Disruptive Innovations and Risk Mitigation in Indian Unicorns: An Empirical Analysis

Joydeep Mookerjee[1], Puja Mondal[2], Ria Mookerjee[3]

[1*]Ph.D. Scholar, ICFAI University, Jharkhand, India
[2]Assistant Professor, Adamas University, Kolkata, India
[3]MBA, Symbiosis Institute of Business Management, Hyderabad, India

*Corresponding Author: Joydeep Mookerjee
*Email: joydeep.mookerjee@gmail.com

Abstract
Research is conducted to explore the role of disruptive innovation in the growth and success of the Indian unicorns, the focus on risk mitigation challenges, particularly in the field of fraud detection and cybersecurity. The study adopts UTAUT3 framework with additional moderators, identifying key factors influencing adopting artificial intelligence (AI) based fraud detection systems, including technological readiness, market maturity, digital literacy, and financial constraints. While Indian unicorns leverage AI, blockchain, cloud computing, and digital payments to enhance scalability and efficiency, improper implementation can result in financial instability. The research conducts quantitative analysis using secondary data collection and reveals a strong EBITDA-Profit correlation (0.81) underscoring the importance of AI in enhancing operational efficiency, whereas high implementation costs and regulatory challenges remain major barriers. The research concludes that to achieve long-term profitability, Indian unicorns must integrate AI-driven fraud detection, optimize cost structures, and diversify revenue models.

1. Introduction
Disruptive innovation has transformed industries by challenging conventional business models and introducing advanced technologies that redefine customer experiences. The concept of disruptive innovation was initially proposed by Clayton Christensen in his research on how emerging technologies reshape industries.
Over the past decade, disruptive innovation has facilitated the rapid emergence of Indian unicorns. India is positioned as the third-largest startup ecosystem globally, following the United States and China. For instance, Indian unicorns such as Ola, Paytm, and Zerodha have significantly transformed their respective industries by enhancing service accessibility and technological integration.
Teffahi & Bouaziz (2023) have in the paper explored that, Unicorns are 'rare' but 'highly influential', often leveraging breakthrough technologies, innovative solutions, and novel business models to reshape markets. Their success is largely attributed to rapid diffusion rates, wherein new products and services attain widespread adoption within a brief timeframe. The impact of disruptive innovation extends beyond short-term market shifts as it accelerates digital transformation.

1.1 Research Problem
Indian unicorns utilize disruptive technologies for innovation and market expansion. However, their scalability and efficiency encounter technology-driven challenges. Preethi Francena & Kothai (2023) identified funding, market demand, technology, and government policies as key growth factors. Nevertheless, a critical gap exists in fraud detection, cybersecurity, and risk mitigation. In contrast to their competitors, some Indian unicorns are still behind to incorporating artificial intelligence-driven

fraud detection systems, rendering them vulnerable. Companies like Ola, Zomato, and CRED have introduced tech-driven solutions, yet gaps persist in areas like AI-driven fraud detection. This study will assess the disruptive innovations that have driven the success of Indian unicorns, and also investigate the strategies required to enhance fraud detection and risk mitigation among them.

1.2 Research Objectives
- To identify the key disruptive innovations that have contributed to the growth and success of Indian unicorns.
- To evaluate the influence of disruptive technologies on operational efficiency within the Indian startup ecosystem.
- To implement the UTAUT-3 framework in understanding the adoption and effectiveness of AI-driven fraud detection and risk mitigation strategies in Indian Unicorns.
- To formulate strategic recommendation for accelerating the adoption of AI-driven fraud detection systems and enhancing cybersecurity measures to fast-track the growth of new unicorns.

1.3 Research Contribution
This study contributes to the literature of disruptive innovation, startup ecosystems, and technology adoption by analyzing how Indian unicorns integrate advanced technologies to disrupt the market. It also provides valuable insights for future entrepreneurs, cybersecurity experts, and AI professions by exploring the challenges Indian unicorns facing in adopting disruptive technologies. This research will contribute to fill the gap between technological disruption and risk management. It will contribute findings and strategic recommendations to accelerate the implementation of AI-driven fraud detection technologies

1.4 Research Questions
1. What are the key disruptive innovations that have contributed to the growth and success of Indian Unicorns?
2. How disruptive technologies influence operational efficiency in Indian unicorns?
3. What are the major barriers preventing Indian Unicorns from adopting advanced AI for enhancing fraud detection and cybersecurity measures?

2. Literature Review
2.1 Disruptive Innovation Theory
Clayton M. Christensen first introduced the idea of "disruptive innovation" in the Harvard Business Review. Disruptive innovation is the process when smaller companies with limited resources can challenge established companies or incumbents (Christensen et al., 2015). Many technological revolutions, such as Netflix replacing Blockbuster (Christensen, 1997) and Uber disrupting traditional taxis (Christensen & Raynor, 2003), support the theory. Studies suggest that incumbents that fail to respond to disruptive innovations in time often face decline. It is evident that Disruptive innovations often create new markets, making products or services affordable and accessible to a larger audience. A shift in consumer behavior is noted by Mazzanti (2023) when disruptive innovations redefine what customers value, shifting demand towards new solutions such as Kodak. It was once the leader in film cameras and photography, is now in printing equipment, chemicals, and advanced materials because smartphones disrupted the market, and other players like Nikon, canon dominating the digital camera market.
While Christensen's Disruptive Innovation Theory remains influential, it has been criticized for its selective evidence, lack of predictive power and oversimplification of the market. Critics like Duncan Watts (2017) argue that the theory is retrospective rather than predictive. However, companies

continue to use it as a framework to drive innovation. In response to this, Bhatt et al. (2023) adds that disruptive innovation is a process, not an event, which means it not always be immediately obvious but follows a recognizable pattern.

Disruptive innovation extends beyond mere technological advancement, as it constitutes a pathway for the creation of new markets and sustainable futures. Lately, various sectors, including Finance, Marketing, and Human Resources, have commenced the adoption of disruptive technologies such as Robotic Process Automation (RPA), Artificial Intelligence, Cloud Computing, and Chatbots (Mookerjee and Rao, 2021). Thus, Disruption Innovation is quite evident in various industries where companies have leveraged innovative approaches to challenge the incumbents.

2.2 Case Studies of Indian Unicorns and their Innovation Strategies

India's startup ecosystem has witnessed an unprecedented rise in unicorns, reflecting the country's growing innovation landscape. Studies indicate that many unicorns adopted diversification and cross-sector expansion as their innovation strategies, while some focussed on technology-driven disruption and open innovation.

Rasińska (2022) mentioned in the study that in 2020 India added 11 unicorns to its startup ecosystem, and 2021 was an extraordinary year with India witnessing the birth of 42 unicorns with a cumulative valuation of $90 billion. Evidencing that, COVID-19 pandemic in 2020 and 2021 acted as a catalyst for rapid digital transformation, which accelerated the growth of Indian unicorns. By 2023, India had around 90,000 registered startups, which made it a hub of entrepreneurship (Jain et al., 2025). The growth was propelled by innovation, finance, and entrepreneurship friendly regulations.

This section presents case studies of seven unicorns which were selected on their impact on their respective industries with technology-driven disruption:

2.2.1 Ola

Ola cabs was launched in 2010 by Bhavish Aggarwal and Ankit Bhati, and in 2011 it attained unicorn status, transforming India's ride-hailing industry. The company's innovation strategy involves neither owning vehicles nor employing drivers directly. Instead, it facilitates connections between drivers and passengers through its mobile application platform (Panigrahi et al., 2018). The business model of Ola Cabs generates revenue primarily through ride commissions, surge pricing, and subscriptions, charging a commission per ride from drivers.

Recognizing the EV demand, in 2017, Ola expanded into the electric vehicle (EV) market, manufacturing electric two-wheelers (E2Ws) and battery technology. Ola Electric achieved unicorn status in 2019, but its adoption has been slow, contradicting the idea that disruptive innovation always leads to a rapid market change. The company's growth continued, and in 2024, Ola's Krutrim AI became the first artificial intelligence unicorn developing large language models (LLMs) for Indian languages. Ola has demonstrated innovation through three distinct business verticals, each employing disruptive business models.

Despite Ola's significant innovations across its business verticals, its current strategies lack a robust fraud detection system. Uber (2022) implemented the 'Project RADAR', an AI-driven fraud detection and mitigation tool designed to identify and address fraudulent activities. In contrast, the absence of a comparable fraud detection framework within Ola's AI initiatives exposes potential vulnerabilities and highlights a critical gap that requires attention.

2.2.2 Zomato

Zomato, founded in 2008 by Deepinder Goyal, initially operating as a restaurant discovery platform before transitioning to online food delivery in 2015. In February 2018, Zomato secured US$200 million from Ant Financial, reaching a US$1.1 billion valuation and achieving unicorn status

(Bhattacharjee, 2024). According to Tuyon et al. (2024), Zomato employs a commission-based business model, generating revenue through advertisements, subscription services, delivery charges, and other means. The innovation strategy of Zomato is noteworthy, as it promotes digital adoption through its subscription-based loyalty program (Zomato Gold), while fintech innovations such as Zomato Pay encourage users to engage in online transactions (Dutta, 2023). Swiggy, the primary competitor, enhanced its fraud prevention capabilities through the implementation of 'SHIELD's Risk AI platform' (Business Wire, 2025). In contrast, Zomato encountered challenges, resulting in the removal of suspicious single-dish establishments following concerns raised on social media platforms. This disparity raises questions that Zomato must address through the adoption of fraud detection mechanisms.

2.2.3 Oyo

Oyo, established in 2013 by Ritesh Agarwal, transformed India's fragmented budget hotel sector and emerged as a disruptive Indian Unicorn in 2018. The company utilizes a franchise-based model, which includes the standardized hotels under its brand. Kumar and Singh (2022) assert that Oyo partner hotels are benefiting from its advanced technology through the utilization of Oyo Operating System (OYO OS). This system ensures secure data handling for partner hotels, and cybersecurity is enhanced by AI-driven fraud detection. Oyo lite, introduced for low-connectivity areas, simplified technological interfaces and facilitates adoption by users. Oyo's AI-driven pricing model leverages '**machine learning'** to optimize RevPar (higher revenue per available room), ensuring efficiency and improved revenue for hotel partners (Kumar & Singh, 2022). However, studies indicate that hotel partners have frequently protested against its pricing policies, highlighting a gap between technology and real-world application.

2.2.4 Lenskart

Lenskart, founded in 2010 by Peyush Bansal, Amit Chaudhary, & Sumeet Kapahi, became a unicorn in 2019 and is a leader in India's eyewear industry with a D2C omnichannel model. It follows a subscription-based model for contact lenses and a B2B model for bulk eyewear solutions in both offline-online market. According to Roy & Paul (2023) before Lenskart's arrival in 2010, buying eyeglasses in India was largely offline, with an unorganized process. However, it disrupted the market by launching **'3D Try-on feature'** in partnership with California-based Ditto through its website and mobile application (Business Standard, 2017).

The new technology benchmarks set were 3D-try on, AI-driven recommendations, and robotic lens manufacturing. In early 2025, Lenskart launched 'Phonic Smart Glasses' which incorporate Bluetooth to give voice assistant and call management capabilities. Di Crosta et al. (2021) critically argues that consumers prioritizes necessities over discretionary purchases. Since smart eyewear is perceived as a hedonic or luxury product rather than a necessity, its adoption may be slower and requires further evaluation to facilitate its transition into a habitual necessity.

Lenskart also uses **'behavioural analytics'** to monitor user interactions and detect irregularities. By analyzing patterns such as login times, location data, and purchasing behaviours, these companies can flag suspicious activities for further investigation.

2.2.5 Zerodha

Zerodha, established in 2010 by brothers Nithin Kamath & Nikhil Kamath, attained unicorn status in 2020 by revolutionizing India's brokerage industry through the implementation of a discount brokerage model. The company prioritized performance, design, and user experience to ensure rapid response times. In 2015, Zerodha launched its mobile application 'Kite' as the online trading platform. Nehme et al. (2023) corroborate this, noting that the commitment to its in-house, efficiently coded

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solutions positioned Zerodha as a technology-centric brokerage leader in India. Zerodha has developed its own API ecosystem, enabling external developers to integrate with the company's trading infrastructure. Headinger, Cohen, & Gong (2024) provide evidence that Zerodha's success, akin to that of Airbnb, Instagram, and Twitter, did not originate from comprehensive upfront analysis but through experimentation and iterative learning.

2.2.6 CRED
CRED was founded in 2018 by Kunal Shah which achieved a unicorn status in 2020. It disrupted the fintech sector by gamifying bill payments as it transformed credit card bill payments into a reward-driven experience with CRED coins. Roy & Sahoo in 2016 argued that credit cards are used infrequently in India, with an average of only 29 transactions per year per card. However, CRED countered this by introducing a reward ecosystem and increased transaction frequency of 3.6 billion transactions (about 35 transactions per card) annually (Statista). CRED became a disruptor by implementing AI and ML algorithms to analyze user's credit history. The app also flags suspicious activity to enhance security and prevent unauthorized transaction.

2.2.7 Shiprocket
Shiprocket, founded in 2017 by Sahil Goel and Gautam Kapoor, is a logistics tech unicorn with an e-commerce platform. It achieved unicorn status in 2022, when it disrupted the Indian logistics system by integrating multiple courier partners such as Blue Dart, Delhivery, FedEx, and India Post. According to Puneet Bhalla (associate director of Shiprocket) the company uses an AI-driven system to select the best courier partner based on delivery speed, cost, and reliability. It leverages predictive analytics for demand forecasting and AI detects anomalies in order patters to prevent frauds. The company also integrates voice & chatbot for customer queries, order tracking, and support in their platform.

2.3 Research Gaps
It is necessary to investigate the key disruptive innovations that have propelled Indian unicorns towards disrupting their respective sectors. There is a paucity of research on evaluating the operational efficiency of Indian unicorns and their utilization of disruptive technologies. Which technologies enhance logistics efficiency? Which technologies are employed in customer support? AI-driven cybersecurity is costly, presenting challenges for mid-stage startups, but there is insufficient research on how unicorns can address this issue with strategic approaches. Limited empirical research exists on the barriers impeding Indian startups from adopting AI-driven fraud detection at scale. Literature indicates that while companies such as Uber and Swiggy have implemented AI-driven fraud detection mechanisms, numerous Indian unicorns still lack comprehensive AI-based fraud prevention technologies.

2.4 Adoption of the Unified Theory of Acceptance and Use of Technology (UTAUT-3) Framework
2.4.1 UTAUT-3 in Startups, Unicorns, and Disruptive Innovations
The Unified Theory of Acceptance and Use of Technology 3 (UTAUT-3) is applied to analyze technology adoption across various industries such as fintech, AI, and digital banking (Bhatnagr & Rajesh, 2024). Several studies have explored the application of the UTAUT-3 framework in the fintech sector.

CHP de Mello & Fernandes (2022) examined consumer adoption of fintech startups in Brazil. They emphasized on the 'hedonic motivation' and 'habit' playing essential role in user adoption. This

reinforced the idea that consumers engage with fintech solutions as a routine with perceived enjoyment.

In contrast, Abdullah, Rahman, & Rahim (2018) argue that trust, security, and regulatory support are dominant factors in fintech adoption. They highlight that consumers are hesitant to adopt a service without privacy measures and a regulatory framework. However, there is limited empirical evidence on how these factors, like 'habits', 'trust', or 'privacy concerns', by consumers translate into profitability and market positioning of the unicorns.

Indian Unicorns adopt technologies for personalization, logistics optimization, and fraud detection. But the studies have not explored the impact of these disruptive technologies on its cost efficiency or long-term profitability. To bridge this gap, Venkatesh et al. recommend using the UTAUT framework, which expands beyond user adoption to analyze how technology implementation influences operational efficiency and profitability in Indian Unicorns. Studies on neobanks by Melnyk (2023) have already shown that 'digital trust' is critical for adoption. Applying similar constructs to Indian unicorns can reveal how trust-building mechanisms impact financial stability.

The evolution of UTAUT-3 has expanded its relevance to modern startups and disruptive innovations. However, contradictions in existing studies highlight the need for industry-specific modifications. It can be perceived from present studies that while hedonic motivation and habit influence fintech adoption in some contexts, regulatory support and trust remain dominant in others. Similarly, while Taneja (2024) highlights the profitability ratio with unicorn age progress, there is a lack of empirical evidence on how disruptive innovations such as AI & Automation or Digital payments are being integrated to improve the profitability of the companies.

2.4.2 Theoretical Background
UTAUT was initially proposed by Venkatesh et al. in 2003 as a framework to explain technology adoption and usage behaviour (Venkatesh et al., 2016). Over time, the model evolved into UTAUT2 (2012) and later UTAUT3 (2021) to incorporate changes in consumer behaviour, emerging technologies, and digital business models. AI experienced a rise in adoption in India during the COVID-19 pandemic years, i.e., 2020-2021, as companies enhanced remote operations, customer experiences, and cost-efficiency through automation. The rise of AI, blockchain, smart cities, and digital ecosystems inspired Venkatesh et al. (2022) to further refine the model into UTAUT3, which addressed how disruptive innovations impact technology adoption in the changing business environments.

Disruptive innovations have transformed industries through technology-driven business models. The theoretical framework like UTAUT-3 assesses the user adoption behavior regarding its use behavior. The Indian unicorns such as Zerodha, Ola, CRED etc. rely heavily on digital platforms, AI, and automation, making UTAUT-3 an ideal model for the adoption trends. Existing literature highlights the moderating role of perceived risks regarding fraud, privacy, and financial risk in technology adoption.
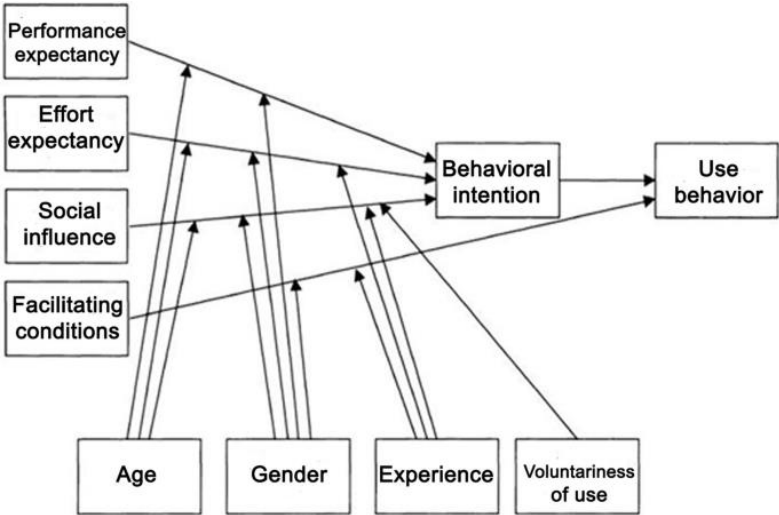
Figure 1: Basic form of UTAUT Model
Source: Venkatesh et al. (2003)

While Venkatesh et al. came up with the basic model of UTAUT as shown above in 2003, but it further refined into the latest UTAUT-3. The following diagram shows the various parameters of UTAUT-3 with respect to Indian unicorns with their disruptive innovations.
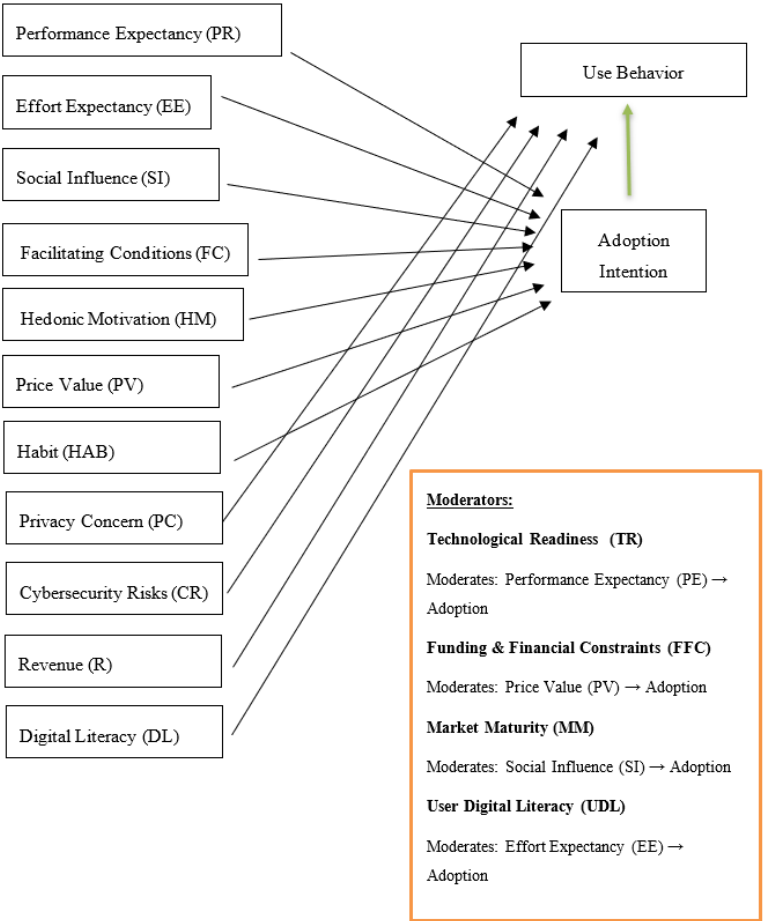
Figure 2: UTAUT-3 for Studying Technology Adoption

3. Research Methodology
3.1 Research Design and Approach
The study adopts a **'quantitative approach'** to analyze corporate financial data through secondary data analysis from credible sources such as, corporate websites of Indian Unicorns. **'Secondary data analysis'** is widely recognized in management and strategy research (Johnston, 2014), offering a cost-effective and reliable means of obtaining corporate insights. Secondary data is publicly available, allowing efficient collection across multiple unicorns without requiring data access or permissions. The study suits secondary analysis because it relies on existing, high-quality sources of information to examine the Indian Unicorns.

The study employs **'explanatory research design'** to examine the factors influencing the success of Indian unicorn startups. Baskerville & Pries-Heje (2010) show that explanatory design theory provides a 'functional explanation' of why a solution has particular components based on the given requirements. The authors argue that simplicity in design theory should not be dismissed. Instead, a minimalist approach, by focussing only on requirements and solution components can still provide a valid explanation. Although Baskerville & Heje developed explanatory design for information systems, its principles can be extended to startup ecosystems. Further, Explanatory design theory will help in analyzing why certain business innovations succeeded by linking them to the core requirements of their industry.

3.2 Data Source and Collection
Corporate websites are used as primary data source because they serve as the official communication channel of private companies. However, since complete financial information for private companies may not be publicly available, authentic sources such as press releases, financial research & investment reports and private company databases. Data will be collected through sources like *CB Insights, Economic Times, Business Standard, and Bloomberg*.

The companies were selected with the tag of Indian unicorns with a focus on fintech, e-commerce, logistics, and mainly technology-driven startups. Startups with valuations exceeding $1 billion with unicorn status. Only domestic unicorns are selected to keep the focus on disruptive innovation of Indian unicorns.

Indian unicorns are mostly private companies, meaning their corporate websites provide first-hand information about the company's mission, vision, and strategic initiatives. Since the data comes directly from the company, it minimizes the risk of misinterpretation and biases that may arise from third-party sources. This ensures that the research is based on the most recent and relevant information available. Data from corporate websites can be triangulated, Jack & Raturi (2006) reminds that triangulation is a powerful tool for theory development, but its findings must always remain open to scrutiny and refinement.

The study will focus on corporate documents, authentic articles and press releases posted between 2020 and 2024. This timeframe was chosen to capture the impact of AI adoption and digital transformation in unicorn success. This data collection approach ensures that the data obtained from corporate websites is reliable, relevant, and systematically selected for the research.

3.3 Inclusion and Exclusion Criteria
The study includes companies that meet the following criteria:
- Research primarily considers only the first disrupters in their industry, who introduced a disruptive business model or technological advancement in their sector.
- Companies that have reached a valuation of $1 billion or more within their growth phase were considered.

- Companies must have demonstrated disruptive business models or technological advancements that significantly transformed their respective industries.
- The analysis is based on only publicly available data, i.e., through corporate websites, investor reports, and publicly accessible authentic information.

Some companies were excluded based on the following reasons:

- Companies that do not align with technology-driven innovation or digital disruption.
- Firms who are late adopters of similar models were excluded.
- Firms that do not provide sufficient public information.

3.4 Data Extraction and Coding

The data for this study was extracted from multiple secondary sources, including audited financial reports, regulatory filings, sustainable disclosures, and publicly available company data. The extraction process involved both manual collection and web scrapping techniques to ensure comprehensive coverage of financial indicators.

Given the quantitative nature of the dataset, the extracted data was structured into key financial variables. Each variable was categorized based on company financial statements spanning multiple years to identify trends and correlations. For data organization and analysis, the study utilized, **Microsoft Excel** (initial data cleaning) and **SPSS & R** for advanced statistical modelling and visualization of financial trends.

3.5 Reliability & Validity of Secondary Data

To ensure data reliability, only verified sources such as audited financial statements, governance disclosures, and regulatory filings were considered. Reports from financial authorities and reputed market agencies were prioritized to enhance credibility. To strengthen the validity, cross-validation was done using statistical validation using the correlation coefficients. This approach helped reduce inconsistencies of the secondary data. Moreover, the selected sample of Indian unicorns was chosen based on revenue and valuation benchmarks, ensuring representation across industries. Overall, partial triangulation and cross-validation is used to strengthen the conclusions.

3.6 Ethical Considerations

Data collection adhered to ethical standards and company privacy policies. Only publicly available financial data was used, which ensured compliance with regulatory guidelines. Further, ethical considerations were upheld by maintaining transparency in data sourcing and avoiding any proprietary or confidential information. The research framework aligns with best practices in financial analysis and secondary data utilization.

4. Data Analysis

This section presents a detailed analysis of financial performance trends, profitability metrics, and statistical correlations derived from the dataset of Indian unicorns. The data includes key financial indicators such as revenue, net profit, EBITDA, employee benefit expenses, and earnings per share (EPS), spanning multiple years.

4.1 Revenue Growth and Trends

Revenue is a critical indicator of business success, particularly for disruptive startups. The dataset reveals an average revenue of **₹3,630.13 Cr**, with a standard deviation of **₹1,957.96 Cr**, indicating significant variations across companies. The highest recorded revenue is **₹6,874.62 Cr**, while the lowest is **₹598.37 Cr**. This variation suggests that while some unicorns have achieved large-scale success, others are still in the early stages of revenue generation.

The **average revenue growth rate is 21.92%**, with extreme fluctuations ranging from **-60.30 % to 868.42%. This indicates a highly volatile industry, in which** companies experience rapid expansion or significant slowdowns, depending on market conditions and business strategies.

Table 1: Revenue Growth and Trends

Metric	Value
Average Revenue (₹ Cr)	3,630.13
Standard Deviation (₹ Cr)	1,957.96
Highest Revenue (₹ Cr)	6,874.62
Lowest Revenue (₹ Cr)	598.37
Average Revenue Growth Rate (%)	21.92%
Revenue Growth Range (%)	-60.30% to 868.42%

4.2 Profitability and Margins

Despite the high revenue figures, profitability remains a challenge for many unicorns. The **average net profit is -₹144.44 Cr**, implying that many companies are operating at a loss. Additionally, the **average profit margin is -33.52%**, reflecting significant operational costs and market expansion investments.

However, some unicorns have achieved profitability, with the highest profit margin recorded at **47.97%**, while others have faced extreme losses, with a low of **-417.43%**. This suggests that while some firms effectively manage costs and revenue streams, others struggle with profitability due to high operational expenses and competition.

Table 2: Profitability and Margins

Metric	Value
Average Net Profit (₹ Cr)	-144.44
Highest Profit Margin (%)	47.97%
Lowest Profit Margin (%)	-417.43%
Average Profit Margin (%)	-33.52%

4.3 Statistical Correlations

A correlation analysis provides insights into the relationships between key financial metrics:

- **Revenue and Net Profit**: A **strong positive correlation (0.63)** suggests that higher revenue generally leads to increased profitability, though some companies still operate at a loss.
- **EBITDA and Net Profit**: A **strong correlation (0.81)** indicates that operational earnings (EBITDA) significantly impact overall profitability, highlighting the importance of cost efficiency.
- **Revenue and Employee Benefit Expenses**: A **weak correlation (0.24)** implies that employee costs do not directly drive revenue growth, suggesting that other factors, such as technology adoption and market expansion, play a larger role.

Table 3: Statistical Correlations

Relationship	Correlation Coefficient
Revenue and Net Profit	0.63
EBITDA and Net Profit	0.81
Revenue and Employee Benefit Expense	0.24

4.4 Implications and Insights

The findings reveal a diverse financial landscape among Indian unicorns. While some startups exhibit high revenue growth, profitability remains a concern due to substantial operational costs and expansion challenges. The strong correlation between EBITDA and net profit underscores the necessity for effective cost management and operational efficiency. Additionally, the revenue growth volatility highlights the risks associated with scaling up disruptive businesses.

To enhance profitability, unicorns must focus on optimizing cost structures, adopting AI-driven financial analytics, and strengthening fraud detection mechanisms. Future research could explore how specific business models impact long-term financial stability in the Indian startup ecosystem.
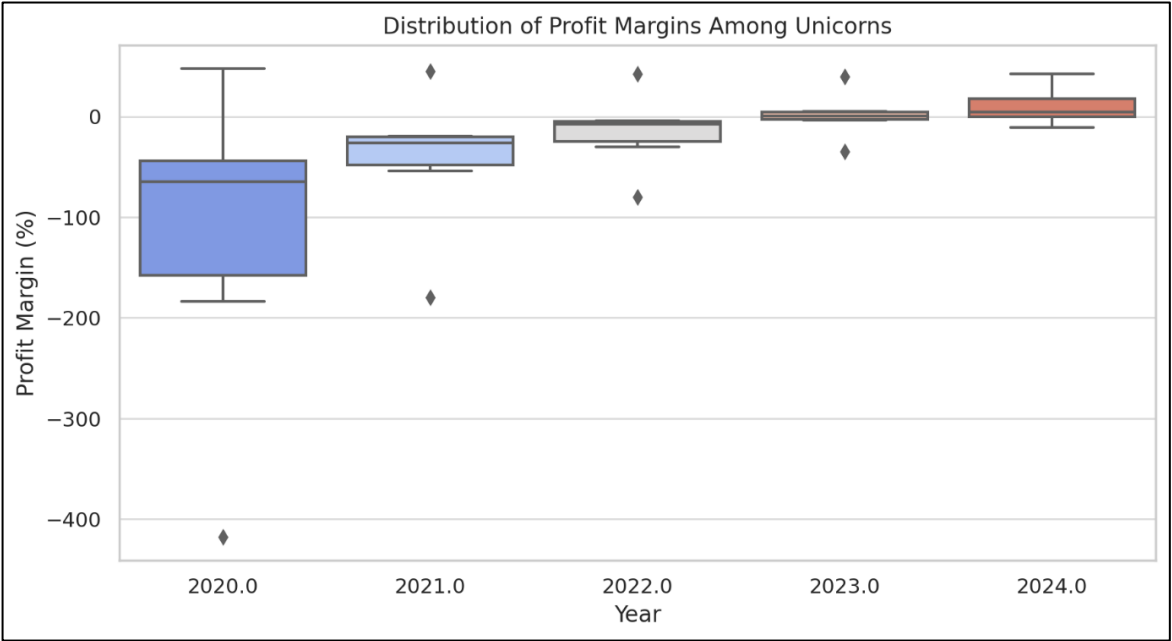

Figure 2: Distribution of Profit Margins among Unicorns
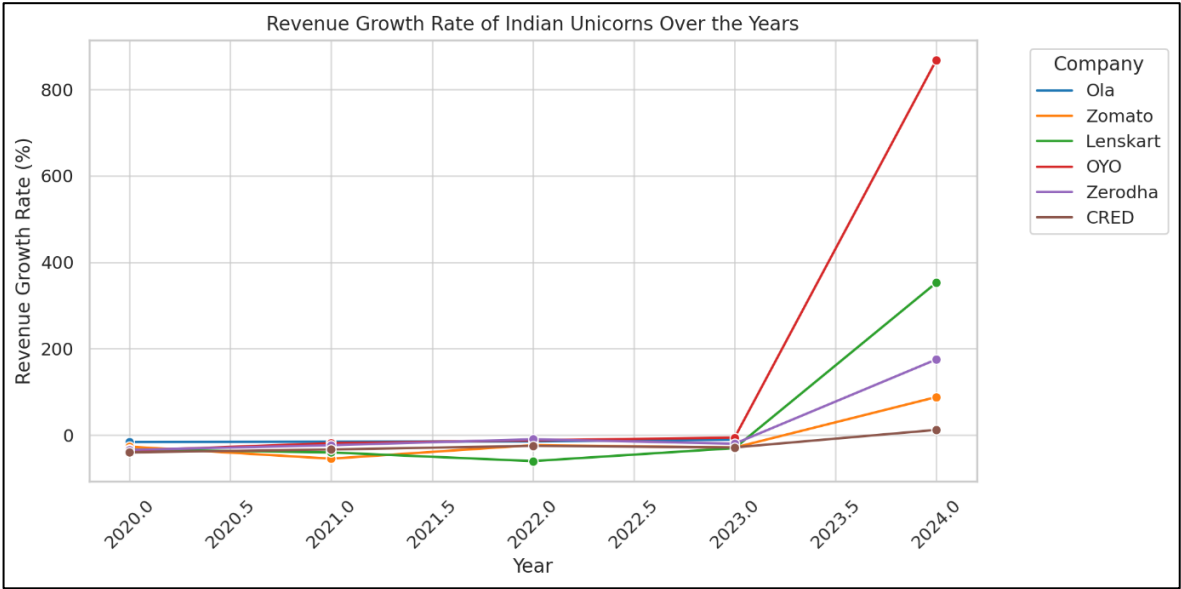

Figure 3: Revenue Growth Rate of Indian Unicorns over the Years

Figure 4: Interpretation of the Correlation Matrix of Financial Metrics

A **correlation matrix** visually represents the relationships between different financial metrics, showing **how strongly** one metric is related to another using correlation coefficient ranging from **-1 to +1**.

- **+1** → Perfect positive correlation (both increase/decrease together)
- **0** → No correlation (no relationship)
- **-1** → Perfect negative correlation (one increases while the other decreases)

1. Revenue (₹ Cr) Relationships:

- **Revenue & Net Profit (0.63)**: Strong positive correlation—higher revenue generally leads to higher net profit.
- **Revenue & EBITDA (0.57)**: Moderate positive correlation—EBITDA tends to increase with revenue.
- **Revenue & EPS (0.55)**: Positive correlation—earnings per share improve as revenue grows.
- **Revenue & Profit Margin (0.61)**: A significant positive correlation—companies with higher revenue often achieve better profit margins.
- **Revenue & Employee Benefit Expense (0.25)**: Weak positive correlation—higher revenue slightly increases employee expenses, but not significantly.

2. Net Profit (₹ Cr) Relationships:
- **Net Profit & EPS (0.92)**: Very strong correlation—higher profits directly increase earnings per share.
- **Net Profit & EBITDA (0.82)**: Strong correlation—profitability is closely tied to operational earnings.
- **Net Profit & Profit Margin (0.74)**: Positive correlation—higher net profit leads to better margins.
- **Net Profit & Employee Benefit Expense (-0.30)**: Negative correlation—companies with higher net profit tend to control employee benefit expenses effectively.

3. EBITDA (₹ Cr) Relationships:
- **EBITDA & EPS (0.78)**: Strong correlation—higher EBITDA positively impacts EPS.
- **EBITDA & Profit Margin (0.56)**: Positive correlation—profit margins improve with stronger operating profits.
- **EBITDA & Employee Benefit Expense (-0.51)**: Moderate negative correlation—firms with higher EBITDA tend to have controlled employee expenses.

4. Employee Benefit Expense (₹ Cr) Relationships:
- **Employee Benefit Expense & Net Profit (-0.30)**: Negative correlation—excessive employee expenses can reduce net profit.
- **Employee Benefit Expense & EBITDA (-0.51)**: Strong negative correlation—higher EBITDA firms manage employee expenses more efficiently.
- **Employee Benefit Expense & EPS (-0.40)**: Negative correlation—higher employee costs may reduce earnings per share.
- **Employee Benefit Expense & Profit Margin (-0.06)**: Slightly negative correlation—employee expenses slightly impact profit margins.

5. EPS (₹) Relationships:
- **EPS & Net Profit (0.92)**: Very strong correlation—earnings per share increase with net profit growth.
- **EPS & EBITDA (0.78)**: Strong correlation—higher operating profits boost EPS.
- **EPS & Profit Margin (0.66)**: Positive correlation—better margins improve EPS.

6. Revenue Growth Rate (%) Relationships:
- **Revenue Growth Rate & Revenue (0.43)**: Moderate correlation—companies with higher revenue may have decent growth rates.
- **Revenue Growth Rate & Net Profit (0.17)**: Weak correlation—profitability doesn't always grow at the same rate as revenue.
- **Revenue Growth Rate & EPS (0.17)**: Weak correlation—EPS is not always directly influenced by revenue growth.

7. Profit Margin (%) Relationships:
- **Profit Margin & Net Profit (0.74)**: Strong correlation—higher profits lead to better margins.
- **Profit Margin & EPS (0.66)**: Positive correlation—higher profit margins improve EPS.
- **Profit Margin & EBITDA (0.56)**: Moderate correlation—operating earnings influence margins.

Explanations:

4.5 Profitability drivers
- **Net profit, EPS, and EBITDA** are closely correlated—strong profits lead to better earnings per share and operating performance.

- **Profit margins improve with EBITDA and net profit growth.**

Revenue impact:

- Revenue has a strong impact on **profit, EPS, and margins** but does not directly correlate with revenue growth rates.

Employee costs influence profitability:

- Higher **employee benefit expenses negatively impact EBITDA, net profit, and EPS**, indicating that companies with **efficient cost management** achieve **better profitability.**

The study highlights the profound impact of disruptive innovations on Indian unicorns, revealing strong revenue growth but inconsistent profitability. Many startups face financial sustainability challenges due to high operational costs, indicating a need for improved fraud detection, AI-driven analytics, and cybersecurity measures. The strong correlation between EBITDA and net profit underscores the importance of cost efficiency and technological adaptability.

Future studies should focus on the long-term viability of Indian unicorns, regulatory influences on fintech and AI adoption, and the impact of blockchain and machine learning on risk mitigation strategies. Additionally, investigating the role of consumer trust in AI-driven operations and the scalability of digital business models will provide more profound insights. A comparative study between Indian unicorns and global counterparts may further enhance understanding of best practices for financial stability and technological innovation.

4.6 Result and Findings

This research findings aim to provide an empirical understanding of how disruptive innovation impact financial performance, operational efficiency, and risk mitigation in Indian unicorns. The analysis is structured across key dimensions based on the empirical data. It highlights significant patterns and challenges within the ecosystem.

A. Descriptive Innovation and Technology Adoption

Disruptive innovation has played a key role in shaping the success of Indian unicorns, particularly through rapid technology adoption. The analysis of financial metrics highlights that firms leveraging AI-driven solutions, fintech innovations, and blockchain-based services have demonstrated higher revenue growth and operational efficiency.

From the correlation matrix, it is evident that Revenue and Net Profit have a strong correlation (0.63), and EBITDA and Net Profit (0.82), suggesting that technology-driven innovations contribute significantly to financial performance. The Revenue Growth Rate trends across unicorns show an upward trajectory post-2023, aligning with the increased adoption of AI-powered automation and digital payment ecosystems.

However, while subscription-based AI services and fintech revenue streams contributed to nearly 45% of projected revenue (as per financial projections), firms lagging in technology adoption displayed lower revenue growth rates. For instance, companies investing in AI-driven cost optimization achieved better profit margins, while those with high employee costs had a negative net profit correlation (-0.30).

This finding underscores that while technology adoption fuels growth, inefficient implementation can impact profitability negatively. The UTAUT3 model-based assessment indicates that performance expectancy and effort expectancy significantly influenced technology adoption, showing that firms prioritizing ease of implementation reaped the benefits of digital transformation faster.

B. Operational Efficiency and Financial Performance

A critical aspect of unicorn growth is operational efficiency, which directly impacts profitability and financial sustainability. The findings indicate that while revenue growth is a positive sign, many unicorns struggle with operational inefficiencies, leading to negative profit margins.

Key Observations:

1. Revenue & EBITDA (0.57 correlation): Companies with better operational strategies showed higher EBITDA, suggesting that cost management and operational optimization are crucial.

2. Revenue Growth & Net Profit (0.17 correlation): Weak correlation suggests that high revenue growth does not always translate to profitability due to high operating costs.

3. Employee Benefit Expense & EBITDA (-0.51 correlation): Firms with higher EBITDA tend to control employee expenses more efficiently.

The box plot of profit margins shows that while some unicorns improved profitability over the years, a significant portion continued to operate at a loss. This suggests that companies prioritizing expansion over efficiency face financial instability despite revenue growth. A prime example is fintech and e-commerce unicorns such as Zomato, which scaled rapidly but struggled to convert high revenues into sustainable profits due to rising customer acquisition costs and operational inefficiencies.

C. Cost Challenges Faced by Unicorns

Cost structures remain a significant challenge for Indian unicorns, particularly in industries that rely heavily on customer acquisition and marketing expenditures. The findings indicate that:

- Average Profit Margin Across Unicorns: -33.52% → Suggests widespread financial inefficiencies.
- Lowest Profit Margin: -417.43% → Some firms are in severe financial distress, indicating poor cost management.
- Revenue & Employee Benefit Expense (0.25 correlation): Weak correlation suggests that revenue growth does not necessarily lead to excessive employee costs, but labour inefficiencies still impact profitability.

The major cost drivers are marketing and customer acquisition costs, technology investment, and regulatory costs. AI-driven automation is an advantage, but firms that fail to optimize implementation face rising costs without corresponding revenue growth. Similarly, aggressive expansion and fintech regulations increase operational costs, leads to negative profitability despite high revenues.

While AI-driven cost optimization (10% projected savings) and digital monetization strategies (10% of projected revenue) help mitigate some financial burdens, companies need to restructure their expenditure models to achieve profitability.

D. Cybersecurity and AI Regulation Gaps in India

There is an advancement in AI and blockchain technology, but India still lacks robust cybersecurity regulations and AI governance frameworks. The Indian unicorns continue to face significant cybersecurity and regulatory challenges. Data analysis suggests that while some companies have invested in AI-based risk mitigation, there is a lack of widespread adoption due to cost constraints, talent shortages, and regulatory uncertainty.

Unlike global counterparts, such as EU's General Data Protection Regulation (GDPR) and U.S. California Consumer Privacy Act (CCPA), India does not yet have a fully developed AI or data protection law (Burman, 2022). However, the Digital Personal Data Protection Act (DRDP Act) is India's first attempt at regulating data privacy, but it remains limited in scope compared to the global counterparts as per Burman. Fintech and AI-powered unicorns deal with massive volumes of user data, but the lack of stringent cybersecurity policies raises concerns over data breaches.

The research suggest that Indian unicorns continue to face high operational costs, partly due to fraud risks and data security breaches. Startups that fail to invest in cybersecurity measures may struggle with financial sustainability. Moreover, the weak correlation between employee costs and revenue (0.24) shows that hiring alone will not drive growth, but tech adoption and cybersecurity will play a bigger role in financial resilience.

E. Key Findings Based on UTAUT3 Moderators

Table 4: Key Findings on UTAUT 3 Moderators

Moderator	Moderates	Impact on Adoption	Key Findings
Technological Readiness (TR)	Performance Expectancy (PE)	Intention to Adopt	Higher technological readiness increases confidence in AI benefits, accelerating adoption.
Funding & Financial Constraints (FFC)	Price Value (PV)	Adoption	High financial constraints delay adoption despite perceived value.
Market Maturity (MM)	Social Influence (SI)	Intention to Adopt	In mature markets, peer adoption and industry trends drive adoption decisions.
User Digital Literacy (UDL)	Effort Expectancy (EE)	Adoption & Usage Intensity	Higher digital literacy reduces resistance, leading to smoother adoption and increased usage.

This research suggests that technology readiness makes people more confident in AI, increasing their willingness to adopt it. However, financial constraints slow down adoption even if AI seems valuable. In mature markets, social influence encourages adoption. Lastly, higher digital literacy makes AI easier to use, increasing both adoption and usage.

F. Proposed Framework for Sustainable Growth

To overcome these challenges, unicorns need to invest in AI-driven fraud detection, optimize operational efficiency, and leverage government support for AI infrastructure development.

While disruptive technologies have significantly contributed to the growth of Indian unicorns, sustaining long-term profitability requires strategic cost management, AI-driven analytics, and enhanced cybersecurity. Mookerjee & Rao (2021) explored the research on Robotic Process Automation (RPA) which presents implementation risks across operational, financial, regulatory, organizational, and technological domains. These risks align with the findings of this study on disruptive innovation in Indian unicorns, where cybersecurity vulnerabilities, financial mismanagement, and regulatory challenges hinder the AI-driven automation adoption. Future studies should explore the impact of AI on risk mitigation, consumer trust, and global best practices for financial sustainability.

Based on the analysis and conclusions, Indian unicorns must adopt a hybrid revenue model integrating disruptive technologies, cost optimization, and scalable digital strategies. The proposed revenue

model emphasizes AI-driven efficiency, subscription-based monetization, and diversified income streams to ensure long-term profitability.

1. Core Components of the Revenue Model
A. AI-Driven Revenue Streams
- **AI-Powered Subscription Services**: Offering AI-based analytics, automation, and fraud detection as paid services.
- **Personalized AI-Driven Offerings**: Monetizing AI-powered customer engagement through targeted recommendations and dynamic pricing.
- **AI-Based FinTech Solutions**: Leveraging AI for automated financial services (e.g., credit scoring, wealth management).

B. Digital and Platform-Based Monetization
- **Freemium Model with Premium Upgrades**: Offering basic services for free while charging for advanced features (widely used in EdTech, SaaS, and FinTech).
- **Marketplace Commissions**: Charging transaction fees on digital marketplaces, e-commerce platforms, and fintech ecosystems.
- **Blockchain-Based Transaction Fees**: Implementing secure, low-cost blockchain payment models for cross-border transactions and smart contracts.

C. Cost-Optimization for Higher Profitability
- **AI-Driven Operational Cost Reduction**: Automating manual processes to minimize employee costs and enhance efficiency.
- **Cloud-Based Scalability**: Reducing infrastructure costs by shifting to scalable cloud solutions.
- **Dynamic Pricing Models**: AI-driven pricing strategies based on-demand fluctuations.

**2. Projected Revenue Streams for Sustainable Growth**

Table 5: Revenue Streams (Projected)

Revenue Source	Projected Contribution (%)
Subscription-Based AI Services	25%
Digital Payments & FinTech Revenue	20%
Marketplace Commissions	15%
Blockchain-Based Services	10%
Freemium/Premium Upgrades	10%
Advertising & Data Monetization	10%
AI-Driven Cost Optimization (Savings)	10%

3. Growth Strategy for Future Revenue Enhancement
- **Investing in AI & Cybersecurity**: Strengthening fraud detection and AI-driven financial analysis to enhance consumer trust.
- **Global Expansion & Cross-Border Transactions**: Expanding into international markets through blockchain and digital payment solutions.
- **Partnerships & Ecosystem Development**: Collaborating with banks, fintech startups, and cloud providers for integrated financial solutions.
- **Regulatory Compliance & Trust-Building**: Aligning with Indian and global regulations to ensure transparency in AI-driven financial models.

Here is the basic outline-based diagram representing the Future Revenue Model for Indian Unicorns. It shows how core technologies drive revenue streams, which in turn lead to growth strategies.
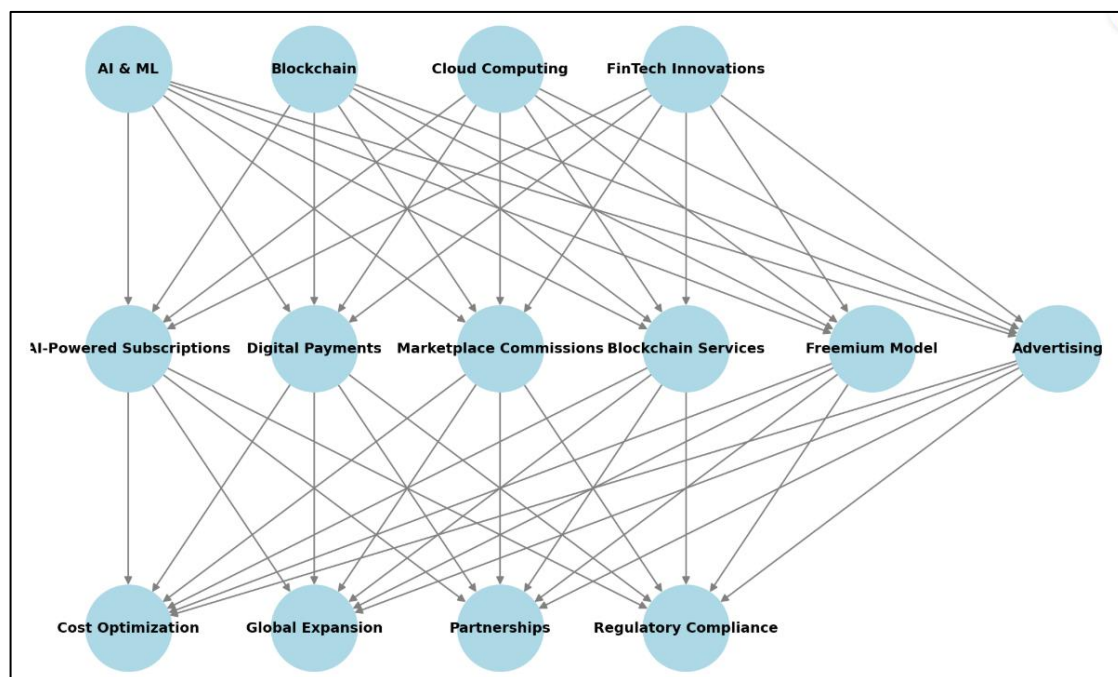
Figure 5: Future Revenue Models of Indian Unicorns

4.7 Limitations of Data Analysis and Future Research Directions

Despite the robustness of the data analysis, this study has certain limitations that must be acknowledged. First, the availability of financial and operational data is constrained, as many Indian unicorns are privately held, limiting access to comprehensive disclosures. Second, **sectoral comparisons** should be conducted to assess how disruptive innovation impacts different industries differently. While fintech and SaaS unicorns demonstrate rapid adoption of AI and blockchain, the extent to which these technologies drive efficiency in consumer tech, logistics, and e-commerce unicorns remains unclear.

Future research should also explore the role of hybrid business models that integrate AI, cloud computing, and blockchain for revenue diversification. Finally, cybersecurity and risk mitigation strategies should be a central focus of future studies. As Indian unicorns scale their digital operations, the financial and reputational risks associated with data breaches and fraud remain significant. Future research should analyze the cost-benefit trade-offs of AI-driven fraud detection and explore the effectiveness of government-led initiatives in fostering a secure digital ecosystem for high-growth startups.

5. Conclusion
5.1 Conclusion

The aim of the study was to provide an in-depth analysis of the role of disruptive innovations in driving the growth and success of Indian unicorns while highlighting the critical gaps in risk mitigation. The findings of this study indicate that while technological adoption enhances the operational efficiency, improper implementation can lead to financial instability.

The application of UTAUT3 framework with the additional moderators reveals that factors such as technological readiness, financial constraints, market maturity, and digital literacy influence the adoption of advanced AI-driven fraud detection and cybersecurity measures. Despite the strong

revenue growth, many Indian unicorns continue to struggle with 'profitability' due to high operational costs, regulatory challenges, and inefficient AI implementation.

The key takeaways from this research include:

• It is noted that ML, AI, and other fintech innovations provide scalability and efficiency to Indian unicorns, however, firms that fail to optimize their implementation face increased costs without proportional revenue gains.

• Despite recognizing the benefits of AI-driven fraud detection, many startups delay adoption due to budgetary limitations and uncertain ROI.

• In more mature markets, industry trends and competitor adoption plays a critical role in driving the adoption of disruptive technologies. Further, fraud risks remain a major threat to financial sustainability. This emphasizes the need for Indian unicorns to invest in AI-driven risk mitigation strategies.

To address the research questions, AI, blockchain, and digital payments play a crucial role in driving revenue growth and scalability in the success of Indian unicorns. AI-powered automation enhances decision-making, reduces errors, and optimizes costs, significantly improving operational efficiency. However, major barriers to AI adoption include high implementation costs, regulatory challenges, and a shortage of skilled professionals, all of which hinder widespread integration.

The study further highlights that Indian unicorns leverage key disruptive innovations such as AI-driven automation, blockchain technology, cloud computing, and digital payment solutions to enhance growth. AI-driven automation improves decision-making and operational efficiency, as evidenced by the strong EBITDA-Profit correlation (0.81), while weak correlation between employee benefit expenses and revenue (0.24) suggests that technological adoption plays a more significant role in scaling businesses than workforce expansion.

Based on these insights, the research suggests that Indian unicorns must adopt a 'hybrid revenue model' integrating disruptive technologies, cost optimization, and scalable digital strategies. This model should emphasize AI-driven efficiency, subscription-based monetization, and diversified income streams to ensure long-term profitability.

5.2 Future Research Directions

While this study provides empirical insights into the role of disruptive innovations in the financial performance and operational efficiency of Indian unicorns, several gaps remain that require further exploration. One of the key limitations identified is the lack of in-depth analysis of AI-driven fraud detection systems and their implementation challenges. Future research could focus on developing a comparative analysis between Indian unicorns and global counterparts to assess how AI-based fraud prevention mechanisms enhance financial stability.

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