2

Digital Transformation in Commerce: Leveraging E-Business and FinTech for Sustainable Value Creation

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Abstract

The digital transformation of business and commerce is about using e-business and FinTech solutions to create and deliver sustainable value. The digital transformation of commerce consists of e-business and FinTech solutions developed in an integrated architecture. E-business enables electronic processes and interactions in the business relationship between the supply and customer sides through the intermediary of a platform. FinTech, or financial technology, is a technology that enables electronic payment and other financial services to support e-business. Among other functions, the concept also covers payments, credit, and risk management (Schöni, 2017). The shift of commerce to digital is propelled by customers wanting more speed, convenience, and access to the broadest choice; for organizations the need to build resilience to survive shocks and dominate the recovery; the fixation to creating compelling customer experiences to gain competitive advantage; and the ability to capture new markets and reach underserved customers especially in emerging economies (Von Leipzig et al., 2017). Conceptual frameworks for digital transformation of commerce emphasise sustainable value creation and enable a clear articulation of characteristics and components (Zott & H. Amit, 2000). The e-business platform uses a four-layer service architecture, namely web, application, data and network, along which data or information flows in two directions. The transaction performance, reliability, and security of a platform depend on effective data management and control over the service layers to enable the operational processing of individual transactions. FinTech, in simple words, includes all those digital add-ons to your financial services and activities that facilitate electronic processes and transactions in your transactions without making extensive multi-modal transfers across different components of this entire service.

Keywords: *Digital transformation, e-business, FinTech, sustainable value, financial inclusion, platform models, data governance.*

1. Introduction

The financial technology and e-business integration create sustainable value for society. E-business incorporates digital technology into commercial activities using different platforms. FinTech allows e-businesses to conduct transactions over several platforms and channels. The digital economy increases access to knowledge, markets and financial services. The community, knowledge, and cash interplays are facilitated by digital platforms (Zott and H. Amit, 2000). Digitalisation means, for instance, greater efficiency and productivity; improved customer experience; greater financial inclusion; better risk management; and improved access to markets (Von Leipzig et al., 2017). E-commerce and Fintech developments show that e-business, Fintech and digitisation have transaction opportunities that are generally useful in carrying out economic activity (Gillpatrick et al., 2019). The creation of value happens at macro, meso and micro levels through economic sustainability (profitability, resilience), environmental sustainability (energy, e-waste, digital efficiency) and social sustainability (inclusion, job quality, equitable access). The finances as well as the sustainability of economic entities, collaboration, platform or platform-based models, risk governance, and climate change are economic factors.

A digital economy serves the purpose of knowledge sharing, value addition, innovation, and the creation of new business models. Digital technology alters the ways information and communications are produced and, therefore, how profits are generated by existing business models. Several disciplines dealing with process and workflow management facilitate knowledge creation, exchange, development and use, which are crucial for knowledge-based economies. The thrust of digital transformation is at the core of most developments globally. In a way, they have recognised rupture and interdependence with e-business and also FinTech. In a way, these transformations impact society, the market, the economy, and the industry. Social connection forces (social media channels); organisation presence forces (website and e-mail); mobile terminal provision forces (mobile phones and tablets); employee access and productivity forces (remote access and flexible working); and digital convergence forces (multi-channel and service delivery options).

2. Conceptual Framework

In commerce (DTC), digital transformation may be defined as the use of digital technology to create new or modify existing value propositions, the value creation processes and ecosystems

associated with them, the financial, operational or sustainability benefits that can be achieved, and the strategic changes needed to achieve this. DTC takes place when at least one piece of the value proposition or the underlying business model, or the sector, such as commerce, financial services or data monetisation, changes. DTC seeks to enhance financial, operational and sustainability value creation across the commerce value proposition. Expected financial and operational improvements will boost margin and competitiveness; sustainability improvements should lower risk and could help mitigate the cost of capital. The DTC proposition is supported by various theories and models related to business, digitalisation, commerce, technology, etc. (Dähler, 2017).

E-business refers to carrying out commercial transactions using multiple technologies and channels between a commerce party and a buyer, supplier, or payment provider. The commercial party could be any business or government. Also, the context here refers to multichannel, omnichannel or the like. You could think of it as e-commerce for wholesale transactions, auctions, and retail selling. E-business is a broader concept and involves much more than digital exchange. You have advertisement and promotion envelopes, various data-exchange streams, payments, platform-level and financing-services check-out processes, risk-management assurance, and embedded financing into ordering and delivery processes, which are all part of an overall commerce-transaction value proposition; apart from pure transaction or exchange modelling.

2.1. Digital Transformation in Commerce

The drive of e-business and FinTech for a digital transformation in commerce. According to Dähler (2017), e-business refers to the implementation of Internet technologies and associated strategies to manage information and commercial flows along the value chain, in all likelihood. The use of digital technologies to deliver financial services (Schöni, 2017) is known as Financial technology (FinTech). FinTech plays the role of an enabler by facilitating seamless commerce in payment processing, lending and credit assessment, risk management, and embedded finance. Together, they address the business model, value proposition and capability runners in integrated commerce. They act in conjunction with commerce and in conjunction with digital transformation.

The combination of e-business and FinTech in commerce to produce sustainable value is digital transformation. The key drivers include pervasive digitalisation, post-pandemic recovery and behaviour. E-business coordinates and optimises information

management and commercial processes along the value chain, front-end and back-end, B2C and B2B, which operates on the platform-based or marketplace model. FinTech makes all relevant transactions easy with the help of payment, lending, wealth management, financial education, etc. The value proposition finally covers improved customer experience, cost efficiency, market access, financial inclusion and operational resilience. These strengthen financial viability, economic growth, and social welfare, which are in line with the sustainability concept.

2.2. E-Business Architectures and Platforms

E-business architectures and platforms enable the seamless exchange of goods and services, the transformation of business processes, effective supply-chain management, and value-added service provision. There's a set of components forming a service-oriented and layered model. The e-business application, typically, is organised into four layers, which include user-interface, application, information and database layers. A mechanism is in place to support the integrated flow of multiple classes of content, such as transaction data, tax/price files, and statistics (See figure-1 below). Each layer deploys one or more application modules whose specific integration patterns determine the knowledge and information flow between layers. The inter-layer data flow is tightly coupled and integrated in a lot of cases (Wulfert et al., 2022). Using XML-based schema standards to define the required content without constraining the specific organisation and representation of data assists in integration. More and more, service-oriented integration is the approach of choice, wherein legacy modules offer their capabilities as remote Web service

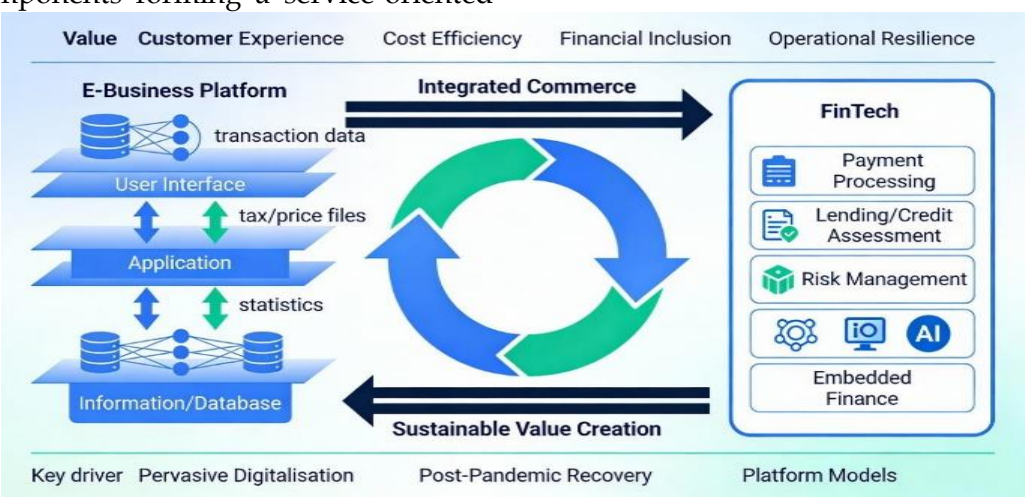

Figure-1: Cycle of value creation and integration using business platforms and levels.

2.3. FinTech as an Enabler

FinTech—the fusion of technology and financial services—represents a highly dynamic and innovation-driven sector within the business domain that enhances operational effectiveness via emerging technologies such as the Internet of Things and artificial intelligence. The sector originated roughly a decade ago in the wake of the global financial crisis, blossomed into a thriving marketplace, and is projected to yield at least $1 trillion for investors through the next decade (Boskov, 2019). The powerful growth rates exhibited by any number of financial service divisions—such as payments, lending, and capital markets—attest to the very liveliness of the FinTech ecosystem (Brandl & Hornuf, 2020).

The FinTech industry enables commercial enterprises to alleviate vertical, horizontal and cross-boundary friction in trade, creating tangible solutions to practical problems such as the ability to send and receive money or manage financial risk. Peer-to-peer lending is a clear example. The product enables businesses to unlock cash from otherwise illiquid assets, assists with liability profile balancing, and supports both consumers and businesses in matching supply and demand directly. Consequently, the FinTech industry expands the scale of digital commerce initiatives and widens the horizon for value-augmenting digital transactions.

3. The Value Proposition of Digital Commerce

Engaging in effective digital transformation allows for the enhancement of efficiency, productivity, customer experience, financial inclusion, and access to markets, which together represent a compelling value proposition and a source of sustainable value creation (Gillpatrick et al., 2019). These dimensions apply throughout the economy, yet they are particularly evident in commerce, where activities are largely transactional in nature. The digital transformation of commerce encompasses e-business and FinTech, which have taken on greater prominence since the onset of the COVID-19 pandemic. Even in the least developed economies, e-business activities such as mobile messaging, social media, and content sharing have increased. The pandemic has accelerated the uptake of FinTech services in the e-business domain, which is expected to continue growing.

Migrating from analogue to digital platforms fosters enhanced real-time application and improved performance across operating parameters. Transporting commerce activities onto digital platforms substantially increases

data generation, which in turn augments design capabilities that feed into the various present technologies that shape the 4IR (Zott & H. Amit, 2000). Digital transformation enables the identification of precisely what and how the various operational and value-generating activities of commerce can be performed, notwithstanding continued close observation of the way the other major parties—consumers, retailers, and personal transactions—engage within the commerce platforms.

3.1. Efficiency and Productivity Gains

Digital technologies have fundamentally changed commercial operations, establishing new avenues for externally oriented processes such as purchasing, sales, and financing. Early studies based on the labour productivity metric observed contrary or neutral effects: negative impacts of widespread automation on market growth, and declining returns on IT capital in advanced economies, labelled the deepening paradox (Aranyossy, 2013). Commercial processes remained the largest cross-country source of productivity loss, while digitalisation provided new growth avenues, enabling efficiency improvements through unitary sales and transaction reductions (Wang et al., 2024). Firm-level evidence has documented productivity gains, including sample studies in Hong Kong showing substantial process and sales effect improvements attributable to e-business deployment. Various systematic analyses highlight the widespread global and sectoral paradox of commercial non-acceleration, on an aggregate basis, and beyond emerging markets—arguably undermining the digital production view.

Emerging roundtable assessment modelling productivity and e-business datasets indicate that early emergence, acceleration, and reversal periods characterise differing regime durations. Sales and operating efficiency boosts, attributed to information accessibility, transaction coarsening, and commercial-hour engendering, remain key effects. In the eighth annual UNCTAD e-commerce survey, from 2019 eight-quarter financial balance and settlement datasets, emerging-market corporation reports specify productivity estimates availing from digital financial commercial operation facilitation. Emerging country firm improvements across credit-risk, operational-cost, digital-scaling enlargement, liquidity-time-saving, and income-claim augment accompany overall economy intelligence gain assertion (Ahmad Al-Omari et al., 2022).

3.2. Customer Experience and Personalisation

Digital transformation in commerce aims to create sustainable value by leveraging e-business and FinTech, which are increasingly vital for individuals and

organisations. E-business covers commercial transactions in various forms, encompassing processes, models, trading systems, and platforms; FinTech encompasses technologies, services, and solutions that facilitate financial transactions and commerce.

The efficiency and productivity of commerce digital transformation is derived from its seamless processes and frictionless working. The metrics also show significant reductions in lead times, distribution times, search efforts, and travel times. According to reports, the productivity gains and cost savings that followed were better than expected. More businesses are also getting new work from new client offerings.

Harnessing data, AI, and automation enables digital transformation to enhance experience & personalisation by seamlessly delivering services at scale. More and more customers are generating data directly from multiple sources, such as e-commerce websites and visits to their website, and indirectly from public sources such as social media. This data supports the segmentation of different audiences, enabling personalised and tailored interactions even within a group scenario. AI can help enhance outreach in real time, automate requests through bot notification and recommendation and personalisation work.

Leverage customer data when engaging with a market or audience. Integrate relevant customer data from products, solutions, services, and platforms for an in-depth understanding at granular levels. Mapping current and potential customer journeys allows identification of pain points, satisfaction moments, and friction causes, enabling determination of desirable states and major obstacles. Enhance post-sale experience, build repeaters and advocates, and expand relationship scopes aligned with product-service portfolios, audience focus, and business model transitions. Personalisation efforts should account for privacy risks, seeking consent via appropriate controls and channels. Collect consent both centrally and when specific data is required, and enable customer access to the consolidated list of accepted consents across various engagements. Identify and configure multiple consent levels according to data type, engagement nature, and applicable regulations.

3.3. Financial Inclusion and Access to Markets

Digital financial services require infrastructure like modern mobile phones supported by updated software. The rapid digital economy, driven by global information infrastructure, enables electronic commerce and virtual supply chains, changing the traditional banking landscape. The shift towards online and mobile banking offers new access points for customers worldwide. However, a significant gap remains for

banks to fully leverage mobile technology as a means of internet access and financial inclusion (Boskov, 2019).

The global information infrastructure is developing rapidly, which consequently is giving rise to electronic business & electronic commerce. Thus, bringing about rapid technological changes supports new business forms. Electronic banking is one such innovation. The strength of the economy is now in the hands of customers due to a digital economy. As a result of this, there will be a need for high-tech assistance during planning. As banking has shifted from traditional to smart transactions, mobile devices have emerged as a prominent medium for accessing banking services and conducting business online. The bankers still need to overcome an important gap before they can use mobile technology for internet access (Boshkov, 2019).

Getting access to finance through Fintech providers has positive effects for financial inclusion in developing economies. The convenience offered to individuals with low and varying incomes can far exceed the costs charged by banks. Yet, financial inclusion and stability, too, are challenged by digital finance. Future research could determine whether digital finance affects the spread of financial contagion during economic crises (Kitakogelu Ozili, 2018).

4. Sustainable Value Creation

Through digital commerce, sustainable value can be created across the economic, environmental and social spheres. First, economic sustainability refers to profitability, resilience, and long-term economic impact. Digitalisation can impact the financial bottom line directly or indirectly. Innovative companies show how digital transformation improves economic sustainability. In addition, environmental sustainability relates to energy use and e-waste. The COVID-19 crisis-related application of digital services reduces travelling and mobility, such that energy consumption is optimised and emissions lowered to support ecological health. Designing digitalised processes as appropriately as possible to avoid energy consumption. Third, social sustainability includes job quality, inclusion, digital skills, and access. Digital commerce can lead to either better transactions or higher-value engagements, which contribute to job satisfaction and overall quality of life. Taking on a standard job increases access to challenges, which target job satisfaction and financial wellness. However, informal work avoids taxes, has no coverage, and has differential regulations for ease of cooperation (Dewan et al, 2013).

4.1. Economic Sustainability

Digitalisation has changed both disruption and opportunity for businesses and economies. Emerging

economies, still facing dilemmas of infrastructure, finance and market access, can leverage a digital transformation revolution to reshape commerce. Emerging markets can leverage an inclusive digital-first approach to leapfrog conventional obstacles to formal commerce and quickly set up new, sustainable businesses of the post-COVID future. Also, like the best-practice examples, they can effectively absorb advanced technologies to enhance enterprise efficiency and develop entirely new modes of business. Rural micro-entrepreneurs in China and India face challenges of access to finance and market opportunities, and could leverage e-commerce as a game-changing opportunity to counter their vulnerabilities and enter the social-productive economy. Dingtalk, WeChat, WhatsApp, JioMeet and others, which provide work from anywhere and a social connect, offer a chance to plug micro-entrepreneurs into information, technology, knowledge, finance and markets. The electronic business in emerging economies hasn't been studied extensively.

Recently, the share of micro-enterprises in the economy has increased, alongside the promising growth of micro-insurance, payment systems, online lending, and digital currencies. However, commercial risks restrict the effective operation of digital finance and financial institutions. A framework showing e-business and FinTech interlinkage has been proposed to guide the digital transformation and sustainable development for rural micro-entrepreneurs in emerging economies. The digital interface of e-business platforms serves as the gateway and channel to connect micro-entrepreneurs with unorganised markets, while Fin-Tech provides the financial ecosystem for digital commerce to link rural micro-enterprises to market opportunities.

4.2. Environmental Sustainability

Environmental considerations are vital for assessing the sustainability of digital commerce. Economic drivers for e-business and FinTech exist alongside the need for responsible value creation as digitalisation continues to expand (Dewan et al., 2013). The transition to e-business technologies, transactions, and communications can substantially lower per-transaction energy requirements (Huang & Lau, 2024). Transactional shift—from physical products to digital goods and services—further reduces energy footprints. However, sustainability requires a holistic view across both physical and digital dimensions. Energy sources also influence overall environmental impacts. The global device ecosystem and disposable technologies result in considerable e-waste. Reduced physical travel through video and teleconferencing improves accessibility

for underserved populations. Enhanced resource access enables education, health services, and retail opportunities, but demand also grows for basic digital access and competency.

4.3. Social Sustainability

Digital technology is changing the way business interacts with the workforce and customers. E-business positively impacts social sustainability by expanding the inclusion of people or groups in employment and commerce, creating jobs that enhance the comfort and safety of workers, and helping one obtain knowledge, skills, and enhance employability (Niu, 2022). Enhanced social interaction due to digitalisation has integrated social sustainability within commerce (Sivarajah et al., 2019). Digital commerce and financial technology services have become accessible using digital technology at a lower cost than consumers pay for daily use items. Digital technology assists the projects that encourage education for the disadvantaged section, which help people to develop their business ideas and do e-marketing while studying and working (Dewan et al., 2013).

5. Business Models and Ecosystems

A business model describes how a company generates revenue. For survival, companies must ensure revenues exceed costs (the models may differ by sector and company). In 2017, business models pivoted from goods or services to a new form of consumption called "experiential economy"—the consumption of object usage experience rather than the ownership of objects, linking customers and enabling firms to enhance customer experiences (C. L. Ng, 2013). Building an ecosystem around the user experience increases engagement and satisfaction. The digital cycle, linked to connectedness among objects, people, and propositions, introduces a new element to business models (Boleslavivna Zubkova, 2017). Consequently, three tiers appear in the interconnected digital economy: connected customer/supplier propositions, connections that create transparency, and data-driven operations throughout the enterprise and value chain. Offering an immersive usability experience encourages customers' repeat usage. Hence, firms must focus on specific value-creating activities and related propositions that improve operability and enrich personal experience. All connected, mobile, and global interactions generate two-way, real-time, big-experience marketplace network data, including physical data, activity data, use data, emotion data, competitive landscape, and community collaboration data. Such data flow shapes distinctive consumption and use patterns by region or segment. Therefore, the firm must construct a new architecture for

analysing data and a connected approach to the consumption experience.

5.1. Platform-Based Models

Platform-based models use data to connect users with products or services. As the number of data increases, and filters become finer, the accuracy of the match improves (Sorri, 2017). Disruption of the mainstream industry occurs with the help of innovative technologies. They do this by altering the processes of value creation. Also, affecting customer behaviour forces companies to re-examine their business models. The traditional pipeline businesses can become platforms by establishing connectivity of a suite of products and services and two-way engagement with consumers, thereby leading to further value creation. These enterprises disrupt social structures and modify our behaviour while we're preoccupied with our busy lives. In platform systems, trust is essential because users often interact with partners unknown to them and across cultural and legal boundaries (Järvinen, 2018). To secure platform success, trust must be created by feedback and evaluation systems & interaction quality. Because pipeline models linearly create value, the model of platform value generation provided above marks a radical departure. In this model, value is created and consumed collectively and simultaneously by the platform's participants – consumers and producers.

5.2. Ecosystem Collaboration

Value co-creation expands the firm's value proposition. The transformation of isolated value cotheft into an entangled ecosystem economy suggests ecosystem; stakeholder-squared partnership along all stages of a value chain. Next-generation territorial services can be perceived as a portfolio—at a local or relay interface (Dini et al., 2008). Value co-creation furthers collection-formatting and scenario-integration of big data travelling through and servicing an ecosystem at a national or economic level as a cross-territory plural. However, these representations require certain forms of "digital-ly" engagement, such as "webin-air" conduction or association with a global good. Value co-creation reverses the customer engagement expectation: customers expect companies to be proactively knowledgeable instead of receiving appropriate intelligence from customers for stimulating "big-data-empowered" interfaces (Boleslavivna Zubkova, 2017).

5.3. Risk and Governance Considerations

To achieve digital transformation of commerce, risk and governance issues related to e-business and FinTech will need to be addressed. Risks come in many forms; they can occur at the strategic, portfolio, program, and project operational levels and are both qualitative and quantitative (Guerin,

2022). As processes and entities increasingly come together, the need for data governance becomes evident. E-businesses that operate transnationally must ensure that they comply with the relevant laws, such as the General Data Protection Regulation (GDPR) and, Payment Services Directive (PSD2). When utilising e-business types that regulators in various jurisdictions are still sceptical of, such as crypto or gambling, AML compliance is vital.

The organisations must protect customer data to prevent its leaks. Moreover, they must inform the customers about what customer data is collected, its usage and sharing with others. In an era where the internet can be compromised if one is forced to use a public wifi or an enemy's DNS, ensuring connection security through trusted open-source software and self-hosting strategies is are essential condition for establishing trust. With respect to preventing cyber risk, measures deployed include penetration testing, formal verification of Smart Contracts, sandboxing, deployment on parallel systems, etc., on the fintech side. When it cannot meet its disclosure requirements, there is a risk of being sanctioned by regulators, which can be accentuated by cyber-risks.

A broader portfolio of ethical questions emerges at the intersection of commerce, finance, and technology sectors. The possibility of avoiding tax disclosure by settling the purchase price outside a regulated platform suggests a tension between doing finance and doing good. The principle that e-business and FinTech are tools that amplify rather than mitigate the Fourth Industrial Revolution remains highly relevant (Niu, 2022).

6. Implementation Pathways

Digital commerce transformation encompasses e-business and financial technology (FinTech) to create sustainable value. This section outlines practical implementation pathways, focusing on strategic alignment and capability building, technology portfolio and architecture, data governance and security, and change management and culture.

Digital transformation of commerce refers to the integration of e-business and FinTech in a systematic manner to offer sustainable value. Griffiths et al. (2018) describe a set of four key implementation pathways: strategic alignment and capability building; technology portfolio and architecture; data governance and security; and change management and culture. The aim is to develop, strengthen or scale an organisation's essential capabilities for an effective digitalisation of commerce.

Effective digital transformation harmonises technology, data, and process across the enterprise. Commercial digitalisation often begins

with point solutions, necessitating gradual enhancement of the overall technology and data architecture. Select appropriate components, develop enabling technology layers, and harmonise functionality across components (Braun, 2003). Consider organisational legacy and scale when leveraging existing technology.

6.1. Strategic Alignment and Capability Building

Creation of a clear vision and tangible goals provides strategic alignment for the transformation roadmap (Gajendran et al., 2013). Stakeholders should agree on the outcomes they desire, their scope, and an accountable executive. Sustainability criteria will be established to the extent to which the commercial viability, stakeholder demand, as well as environmental impact are taken into account. Roadmaps assess what needs to be done first and when, and formally measure progress towards some vision. The transformation process requires the organisation to develop a capability aligned with the chosen pathway. Digital commerce is dependent on competencies such as integration, data protection, distribution, financing, identity management, market analysis, policy compliance, reputation management, security, transaction support and user support.

6.2. Technology Portfolio and Architecture

In the evolving technology portfolio for the smooth functioning of a business, it is essential to select and layer different types of technologies. These include E-business, FinTech, low code/no code, cloud, artificial intelligence (AI)/machine learning, and Internet of Things (IoT). These technologies also enable appealing and/or well-targeted customer interface options, diversify customer touchpoints and identify opportunities for product service or process innovations. According to Griffiths and colleagues (2018), proprietary technologies are very important but only in conjunction with a wider range of complementary and enabling technologies. Furthermore, an increasing share of technology options is subscription- or consumption-based. Both these characteristics are also typical in the lower-tech retail sector. Fintech alternatives that appear at the additional layer can improve the customer journey by helping in onboarding, lending, insuring, and saving. (O'Higgins, 2023). Low-code/no-code tools offer organisations speedy, powerful application development and prototyping with comparatively less programming. The connected digital commerce architecture is inherently modular, and a modernisation plan can be captured to accommodate future technology advances that improve the customer experience and operational efficiencies.

6.3. Data Governance and Security

Digital transformation of commerce by combining e-business with FinTech creates value that is sustainable in the environmental, economic and social spheres. Data governance and integrity are crucial for long-term sustainability. This article outlines the relevant policies and oversight practices that would be useful in addressing the governance and security-related gaps and risks. Despite technological advances in security and the enablement of frameworks to protect privacy and mitigate risks, commerce is vulnerable to leaks and breaches of data. The occurrence of such incidents can jeopardise the well-being of firms, threatening start-ups related to it. Their ongoing events are a challenge to the safety and security of the digital ecosystem and are impeding the ability to grow sustainably and inclusively (Niu, 2022).

Many carmakers have adopted policies for sharing the driving data with third parties to enable innovation without compromising end-user privacy. The publication of documentation that articulates the objectives of data governance and what will happen to the data (Quach et al., 2022). Data governance frameworks specify the roles and responsibilities of stewards (i.e., who can collect, generate, transform, store, share and exploit). Such frameworks are the basis of the expected environmental, economic and social benefits of digital-transformation projects (Thanh Ha, 2022).

6.4. Change Management and Culture

Digital transformation in commerce poses a dual challenge—adapting to the speed of technology and overcoming organisational inertia—and yet creates a new opportunity: the end-to-end digitalisation of traditional supply chains, from 'order-media' through to payment, to become more cost-efficient and to reach new customers in previously unserved segments who rely on alternative transaction channels (Brucker-Kley et al., 2018). Such digital commerce depends on two enablers: Fin-Tech—financial technology that secures the monetary aspects of digital transactions—and e-business architecture, which integrates application software along the transaction path or data-value chain.

7. Measurement and Evaluation

Performance assessment helps to ascertain if objectives are being met and motivates for further improvement. Digital transformation can be assessed through several key performance indicators (KPIs), which allow organisations to track how well they are performing and progressing towards business objectives. Performance measurement systems work best when they are aligned and integrated with the

general strategy of the organisation. The choice of performance metrics could be affected by the degree and design of digital transformation or the business objectives (Wang et al., 2024). Four specific types of KPIs are important, and these are financial, operational, customer, and sustainability. Financial indicators can be used to measure the performance of a firm. They are easy to obtain, used for a long time and have a high level of credibility.

A quantitative assessment of the impact of digitalisation on operational efficiency can be performed by undertaking a measure of causal analysis. Another option is to compare efficiency indicators in one organisation at two different time points. The degree of digitalisation of similar organisations operating in different locations or environments can be determined to ascertain whether they achieve similar levels of economic or commercial impact. The technique enables the assessment of the impact of digital transformation on multi-dimensional enterprise performance on the basis of evaluative metrics that the enterprises have not yet adopted.

7.1. Key Performance Indicators (KPI's)

The expected benefits of digital commerce for the economy—expected as gains in price, quality, choice, and variety—have been increasingly reflected in sustained digital technology diffusion reports. Massivity of e-business intermediation transits significantly and affects commerce, notably in emerging economies, where e-business solutions exhibit higher importance relative to high technology and FinTech categories. Despite productive e-business impacts, the full potential remains underexploited with corporate motivation, and e-platform coverage and enterprise capacity still serve as key determinants (Ahmad Al-Omari et al., 2022). Digital platform restructuring, encompassing new technology and aligned policy mandates, further improves the interests of enterprises.

The digital economy's net benefits depend on safety and risk fundamentals; the presence of operability, compliance, and integration across public, corporate, and individual decision spaces remains critical. During the prior, digital-deferment periods, system might hid commercial and domestic substitution and avoidance of digital processes. Commercial E-business, for instance, ongoing issues, matured weakly, —the record holder being held by 16%— despite higher digital investment and empowerment (Tang & Yang, 2022). Limited-global joined Internet; resulting from both structural–service discontinuity accommodation delays; social awakening, and broad-day and channel bandwidth restrictions; combined with various mobility, obstruction, and solitary process-inducing pre-establishment residuals,

redefined enterprises' operation and deficiency awareness. Broad-spectrum upgrade, covering commerce and high-tech industries, thus, became essential for compatability and comparative advantage.

7.2. Impact Assessment Methods

Causal analysis estimates the impact of digital transformation by correlating changes in relevant metrics against a counterfactual scenario without the transformation. Quantifying expected metrics before transformation enables a comparison to actual metrics (Niu, 2022). Benchmarking gathers performance data across multiple firms for specified indicators (Yahya Alwan et al., 2023). Comparative studies investigate the predicted effects of the transformation.

7.3. Longitudinal Evaluation and Reporting

Digital transformation helps to change the ways businesses work in all sectors and regions. Data shows that enterprises are facing shrinking margins. Competing with emerging competitor digital players is one of the findings of Wang et al. 2024. As a result, they reconsider how they serve customers, what value they deliver, who their competitors are, and how they do business internally. According to Euben (2021), a winner is one who will capitalise on blended solutions, customer experience over product, share price over profit, super-connection over ownership, and wellness and safety over growth. Digital transformation is guided by sustainability. Environmental, social, and governance (ESG) considerations increasingly guide how businesses pursue a digital transformation to help gain new employee and customer engagement, stay relevant to their stakeholders, and empower their competitiveness.

Digital transformation is something never-ending, rather than only a destination. As digital constructs change, changes too become the government frameworks, compliance requirements, reporting obligations, certification and standards norms of different industries. A best practice is to evaluate regularly (quarterly or biannually) and publish the findings - at the start of the journey and during - to all constituents, such as the board, key management, employees, partners, and clients (Karpova, 2021). The purpose of an evaluation every six months to assess the organisation's road map, most significant results achieved to date, and next steps through stakeholder's engagement (Euben, 2021).

8. Policy and Regulation Context

Digital transformation improves the efficiency of commerce and e-business models through the integration of FinTech services and innovation practices for sustainable provision and circulation of value (B. Arewa, 2022). Although the processes and practices

enable commerce, they may require policy adjustments to avoid worsening inequality, discrimination, and job displacement (Diez Guardia, 2001). The emerging e-business solutions with FinTech services require compliance with regulations, standards for information exchange, and the formation of international operating frameworks for smooth operation and to guarantee seamless utilisation of interconnected platforms globally. Digital commerce can alleviate and mitigate the effects of large-scale shocks and promote contactless transactions.

8.1. Data Privacy and Protection

Digital change makes an economy, environment and society richer. As organisations transition, they are increasingly depending on data, posing problems for privacy and protection. Involving the law can improve compliance and risk management.

Digital transformation creates profound economic, environmental, and social value (Ali Berawi, 2018). As organisations embrace transformation in commerce, they depend increasingly on data and associated processes (Quach et al., 2022). These changes heighten privacy and protection challenges, which can threaten value creation and attainment of desired outcomes. Careful consideration of legal contextual issues enhances compliance and risk management, advancing transformation efforts. Data is a vital resource for individuals and organisations engaged in commercial transactions. Generation, collection, analysis, and use of data produce the information on which value and decision-making depend.

8.2. Financial Regulation and Consumer Protection

The quick development of e-business gave birth to new business models, processes, and interaction forms. It includes the exchange of goods and services and information over the digital network (Oliinyk & Echikson, 2018). Several economies are working to make the best use of digital technologies with the help of fiscal and monetary policy, regulatory reform, infrastructure development, skills development and investment in broadband deployment, cyber security and digital literacy. The world today is witnessing an enormous technical transition toward digitisation and digitalisation. Digital commerce is on par with the internet, social, mobile, and cloud computing in terms of the breadth, depth and scale of their impact on business, economy and society. The digital commerce is reshaping current businesses and creating new businesses at an unprecedented scale, changing not only the way business transactions occur but also transforming business and government operations along entirely new lines. It increases macroeconomic productivity of businesses, ramps up the start-up activities of new companies,

improves market access of household enterprises and offers a rich experience to buyers. Digital commerce is also allowing access to financial services and markets in difficult-to-reach areas, which promotes financial inclusion (Didenko, 2018). The growing interest in the circular economy is reflected in the accompanying growth of our coverage of digital business models and value propositions that link to the prevention of waste creation and the recovery of waste that has already been created. The idea of sustainable oceans continues to increase traction, and people are becoming more interested in seeing maritime digitalisation help in leveraging innovation and investment for sustainable oceans.

8.3. Standards and Interoperability

Interoperability is a key driver of digital development and the creation of interconnectivity that helps actors to produce more effective products and services in an ecosystem (Agostinho et al., 2016).

As companies go on a mission to attain Industry related solutions, novel data-driven business models are emerging with sophisticated manufacturing techniques. An array of manufacturing processes and business models result in diverse data standards, languages, and methods to share and interpret data. Common, interoperable data standards and languages are one of the major obstacles to the widespread use of digital-platform technologies. It is a key bottleneck preventing access to crucial data needed for digital transformation and the collection of KPIs. Using the IoT device and the machine-information integration devices (Dini et al., 2008) may address the interoperability challenge. Other challenges faced are: (1) the necessary sharing of information about secure-access gateways; (2) the effort to generate added value from the acquired information; and (3) the identification of information from one of the gigantic pools of non-target data. In the networked economy, there is a trade-off between adopting standards to facilitate data-flow integration and interoperability through the adoption of proprietary or less widely adopted solutions, which is often more attractive from a business economics standpoint.

Technological interoperability between automated systems is recognised as critical for both sharing and storing process data in manufacturing. As systems introduction relies on technical, operational, and functional interoperability, a T—O—F interoperability model has been elaborated. A Digital Business Ecosystem therefore emerges, permitting sustained economic growth in knowledge-based economies through the ability to rapidly connect heterogeneous partners in flexible business arrangements. As stated by Agostinho et al.: "A Digital Business

Ecosystem supports the creation of robust and dynamic business networks such as manufacturing process plants, logistics chains, supply networks, and business-to-business networks, particularly for Small and Medium-sized Enterprises". For interoperability to reach further than what standards can guarantee, the research agenda has to follow a socio-economic-structural trajectory. Consequently, harmonisation efforts should encompass research investments and ergonomics standards, along with the wide diffusion of best practices in design, and participative ergonomics to foster integration in design.

9. Case Studies and Benchmarks

Adoption of digital commerce in emerging markets and emerging economies has varied applications significantly depending on income levels, COVID-19, the maturity of the traditional retail sector, and the relative positions of e-commerce, social media and digital finance. A recent study of 26 emerging markets found four kinds of digital commerce adopters – boomers (China and India), sprinters (Egypt and Indonesia), slow-burners (Nigeria and Pakistan) and reluctant reverse-movers (Brazil and Russia). Policymakers can utilise and leverage the knowledge of the dynamics that underlie, allow or impede the adoption of digital commerce for sustainable and inclusive growth.

By using a variety of case studies, new digital commerce powered by e-business and FinTech-enabled firms in different situations are able to reform their businesses and generate sustainable value. Several retail and wholesale examples illustrate how organisations leverage e-business, cloud and FinTech, optimising operational agility, rethinking product strategies and aligning cash flows with value creation and show concrete ways to facilitate systemic transformation. Some of the expected outcomes are better coordination to enable resilient omnichannel operations, improved access to sale-based financing, and a shift from lengthy product warranties to subscription based services that enhance customer satisfaction and lifetime value. Exploring e-business capabilities and FinTech-related needs, as well as credential protection in digital ecosystems, helps firms to prioritise FinTech integration (Dähler, 2017).

9.1. E-Business Platforms in Emerging Markets

Emerging markets experience lower but increasing levels of e-business activity than advanced economies. Access to the Internet and to the range of digital devices continues to transform retailing across Africa, Asia, Eastern Europe, Latin America, the Middle East, and the Pacific Islands. Since 2020, the COVID-19 pandemic has accelerated the movement to digital business in many emerging

economies. While the trend is evident, there is still limited evidence of the use of detailed e-business frameworks to describe widely adopted business practices, business models, and e-business platforms in those regions; e-commerce activity in B2B trades at an even lower level than in B2C transactions. The application of the e-business framework to emerging economies reveals a pattern of B2C services and a distinct set of mobile e-business platforms—factors that limit economic growth and distance the regions from the general development of e-business. Understanding these unique features may help stimulate the development of organisations and create self-sustaining commercial activities. The individual country cases of three major emerging economies, South Africa, China, and India, each featuring distinctive characteristics, illustrate some of these issues (ZHI WEN et al., 2019).

9.2. FinTech Integration in Retail and Wholesale businesses

FinTech provides important technologies, products and services that lower barriers and allow for participation in commerce across society, underpinning digitisation across the economy. People can easily turn into buyers, sellers or providers of other goods and services, which enables trade, exchange and other kinds of transactions. FinTech firms provide payment, borrowing, risk management, and other financial services. Issues such as lending, investment and insurance form the part of other services. In any marketplace, retail, wholesale, e-commerce, distribution, or trade of any type, money is always involved, and without exception, commerce requires a financial transaction. Omni-channel approaches leverage the strengths of the online and offline transactions, as well as finding solutions to the problem faced by remote and physically secluded situations (Boskov, 2019).

Companies such as MercadoLibre, Linio, and Konga in Latin America and Africa exemplify strong digital commerce growth amid the emerging maturity of the e-business ecosystem, which leverages the integration of merchant payment service offerings and financing at the platform layers. MercadoLibre, Latin America's largest digital commerce platform, facilitates transactions and consumer credit provision integrated within the platform. Konga, Nigeria's largest retail and marketplace platform, offers sellers a hosted payment gateway service that supports multiple channels and also provides financing directly to sellers. Linio, operating in Mexico, Colombia, and Chile, additionally connects sellers electronically to banks for deposit- or sales-based financing without fully owning the service. Transactions completed via hosted pages owned by the marketplace but integrated

into the platform experience show how payment service access on the platform remains essential (Brandl & Hornuf, 2020)and vital for the entrepreneurs.

9.3. Sustainable Practice Exemplars

The advent of digital commerce has created significant and tangible opportunities for conserving scarce and necessary resources while also lowering pollution and non-recyclable waste. The consumerist trappings of modernity remain ever-present; individuals are consuming more than ever. Nevertheless, the advent and impending mass roll-out of ubiquitous broadband connectivity, affordable computing devices, real-time database management, sophisticated algorithms, on-demand production technologies, increased digital instructional materials, and real-time communications technologies provide pathways for reversing waste and conservatory practices that were masked due to the overwhelming prominence of the share economy 1.0 oligopolies. The planning of the pandemic highlighted these pathways. Digital e-commerce, e-business, digital communities, and digital intelligence share universal positive and expanding contemporary utility dimensions to considerably aid these objectives.

The unprecedented strictures and limitations imposed upon individuals and businesses forced antiquated and often ignored without blatant requirement processes to assume mandatory importance. Tele-consulting and tele-preparation and tele-medicines in the medical fields transcended many of the old-fashioned barriers of payment per service. This mode of activity expanded exponentially and permeated into a further range of activities. Digital consultations extend into environmental and health consulting by permitting review and input of extended product selections through web digitisation. Historic textile-consulting and service-providing environments remain in clinical settings. Remote consultations accelerated the provision of thought leadership and discussions on the protection of digitisation for choice and deliberation concerning the acquisition of product selections for the minimisation of avoidable costs. The sophistication and will of the available consultations recurred, but the rate of establishment and associated consultation matured and disseminated into a far wider array of activity than pre-existing activity parameters and routes (Dewan et al., 2013).

10. Conclusion

Digital transformation of commerce will integrate e-business and FinTechs for sustainable value. The operation of e-commerce businesses is dependent on the electronic business or e-business architecture and platform. Payment, lending, risk management and embedded finance micropayments and

micro-savings are made possible by FinTech, which reduces friction. Economic, environmental and social sustainability is creating enhanced value over and above profitability. With digitalisation, efficiency gains, betterment of customer experience, financial inclusion and enhanced access to the market.

E-business platforms in emerging markets have distinct adoption patterns based on existing ICT infrastructure. The synergies of FinTech in retail and wholesale demonstrate different integration paths. Sustainable digital commerce promotes economic growth, creates a wide range of jobs, saves energy and reduces pollution. To get a better understanding of the interactions, further investigation may allow the practitioners to develop sustainable digital commerce strategies within the organisations and across the ecosystems through e-business and FinTech. (Schöni, 2017).

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