II. Comparative Analysis of Digitalised Business Models

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Digital business models are a key component of digital transformation. Understanding these models is essential for operating successfully in the digital economy. A business model defines the value proposition, cost structure, financing sources, target audience, marketing strategy, and potential partnerships. Its primary purpose is to enable sustainable value delivery to customers. This paper uses the Business Model Canvas to analyse digitised business models, focusing on those based on recurring revenues (e.g., subscriptions, SaaS) and network effects (e.g., platforms, marketplaces). These models have fueled the growth of many digital enterprises. As emerging technologies reshape consumer expectations, companies must rethink how they create and deliver value in a constantly evolving digital environment.

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1 Introduction

In the context of business models, all aspects related to the creation, production, and sale of a product or service are comprehensively analysed. This includes information about the target audience, product distribution channels, and company revenue streams, with a focus on monetisation mechanisms and consumer payment models (Teece, 2010). A business model can be compared to a meticulously designed plan that serves as a strategic framework for the project team, enabling systematic business strategy development (Osterwalder & Pigneur, 2010).

A business model is typically structured around the value proposition, representing a fundamental description of the offered products and/or services, emphasising their unique characteristics compared to competing market solutions (Chesbrough, 2010). Additionally, it defines the cost structure, sources of financing, target audience, marketing strategies, revenue and expense projections, competitive analysis, and potential opportunities for strategic partnerships (Osterwalder & Pigneur, 2010).

The primary objective of a business model is to enable a company to create and deliver value to consumers economically and sustainably. Due to its thorough analysis and planning before implementation, the risk of failure is significantly reduced, as the business model functions as a guiding mechanism for effective market positioning and sustainable business growth (Teece, 2010).

The landscape of business models is as diverse as the array of enterprises themselves, reflecting the varying strategies through which firms generate revenue, engage with customers, and create competitive advantages (Teece, 2010). Business models serve as structured frameworks that define how organisations deliver value and sustain profitability within dynamic market environments (Osterwalder & Pigneur, 2010). Among the most prevalent business models are (Fielt, 2013; Schmuck, 2021; Remane et al., 2022):

- Advertisement-Based Model: This model provides free content or services to end users while generating revenue through advertisements displayed on the platform. Companies like Google and Facebook leverage this approach, monetising their vast user base by offering targeted advertising services.

- Affiliate Marketing: Firms earn commissions by promoting and facilitating the sale of partner products, commonly seen in digital marketing strategies employed by platforms like Amazon Associates.

- Agency Model: Specialized firms provide non-core services, such as marketing, branding, and advertising, to other businesses in exchange for service fees.

- Aggregator Model: These companies unify multiple service providers under a single brand while earning revenue through commissions. Well-known examples include Uber and Airbnb, which act as intermediaries without owning the service assets themselves (Chesbrough, 2010).

- Blockchain-Based Model: Decentralized digital networks allow participants to engage in peer-to-peer transactions without centralised authority. This model is foundational in the cryptocurrency and fintech sectors.

- Brick-and-Mortar: Traditional businesses operate physical retail locations where consumers purchase directly.

- Bricks-and-Clicks: Hybrid models combine online and offline commerce, enabling consumers to purchase products online and collect them in-store, enhancing customer convenience.

- Crowdsourcing Model: Businesses leverage user-generated content and contributions to build services or products, exemplified by Wikipedia and open-source platforms.

- Data Licensing and Monetization: Companies collect and analyse user data, generating revenue by selling insights to advertisers and third parties.

- Distributor Model: Entities purchase goods from manufacturers and resell them to retailers or consumers, functioning as intermediaries in supply chains.

- Dropshipping: An e-commerce model where retailers do not hold inventory; third-party suppliers manage fulfilment and logistics while retailers earn commissions on sales.
- E-Commerce Model: Businesses sell products directly to consumers through online stores, with Amazon and Alibaba being prominent examples.

- Franchise Model: Entrepreneurs operate under an established brand name and business framework, paying royalties to the franchisor in exchange for branding and operational support.

- Freemium Model: Companies offer a basic version of their product for free while monetising premium features through subscription fees, as seen in platforms like Spotify and LinkedIn.

- High-Touch Model: Businesses prioritise human interaction to enhance service quality and build customer trust, commonly applied in consultancy and personalised services.

- Low-Touch Model: As exemplified by self-service stores like IKEA, firms minimise human interaction to reduce costs.

- Manufacturer Model: Companies produce goods from raw materials and sell them to distributors, wholesalers, or retailers, forming the backbone of industrial supply chains.

- Network Marketing: Also known as multi-level marketing (MLM), this structure enables individuals to sell products directly and recruit additional salespeople, earning commissions on personal sales and recruiting members' sales.

- Nickel-and-Dime Model: Businesses maintain low base product prices while charging separately for additional features or services commonly used in budget airlines and streaming services.

- Online Marketplace Model: Internet-based platforms facilitate supplier competition, generating revenue through transaction-based commissions.

Marketplaces like eBay and Etsy exemplify this approach (Osterwalder & Pigneur, 2010).

The success of modern enterprises is often linked to the strategic selection and adaptation of business models. Recurring revenue models, such as subscription-based services or Software as a Service (SaaS), have proven highly effective in ensuring financial sustainability and customer retention. Furthermore, business models that capitalise on network effects, such as online marketplaces and digital platforms, benefit from self-reinforcing growth, where increased user participation enhances overall value (Chesbrough, 2010; Appelbaum et al., 2018). The evolution of business models occurs as a response to technological advancements and shifts in consumer behaviour. Emerging technologies, such as artificial intelligence, blockchain, and the Internet of Things (IoT), compel businesses to rethink traditional operational paradigms and explore new avenues for value creation (Teece, 2010). Organisations must continuously assess how to leverage technological innovation to meet evolving consumer expectations and sustain competitive differentiation in an increasingly digital economy (Loebbecke & Picot, 2015).

2 Analysing business models with business model canvas

The Business Model Canvas (BMC) is a widely recognised strategic management tool that provides a visual framework for designing, analysing, and optimising business models. Developed by Alexander Osterwalder and Yves Pigneur (2010), it allows organisations to systematically assess how they create, deliver, and capture value. By leveraging this tool, businesses can document existing models, develop new strategies, challenge industry norms, and pivot their operational approaches in response to market dynamics.

The Business Model Canvas consists of nine interconnected building blocks, each representing a critical component of a sustainable business strategy. These elements facilitate a structured approach to business planning by ensuring that all essential aspects are accounted for in decision-making processes (Osterwalder & Pigneur, 2010).

Nine Elements of the Business Model Canvas (Osterwalder & Pigneur, 2010):

- Customer Segments – Defines the different groups of people or organisations that the business aims to serve. Understanding customer demographics, behaviours, and needs is essential for value proposition alignment.
- Value Proposition – This represents the unique value a company delivers to its customers. This includes the products and services offered and how they address customer needs better than competitors.
- Channels – Describes how a company delivers its value proposition to customers. These may include physical stores, e-commerce platforms, or digital communication channels.
- Customer Relationships – Defines a company's interaction with its customers. This can range from personalised services to automated self-service models.
- Revenue Streams – Identifies the monetisation strategies that sustain the business. Revenue may come from direct sales, subscription models, licensing fees, or freemium offerings.
- Key Resources – Lists the critical assets required for a business to function efficiently. These may include human resources, intellectual property, financial assets, and technological infrastructure.
- Key Activities – Outlines the core business operations necessary for delivering the value proposition. This includes product development, marketing, supply chain management, and strategic partnerships.
- Key Partnerships – Refers to the alliances and collaborations that strengthen business operations. Strategic partnerships can involve suppliers, distributors, technology partners, and investors.
- Cost Structure – Breaks down the financial expenses associated with running the business. This includes fixed and variable costs, operational expenses, and resource allocation.

2.1 Customer segment in business model development

Customer segmentation is pivotal in business model formulation, as consumer behaviour and purchasing patterns directly influence daily operations and strategic decision-making. By systematically categorising customers based on key attributes,

businesses can tailor their value propositions, marketing strategies, and service offerings to better align with customer needs and expectations (Kotler et al., 2021). A thorough understanding of customer attributes enables businesses to implement targeted marketing campaigns, enhance customer experience through personalisation, and optimise product offerings based on consumer demand (Lemon & Verhoef, 2016). The ability to adapt to changing consumer behaviours and leverage data-driven insights ensures that businesses remain competitive in rapidly evolving markets.

2.2 Value proposition in business model development

A value proposition is a concise yet impactful statement articulating the core value a product or service delivers to its customers. In the context of the Business Model Canvas, this element defines why consumers should choose a particular offering over a competing alternative (Osterwalder & Pigneur, 2010). A compelling value proposition addresses a customer pain point, provides a unique benefit, or enhances the overall customer experience, ultimately serving as a strategic differentiator in the marketplace (Payne et al., 2017).

Beyond functional benefits, a compelling value proposition also resonates emotionally and psychologically, fostering stronger customer engagement and brand loyalty (Lemon & Verhoef, 2016). A well-crafted value proposition is the foundation of a company's marketing strategy and significantly impacts consumer perception and decision-making. Businesses that align their value propositions with evolving customer expectations and market trends gain a competitive edge and drive higher customer engagement, conversion rates, and brand advocacy (Kotler et al., 2021).

2.3 Distribution channels in business model development

Distribution channels are crucial in delivering value to customers by ensuring that products and services reach their intended audience efficiently. Osterwalder and Pigneur (2010) identified five key phases of channel development, each essential for effectively engaging customers throughout the buying journey. A well-designed distribution strategy enhances brand visibility, customer experience, and operational efficiency (Kotler et al., 2021).

Marketing and communication channels such as advertising, social media, public relations, and content marketing are pivotal in building interest and driving engagement (Lemon & Verhoef, 2016). Common evaluation channels include free trials, product demonstrations, case studies, and customer reviews, which help build credibility and provide quality evidence (Payne et al., 2017). Distribution channels vary based on the business model, including e-commerce platforms, physical retail stores, direct sales teams, and mobile applications (Chaffey & Ellis-Chadwick, 2019). Delivery channels can include home delivery, in-store pickup, subscription-based shipping, or digital downloads for software-based products (Christopher, 2016). After-sales channels include customer service hotlines, online chat support, help desks, and automated follow-up emails (Kotler et al., 2021).

Companies that leverage digital transformation, such as omnichannel retailing and AI-driven logistics solutions, can gain a competitive advantage by ensuring speed, convenience, and personalised service (Wirtz et al., 2020).

2.4 Customer relationship strategy in business model development

A customer relationship strategy defines how a business interacts with its target audience and fosters engagement throughout the customer journey. Within the Business Model Canvas framework, customer relationships shape how brands acquire, retain, and expand their customer base, significantly influencing customer satisfaction and loyalty (Osterwalder & Pigneur, 2010).

Different business models require tailored approaches to customer interaction. Osterwalder and Pigneur (2010) identified five primary types of customer relationships, each serving different strategic purposes.

Types of Customer Relationships

- Personal Assistance: This traditional, high-touch approach involves direct interaction between customers and company representatives. Luxury retail, financial advisory services, and hospitality industries rely on personal assistance to create strong emotional connections and long-term loyalty (Kotler et al., 2021).

- Self-Service: Self-service models eliminate direct brand interaction, enabling customers to independently navigate products or services through FAQs, knowledge bases, user guides, and online help centres. This cost-effective, scalable approach empowers customers to resolve issues conveniently (Chaffey & Ellis-Chadwick, 2019).
- Automated Service: Advances in artificial intelligence (AI) and machine learning have facilitated automated customer service solutions, such as chatbots, AI-powered recommendations, and virtual assistants. This interactive approach is more engaging than self-service, enabling businesses to handle routine queries, streamline transactions, and enhance operational scalability (Wirtz et al., 2020).
- Communities: Creating customer-driven communities fosters peer-to-peer interaction, shared experiences, and collaborative problem-solving. Community-based engagement enhances customer advocacy and trust (Payne et al., 2017).
- Co-Creation: Co-creation enables businesses to engage customers in product development by incorporating user-generated content, feedback, and innovation. This strategy enhances consumer involvement and strengthens brand attachment (Chesbrough, 2010).

A well-defined customer relationship strategy is critical for brand differentiation, customer retention, and long-term business sustainability. Businesses that align their relationship models with evolving consumer expectations can foster higher engagement levels, enhance customer satisfaction, and optimise service efficiency (Lemon & Verhoef, 2016).

2.5 Revenue streams in business model development

The Revenue Streams block within the Business Model Canvas identifies the financial inflows that sustain a business. Understanding revenue generation is critical, as companies must align their monetisation strategies with customer preferences to maximise profitability (Osterwalder & Pigneur, 2010). By considering the buyer persona, companies can determine what their target audience will pay for and tailor their pricing models accordingly (Kotler et al., 2021).

Various monetisation methods exist, each suited to different business models, industries, and customer expectations. The most prevalent revenue streams include:

- Direct Sales: This traditional model involves selling products or services directly to customers for a fee. Direct sales provide a straightforward and immediate source of revenue, allowing companies to scale based on product demand (Chesbrough, 2010).
- Advertising Revenue: Businesses such as blogging platforms, media outlets, and IT-driven platforms generate income by selling advertising space to brands that want to engage their audience. The effectiveness of this model depends on audience reach, engagement, and data-driven ad targeting (Wirtz et al., 2020).
- Freemium Model: Popular in digital and software industries, the freemium model offers essential services for free while monetising through premium features, enhanced functionalities, or exclusive content. This approach attracts a large user base and converts a fraction of free users into paying customers (Payne et al., 2017).
- Subscription Model: Subscription-based revenue streams provide ongoing access to a product or service in exchange for a recurring fee. This model ensures predictable and stable revenue, making it particularly valuable for businesses in Software-as-a-Service (SaaS), streaming platforms, and membership-based businesses (Chaffey & Ellis-Chadwick, 2019).

- Businesses may also adopt hybrid models, combining multiple revenue streams (Lemon & Verhoef, 2016) —such as advertising + subscriptions (YouTube Premium), direct sales + freemium (mobile apps), or SaaS with add-on services (Salesforce, Adobe Creative Cloud)—to maximise profitability and market adaptability.

2.6 Key resources in business model development

In the Business Model Canvas, key resources represent the essential assets that a company requires to deliver its value proposition, reach customer segments, and sustain operations (Osterwalder & Pigneur, 2010).

Key resources can be classified into four primary types:

- Tangible Resources: These include physical assets such as real estate, machinery, equipment, production facilities, and inventory. Businesses that rely on manufacturing, retail, logistics, and infrastructure depend heavily on tangible resources to produce and deliver goods efficiently (Barney, 1991).
- Intangible Resources: Intellectual property (IP), patents, trademarks, copyrights, proprietary knowledge, and brand reputation fall under this category. Innovation-driven businesses, such as those in technology, pharmaceuticals, and creative industries, leverage intangible resources to maintain market differentiation and protect their competitive position (Teece, 2010).
- Human Resources: Employees are vital in executing business strategies. A highly skilled and motivated workforce enhances productivity, drives innovation, and supports business growth (Wright et al., 2001).
- Financial Resources: Financial resources encompass monetary assets, investment capital, credit facilities, and funding sources such as bank loans, venture capital, grants, and retained earnings. Strong financial management ensures stability, scalability, and strategic expansion (Chesbrough, 2010).

Effective management of key resources is essential for sustaining long-term success and resilience (Barney, 1991).

2.7 Key activities in business model development

In the Business Model Canvas, key activities refer to a business's core operations and processes to deliver its value proposition, reach target customers, and sustain profitability (Osterwalder & Pigneur, 2010). These industry-specific activities directly impact operational efficiency, market positioning, and customer satisfaction.

Key activities can be classified into three primary types:

1. Production Activities: These involve the creation and development of products or services, ensuring that offerings meet market demands and quality standards (Teece, 2010

2. Problem-Solving Activities: Businesses specialising in solving customer challenges engage in problem-solving activities (Barney, 1991).
3. Platform/Network Activities: Companies that function as intermediaries, aggregators, or digital platforms focus on managing and optimising networks (Wirtz et al., 2020).

Key activities form the backbone of a company's business model (Chesbrough, 2010).

2.8 Key partners in business model development

Key partnerships ensure a business's efficient operation, scalability, and sustainability. Within the Business Model Canvas, key partners provide resources, capabilities, and strategic advantages that enhance a company's ability to deliver its value proposition effectively (Osterwalder & Pigneur, 2010).

Key partnerships can be classified into four primary types:

1. Suppliers: Suppliers provide the raw materials, components, or finished goods necessary for manufacturing and production. A reliable supply chain ensures quality consistency, cost efficiency, and reduced production delays (Christopher, 2016).
2. Non-Competitor Partnerships: These partnerships involve collaborations between businesses that complement each other but do not compete directly. Such relationships help firms share resources, expand service offerings, and enhance operational efficiency (Barney, 1991).
3. Joint Ventures: A joint venture is a formal agreement between two or more companies to develop new markets, technologies, or customer segments. Joint ventures allow businesses to combine expertise, share risks, and accelerate market penetration (Gulati, 1998
4. Coopetition (Competitive Collaboration): Coopetition refers to strategic collaboration between direct competitors. This approach allows businesses to co-develop technologies, enter new markets, or tackle industry-wide challenges while maintaining competitive differentiation (Nalebuff & Brandenburger, 1996).

2.9 Cost structure in business model development

The Cost Structure block of the Business Model Canvas represents all expenses associated with executing a business model. Understanding and managing costs is critical for businesses to set realistic revenue targets, ensure financial sustainability, and optimise profitability (Osterwalder & Pigneur, 2010). Start-ups and established enterprises must carefully assess cost components to balance investment, operational efficiency, and long-term growth.

Key Components of Cost Structure

1. Fixed Costs: Fixed costs remain constant regardless of production levels
2. Variable Costs: Variable costs fluctuate based on production volume and business activity.
3. Economies of Scale: As businesses grow, they often experience lower per-unit costs due to bulk purchasing, process optimisations, and operational efficiency. This allows companies to spread fixed costs over a larger output and increase profitability (Ghemawat, 2016).
4. Economies of Scope: Businesses can also reduce overall costs by diversifying their product or service offerings. Shared resources, expertise, and infrastructure across multiple revenue streams help optimise cost efficiency (Chesbrough, 2010).

The cost structure is a fundamental aspect of business model sustainability. Companies that strategically balance fixed and variable costs, leverage economies of scale, and manage industry-specific expenses can enhance efficiency, profitability, and long-term competitiveness.

3 Subscription business model

The subscription-based business model has emerged as a powerful tool for business expansion, offering a predictable and recurring revenue stream. This model benefits both businesses and consumers by ensuring financial stability for companies while providing convenience and continuous value to customers (Teece, 2010). Unlike traditional one-time sales models, the subscription model fosters long-term customer relationships, making customer retention a critical success factor.

A subscription business model allows companies to provide ongoing access to a product or service in exchange for recurring monthly or annual payments. Customers must continue paying the fee to maintain access to the product or service (Osterwalder & Pigneur, 2010). This model has become increasingly prevalent across various industries, from digital streaming services to subscription boxes and SaaS (Software as a Service) platforms (Wirtz et al., 2020).

The subscription business model serves as a sustainable growth strategy, offering several key advantages:

- Predictable Revenue Streams: The recurring nature of subscription payments ensures financial stability and facilitates long-term financial planning (Ghaziani et al., 2017).
- Enhanced Customer Lifetime Value (CLV): The longer customers remain subscribed, the more significant their value contribution to the business (Lemon & Verhoef, 2016).
- Stronger Customer Relationships: The model prioritises continuous engagement, fostering brand loyalty and reducing dependency on one-time purchases.
- Scalability and Innovation: Businesses can regularly update their offerings, ensuring continuous improvement and maintaining customer interest.

Despite its advantages, the subscription model presents unique challenges that businesses must navigate:

- Customer Retention and Churn Management: Since revenue depends on customer retention, businesses must minimise churn by ensuring customer satisfaction and delivering consistent value (Kotler et al., 2021).
- Customer Acquisition Costs (CAC): Acquiring subscribers can be costly, and businesses must carefully manage marketing expenditures to ensure long-term profitability.
- Pricing Strategies: Subscription fees must be affordable yet profitable, balancing customer willingness to pay with operational sustainability.

Subscription businesses employ distinctive marketing strategies to attract and retain customers:

- Freemium Model: Many digital platforms, such as Spotify and LinkedIn Premium, offer a free tier to attract users, later converting them to paid subscribers (Pujol, 2010).
- Customer-Centric Pricing: Subscription fees are typically set at a low monthly price to encourage long-term commitment while reducing the financial burden on the user.
- Personalization and Engagement: Subscription businesses rely on data-driven insights to tailor offerings, improve user experiences, and maximise retention (Wirtz et al., 2020).

The subscription business model represents a transformative approach to revenue generation, fostering customer retention, financial predictability, and business scalability. However, success requires meticulous planning, including cost management, retention strategies, and value delivery. If executed effectively, the subscription model offers substantial growth potential, positioning businesses for long-term market relevance and success.

4 Multi-sided platform business model

The multi-sided platform (MSP) business model has become dominant in the digital economy, and it has been adopted by some of the world's most valuable start-ups, such as PayPal, Uber, Alibaba, eBay, and Facebook. Enabled by internet connectivity and digital technologies, MSPs serve as intermediaries that connect two or more distinct participant groups, facilitating interactions and transactions between them (Parker et al., 2016). This model has gained traction among start-ups, young firms, and established brands, making it an attractive choice for entrepreneurs seeking scalable business models (Gawer & Cusumano, 2014).

At its core, a multi-sided platform creates value by facilitating connections between different participant groups. Unlike traditional businesses that produce goods or services, MSPs do not generate content or manufacture products directly; their value

proposition lies in their ability to enable interactions (Rochet & Tirole, 2003) efficiently.

Most MSPs operate as two-sided platforms, where they link:

- Buyers and sellers (e.g., eBay, Alibaba)
- Drivers and passengers (e.g., Uber, Lyft)
- Owners and renters (e.g., Airbnb, Turo)
- Merchants and consumers (e.g., Amazon, Shopify)

Some platforms, like Facebook and Google, operate as multi-sided ecosystems, facilitating interactions among users, advertisers, and content developers (Eisenmann et al., 2006).

The success of MSPs largely depends on network effects, which influence the platform's value based on the number of users participating.

1. Direct Network Effects (Same-Side Effects): The platform's value increases when more users on the same side join (e.g., more Facebook users make the platform more attractive to other users).
2. Indirect Network Effects (Cross-Side Effects): The value of the platform increases when more users join the opposite side (e.g., more sellers on eBay attract more buyers, and vice versa) (Parker et al., 2016).

A strong network effect enables rapid growth and scalability, while a weak network effect can lead to platform failure due to low engagement and lack of perceived value.

MSPs generate revenue through various monetisation strategies, with the most common being:

- Transaction Fees: Charging a fixed fee or commission on participant transactions.
- Subscription Fees: Charging users a recurring membership or premium access fee.

- Advertising Revenue: Generating income through targeted advertising.
- Freemium Model: Offering essential services for free while monetising premium features.

While many multi-sided platforms have achieved remarkable success, failure is common among new market entrants due to challenges in acquiring and retaining users (Evans & Schmalensee, 2016).

Despite its scalability, the MSP model presents unique challenges, including:

- Customer Acquisition & Retention: Platforms must attract and retain a critical mass of users to sustain engagement and ensure continuous transactions.
- Balancing Supply and Demand: Successful MSPs optimise both sides of the platform to avoid mismatches (e.g., ensuring enough drivers are available for passengers).
- Trust & Security: Building trust between participants is crucial, particularly in peer-to-peer marketplaces (Gawer, 2021).
- Regulatory & Competition Issues: MSPs often face antitrust concerns, data privacy challenges, and regulatory scrutiny, especially in financial technology and ride-sharing (Eisenmann et al., 2006).

The multi-sided platform business model has reshaped entire industries by leveraging network effects, digital technology, and user-driven value creation. While offering substantial growth potential, its success relies on effective participant engagement, trust-building mechanisms, and strategic market positioning. Future research and innovation in this space will likely continue shaping the evolution of digital ecosystems and platform-based economies.

5 Aggregator business model

The aggregator business model has revolutionised numerous industries by consolidating fragmented markets under a single brand, enhancing efficiency, convenience, and user experience. This model has been successfully adopted in transportation, hospitality, travel, food delivery, and e-commerce (Parker et al., 2016). Unlike traditional intermediaries, aggregators control user experience

significantly, ensuring quality, consistency, and brand recognition across their service offerings (Evans & Schmalensee, 2016).

The aggregator model operates as a network-based e-commerce model, where the aggregator partners with multiple independent providers to offer services under a unified brand. The providers retain ownership and operational independence but adhere to standards, pricing structures, and contractual agreements set by the aggregator (Gawer, 2021).

Unlike marketplaces, where buyers and sellers interact directly, aggregators maintain strict control over the transaction process, ensuring standardised service quality and consistent customer experiences. This model leverages economies of scale to drive network effects, where more users attract more service providers, reinforcing a self-sustaining growth cycle (Rochet & Tirole, 2003).

Aggregators primarily generate revenue through the following:

- Commission-Based Fees: Service providers pay a percentage of their earnings to the aggregator for customer access.
- Subscription Fees: Some aggregators charge monthly or annual fees for premium access or enhanced services.
- Advertising Revenue: Platforms monetise through sponsored listings or targeted advertising.
- Lead Generation Fees: Some aggregators sell customer leads to service providers.

Aggregators curate and standardise the service experience, whereas marketplaces are neutral platforms facilitating buyer-seller transactions (Parker et al., 2016).

Aggregators can be categorised based on content type and industry focus:

- Content Aggregators: Aggregate news, articles, or blog content.
- Job Aggregators: Consolidate job postings from multiple sources.
- Poll Aggregators: Compile and analyse public opinion data
- Real Estate Aggregators: Collect and list property details from various agencies-

- Review Aggregators: Aggregate user reviews for products, movies, or businesses.
- Search Aggregators: Provide meta-search functionality, pulling results from multiple search engines.
- Social Network Aggregators: Aggregate content from various social media platforms.
- Shopping Aggregators: Compare product prices across different retailers.
- Video Aggregators: Aggregate videos from multiple sources into curated lists.

Although commonly associated with the digital revolution, aggregation predates the internet—traditional businesses such as record labels (music industry aggregators) and travel agencies operated under similar principles. However, digital technology has accelerated scalability, enabling aggregators to optimise processes, reduce costs, and reach global audiences (Evans & Schmalensee, 2016).

The aggregator business model continues to evolve, with innovations in artificial intelligence (AI), big data analytics, and blockchain enhancing operational efficiency. Future trends may include automation, decentralised aggregation models, and enhanced data-driven decision-making (Gawer, 2021).

The aggregator business model has fundamentally reshaped consumer behaviour, market competition, and industry dynamics. By leveraging network effects, economies of scale, and digital technology, aggregators streamline fragmented industries, enhance customer experience, and drive business efficiency. Despite customer acquisition, trust, and competition challenges, the model remains a robust and scalable framework for modern businesses.

6 Freemium business model

The freemium business model has become a dominant strategy in the digital economy, particularly for software, cloud services, and online platforms. This model provides a free, limited version of a product or service while offering a premium version with enhanced features for a fee (Pujol, 2010). Due to its low customer acquisition costs and scalability, companies such as Spotify, LinkedIn, Skype, and Dropbox have widely adopted the freemium model.

Unlike traditional free trials, where access to premium features is temporarily granted, the freemium model permanently offers a free basic version. This ensures continuous user engagement, allowing businesses to convert free users into paying customers over time (Nason, 2010).

The effectiveness of the freemium model depends on several critical factors:

1. Clear Value Differentiation: The premium version must provide significant advantages over the free version to entice users to upgrade (Kumar, 2014).
2. User Engagement & Retention: Customers are unlikely to upgrade immediately; therefore, retention strategies such as loyalty programs, feature updates, and targeted promotions are crucial (Lemon & Verhoef, 2016).
3. Optimized Free-to-Premium Ratio: While free users drive brand awareness, only a small percentage (typically 1-5%) convert to paid plans. Businesses must ensure premium revenue offsets operational costs (Pujol, 2010).
4. Viral & Network Effects: A large user base enhances brand credibility and encourages word-of-mouth marketing, reducing reliance on traditional advertising (Parker et al., 2016).

Despite its advantages, the freemium model presents several challenges:

1. High User Volume Requirement: The model depends on large-scale adoption; a small user base may not generate sufficient premium conversions (Chesbrough, 2010).
2. Long-Term Monetization: Revenue generation takes time, requiring businesses to carefully balance cost structures (Osterwalder & Pigneur, 2010).
3. Risk of Cannibalization: If the free version is too feature-rich, users may never upgrade, diminishing profitability (Kumar, 2014).

The freemium business model remains a robust growth strategy for digital and internet-based companies. Businesses can scale effectively and drive long-term profitability by combining low acquisition costs, viral effects, and strategic premium differentiation. However, success depends on balancing free and premium offerings, optimising conversion rates, and ensuring financial sustainability.

7 Blockchain business model

Since Satoshi Nakamoto's groundbreaking paper, Bitcoin: A Peer-to-Peer Electronic Cash System (2008), blockchain technology has rapidly permeated various business sectors. As an immutable, decentralised, and transparent system, blockchain has redefined transaction security, data integrity, and peer-to-peer interactions (Tapscott & Tapscott, 2016). The increasing adoption of blockchain-based business models across industries reflects its potential to disrupt traditional business frameworks and eliminate intermediaries (Iansiti & Lakhani, 2017).

Blockchain technology is founded on three core principles:

1. Decentralization – Unlike traditional databases controlled by a central authority, blockchain distributes data across a network of nodes, ensuring resilience and eliminating single points of failure (Nakamoto, 2008).
2. Immutability – Data stored on the blockchain is cryptographically secured and tamper-proof, ensuring data integrity and cybersecurity (Yli-Huumo et al., 2016).
3. Transparency – While user identities remain encrypted, all transactions are publicly recorded, fostering trust and accountability in digital ecosystems (Casino et al., 2019).

These features enable blockchain to redefine traditional business models, particularly those reliant on transaction processing, record-keeping, and security mechanisms (Pilkington, 2016).

Several blockchain business models have emerged, leveraging its peer-to-peer architecture, decentralised governance, and token-based economies:

1. Peer-to-Peer (P2P) Blockchain Business Model

This model leverages blockchain's decentralised nature to facilitate direct user interactions without intermediaries. Businesses profit through:

- Transaction fees (e.g., Bitcoin, Ethereum).
- Storage and data-sharing platforms (e.g., Filecoin, IPFS).

- Decentralized marketplaces (e.g., OpenSea for NFTs).

By removing intermediaries, P2P blockchain platforms reduce costs, enhance security, and give users greater control over their data (Swan, 2015).

2. Blockchain-as-a-Service (BaaS) Business Model

BaaS companies offer blockchain infrastructure and services to enterprises, enabling them to integrate blockchain without complex backend development (Zhang et al., 2020). Services include:

- Smart contract deployment (e.g., Ethereum, Hyperledger).
- Cloud storage solutions (e.g., Amazon Managed Blockchain, Microsoft Azure Blockchain).
- Identity management and authentication services (e.g., Civic, Sovrin).

BaaS allows businesses to focus on front-end applications while outsourcing blockchain architecture, reducing development costs and accelerating adoption.

3. Token Economy: Utility Token Business Model

Blockchain utility tokens are digital assets that facilitate network activities and transactions within blockchain ecosystems. Companies issue tokens to:

- Incentivize network participation (e.g., Basic Attention Token rewards users for viewing ads).
- Enable decentralised applications (DApps) (e.g., Ethereum ERC-20 tokens).
- Facilitate microtransactions and cross-border payments (e.g., Ripple XRP).

Utility tokens are widely used in decentralised finance (DeFi), gaming, and digital content monetisation, allowing businesses to engage users through token-based incentives (Davidson et al., 2018).

Despite its disruptive potential, blockchain faces several challenges:

- Scalability Issues – High transaction loads may slow network performance (e.g., Bitcoin's transaction limitations).
- Regulatory Uncertainty – Governments worldwide are still developing blockchain regulations (Zohar, 2015).
- Energy Consumption – Proof-of-Work (PoW) consensus mechanisms consume substantial energy, raising environmental concerns.

The blockchain business model is a transformative approach to secure, decentralised, and efficient transactions. By leveraging peer-to-peer networks, token economies, and blockchain services, businesses can reduce costs, enhance transparency, and build trust-driven digital ecosystems. While challenges remain, the continued evolution of blockchain applications ensures its long-term viability and impact across industries.

8 SaaS business model

The Software-as-a-Service (SaaS) business model has become one of the most influential developments in the digital economy, transforming how software is developed, delivered, and monetised. Introduced by John Koenig in 2005 at the *SDForum Software as a Service Conference*, SaaS has experienced exponential growth, driven by advancements in cloud computing, scalable infrastructure, and subscription-based monetisation (Koenig, 2005; Cusumano, 2010).

SaaS is a subscription-based model where software is centrally hosted in the cloud and provided to users on-demand. This shift from product ownership to service access has disrupted software industries across B2B and B2C markets, fostering customer retention, cost-efficiency, and global scalability (Choudhary, 2007).

The SaaS model is distinctly different from traditional software businesses, offering:

1. Recurring Revenue Streams

- SaaS companies rely on subscriptions rather than one-time purchases.
- Initial development costs are high, but revenue accumulates over time, ensuring predictable income (Cusumano, 2010).

2. Customer Retention & Engagement

- Long-term success depends on reducing churn rates and maximising customer lifetime value (CLV).
- Frequent customer interactions through personalised services and continuous updates help sustain subscription renewals (Lemon & Verhoef, 2016).

3. Continuous Software Updates & Enhancements

- Unlike traditional software, where updates occur through new releases, SaaS platforms allow real-time feature enhancements.
- Providers manage security patches, bug fixes, and software optimisations without user intervention.

Despite its advantages, SaaS companies face several challenges:

- High Customer Acquisition Costs (CAC) – Marketing, lead generation, and sales require significant upfront investments.
- Churn Management – Retaining customers is critical, as losing subscribers reduces lifetime value (LTV).
- Infrastructure Costs – Hosting, security, and data storage expenses increase with scale (Krishnan et al., 2007).
- Competitive Market – The SaaS sector is highly saturated, requiring strong differentiation and customer-centric innovations.

Successful SaaS businesses focus on three core performance indicators (Reinartz & Kumar, 2003):

1. Customer Acquisition Cost (CAC) – The expense of acquiring a new subscriber.
2. Customer Lifetime Value (CLV) – The total revenue from a single customer over their subscription period.

3. Churn Rate – The percentage of customers cancelling subscriptions, affecting long-term profitability.

Balancing CAC and CLV is essential to creating a self-sustaining, profitable SaaS company (Bessemer Venture Partners, 2016).

The SaaS model is prevalent across various industries: CRM and sales (Salesforce, HubSpot, Pipedrive), ERP and accounting (NetSuite, QuickBooks, Xero), Project Management (Asana, Trello, Basecamp), E-commerce and web hosting (AWS, Shopify, Google Cloud), and HR & Recruitment (BambooHR, Workday, WebHR). These companies leverage AI, automation, and integrations to enhance SaaS offerings and drive business innovation.

The SaaS business model has revolutionised software distribution and monetisation, enabling scalable, customer-centric solutions. While subscription-based revenue ensures financial stability, customer acquisition costs, retention strategies, and ongoing updates remain key challenges. The future of SaaS lies in AI-driven automation, enhanced cybersecurity, and hyper-personalization, ensuring continuous industry evolution.

9 Crowdsourcing business model

The crowdsourcing business model is a digital-era innovation that utilises the collective knowledge, skills, and contributions of a large group—or 'crowd'—to enhance business operations. Businesses outsource tasks, gather data, and engage users through multi-sided platforms, fostering cost efficiency, scalability, and rapid problem-solving (Howe, 2006).

Crowdsourcing involves obtaining work, ideas, opinions, or funding from a large, decentralised group via the Internet, mobile apps, and social media. Participants may contribute:

- Voluntarily (e.g., Wikipedia, Waze).
- For monetary compensation (e.g., Upwork, Amazon Mechanical Turk).

– In exchange for social recognition or community engagement (e.g., Open-source software development).

The ability to mobilise collective intelligence makes crowdsourcing a powerful tool for data collection, innovation, and problem-solving (Surowiecki, 2004).

The term "crowdsourcing" was first coined by Jeff Howe (2006), describing how businesses leverage a distributed workforce to complete projects. The rise of internet connectivity, social media, and cloud computing has accelerated crowdsourcing adoption across industries, from market research and customer engagement to software development and funding campaigns (Brabham, 2013).

Several crowdsourcing models cater to distinct business objectives:

1. Crowdsourced Data & Intelligence. Platforms leverage user-generated content to aggregate real-time data. Examples: *Waze* collects traffic reports from drivers, offering real-time navigation; *Google Local Guides* crowdsources reviews and photos for Google Maps.
2. Open-Source Software Development. Decentralised developers collaborate to create and improve software, often for free. Examples: *Linux* and *Mozilla Firefox* are maintained by global volunteer programmers; *GitHub* enables developers to share and enhance code collaboratively.
3. Crowdfunding Platforms. Businesses raise funds by soliciting small contributions from a large number of backers. Examples: Kickstarter and Indiegogo provide platforms for entrepreneurs to fund projects. For Example, GoFundMe enables charitable donations and personal fundraising.

The crowdsourcing model aligns with Osterwalder & Pigneur's (2010) Business Model Canvas:

1. Value Propositions:

– Access to data, expertise, funding, or services from a global crowd.

- Users gain incentives, including monetary rewards, recognition, or community engagement.

2. Customer Segments:

- Supply Side: The crowd (freelancers, contributors, or backers).
- Demand Side: Businesses, organisations, or individuals seeking input or funding.

3. Channels:

- Digital platforms (websites, mobile apps) facilitate participation and data collection.
- Social media and word-of-mouth play a crucial role in engagement.

4. Customer Relationships:

- Self-service participation through platform interfaces.
- A strong sense of community, fostering loyalty and recurring engagement.

5. Revenue Streams:

- Transaction fees (e.g., commissions on crowdfunding campaigns).
- Advertising revenue (e.g., Google Local Guides monetising data for businesses).
- Premium services and subscriptions (e.g., LinkedIn crowdsourcing user data for paid insights).

6. Key Resources:

- Crowdsourced data is the core asset.
- A scalable digital platform to process contributions.

7. Key Activities:

- Platform development and maintenance.
- Marketing and community engagement.
- Moderation and quality control.

8. Key Partners:

- Third-party applications, businesses, and platform integrators.

9. Cost Structure:

- Lower overhead than traditional businesses, but requires investment in platform infrastructure, moderation, and marketing.

Despite its advantages, crowdsourcing presents several challenges, which are Quality Control Issues – Ensuring reliable contributions from an open community requires moderation (Howe, 2008); User Motivation and retention – Encouraging long-term participation without direct financial incentives (Estellés-Arolas & González-Ladrón-de-Guevara, 2012) and Data Security & Privacy – Handling sensitive user-generated data ethically and securely.

10 Peer-to-Peer (P2P) Business Model

The peer-to-peer (P2P) business model has transformed traditional industries by enabling direct individual transactions and reducing the need for corporate intermediaries. Initially popularised by Napster (1999), a file-sharing system that disrupted the music industry, P2P has since evolved into a fundamental business model underpinning ridesharing (Uber, Lyft), accommodation (Airbnb), and financial services (DeFi, peer-to-peer lending platforms) (Botsman & Rogers, 2010).

The P2P economy facilitates direct exchanges of goods, services, or data between individuals without requiring a centralised corporation to manage production or distribution (Eisenmann et al., 2006). Instead, digital platforms act as intermediaries, ensuring secure transactions and minimising risks.

Despite its name, accurate peer-to-peer transactions without an intermediary are rare, as platforms provide essential services such as trust mechanisms, payment processing, and dispute resolution (Evans & Schmalensee, 2016).

Core Characteristics of the P2P Model are:

- Decentralized Transactions: Buyers and sellers interact directly without centralised corporate ownership.
- Digital Intermediation: Platforms facilitate trust, payment security, and user verification.
- Lower Costs & Accessibility: Reduces overhead costs, making services affordable and scalable.
- Network Effects: The more users a platform has, the more valuable it becomes (Metcalfe's Law).

The P2P business model generally follows this operational structure:

1. A digital platform connects individuals offering products or services.
2. Users list and browse offerings (e.g., an apartment for rent on Airbnb, a ride on Uber).
3. A transaction occurs, facilitated by the platform's payment and security systems.
4. The platform earns revenue through transaction fees, advertising, or premium services.

The peer-to-peer (P2P) business model offers several key advantages contributing to its widespread adoption and success. One of the most significant benefits is cost reduction, as individuals can monetise their assets or services without relying on traditional corporate structures, leading to lower operational expenses for providers and consumers. Additionally, increased consumer choice is another critical advantage, as buyers can access diverse products and services at competitive prices. The flexibility and scalability of P2P platforms also allow businesses to expand without the need for significant infrastructure investments, as they do not own the assets being exchanged. Furthermore, trust and community engagement play a vital role in sustaining the P2P economy, as user ratings, reviews, and feedback

mechanisms help foster reliability and accountability among participants. These advantages collectively make the P2P model a disruptive force in various industries, enabling efficient and cost-effective individual transactions.

The peer-to-peer business model has revolutionised traditional industries, empowering individuals to transact directly and leveraging digital platforms for efficiency and security. While regulatory uncertainty, fraud prevention, and market saturation persist, the continued evolution of technology and decentralisation ensures P2P's long-term viability as a disruptive business model.

11 Conclusion

The evolution of digital technologies has facilitated the emergence of innovative business models, reshaping traditional industries and creating new economic opportunities. Among these, peer-to-peer (P2P), multi-sided platforms, aggregator, freemium, subscription, SaaS, crowdsourcing, and blockchain-based models have demonstrated their ability to disrupt established markets by leveraging decentralisation, scalability, and digital connectivity. These models enable businesses to optimise resource allocation, reduce costs, and enhance customer engagement while fostering more flexible and user-centric ecosystems.

Each of these business models presents distinct advantages and challenges. The subscription and SaaS models provide businesses with predictable revenue streams and long-term customer relationships yet require continuous innovation and high initial investment. The freemium model, widely used in digital services and software, lowers customer acquisition costs but demands careful balancing between free and premium offerings to ensure profitability. The aggregator model consolidates service providers under a single brand and relies on network effects and stringent quality control. Meanwhile, blockchain-based and decentralised business models have introduced trustless transactions yet face scalability, regulation, and adoption challenges.

The P2P business model has emerged as one of the most transformative, enabling individuals to transact directly without corporate intermediaries. Crowdsourcing has also proven to be a valuable mechanism for companies seeking to leverage collective

intelligence, whether for data collection, open-source innovation, or funding purposes.

Despite their success, these business models face several limitations that businesses must address for long-term sustainability. Regulatory challenges persist, particularly for platform-based and blockchain-driven models, as governments struggle to establish appropriate policies for taxation, labour rights, and liability. Consumer trust and security remain critical, especially in decentralised and P2P environments, where fraud, privacy breaches, and misinformation can undermine platform credibility. Furthermore, competition in digital markets is fierce, requiring businesses to continuously innovate to retain customers and differentiate themselves.

While this research comprehensively analyses digital business models, several limitations must be acknowledged. One major constraint is industry-specific variability, as the success and applicability of these business models differ across industries. For instance, while the subscription model thrives in SaaS and streaming services, it may not be as effective in physical product-based industries. Future studies could explore how these models function in niche markets and assess their long-term sustainability in various sectors.

Another limitation is the regulatory and legal barriers associated with platform-based and decentralised business models. The study identifies regulatory concerns but does not provide an in-depth legal analysis of how different jurisdictions govern digital platforms, blockchain-based businesses, and P2P services. Future research could conduct comparative studies on global regulatory frameworks, examining how policies impact the scalability and compliance of digital businesses.

Moreover, technological advancements are rapidly reshaping digital business models. Innovations such as artificial intelligence (AI), machine learning, and blockchain technology may alter the effectiveness of freemium, SaaS, and P2P models. This study is limited in its ability to predict long-term technological disruptions, highlighting the need for continuous research into how businesses can adapt to emerging digital trends.

Finally, consumer behaviour and adoption dynamics are pivotal in the success of subscription, freemium, and crowdsourcing models. While the study discusses customer retention strategies, it does not delve into the psychological and behavioural factors influencing consumer decision-making. Further research could examine user motivations, willingness to pay for premium features, and trust mechanisms in decentralised platforms, providing a deeper understanding of how digital businesses can enhance user engagement and loyalty.

Given the evolving landscape of digital business models, several areas warrant further exploration. One key direction is the role of AI and automation in optimising business operations, customer personalisation, and fraud detection. AI-driven insights could help companies enhance P2P platforms, SaaS services, and subscription-based offerings, making them more efficient and responsive to consumer needs.

Another critical area for future research is regulatory frameworks for emerging business models. Governments worldwide are grappling with how to regulate platform economies, blockchain businesses, and decentralised finance (DeFi). A comparative analysis of regulatory best practices could provide valuable insights into policy development and compliance challenges, helping companies to navigate legal complexities while fostering innovation.

The sustainability and ethical implications of digital business models also deserve further investigation. While these models optimise efficiency and scalability, their environmental and social impacts remain underexplored. Research could assess how SaaS, crowdsourcing, and blockchain-based businesses contribute to sustainable practices, ethical labour use, and responsible data management.

Additionally, the future of hybrid business models is an emerging area of interest. Companies increasingly combine subscription, freemium, and blockchain elements to create diversified revenue streams and enhance customer experience. Future studies could examine successful hybrid models, identifying key factors contributing to their adaptability and profitability.

Finally, consumer trust and digital security are becoming pressing concerns, especially in P2P, decentralised finance, and data-driven business models. Given the rising risks of fraud, data breaches, and misinformation, research should focus on building trust mechanisms, exploring how businesses can enhance cybersecurity, ensure data privacy, and foster user confidence in digital transactions.

By addressing these research gaps, future studies can provide valuable insights into the ongoing transformation of digital business models, equipping companies with the knowledge needed to navigate technological advancements, regulatory landscapes, and evolving consumer behaviours.

Digital transformation has unlocked unprecedented opportunities for businesses to innovate and reach consumers in new ways. While each business model has unique strengths and challenges, their continued evolution will depend on technological advancements, regulatory adaptations, and changing consumer behaviours. As competition intensifies in digital markets, businesses must embrace flexibility, user-centric design, and ethical responsibility to sustain long-term success. Future research in this area will be instrumental in shaping the next generation of digital business models and their impact on the global economy.

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