investors, policymakers, and researchers, and can include GDP and employment data[40]. Big Data describes large and complex datasets that exhibit volume, velocity, variety, and veracity, and can include forms of data like social media data, sensor data, and web traffic data[40]. Alternative Data provides unique insights to economic variables either not explained by conventional data or otherwise by Big Data, including geolocation information, foot traffic data, credit card purchases, and satellite data, to provide two examples[40,41].

**Results:**

The transformative nature of AI and digital technology into the FinTech industry means profound and multi-faceted changes. This review has outlined how AI-based strategies can play a significant role in enhancing product business success and profitability when used in the financial technology sector. As mentioned in McKinsey’s report on FinTech organizations, renewals of advanced technologies often compete with the complexity of regulatory environments.

Artificial intelligence and algorithm-based techniques hold vast promise for process automation, efficiency, productivity, and labour inclusion that span a vast audience of consumers. The economics of AI in labour and consumer behaviours are ample at the macro-economic level. These arguments lead to a position that may require responsive public policies of governments to prepare for the efficiencies expected in these examples of technology.

This review has also included a discussion of the important role of digital leadership when exploring organization excellence, training, and development to prepare for maximum use of digital devices and AI technologies. Furthermore, the combination of AI in finance, and including blockchain technology and digital transformation, has been proven to improve economic efficiency and growth. These technologies provide new business models, improve productivity and create enhanced financial systems, however, the development of these technologies requires strong legal frameworks and continual investment in research and development to address regulatory obstacles and appropriate security measures.

The outcomes of this review highlight significant opportunities for AI and digital technologies to

transform the Fintech industry. By outlining the economic, organizational, and legal implications of integrating AI, the review has provided critical information for future research and policy considerations. The continued advancement of AI and digital technologies will have a significant impact on the future of FinTech and its continuing relationship between technological advancement, economic efficiency and loss prevention. As such, stakeholders at each phase of the process must work together to enable a protective space for technological advancement so that there is sufficient opportunity for mutual benefit and enhancement to society.

### **Discussion:**

The findings of this review highlight the transformative role of artificial intelligence (AI) and digital technologies in reshaping the FinTech sector. AI's ability to streamline workflows, enhance productivity, and provide tailored solutions has positioned it as a catalyst for operational efficiencies and financial inclusion. However, these advancements are accompanied by significant challenges, including the complexities of regulatory frameworks, ethical concerns, and technological adaptability.

The implementation of AI-driven strategies in FinTech has demonstrated potential in improving financial accessibility for underserved populations, advancing algorithmic trading, and enhancing risk management. These applications underline the critical role of data science and machine learning in decision-making processes. Yet, challenges persist, such as biases in AI algorithms, replicability issues, and the need for robust governance frameworks to ensure ethical use and reliability.

Blockchain technologies, discussed as complementary innovations, further amplify the potential for decentralizing financial systems and democratizing access. This integration of blockchain and AI suggests significant opportunities for portfolio diversification, enhanced security in transactions, and optimized financial services. However, the regulatory landscape surrounding blockchain, particularly regarding central bank digital currencies (CBDCs), raises questions about market liquidity and stability.

A noteworthy insight is the critical influence of digital leadership in fostering organizational readiness for AI adoption. Leadership initiatives, such as workforce training and strategic resource allocation, are vital for leveraging AI's benefits effectively. Additionally, the macroeconomic implications, particularly in employment and consumer behavior, necessitate careful policy considerations to balance innovation with societal impacts.

Limitations identified in this study include the narrow focus of existing literature on specific geographies and sectors, underscoring the need for broader research. Future studies should explore the long-term impacts of AI on economic efficiency, delve deeper into ethical considerations, and develop more adaptive algorithms tailored to dynamic financial environments. By addressing these gaps, the FinTech industry can harness the full potential of AI and digital technologies for sustainable growth and innovation.

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