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Foreword

The Post Graduate Department of Business Management, overseeing the MBA programme at Sardar Patel University, exemplifies educational excellence and innovation. Established in 1989, the department has developed a strong reputation within the university and across Gujarat. Sardar Patel University, holding an "A" grade accreditation from NAAC (CGPA 3.25), offers a nurturing academic environment for aspiring business leaders.

Since its inception, the department has played a key role in shaping future managers and entrepreneurs. Its curriculum, tailored to global business needs, blends theoretical concepts with practical applications. Supported by dynamic faculty and a robust learning environment, the department consistently produces graduates equipped for the corporate world. Its dedication to quality and innovation has established it as one of Gujarat's leading management institutions.

The department also excels in research and outreach. Recognized by the University Grants Commission (UGC) with special assistance under the DRS-II scheme, it completed the pioneering project "Consumer Research in Rural Areas" in March 2016, offering significant insights into rural consumer behavior. Building on this success, the department received the SAP DRS-III grant (2016–2021) for the "Transformation of Rural Economy" initiative, which explored changes in rural communities and their economic impact.

Additionally, the department addressed social and civic concerns through the "Knowledge, Attitude, and Perception of Voters in Gujarat" project, commissioned by the Election Commission of India, deepening the understanding of voter behavior and influencing electoral strategies.

These achievements underscore the department's ongoing commitment to high-quality education, research, and real-world engagement. Its legacy is defined by rigorous academics, impactful research, and successful placement of graduates across various industries, upholding its role as a leader in management education and research.

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Editorial

It gives us immense pleasure to present Volume 25, Issues 1 and 2, for the year 2023. This edition features a diverse and insightful collection of research papers reflecting vibrant scholarly inquiry into some of the most pressing challenges and opportunities across various sectors, both in India and globally.

At the forefront, Dr. Darshana Dave and Mohammad Ghufran Ahangar explore the nuances of technology adoption within the pharmaceutical industry of Gujarat, highlighting both the barriers faced and potential avenues for growth. Their work underscores the critical role of innovation in healthcare advancement and regional development.

Financial inclusion remains a pivotal theme addressed by Dipali Gajjar and P.K. Priyan, who provide a global analysis of access and barriers. Their comprehensive study illuminates systemic gaps and opportunities for enhancing financial accessibility, which remains fundamental for equitable economic progress.

E-commerce and digital consumer behavior receive substantial attention through the research contributions of Mayuri Shah and Dr. Mitesh Jayswal, along with Dhruvin Kumar Chauhan and Dr. Jayswal. These papers delve into key drivers of review quality and the influence of user-generated content on Generation Z's purchase intentions in fashion, thereby unravelling the dynamics shaping modern retail ecosystems.

Customer satisfaction in specialized service domains is thoughtfully examined by Mamta Brahmbhatt through SERVPERF insights into private banking, providing valuable perspectives on improving client experiences in a competitive financial landscape.

Environmental sustainability and community governance find focus in the study by Mehta Kapil and Dr. R M. Rathod, presenting best practices in waste management through the lens of Petlad Municipality's case. Their findings contribute to the discourse on sustainable urban management and public health.

Lastly, the importance of quality assurance in education is comprehensively reviewed by Mr. Sumit G. Dhamani and Dr. Raju M. Rathod, who systematically assess accreditation standards in higher education, emphasizing their critical role in shaping academic excellence and institutional credibility.

This edition stands as a testament to the invaluable contributions of researchers dedicated to advancing knowledge and practical solutions across multiple domains. We believe that the insights shared here will inspire further research, policy formulation, and implementation of strategies that drive sustainable and inclusive growth.

We extend our sincere gratitude to all authors, reviewers, and readers for their unwavering commitment and support. Together, we continue to foster a community passionate about research excellence and societal impact.

Happy reading!

(Dr. Darshana R. Dave)
Director

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Technology Adoption in Pharmaceutical Industry of Gujarat: Challenges and Opportunities

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and

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Abstract

The Gujrat pharmaceutical industry is crucial in the Indian healthcare and economic landscape. To understand the journey of digitalization and its opportunities and challenges in the pharma industry of Gujarat, the author utilizes secondary data sources, including government regulations, industry reports, academic literature, and corporate announcements; the result of this study indicates that cutting-edge technologies such as blockchain, automation, artificial intelligence (AI), and digital quality management systems (QMS) could significantly improve supply chains, ensure compliance with regulations, broaden market access, foster innovation, and enhance operational efficiency. However, the digital divide among MSMEs, as well as high investment costs, a lack of employees, complicated regulations, and inadequate infrastructure, all impede the broad use of technology. Nevertheless, ambitious government initiatives, large corporate expenditures in R&D and digitalization, and the evolving climate have put Gujarat's pharmaceutical industry in a strong position for global leadership. In particular, primary data collecting and the investigation of new technologies, such as digital twins and customised treatment solutions addressed in the study.

Keywords: ***Technology Adoption, Pharmaceutical industry, Government Initiatives, opportunities & challenges***

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Introduction

Gujarat Pharmaceuticals, known for producing reasonable, life-saving medicines, transitioned from small-scale units in the 1980s to a national pharmaceutical powerhouse. Gujarat contributes approximately 30% of India's pharmaceutical production and 28% of exports.

Government initiatives, robust policy support, and a strong R&D culture have driven this transformation. Important businesses like Zydus Lifesciences, Torrent Pharmaceuticals, and Dishman Carbogen Amcis are prime examples of how the state has embraced cutting-edge technology to improve operational effectiveness, product quality, and competitiveness internationally.

This study examines the level of technology adoption in Gujarat's pharmaceutical sector, highlighting both the challenges and opportunities.

Review of Literature

The adoption of technology in the pharmaceutical industry of India as a whole and Gujarat mainly has caused rapid growth and changes. Upadhyaya (2019), in his study, explores the digitalization and digitization growth stages of the Indian pharma industry, particularly in terms of its development, market size, digitalization, and challenges and opportunities in the pharmaceutical industry. The author surveyed medical representatives in Bangalore. The survey indicates a transition toward online, e-commerce, and email marketing. Despite the transition and interests of medical representatives toward digitalization, internet use shows regulatory constraints, resistance from healthcare professionals, and organizational silos main barriers to technology adoption. In addition, the findings reveal the benefits of digitalisation, such as increased Transparency, enhanced productivity, cost-effectiveness, sped-up business processes, Scalability, and enhanced customer interactions.

Government policy, initiatives, and support play a crucial role in the digitalization of overall industries in India, particularly the pharmaceutical industry; the government of India has initiated start-up India, e-Governance, and digital India to help boost the digital transformation and journey in Gujarat. Zaveri and Miguel (2023) investigate the digital transformation process within the Gujarat MSME sector, aiming to understand the factors contributing to the slow rate of digital adoption despite considerable government initiatives and support. Low technical competency, financial limitations, a

shortage of skilled workers, a lack of technological awareness, and the high cost of digital solutions are among the persistent challenges shown by the research. Based on these insights, the authors propose targeted improvements to the Gujarat MSME policy to address these challenges better and accelerate digital transformation across the sector.

According to the Gujarat government (2022), Gujarat's chief minister highlighted the role of Gujarat in the revelation and leading of digitalization, which the state ranking to the Start-up India rankings for three years in a row, the CM Dashboard, as the third eye of the government has played a crucial role and improve governance and supportive environment for technology adoption. In their research, Patani and Modi (2020), studied Gujarat's e-government initiatives challenges, and opportunities. They found that issues, including poverty, a lack of digital skills, and language hurdles, have hampered progress. Despite this, their assessment remains hopeful. It demonstrates how Gujarat's e-governance initiatives may result in significant, constructive change with the correct assistance. Thoughtful government initiatives like SWAN and e-GRAM demonstrate the state's dedication to leveraging technology. A large amount of this potential is accounted for by its ability to develop and enhance the lives of its population. It demonstrates the impact of government support in pushing for e-governance, which could make a positive difference in people's lives. This promise owes a lot to forward-looking programs like SWAN and e-GRAM, which reflect the state government's strong dedication to using technology to bring about meaningful digital change.

In their report, Sufalam, Technology (2022) highlights Gujarat MSMES' challenges, such as insufficient skills, funding shortages, and opposition to transformation or change. The highlighted barriers primarily target pharmaceutical industry operations, as adopting new advanced technology in this sector requires more financial support and a skilled workforce.

A comprehensive approach has drowned out Gujarat's biotechnology ambitions plan. Bio Spectrum Report (2007) supports the claim and reveals that the Gujarat government plans to have one of the best world-class Biotech Ecosystems focusing on healthcare, Eco-sustainability, and agriculture. Furthermore, the state government's genetic diagnostics, stem cell therapy, and marine biotechnology show the government's long-term vision for a better future and advanced biotechnology.

Infrastructure and a shortage of trained labor are two issues that persist despite all government efforts in the private sector; by resolving these issues, the projects' investment reaches its maximum potential. Gujarat's pharmaceutical sector has significant development potential, according to KPMG's (2008) report, which is primarily driven by the establishment of Special Economic Zones (SEZs) to make the state a worldwide competitor. Creating active pharmaceutical ingredients (APIs) and intermediates is firmly based on Gujarat's well-established chemical sector. To achieve this potential, the sector has to focus on investing in training programs and strengthening research and development (R&D). Major problems like the shortage of skilled workers and the limited funding for research and development must be addressed if long-term success is to be achieved.

The NASSCOM Centre of Excellence, in their (2023) report, discusses the initiative incorporation with the Commissionerate of Gujarat's MSME titled 'Digital Manufacturing Champions,' which was designed to support and guide the Micro, Small, and Medium Enterprises (MSMEs) in Gujarat in the adoption of new tools and cutting-edge technology like AI, IoT, and AR. The initiative aims to familiarize and popularize the MSMEs with advanced technology to overcome the ongoing operational and quality management challenges and improve Gujarat's industrial ecosystem.

As demonstrated by Gujarat's integration of cutting-edge technology into its healthcare operating systems, research indicates that public-private collaborations are essential to research and development and the deployment of modern technologies. According to the Gujarat Informatics Ltd. (2008) report, implementing the Hospital Management Information System (HMIS) in government hospitals significantly improves the decision-making process and patient care. The project's incorporation with Tata Consultancy Services (TCS) shows the importance of public-private partnerships in using the new technology in the healthcare industry.

Kasthuri. (2018), in his research article entitled Challenges of Healthcare in India, the study's findings show five significant challenges within the country's healthcare: the "Five A's" awareness, access, absence, accountability, and affordability. To tackle these obstacles in the healthcare industry, the authors emphasize the need for healthcare infrastructure, boosting public health expenditure, and improving education on health matters.

Shah, (2012) explores the global pharmaceutical industry's historical development, growth patterns, and challenges from a global perspective within India, particularly In Gujarat; the study highlights the significant role of Gujarat in pharmaceutical machinery production and its development as a central Pharma hub in the country. The study's findings indicate challenges such as the fragmented engineering sector, lack of funding for R&D, scalability issues, and the need for industry consolidation. On the other hand, the study highlights the opportunities and strength of Gujarat's pharma industry, such as its well-established engineering sector for pharmaceutical machinery, significant contributions to contract research and manufacturing services (CRAMS), and opportunities in biotechnology backed by government support and its strong base on pharmaceutical export. Shah, (2021), studied the impact of the COVID-19 pandemic on India's pharmaceutical supply chain, stressing the need for the use and implementation of technologies in the sector like AI and machine learning (ML) to the efficiency of supply chain operations. Different authors have studied the potential of digital tools and AI in the pharmaceutical sector from different angles. Verma et al. (2020) and Lalan et al. (2023). Verma et al. explore the systematic challenges of regulating public health; the authors highlight both the challenges and potential. They argued that while AI can change and help the sector in better and more comprehensive decision-making and disease, the regulatory framework in the country is not able to handle the rapid pace of AI innovation; the authors suggest a flexible and ongoing approach to regulation Lalan et al. researched the influence of advanced technology on the pharmaceutical industry and how it transfers operations. In addition, the authors investigated how these technologies accelerate, simplify, and improve the process of drug development, clinical trials, and data analysis. Furthermore, the authors have brought the example of major multinational firms, like Novartis and Pfizer, using AI in their operations to improve their R&D efforts.

In conclusion, the analysis of the existing Review of literature on the use of technology in Gujarat's pharmaceutical business offers a thorough summary of the industry's potential challenges and opportunities.

State and national government policies, efforts, and public-private sector cooperation made Gujarat's digital transformation possible. While the advancement in innovation and

biotechnology gives a significant opportunity for growth potential, some challenges, such as regulatory, technical, and workforce barriers, make the process a hurdle that needs to be addressed for successful implementation.

Overview of Pharmaceutical Industry of India

The Indian pharmaceutical industry has successfully journeyed from a market controlled by international corporations to a global leader in manufacturing generic medications and vaccines. An important turning point was the Indian Rights Act of 1970. It encouraged Indian companies to create their economic production techniques without infringing on foreign rights by substituting process patents for product patents (Chaudhuri, 2005). A local manufacturing boom was sparked by this legal change, which made it possible for businesses like Cipla, Ranbaxy, and Dr. Reddy's Laboratories to become major participants on the international stage.

Throughout the 1980s and 1990s, India witnessed a strengthening of its pharmaceutical base, facilitated by government incentives, greater investments in R&D, and the strategic establishment of public sector units (Kumar & Rani, 2021). By embracing reverse engineering techniques, Indian firms expanded access to affordable generics domestically and internationally. The signing of the TRIPS Agreement in 1995 and India's subsequent compliance by 2005 realigned the industry's focus toward innovation, biosimilars, and contract manufacturing for global markets (Sampath, 2019).

Today, India ranks third globally by pharmaceutical production volume and fourteenth by value, reflecting its strength in producing affordable medicines while maintaining price competitiveness (India Brand Equity Foundation [IBEF], 2024). As of 2024, the Indian pharmaceutical market is valued at approximately USD 62.93 billion, with projections suggesting growth to USD 130 billion by 2030 (Devdiscourse, 2024). India is also known as the "Pharmacy of the World," supplying over 60% of the global vaccine demand and approximately 40% of the generic medicine requirements in the United States (IBEF, 2024).

The export performance of the sector highlights its importance on a worldwide scale. In FY 2022–2023, India's pharmaceutical exports to markets in North America, Africa, and Europe were USD 25.4 billion (Pharmaceuticals Export Promotion Council of India [Pharmexcil],

2023). The country is home to more than 665 USFDA-approved manufacturing facilities outside the United States, the highest number globally, signifying India's adherence to global regulatory standards (McKinsey & Company, 2023).

Several government initiatives have accelerated this growth trajectory. Programs like Atmanirbhar Bharat (Self-Reliant India) and the Production Linked Incentive (PLI) Scheme for Pharmaceuticals aim to reduce dependency on imported APIs (especially from China) and encourage the domestic production of high-value drugs, complex generics, and biosimilars (Department of Pharmaceuticals, 2023). Furthermore, establishing Bulk Drug Parks and Medical device parks across states like Gujarat, Himachal Pradesh, and Andhra Pradesh seeks to build integrated infrastructure for pharma manufacturing and reduce production costs.

Innovation is an increasingly important pillar of India's pharmaceutical landscape. The country is emerging as a leader in biosimilars, with companies like Biocon, Dr. Reddy's, and Intas Pharmaceuticals launching biosimilar versions of blockbuster biologics for global markets (Ernst & Young, 2022). Investment in contract research and manufacturing services (CRAMS) is also rising, supported by India's skilled workforce, cost advantages, and strong IP protection frameworks.

Notwithstanding these successes, the sector still confronts significant obstacles. Seamless market approvals are hardened by regulatory complexity and surprisingly uneven enforcement across federal and state authorities (Sharma & Patil, 2022). Price control measures are important for affordability, but they burden industry profits and reduce the ability to reinvest in R&D and innovation (Kumar & Rani, 2021). Furthermore, supply chains are vulnerable due to reliance on imported active pharmaceutical ingredients (APIs), especially from China. This danger was highlighted during the COVID-19 pandemic (Pharmexcil, 2023).

Nevertheless, with ongoing reforms such as the New Drugs, Medical Devices, and Cosmetics Bill, 2023 aimed at updating regulatory frameworks and increased incentives for R&D under national missions like Make in India, the Indian pharmaceutical industry is well-positioned for sustained growth and deeper integration into global value chains.

Although India has earned its position internationally through its previous accomplishments in generics and vaccines, the industry's ability to shift toward innovation-driven development, maintain regulatory excellence, and create robust, independent supply chains will determine its future success.

Overview of Gujarat Pharmaceutical Industry

Gujarat is India's leading pharmaceutical-producing region, significantly supporting the nation's healthcare sector and economic growth. In Gujarat's history, the pharmaceutical sector began in the early 1900s when businesses like Alembic Pharmaceuticals were founded in Vadodara (Alembic Pharmaceuticals, 2023). Over the decades, Gujarat evolved from small-scale drug manufacturing to a globally recognized pharmaceutical production center driven by its entrepreneurial culture, infrastructure development, and government support (Government of Gujarat, 2020).

Gujarat accounts for approximately 30–33% of India's pharmaceutical production and nearly 28% of pharmaceutical exports, making it the most significant contributor among all Indian states (India Brand Equity Foundation [IBEF], 2024). The state hosts over 4,000 licensed pharmaceutical manufacturing units, including multinational corporations, mid-sized enterprises, and MSMEs. These companies collectively employ over 50,000 people, spanning formulations, active pharmaceutical ingredients (APIs), biotechnology, and medical devices (IBEF, 2024).

Major pharmaceutical clusters have developed in Ahmedabad, Vadodara, Ankleshwar, Vapi, and Surat. Ahmedabad leads formulations and research, housing major companies like Zydus Lifesciences, Torrent Pharmaceuticals, and Intas Pharmaceuticals. Vadodara remains strong in traditional manufacturing and emerging biotech sectors (Gujarat FDCA, 2023). The Ankleshwar and Vapi industrial belts specialize in bulk drug and API production and are supported by standard facilities like effluent treatment plants and logistics hubs.

Government initiatives have strategically supported Gujarat's growth. The Gujarat Industrial Policy 2020 introduced incentives for pharmaceutical and biotechnology sectors, offering capital subsidies, interest subsidies, and assistance for R&D and patent filing (Government of Gujarat, 2020). With its Food and Drug Control Administration (FDCA) developing e-government systems for quicker regulatory approvals, less

bureaucratic hold-ups, and more business trust, Gujarat has also been a leader in digital governance (Gujarat FDCA, 2023).

Gujarat's pharmaceutical success can be attributed in large part to its infrastructure. The state boasts dedicated industrial estates like Ankleshwar GIDC, Vapi GIDC, and Pharma SEZs near Ahmedabad, facilitating manufacturing scale-up with robust utilities and connectivity. Developing a Bulk Drug Park at Jambusar and a Medical Device Park near Ahmedabad further strengthens Gujarat's ecosystem, promoting backward integration and reducing import dependency (Department of Pharmaceuticals, 2023).

In addition to manufacturing, Gujarat has seen growth in clinical research and biotech innovation. Approximately 40% of India's contract research organizations (CROs) operate from Gujarat, including Lambda Therapeutic Research and Veeda Clinical Research (Economic Times, 2023). Companies like Zydus Lifesciences have also pioneered biotechnology products, notably developing India's first plasmid DNA COVID-19 vaccine, ZyCoV-D (Zydus Lifesciences, 2022).

Gujarat has several benefits compared to other pharmaceutical hubs like Hyderabad and Mumbai. Its seaside position lowers export logistical costs by providing direct port access. Moreover, unlike Maharashtra's more dispersed industrial patterns, the high chemical, pharmaceutical, and biotech business concentration fosters supply chain efficiency (Ernst & Young, 2022). Gujarat has a distinct advantage in luring foreign and local investors thanks to its proactive regulatory environment, stable governance, and ease of business.

However, there are still difficulties. MSMEs' technology adoption varies, with smaller businesses finding it difficult to invest in Industry 4.0 capabilities because of budgetary limitations (McKinsey & Company, 2023). Moreover, innovative industries such as biologics and data-driven manufacturing are not adequately staffed (CII, 2023). Meeting environmental requirements requires ongoing investment in green technologies, especially for chemical-intensive pharmaceutical clusters like Ankleshwar.

Gujarat's pharmaceutical sector is robust and forward-thinking despite these obstacles. Gujarat is positioned as India's pharmaceutical production leader and a developing center for pharmaceutical research and biotechnology breakthroughs because of ongoing infrastructural

development, legislative assistance, and a robust entrepreneurial base.

The Gujarat government's policies and initiatives to promote technology adoption

The study shows that the Gujarat government's commitment toward advanced e-governance holds the potential to bring about meaningful progress, especially with adequate resources and infrastructure. Innovative government initiatives such as SWAN and e-GRAM are major contributors to this momentum.

Gujarat Industrial Policy 2020

Gujarat Industrial Policy paves the way and supports encouraging technology-driven industrial growth, notably in the pharmaceutical industry. The policy provides specific financial incentives to promote the implementation of automation, digital manufacturing techniques, and Industry 4.0 technologies. Key measures include capital subsidies of up to 25% for technology acquisition and modernization, interest subsidies of up to 7%, and dedicated support for industries investing in research and development (Government of Gujarat, 2020).

The policy also emphasizes the establishment of Centers of Excellence (CoEs) in collaboration with industry and academia to foster innovation, skill development, and the use of cutting-edge technology in industrial processes, like AI and IoT.

Biotechnology Policy 2022–27

Recognizing the critical role of biotechnology in healthcare innovation, Gujarat introduced the Biotechnology Policy 2022–27 to bolster R&D and commercial production in the life sciences sector. Under this policy, biotechnology companies are eligible for capital investment subsidies of up to 25%, interest subsidies of 7%, and operational expenditure support (Government of Gujarat, 2022).

Additionally, the strategy encourages the creation of specialized biotech parks with integrated research facilities, such as genome sequencing centers and cutting-edge Bio-Safety Level (BSL)-3 labs. Pharmaceutical businesses pursuing biopharmaceuticals, biosimilars, vaccines, and innovative medicines will find these programs especially pertinent. By supporting infrastructure and innovation simultaneously, the policy encourages greater technological sophistication within Gujarat's pharmaceutical ecosystem.

Bulk Drug Park at Jambusar

In alignment with the national goal of reducing dependence on imported active pharmaceutical ingredients (APIs), Gujarat is developing a Bulk Drug Park at Jambusar, Bharuch district. Approved under the central government's Bulk Drug Parks Scheme, the park will feature common infrastructure such as solvent recovery systems, central utilities, effluent treatment plants, and advanced quality testing laboratories (Department of Pharmaceuticals, 2023).

With ₹1,000 crore in approved financial support from the central government and an emphasis on world-class infrastructure, the park is designed to promote the adoption of environmentally sustainable manufacturing technologies and enhance Gujarat's capacity for indigenous API production (Times of India, 2023).

Medical Device Park at Rajkot

Medical technology in Gujarat features the building of a Medical Device Park in Rajkot. This initiative promotes manufacturing excellence in healthcare equipment, implants, and diagnostic devices. To guarantee quality control and regulatory compliance, the park offers integrated manufacturing facilities, R&D centers, and testing labs (Digital Health News, 2024). The initiative supports the government's goal of self-reliance in the medical devices sector and encourages the adoption of advanced production technologies and precision manufacturing within the pharmaceutical supply chain.

Digital Governance Initiatives by FDCA Gujarat

One of India's most technologically sophisticated drug regulatory agencies is the Food and Drug Control Administration (FDCA) of Gujarat, which has led the way in developing digital platforms to expedite regulatory procedures.

FDCA introduced online systems for licensing, renewing, and monitoring pharmaceutical manufacturing and sales licenses through the e-governance platform XGN (eXtended Green Node) (FDCA Gujarat, 2023). Additionally, the FDCA mobile governance (m-Governance) initiatives allow real-time monitoring of field inspections, quality surveillance, and compliance checks via mobile applications. These digital interventions have significantly reduced administrative bottlenecks, improved transparency, and accelerated regulatory approvals, enabling faster and smoother technology adoption by pharmaceutical companies.

Participation in Central Schemes: PLI and Atmanirbhar Bharat

Gujarat's pharmaceutical companies have been active beneficiaries of national programs such as the Production Linked Incentive (PLI) Scheme for Pharmaceuticals and the Atmanirbhar Bharat Abhiyan.

Under the PLI scheme, Gujarat-based firms receive financial incentives to invest in high-value production areas, such as complex generics, novel drug delivery systems (NDDS), and innovative formulations (Department of Pharmaceuticals, 2023).

Furthermore, investments in sophisticated manufacturing facilities, digital supply chain management, and strong quality control systems have been spurred by the state's emphasis on developing an independent pharmaceutical supply chain, which is backed by programs like Atmanirbhar Bharat's indigenous API production.

The Government of Gujarat's multi-pronged policy framework strongly supports the technological advancement of the pharmaceutical sector.

Through financial incentives, infrastructure development, regulatory reforms, and proactive participation in national missions, Gujarat has created an ecosystem where pharmaceutical companies are encouraged—and often compelled—to adopt cutting-edge technologies.

These initiatives strengthen Gujarat's position as India's leading pharmaceutical hub and prepare the industry for the future demands of global healthcare innovation.

Technology Adoption and R&D Strength in Leading Gujarat-based Pharmaceutical Firms

Dishman Carbogen Amcis Ltd

Dishman Carbogen Amcis Ltd (DCAL), established in 1983 by Janmejay R. Vyas in Ahmedabad, Gujarat, began as a bulk drug manufacturing company. It has progressively developed into a worldwide supplier of contract development and manufacturing services (CDMO), with an emphasis on complex intermediates and high-potency active pharmaceutical ingredients (HPAPIs). A defining moment in this transformation was the acquisition of Switzerland-based Carbogen Amcis AG in 2006, significantly strengthening Dishman's presence in the premium segment of the global CDMO market (Dishman Carbogen Amcis, 2023a).

DCAL's core expertise lies in developing and manufacturing APIs, HPAPIs, cytotoxic compounds, and intricate

pharmaceutical intermediates. The company serves various multinational pharmaceutical clients, offering tailored support across the drug development lifecycle—from early-stage formulation to full-scale commercial production (Dishman Carbogen Amcis, 2023a).

The company operates multiple R&D centers across India and Europe, employing over 500 scientists within 28 specialized laboratories (Dishman Carbogen Amcis, 2023a). Dishman has substantially increased investments in analytical sciences, particle engineering, and advanced process development to enhance efficiency and scalability. In FY2023, approximately 6–7% of its revenue was allocated toward research and development and technological innovation initiatives (Dishman Carbogen Amcis, 2023b).

As part of its digital transformation, DCAL has implemented Process Analytical Technology (PAT) to enable real-time monitoring of critical quality parameters during manufacturing. The company has also embraced automation in its injectable manufacturing lines, integrated digital quality management systems (QMS), and adopted AI-driven predictive analytics for process optimization and yield enhancement. These advancements have improved product consistency and strengthened compliance with global regulatory standards, even as the company navigates financial pressures and an increasingly complex international regulatory environment (Dishman Carbogen Amcis, 2023b).

Torrent Pharmaceuticals Ltd

Established in 1959 by U.N. Mehta in Ahmedabad, Gujarat, Torrent Pharmaceuticals Ltd has grown from a modest pharmaceutical unit into one of India's most prominent pharmaceutical companies. As part of the Torrent Group, the company is widely recognized for its specialization in chronic therapeutic segments and its strong international presence, particularly in the United States, Germany, and Brazil (Torrent Pharmaceuticals, 2023a).

Torrent's therapeutic focus spans cardiology, central nervous system (CNS) disorders, gastroenterology, diabetology, pain management, and oncology. Its product portfolio includes branded formulations, complex generics, biosimilars, and active pharmaceutical ingredients (APIs), reflecting its commitment to therapeutic breadth and scientific innovation (Torrent Pharmaceuticals, 2023b).

The company operates four dedicated R&D centers staffed by over 1,200 scientists. In

FY 2023, Torrent allocated approximately 6–7% of its annual revenue, equivalent to ₹800 crore (approximately USD 96 million)—to research and development (Torrent Pharmaceuticals, 2023b). Key R&D priorities include the development of complex generics, new drug delivery systems (NDDS), biosimilars, and specialty pharmaceuticals. In addition to product innovation, the company strongly emphasizes optimizing manufacturing processes to enhance cost efficiency and maintain global competitiveness.

Torrent has embraced advanced digital technologies to support its R&D and manufacturing efforts. Integrating Computer-Aided Drug Design (CADD) and AI-driven molecular modeling tools has accelerated its drug discovery pipeline. Predictive maintenance technology and enterprise resource planning (ERP) systems technologies have been deployed on the operations front to enhance efficiency and reduce downtime. Furthermore, Torrent has initiated Industry 4.0 solutions across its manufacturing sites, enabling innovative production, real-time digital monitoring, and data analytics-driven decision-making to achieve operational excellence (Torrent Pharmaceuticals, 2023a).

Zydus Lifesciences Ltd (formerly Cadila Healthcare Ltd)

Mr. Ramanbhai B. Patel established Zydus Lifesciences Ltd., originally Cadila Healthcare, in Ahmedabad in 1952. Since its inception, the company has grown into one of India's leading pharmaceutical firms, with a strong global footprint. It operates across the entire pharmaceutical value chain, encompassing the development and production of active pharmaceutical ingredients (APIs), formulations, vaccines, biosimilars, and novel biologics (Zydus Lifesciences, 2023a).

The company offers various products, including generic medicines, biosimilars, vaccines, over-the-counter (OTC) drugs, diagnostics, and specialty pharmaceuticals. A notable achievement was the development of ZyCoV-D, India's first plasmid DNA vaccine for COVID-19, highlighting Zydus's innovation capacity in the vaccine technology space (Zydus Lifesciences, 2023a).

Zydus operates seven advanced R&D centers, employing more than 1,400 scientists who work across various research domains, including small molecules, biologics, vaccines, and transdermal drug delivery systems (Zydus Lifesciences, 2023b). In FY2023, the company invested approximately 8% of its total revenues into

research and development, with a strategic focus on discovery research, complex generics, biologics, and therapies for cardiometabolic disorders, oncology, and autoimmune diseases (Business Today, 2023).

Zydus has modernised its processes by implementing cutting-edge technology in keeping with its dedication to innovation. Research procedures have been digitised through the use of Electronic Laboratory Notebooks (ELNs), and compliance and traceability are improved by digital batch production records. Additionally, the business uses AI-powered pharmacovigilance systems to improve medication safety oversight. Notably, blockchain technology has been introduced to improve transparency and security across the supply chain (Zydus Lifesciences, 2023b). These technological advancements have improved internal efficiency and reinforced regulatory compliance, especially for exporting to markets with strict regulations, including the US and the EU.

Objective of the Study:

The purpose of this research is to investigate the adoption of technology in the Gujarat pharmaceutical industry and its challenges and opportunities:

- To obtain a comprehensive understanding of the pharmaceutical industry at the national level, as well as within the state of Gujarat
- To explore the opportunities and challenges associated with technology adoption in the pharmaceutical industry of Gujarat.

Research Methodology

This paper uses literature to investigate research variables and fill the research gap.

Study findings

Opportunities in Technology Adoption

Gujarat's pharmaceutical sector has the potential to use cutting-edge technologies in a new way. First, utilizing advanced technology, like automation and artificial intelligence (AI), significantly boosts operational efficiency by optimising manufacturing processes, improving batch quality, reducing human error, and enabling predictive maintenance approaches (McKinsey & Company, 2022).

Secondly, expanding digital supply chains and e-commerce platforms facilitates broader market expansion, allowing Gujarat-based pharmaceutical companies to access global markets more seamlessly and respond to dynamic demand patterns (IBEF, 2024).

Third, putting in place electronic documentation, digital quality management systems (QMS), and real-time regulatory monitoring technologies improves regulatory compliance and guarantees that strict guidelines set by organizations like the USFDA, EMA, and CDSCO are followed (EY India, 2022).

Additionally, integrating AI, bioinformatics, and machine learning accelerates innovation in drug discovery, clinical trial management, and personalized medicine, moving Gujarat's pharmaceutical companies up the global value chain (NASSCOM, 2023).

Finally, supply chain resilience is increased through transparency, fewer disruptions, and improved risk responsiveness through blockchain-enabled supply chain tracking and predictive analytics (KPMG India, 2023).

Challenges in Technology Adoption

Despite the promising opportunities, Gujarat's pharmaceutical industry faces several critical challenges in technology adoption.

Since the acquisition and integration of cutting-edge digital technologies necessitate a significant upfront capital expenditure, financial restrictions remain a major obstacle, especially for micro, small, and medium-sized businesses MSMEs (Deloitte, 2022).

Additionally, the industry's ability to successfully utilize emerging technologies is limited by a continuing talent shortage in biotechnology R&D, automation system management, and AI programming (CII, 2023).

As businesses manage changing cybersecurity requirements, digital regulations, and cross-border data privacy standards, regulatory complexity exacerbates these challenges by increasing operational and compliance responsibilities (PwC India, 2023).

Infrastructure deficiencies, including the limited availability of high-end R&D facilities, clinical trial networks, and secure digital platforms, especially outside urban centers, also restrict full-scale technology adoption (McKinsey & Company, 2022).

Lastly, the digital divide within MSMEs—characterized by a lack of financial resources, technological know-how, and strategic guidance—continues to slow down the pace of digital transformation for a large segment of the industry (EY India, 2022).

Limitations of the Study

This study is based entirely on secondary data sources, including government reports, industry whitepapers, company annual reports, and peer-reviewed academic literature.

While every effort was made to ensure the accuracy and reliability of the information, the absence of primary data collection (such as direct surveys or interviews with pharmaceutical companies and regulatory authorities) may limit the specificity and direct applicability of the findings to individual and organisational contexts.

Moreover, given the dynamic nature of technology adoption, rapid advancements after early 2024 may not be fully captured within the scope of this study. Future primary research could enrich and validate the findings presented here.

Future Research Directions

Future research should focus more on gathering primary data to build on the insights driven by secondary data obtained from this study. This might entail conducting systematic surveys, speaking with important industry participants, and examining actual case studies that examine how Gujarati pharmaceutical businesses are embracing and implementing new technology.

Furthermore, more studies may examine how new technologies like blockchain, digital twin simulations, platforms for customized medicine, and AI-driven clinical research ecosystems affect market competitiveness, regulatory compliance, and operational performance.

Conducting a comparative analysis between Gujarat and other pharmaceutical hubs—such as Hyderabad (Telangana) or Mumbai (Maharashtra)—could also offer valuable contextual insights into Gujarat's relative strengths and areas for improvement in technology adoption.

Conclusion

Technology adoption is increasingly pivotal to sustaining and enhancing Gujarat's leadership in the pharmaceutical industry. The state's strong foundation—bolstered by robust government initiatives such as the Gujarat Industrial Policy 2020 and Biotechnology Policy 2022–27 and by forward-thinking companies like Dishman Carbogen Amcis Ltd, Torrent Pharmaceuticals Ltd, and Zydus Lifesciences Ltd—has facilitated significant progress in digitalization, biotechnology innovation, and smart manufacturing.

Having said that, the implementation of advanced technology in the pharmaceutical industry endures issues such as significant financial obstacles, complicated regulations, a lack of skilled labor in cutting-edge technology, and infrastructural deficiencies. Developing a workforce prepared for the future, bridging the MSME digital gap, and bolstering digital governance mechanisms remain top concerns.

Gujarat's pharmaceutical sector can further consolidate its global competitiveness with targeted public-private collaborations, sustained R&D investments, and strategic adoption of emerging technologies like blockchain, AI-driven clinical research, and digital supply chain management. As the global healthcare landscape transitions towards more personalised, data-driven, and technology-intensive models, Gujarat's proactive engagement in technological innovation will determine its trajectory toward becoming a truly global pharmaceutical innovation hub.

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Exploring Financial Inclusion: A Global Analysis of Access and Barriers

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Abstract

This research takes a close look at how far the world has come—and how far it still has to go—in bringing basic financial services to everyone, relying entirely on already published data. Its main aim is to identify the remaining hurdles and assess how innovations like mobile wallets and app-based banking have opened the gate. Although having a bank account or the ability to borrow small amounts of money should boost growth and alleviate poverty, hundreds of millions still do not enjoy even these basic services. The team focuses on people living in low-income neighbourhoods and villages, where maps of poverty often coincide with maps of exclusion. It tests the idea that smartphones can shrink that map by measuring how features such as peer-to-peer transfers and simple credit scores draw people into the financial system. Evidence comes from well-respected databases, including the World Bank's Global Findex, the IMF's Financial Access Survey, and country reports on mobile-money traffic. Using straightforward averages and correlation checks, the authors reveal significant regional variations, showing, for instance, that rural areas lag far behind cities.

Results highlight persistent gaps for women and for people who live far from bank branches, suggesting that the formal system still whispers when it should shout. At the same time, the study celebrates the leap offered by digital platforms, especially mobile-money services, which have begun to reach corners that brick-and-mortar banks never planned to visit. These tools are clearly widening the circle, yet old problems—such as patchy internet, fraud fears, and lack of literacy—still keep many people on the edge. The report makes it clear that while things are slowly improving, serious roadblocks still linger: poor financial literacy, unreliable networks, and restrictive regulations. Tackling these problems requires steady collaboration, combining open policies, innovative fintech solutions, and practical education that helps every person understand money. Real financial inclusion only sticks when the plan puts access first, treats everyone fairly, and looks years—not months—ahead.

Keywords: ***Financial Inclusion, Access to Financial Services, Barriers to Inclusion, Digital Financial Services, Global Economic Development.***

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Introduction

Financial inclusion basically means helping people and small businesses gain fair and affordable access to banking tools without exposing them or the planet to risk. Experts agree that expanding this access reduces poverty and boosts economies. Yet, even with smartphone apps and mobile wallets becoming increasingly widespread, millions—especially those in the hardest-hit communities—still cannot access official banking services. According to the (World, 2020), around 1.7 billion adults worldwide still live without a basic bank account. This simple tool is vital for participating in nearly every aspect of the modern economy.

Financial inclusion refers to how people can access and use official financial services—such as credit, savings, insurance, and payment systems—for themselves and their small businesses. When these doors open, households can plan budgets, protect against unexpected expenses, fund new ideas, and improve their day-to-day living standards.

Broadly speaking, analysts agree that widespread access to financial services fuels long-term economic growth. For low-income families, women, rural residents, and micro-entrepreneurs—groups often left behind—this access matters even more. (Demirgüç-Kunt et al., 2018).

The recognition that the use of financial services is crucial for reducing poverty, supporting poverty alleviation programs, fostering economic growth, and promoting financial stability has led to increased emphasis on financial inclusion in recent years. According to the (Bank, 2021), There are 1.7 billion adults worldwide without bank access. Many of adults live in the growing world. This exclusion constrains their (Klapper et al., 2016). Internet-based financial facilities, including online wallets, mobile banking have joined other traditional banking products as beneficial tools for furthering financial inclusion. These facilities can serve underserved populations, and particularly in rural and remote areas where traditional banking infrastructure is not present (Jack & Suri, 2014). Masses of Kenyans, for instance, they can to take advantage themselves by banking services like mobile money systems like M-Pesa. These services enabled them to get money, save and get credit without the need for a bricks-and-mortar bank branch (Suri & Jack, 2016).

Despite these gains, significant barriers to achieving financial inclusion remain. These hurdles include language barriers, high transaction costs, financial illiteracy, remoteness, gender inequality, and weak regulatory frameworks. (Zins & Weill, 2016). These obstacles must be removed to

ensure that every member of society, especially underserved populations, benefits from financial inclusion.

Literature Review

Methodology for Literature review

Systematic Literature Review (SLR) Approach: This study employs a Systematic Literature Review (SLR) to comprehensively assess the existing body of research on financial inclusion, focusing on global access and barriers.

The SLR follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency, rigor, and reproducibility in identifying, screening, and selecting relevant literature. The search was limited to publications from 2010 to 2024 to capture recent developments, especially in digital finance.

Inclusion and Exclusion Criteria

To ensure the relevance and quality of the selected literature, the following criteria were applied:

Inclusion Criteria:

- Peer-reviewed journal articles, conference papers, and reputable reports focused on financial inclusion.
- Studies addressing global, regional, or country-level data on financial access.
- Research covering barriers and enablers of financial inclusion, particularly related to digital financial services.
- Publications in English.
- Empirical studies, systematic reviews, and meta-analyses.

Exclusion Criteria:

- Articles not related to financial inclusion or access issues.
- Studies focusing solely on developed countries without implications for low-income or underserved populations.
- Non-peer-reviewed sources, opinion pieces, editorials, and news articles.
- Papers lacking sufficient data or methodological rigor.

Introduction to Financial Inclusion: Financial inclusion means extending access to financial services—such as payment systems, insurance, loans, and savings—and ensuring their availability to the entire population, especially to deprived sections (Bank, 2021). Considered key drivers of

economic growth, poverty reduction, and financial stability, respectively, financial inclusion efforts play a vital role in development (Klapper et al., 2016). Increased financial inclusion mechanisms can lead to better financial protection, larger credit availability and greater economic participation and conduce for inclusive growth. (Demirgüç-Kunt & Klapper, 2012).

Global Trends in Financial Inclusion: The Global Findex Database by the (Bank, 2021) There has been a steady rise in financial inclusion worldwide, with over 70% of adults globally holding a formal financial account as of 2021, compared to 62% in 2014. Mobile money platforms have significantly transformed access to finance in the developing world, especially in sub-Saharan Africa, where they have enabled a large number of previously unbanked people to enter the formal financial system (Suri & Jack, 2016). Digital financial services are particularly impactful in low-income economies where traditional banking infrastructure is limited (Narain & Singh, 2020).

Barriers to Financial Inclusion: Even though there was the development, important problems continued effected to financial inclusion. Geographic factors, high costs of financial services, and lack of financial knowledge are major problems or it can be the causes (Zins & Weill, 2016). Again, there was the main problem regarding gender differences in financial inclusion, also in many countries women participation less as comparing to usage of formal financial account ((Demirgüç-Kunt et al., 2018). I this research paper, women participation face more problems because of some factors related to socio-cultural norms, lower education levels, and economic dependency (Phiri, 2017).

Digital Financial Services and Financial Inclusion: In digital platforms Mobile currency, mobile banking, and peer-to-peer lending are used to create financial inclusion and also providing affordable, simple, and easy to use. Mobile money, especially in Kenya, with M-Pesa, has increased the access of financial services in the rural areas (Jack & Suri, 2014). These digital tools have helped clear many of the hurdles associated with traditional banking, including steep fees and the long distances to banks (Gomber, 2017). But there are many problems during adopting digital financial services, including not knowing how to use the technology, lack of infrastructure and concerns about data security. (Osei-Assibey & Asante, 2021).

Economic Growth affected by Financial Inclusion: Financial inclusion has been

linked to broader economic development outcomes, including poverty alleviation and greater commercial flexibility. In this study (Rancière, 2010) suggests that financial inclusion contributed into county's economic growth by providing credit, savings, and insurance services which in was increased the growth in entrepreneurship and enhances labour force. Additionally, financial inclusion can lessen households' and individuals' susceptibility to economic shocks like natural disasters or health crises (Banerjee, 2015).

Regulatory and Policy Frameworks:

Increasing financial inclusion requires effective regulation. By enacting legislation that promotes the delivery of affordable financial services, especially through digital channels, governments and regulatory bodies can help to ensure an inclusive financial system (Bank, 2020). Regulations that safeguard consumers, encourage competition, and allow for advancements in digital and mobile banking are essential to achieving broad financial inclusion (Beck & Demirguc-Kunt, 2008). To prevent fraud, cybercrime, and data privacy concerns, the regulatory environment must, however, also strike a balance between innovation and risk management (Allen et al., 2016).

Financial knowledge and Inclusion: According to this study, the primary factor influencing financial inclusion was financial knowledge. This study shows that formal financial services have a greater influence on people with more financial education (Atkinson & Messy, 2012). However, poor levels of financial knowledge, especially in rural and low-income communities, hinder the effectiveness of monetary presence efforts. Promoting monetary knowledge can increase the usage of existing financial services and ensure that they are used appropriately. (Lusardi & Mitchell, 2014).

Conclusion of literature review

Research on financial inclusion highlights its critical role in fostering economic growth, reducing poverty, and maintaining financial stability. Although digital financial services have become more widely accessible, significant barriers related to geography, gender inequality, and financial literacy still persist. To enhance financial inclusion, regulators, financial institutions, and stakeholders must continue collaborating to address these challenges. Furthermore, the long-term effects of financial inclusion on economic resilience and growth require deeper investigation, alongside exploring innovative technological solutions to close the

financial gap. FinTech, as numerous studies have demonstrated, plays a vital role in advancing financial inclusion. Research by (Rani, 2019) highlights the significant reduction in barriers to financial inclusion in rural and impoverished communities brought about by digital payment technologies, mobile banking, and micro lending platforms.

Financial Inclusion Research Gaps

- There is limited research on the long-term impact of financial inclusion on economic growth, particularly in low-income economies.
- **Gender Gaps:** More research is needed to better understand the challenges women face in accessing financial services and to develop solutions tailored to their specific needs.
- Research on the use of digital financial services in rural and remote areas is very limited, especially regarding the barriers to adoption.
- Further investigation is essential to assess the effectiveness of financial literacy programs in promoting financial inclusion.
- **Regulations in Place:** Additional research is required to understand how regulators across the globe are managing various forms of financial regulation, how these regulations affect mobile money services, and their overall impact on financial inclusion.

Objectives of this Study:

- **Determine the Global and Regional Status:** Examine different regions to assess their levels of financial inclusion and identify gaps in access to specific financial services such as savings accounts, loans, insurance, and electronic payments.
- **Identify Barriers to Financial Inclusion:** Analyse the various obstacles contributing to financial exclusion, including geographic, economic, and gender-based factors, with a particular focus on digital barriers.
- **Explore the Impact of Digital Financial Services:** Investigate how policies that promote mobile banking and access to fintech platforms can help integrate underserved and underdeveloped communities into the financial system.

- **Examine Socio-Economic Impacts:** Evaluate the role of financial inclusion in promoting economic development, reducing poverty, and enhancing social stability, especially in emerging and developing economies.
- **Make Policy Recommendations:** Provide practical and actionable recommendations for governments and financial institutions to improve financial inclusion through inclusive legislation, regulatory frameworks, and technological innovations.

Research Methodology

This study aims to investigate the current status of financial inclusion, identify key barriers to access, and assess the impact of digital financial services using secondary data. A quantitative research approach is employed, relying on established and credible data sources for analysis. A detailed description of the research methodology used in this study is provided below.

Data Collection

This study evaluates global and regional trends in financial inclusion using secondary data sourced from reliable and well-established institutions.

Secondary Data:

Financial inclusion data encompasses statistics and indicators that demonstrate how individuals and businesses access and utilize various financial services. These include savings accounts, credit, insurance, and payment systems. Understanding regional and global disparities in the availability and usage of these services is essential for evaluating financial inclusion.

Key Data Sources:

World Bank – Global Findex Database

The Global Findex Database, maintained by the World Bank, is one of the most comprehensive sources on global financial inclusion. It provides detailed data on access to and use of financial services across more than 140 countries, covering areas such as account ownership, mobile money, digital payments, savings, credit, and insurance.

Key Findings from the 2021 Global Findex Report:

- In 2021, 76% of adults globally held an account at a formal financial institution, up from 62% in 2014.
- The gender gap in account ownership has narrowed but remains significant in many

regions, especially in developing economies. In 2011, the gap between men and women was 9 percentage points.

- The amount of money saved in financial institutions is increasing, indicating improved financial behaviour.
- Mobile money usage has surged, particularly in developing countries. Over 1.5 billion individuals now use mobile wallets. In Sub-Saharan Africa, services such as M-Pesa have revolutionized access to formal financial services, with over 900 million registered mobile money accounts. About 40% of adults with a formal financial account use mobile wallets.

IMF – Financial Access Survey (FAS)

The IMF's Financial Access Survey provides valuable data on the accessibility of financial services globally, including infrastructure indicators like the number of ATMs and bank branches.

Key Findings from the 2020 FAS Report:

- On average, there are several commercial bank branches per 100,000 adults worldwide. However, in low-income countries, this figure can be as low as 1–2 branches per 100,000 adults.
- Regions such as Southeast Asia and Sub-Saharan Africa have seen increased access to financial services due to digital payment systems and mobile wallets.

IFC – Global Financial Inclusion Index (FII)

Developed by the International Finance Corporation, the Global Financial Inclusion Index ranks countries based on financial access, using metrics like access to credit, savings accounts, and insurance.

Key Findings from the 2020 Report:

- High-income nations, particularly in Europe and North America, report high levels of financial inclusion, with over 90% of adults owning a bank account.
- Developing countries such as Nigeria and India, particularly rural areas in Sub-Saharan Africa, still experience substantial gaps in access to formal financial services.

Digital Inclusion and Mobile Services

The growing adoption of digital tools and mobile technology is playing a critical role in advancing financial inclusion.

Examples and Key Findings:

- In Kenya and Tanzania, mobile money services like M-Pesa have given millions of people access to financial services.
- In India, mobile payments grew by 50% annually in 2020, with platforms like Paytm and PhonePe leading the market.
- Over 70% of adults in these countries now have access to some form of financial service, driven in part by government-backed initiatives like Digital India, which promote digital transactions and mobile banking.

Access to Credit and Loans

Access to credit remains a crucial component of financial inclusion, yet disparities persist between high-income and low-income countries.

Key Findings from the 2020 Global Findex:

- Only 20% of adults in low-income countries have access to formal credit, compared to nearly 60% in high-income economies.
- Digital lending platforms in countries such as Kenya and India have improved access to credit for underserved populations, resulting in increased usage of credit products.

Impact of FinTech on Financial Inclusion

FinTech has emerged as a transformative force in the financial inclusion landscape. Innovations such as mobile payments, peer-to-peer lending, and microfinance platforms have significantly increased access to financial services for marginalized communities. These technologies have made it easier and more affordable for individuals and small businesses to participate in the formal financial system (Mishra, 2019). The (Bank, 2020) report suggests that innovations in FinTech can help reduce the cost of financial transactions and increase access for marginalized groups.

Results and Discussion

Several significant global trends in financial inclusion are shown by the data analysis:

Regional Disparities:

Nearly 95% of adults in high-income nations have access to a bank account, indicating the highest levels of financial inclusion. Conversely, South Asia and sub-

Saharan Africa lag behind, with more than 40% of adults lacking access to formal financial services. (Bank, 2021).

Gender Gaps:

Women remain disproportionately excluded from financial systems. In many regions, women are 9% less likely to have an account at a formal financial institution than men (Demirguc-Kunt, 2018).This disparity is particularly acute in developing economies.

The Role of Mobile Banking:

One of the most important factors in closing the gap in financial inclusion has been the widespread use of mobile phones. For instance, M-Pesa and other mobile money services in Kenya have made it possible for millions of people to obtain financial services without needing a traditional bank account (Suri, 2011).

Challenges to Financial Inclusion

One area of progress, still many barriers to financial inclusion exist:

• **Geographic Barriers:**

Remote and rural areas still do not have access to banking infrastructures. There are lower access to ATMs and bank branches.

• Expensive Banking: In many developing countries, the costs of banking, like account maintenance, are often too high for low-income populations.

• Financial Literacy: Low levels of financial literacy make it difficult for people to use financial products in a meaningful way. For example, people living in underserved areas may not know how to manage a bank account or a loan, or even insurance.

FinTech's Contribution to Financial Inclusion

FinTech has become disruptive for financial inclusion. Mobile payments, peer-to-peer lending, and microfinance platforms have greatly improved access to financial services in underserved areas. For example, platforms such as Paytm and PhonePe, have allowed millions of people in India to complete digital transactions where they don't need a bank account. (Mishra, 2019). According to 2020 World Bank research, FinTech technologies can lower transaction costs and improve access for underserved populations.

Policy Recommendations

To further improve financial inclusion, the following recommendations are proposed:

Regulatory Support for Digital Platforms:

Governments should create policies that foster the growth of digital financial services while ensuring consumer protection. *Reason:* Clear and supportive regulations encourage innovation and investment in digital finance, making services more accessible and affordable. At the same time, strong consumer protection builds trust, which is essential for widespread adoption.

Financial Literacy Programs:

A focus on improving financial literacy, especially in rural areas, can help individuals make better financial decisions. *Reason:* Many underserved populations lack the knowledge to effectively use financial products, leading to misuse or mistrust. Educating people increases their confidence and ability to engage with financial services responsibly.

Incentives for Financial Institutions: There should be incentives for banks and other financial service providers to reach underprivileged groups. *Reason:* Serving low-income or remote customers often involves higher costs and risks, making it less attractive for financial institutions. Incentives can motivate providers to expand their outreach, thereby improving access for those most in need.

Conclusion

Significant strides have been achieved in facilitating access to financial services worldwide, as this assessment of financial inclusion using secondary data shows. It also identifies regions, including low-income and rural people, where disparities continue to be especially troublesome. According to the study, digital financial services—such as digital banking and mobile money—have the most potential to increase financial inclusion, especially in areas of the world where access to traditional banking services is first impeded. However, there are still obstacles to expanding access: gender inequality still restricts access to financial services for half of the population, low financial literacy impairs the ability to use financial services, and banking costs are frequently prohibitive. In order to expand inclusion and encourage changes toward inclusive economic growth, the research emphasizes the necessity of actions and policies that target undesired barriers and improve the supply side of banks or service entry through financial knowledge and accessibility. Additionally, there hasn't been much attention paid to the topics of regulatory responses that either facilitate or

impede access to financial services, such as mobile money, which would benefit from the extensive effort to ensure that regulations support financial inclusion. It is important to combine technology innovation with sound policymaking and financial education initiatives in order to have a continuous and widespread financial presence. Supporting financial inclusion is essential for both society advancement and personal empowerment. It contributes to global financial stability, economic prosperity, and poverty reduction.

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Understanding the Key Drivers of Review Quality: Implications for E-Commerce Businesses in India

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Abstract

This study investigates the key determinants influencing the perceived quality of online customer reviews within the Indian e-commerce context. Drawing from a comprehensive literature and empirical analysis, the research identifies four primary dimensions: review content, review expression, review context, and review design and accessibility. To validate these constructs, the study employs both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Additionally, Multi-Criteria Decision-Making (MCDM) techniques such as RIDIT and GRA analysis are used to assess and rank the relative significance of each dimension. The findings offer valuable theoretical and practical implications, highlighting actionable strategies for e-commerce businesses to enhance review quality and foster consumer trust. By considering review quality within the dynamics of a developing economy, this research contributes to the broader understanding of online consumer behavior and sets the stage for future inquiries.

Keywords: Customer Reviews, Information Quality, EFA, CFA, MCDM, Indian E-commerce

Introduction

Online reviews play a significant role as to how people in India choose what to buy especially in the growing world of online shopping. With more people using smartphones and equipment with internet

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access, buying habits and brand interactions in India have changed a lot. Experts predict India will have more than 500 million internet users by 2025, which shows how important digital platforms are in daily life (IAMAI, 2023). Studies say about 80% of Indian shoppers check reviews online before buying something. This shows how much user-created content shapes what customers like (KPMG, 2024).

India's e-commerce sector could hit USD 200 billion by 2026, thanks to a growing number of online shoppers spanning all age brackets (Statista, 2025). As online payments become more common, people now rely on web reviews to judge products and services. Surveys reveal that 78% of shoppers from India regard online reviews as equal to personal advice in areas like travel, gadgets, and clothing (EY, 2024). Consumers' worries about fake products, false ads, and quality issues fuel this trust making reviews from fellow buyers an essential tool to make decisions (Filieri, 2016; Cheung & Thadani, 2012).

However, the rapid rise in platforms focused on reviews has sparked worries about whether those reviews are genuine. Fake or paid reviews have become more common in India's e-commerce market pushing companies like Amazon and Flipkart to build strong tools to catch and delete misleading posts (Press Trust of India, 2024). To protect consumer trust, regulations have changed requiring clearer policies and verifying reviews through proof of purchase (Ministry of Consumer Affairs, 2023).

In the purview of understanding how people judge review quality, it is important to examine the key factors that shape those perceptions. Research highlights several aspects of good reviews, including accuracy clear language, relevance to the topic, and how visuals are used (Mudambi & Schuff, 2010; Ghose, 2011; Filieri et al., 2021). But most of these studies focus on Western countries and often overlook the cultural, language, and economic diversity found in growing markets like India (Banerjee and Chua, 2019; Srinivasan et al., 2022).

This study basically delves into the main elements shaping online review quality in India diving into four key areas: content detailing, expression of the content, the setting or the context, the design, and the way it is accessed. It builds on different fields of research and uses methods like Exploratory and confirmatory Factor Analysis and Multi-Criteria Decision-Making to create a system that fits India's growing online market. The results provide useful tips to e-commerce companies trying to upgrade their review platforms, keeping users involved, and

finally boosting customer trust. It also provides shares advices to marketers trying to adapt to India's fast-changing and digital customer landscape.

Literature Review

Conceptualizing Review Quality and E-Commerce

In e-commerce, review quality means how well a review gives accurate, clear, and practical details that help shoppers decide what to buy (Chevalier and Goolsbee, 2003). This includes not the actual text in the review but also how trustworthy, relevant, or useful the information is. Research has shown how important review quality is online. Customer-written reviews affect buyer choices and how products are seen (Mudambi & Schuff, 2010). Online platforms rely on customer trust in these reviews to ease worries people may have about shopping online. Good reviews can increase sales, and even bad reviews when based on honest feedback, help shoppers spot problems and make better decisions (Cheung et al., 2008). Because people cannot check products like in stores, review quality becomes a vital link between what customers experience and their decision to buy (Kim and Park 2013).

One big hurdle e-commerce businesses face is creating a space where strong reliable reviews thrive. Zhang and Liu (2013) explained that shoppers now lean more than ever on reviews to assess product quality and trust the platform. Platforms that encourage reviews that people can trust and find useful can win over customers and make shopping better. Defining what makes a review "high-quality" is tricky though. It is important to consider both how detailed and accurate the product information is, along with other factors like verified reviews and even ratings to make it a quality one (Filieri, 2015)

Dimensions of Review Quality

The range of factors that define review quality is wide covering both the content itself and the sources it comes from. People often focus more on content quality, which includes traits that shape how useful a review seems. For instance, informativeness measures how well a review gives clear and practical details about a product or service. This helps readers to judge its strengths and flaws (Shao et al., 2018). Reviews are more helpful when they include specifics, like features, advantages, disadvantages, or real-world experiences (Sparks & Browning, 2011). Accuracy is another key factor, meaning the review should reflect what the reviewer has experienced with the product

(Zhang et al., 2014). Consistency in what reviews say also matters a lot. This could mean staying in line with the reviewer's other feedback or agreeing with what others have written. Such consistency cuts down on confusion and makes the reviews seem more trustworthy (Wang et al., 2018).

According to research, credibility stands out as a key element when judging the quality of reviews (Flanagin & Metzger, 2007). People tend to trust reviews written by verified buyers or those known for giving reliable opinions. The helpfulness of a review comes from how much it guides potential customers in making smart choices. Helpfulness ratings provided by other users, highlight how well a review answers concerns or explains details about a product (Mudambi & Schuff, 2010). Relevance plays a considerable role too, ensuring that the review talks about specific features that matter to buyers. For instance, tech buyers look for comments on durability, while clothing shoppers care more about comfort (Filieri, 2015).

Research Gap and Model Synthesis

Although previous research has provided valuable insights into various aspects of review quality, most studies have focused on individual components in isolation. There is a lack of in-depth exploration into how these elements collectively shape consumer perceptions and actions. The current research develops a combined framework to address this gap covering every part of review quality. Understanding how people read and make sense of reviews is also crucial (Filieri et al. 2021; Zhang et al., 2022).

Advanced tools like multi-criteria Decision-Making have been used by researchers to understand how people rank different aspects of a review in various situations. This study uses a combined approach with existing models of review quality. It seeks to explain how different factors connect and shape how Indian consumers make decisions. In the end, this research gives useful knowledge to e-commerce companies aiming to upgrade their review systems. These improvements might help them engage customers better and boost sales conversions.

Research Framework

Research Design

This study analyses customer online reviews and considers how the quality of reviews can impact a consumer's purchasing behavior. It uses a descriptive, correlational research design quantitative approach to showcase the growing significance of e-WOM in relation to consumer shopping behavior. Especially in India, understanding why consumers perceive some online reviews as credible is crucial. To achieve such an objective, the study applies both exploratory and confirmatory methods because it aims to

understand the reasons for such reliability concerning online reviews. Moreover, it seeks to evaluate review quality and its relevance by applying the Multi-Criteria Decision Making (MCDM) technique to rank different dimensions concerning their importance to customers. Such a systematic approach ensures that relevant factors identified are applicable within the Indian context.

Research Objectives

The study aims to uncover the key determinants of customer review quality and analyze their influence on consumer purchasing behavior. The specific objectives of this research are:

1. To identify the key determinants of customer review quality in the Indian online shopping context, covering areas such as review content, review expression, review context, review design and accessibility.

2. To validate the findings through Confirmatory Factor Analysis (CFA) and Exploratory Factor Analysis (EFA), ensuring the reliability and robustness of the identified constructs related to online customer reviews.

3. To rank the relative importance of the identified factors using Multi-Criteria Decision-Making (MCDM) techniques, providing insights into the factors that significantly influence consumer behavior in the Indian market.

Sampling and Data Collection

This study targets Indian consumers who often use online reviews to make buying choices. We use convenience sampling to get a mix of consumers those who read online reviews.

Survey Design: The study collects secondary data through an online structured questionnaire. The questions measure how people view review quality and how it affects their buying habits. A pre-test was run to check if the questions are clear, valid, and reliable.

Sampling Method: The research employed convenience sampling technique for collecting responses from the respondents. The respondents comprised individuals who have made decisions with the help of online reviews. A screening question was indicated at the start of the instrument to gather responses from individuals who have used online review for buying decision. The sample was collected from 297 respondents.

Variables and Measures

The survey questionnaire consisted of the following two parts:

Demographic Data: This section of the survey collects data such as age, gender, income, education, and online shopping habits. These data are used to analyze potential trends associated with demographic variables.

Independent Variables: This part of the questionnaire measures the principal determinants of review quality, as shown in Figure 1. The study used constructs that were obtained by a comprehensive analysis of available literature. To maintain consistency and comparability, we operationalized each of the constructs with a set of statements rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The items utilized within this section are presented in Appendix A, and modified them from well-established scales within existing research to enhance the validity and reliability of the results.

Results

The findings of the study are categorized into four parts. First, the study applies Exploratory Factor Analysis (EFA) to determine the underlying factors that explain why online reviews vary in quality. It assists in reducing the number of variables by grouping them into more manageable groups (Hair et al., 2010). Secondly, Confirmatory Factor Analysis (CFA) verifies whether the groups identified by EFA are valid through testing the reliability of the same and whether they fit the data or not. This method helps us understand how well these factors show what we are trying to measure (Byrne 2016). Then Multi-Criteria Decision-Making (MCDM) technique was used to prioritize the ranking of the determined review quality factors based on consumer preference. The research applies methods such as RIDIT and GRA methods to rank these factors.

Exploratory Factor Analysis (EFA)

To figure out the attributes that make customer reviews good, Exploratory Factor Analysis (EFA) was conducted using SPSS Version 27. The Kaiser-Meyer-Olkin (KMO) test, which generated a value of 0.974, was used to confirm that the sample was adequate for factor analysis. This indicates excellent sampling adequacy because it surpasses the generally accepted threshold of 0.70 (Kaiser, 1974). The data's suitability for exploratory factor analysis (EFA) was further supported by the statistical significance of Bartlett's Test of Sphericity ($p < 0.001$). The Principal Component Analysis (PCA) with Varimax rotation was used for the analysis as suggested by Hair (2019). The factors that had eigenvalues greater than 1.0 were further used in the analysis, following Kaiser's rule.
The findings showed four separate factors that together explained 71.83% of the total variance. All factor loadings were above the suggested minimum of 0.50, and there were

no major cross-loadings, which confirmed the clear factor structure. The factors identified were Review Content, Review Expression, Review Context, and Review Design & Accessibility. Table 2 presents the factor loading and the variance extracted for each of the factors.

Exploratory Factor Analysis (EFA) was applied to reveal the latent factor structure of

Table 2: Results of Exploratory Factor Analysis

Item	Constructs			
	Content	**Context**	**Expression**	**Design & Accessibility**
Var1	0.679			
Var2	0.625			
Var3	0.670			
Var4	0.699			
Var5	0.713			
Var6	0.727			
Var7	0.689			
Var8	0.643			
Var9	0.601			
Var10	0.515			
Var11	0.540			
Var12	0.559			
Var13	0.622			
Var14	0.552			
Var15	0.555			
Var17		0.556		
Var18		0.693		
Var19		0.701		
Var20		0.774		
Var21		0.719		
Var22		0.742		
Var23		0.729		
Var24		0.828		
Var25		0.782		
Var26		0.841		
Var27		0.779		
Var28		0.503		
Var31			0.751	
Var32			0.843	
Var33			0.773	
Var34			0.758	
Var35			0.545	
Var36			0.637	
Var37			0.624	
Var40				0.706
Var41				0.727

Var42				0.634
Var43				0.509
Var44				0.510

the measurement items and confirm construct validity. In accordance with the commonly used criterion of 0.40 for tolerable factor loadings and a difference in cross-loadings as a minimum of 0.20 between a primary and any secondary factor (Hair et al., 2019; Tabachnick & Fidell, 2013), some items were removed to strengthen the psychometric distinctness of the model.

Particularly, Variable 16 of the Content construct had a loading of less than 0.40, suggesting minimal correlation with its targeted factor and weak representation of the underlying construct. Likewise, Variable 29 of the Context construct did not load strongly on any one factor and had diffuse loadings across several factors, thus failing discriminant validity.

Two of the items in the Expression construct, Variables 28 and 38, were deleted because of high cross-loadings (difference < 0.20) on more than one factor, contravening the criterion of item distinctiveness (Worthington & Whittaker, 2006). Variables 39, 45, and 46 in the Design and Accessibility construct showed either low factor loadings (< 0.40) or unsatisfactory cross-loadings, compromising their reliability as distinct indicators of the intended construct.

The factor loading matrix describes these loadings and cross-loadings, putting each item's exclusion clearly on a statistical footing. For instance, Item 28 loaded on Expression at 0.42 but also on Design and Accessibility at 0.34, crossing the minimum margin of cross-loading.

This iterative process of refinement, in line with optimal scale development practices (Fabrigar and Wegener 2011), enhanced the factor structure's clarity and coherence. Finally, the EFA produced four defined and conceptually consistent factors—Content, Context, Expression, and Design & Accessibility—each showing acceptable internal consistency and factorial integrity. These outcomes formed a sound basis for subsequent Confirmatory Factor Analysis (CFA), facilitating further validation of the measurement model.

Confirmatory Factor Analysis (CFA)

CFA was conducted using Smartpls 3 to validate the factor structure identified through EFA. The fit indices indicated an acceptable model fit. The root mean square error of approximation (RMSEA) was 0.069, which is within an accepted threshold of less

than 0.08 (Browne and Cudeck 1992). The Normed fit index (NFI) was 0.775, although is modest, yet partially falls within a permissible range for partial least squares analysis (Hu and Bentler 1999). The measurement model also demonstrated strong reliability and validity. The overall reliability (CR) values for all constructs exceeded the recommended range of 0.70, reflecting good internal consistency (Hair et al., 2019). The average variance (AVE) extracted for each construct was above 0.50, which confirmed convergent validity (Fornell and Larcker 1981).

In addition, Cronbach's alpha values were above 0.80 for all constructs, indicating high internal consistency and reliability (Nunnally and Bernstein, 1994). The summary of reliability and validity metrics is presented in Table 3.

Researchers confirmed discriminant validity by applying the Fornell-Larcker criterion. This approach checks if the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with other constructs. The condition was satisfied as in Table 4, showing that the constructs are distinct from one another (Fornell and Larcker 1981).

Factors Influencing Review Quality

Quality of reviews in e-commerce is affected by an abundant number of factors. These include both the personal traits of reviewers and the features of platforms that guide interactions about reviews. When it comes to individuals, how skilled a shopper is matters a lot. According to Senecal and Nantel (2004), consumers with more experience often write thorough and detailed reviews because they know enough to judge products well and give meaningful feedback. Motivation also plays a part in how detailed reviews get. People with very strong feelings—whether happy or upset—tend to write more descriptive reviews to show how they feel (Cheung et al., 2008). Personality also has an influence. Traits like being open to new experiences can affect the style and level of detail in what a person writes (Yiu & Lee, 2011). Platforms make sure review visibility is the key to boosting the amount and quality of reviews. E-commerce sites that

Table 3: Reliability and Validity Results

Constructs	Cronbach's Alpha	rho_A	CR	AVE
Content	0.980	0.982	0.981	0.767
Context	0.968	0.971	0.972	0.745
Design & Accessibility	0.923	0.93	0.938	0.683
Expression	0.942	0.954	0.95	0.656

show reviews and let users sort them by helpfulness, recentness, or rating see better and more reviews (Kim et al., 2012).

Features that allow interaction, like asking or answering questions replying to reviews, or marking some as helpful, help users connect better and make reviews more valuable (Zhang et al., 2018). Credibility checks, like verified purchase tags or moderating reviews also have an effect by cutting down on fake reviews (Liu & Karahanna, 2017).

Social influence plays a critical role in shaping the quality of reviews. People depend on reviews that match what their friends or others think, thereby, trusting group opinions to guide their choices (Lee et al. 2011). Many reviews for a particular product show increased trust, as products with more reviews are often seen as more reliable (Chevalier & Goolsbee, 2003). The Figure 1 presented below shows the key factors influencing review quality, as identified through Exploratory Factor Analysis and Confirmatory Factor Analysis, along with the underlying constructs of review quality. Further, the application of RIDIT and Grey Relational Analysis (GRA) provides a ranking of these factors based on their relative impact on review quality.

RIDIT Analysis

To assess the relative importance of factors influencing customer review quality, the researchers employed Multi-Criteria Decision-Making (MCDM) techniques—specifically, **RIDIT analysis** and **Grey Relational Analysis (GRA)**. These techniques are well-regarded in decision science for enabling comparisons among complex qualitative and quantitative criteria (Hwang & Yoon, 1981; li et al., 1982).

Table 4: Discriminant Validity Results

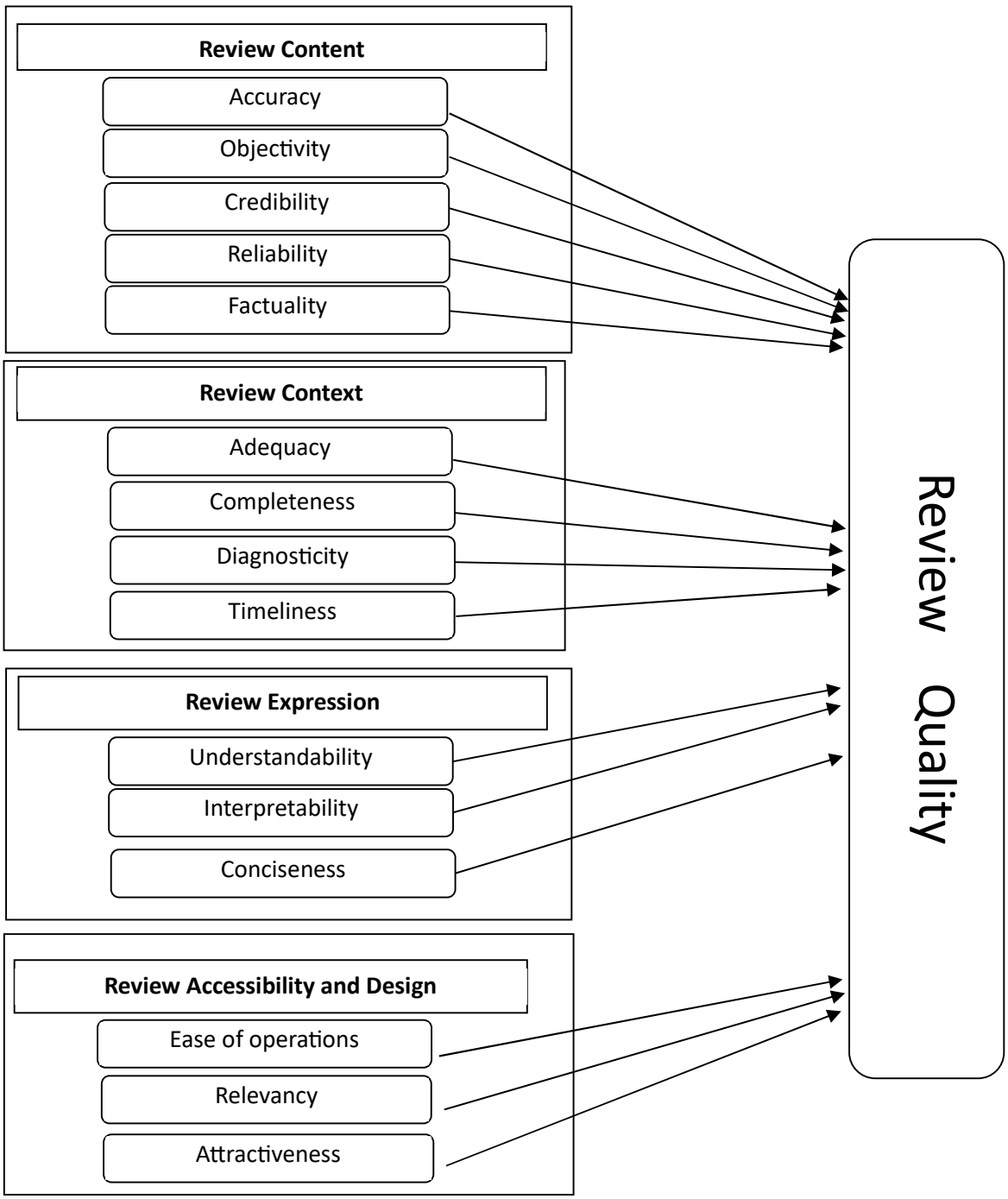
Constructs	Content	Context	Design & Accessibility	Expression
Content	0.876			
Context	0.883	0.863		
Design & Accessibility	0.851	0.756	0.827	
Expression	0.874	0.775	0.857	0.81

RIDIT (Relative to an Identified Distribution Integral of Individual Total) analysis is a non-parametric statistical method that converts ordinal survey responses into standardized scores based on cumulative probability distributions. This transformation enables more meaningful inter-item comparisons by representing qualitative preferences numerically. The method starts with generating frequency distributions for each item, followed by the calculation of

cumulative relative frequencies. RIDIT scores are then computed, offering a normalized index that reflects the importance or preference level associated with each factor (Bross, 1958; Hwang & Yoon, 1981).

In the current study, RIDIT analysis revealed the relative importance among the four constructs. These results indicate that consumers prioritize the substance and articulation of reviews over their contextual cues or visual/structural presentation. The detailed RIDIT scores and corresponding

Figure 1: Factors Identified by the study



rankings are presented in **Table 5**. While RIDIT provides insights into perceived importance based on survey distributions, the researchers have also applied Grey relational Analysis (GRA)—a method particularly useful when dealing with limited or uncertain data. GRA quantifies the degree of similarity between sequences (criteria) and an ideal reference sequence, allowing for a robust ranking of alternatives even under incomplete information (Li et al., 1982; Julong, 1989). Together, these MCDM approaches increase the methodological rigor of the factor prioritization process and validate the consistency of the findings across techniques. The findings showed that Review Content had the biggest impact on how consumers viewed review quality.

Table 5: RIDIT Scores and Ranks

Determinant	RIDIT Score	Rank
Review Content	0.58	1
Review Expression	0.57	2
Review Context	0.51	3
Review Design & Accessibility	0.48	4

Grey Relational Analysis (GRA)

To establish the relative weights of the four dimensions that affect customer review quality—Review Content, Review Expression, Review Context, and Review Design & Accessibility—a total of two commonly used Multi-Criteria Decision-Making (MCDM) approaches were utilised in this research: RIDIT analysis and Grey Relational Analysis (GRA). Both methods were selected for their strength in dealing with qualitative and quantitative data as well as in situations that entail subjective judgments and scarce data (Hwang & Yoon, 1981; Li et al., 1982). To confirm the results of RIDIT Analysis, the research further employed Grey Relational Analysis (GRA), a technique that was originally developed by Julong (1989) and especially appropriate for situations involving incomplete, fuzzy, or

Table 6: Grey Relational Analysis Results

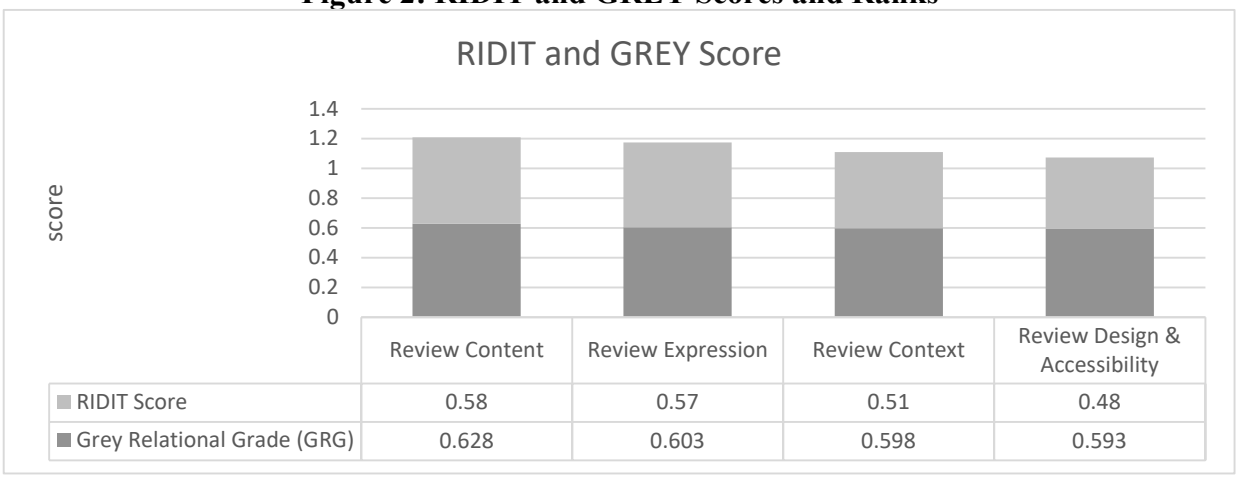
Determinant	Grey Relational Grade (GRG)	Rank
Review Content	0.628	1
Review Expression	0.603	2
Review Context	0.598	3
Review Design & Accessibility	0.593	4

uncertain information. GRA analyzes how various alternatives correlate with an ideal reference through the measurement of their relative proximity.

The procedure starts by establishing a reference sequence—based on the maximum observed average value for every factor—against which deviation sequences are determined. The deviations are employed to calculate Grey Relational Coefficients (GRCs), reflecting the degree of association between every factor and the optimum. The average of the coefficients, or the Grey Relational Grade (GRG), then presents the collective impact of each factor (Li et al., 1982). The findings of GRA closely supported the RIDIT results in validating the consistency of the factor ranking. As presented in Table 6, Review Content was ranked the highest once more (GRG = 0.628), and this was again trailed by Review Expression (0.603), Review Context (0.598), and Review Design & Accessibility (0.593). This result convergence between two distinct MCDM methods further enhances the reliability of the prioritization and strengthens the role of content-related factors in driving perceptions of review quality.

The steady position in both RIDIT and GRA rankings bolsters the idea that Review Content has the biggest impact on how people view the quality of customer reviews. The graph presented here illustrates the same.

Figure 2: RIDIT and GREY Scores and Ranks



Discussion

This research aimed to find and assess the latent constructs underlying the perceived quality of online customer reviews (OCRs) in the Indian e-commerce environment. Adopting a multi-method research design incorporating Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), RIDIT analysis, and Grey Relational Analysis (GRA), this work presented a strong

framework for how customers perceive and order various elements of review quality. The results validate that consumer understandings of review quality are multidimensional and influenced by an intricate combination of richness of content, expressiveness of expression, contextual fit, and functional design. Of the four constructs measured—Review Content, Review Expression, Review Context, and Review Design & Accessibility—a hierarchical pattern was evident, headed by Review Content and followed closely by Review Expression, with Context and Design serving a subordinate role.

The dominance of Review Content in all analyses supports the theoretical assertion that consumers make extensive use of diagnostic and reliable information when assessing products on the web. This result holds in close alignment with the Elaboration Likelihood Model (Petty & Cacioppo, 1986), which posits that consumers making high-involvement decisions-like online shopping—prefer the central route of persuasion that emphasizes extensive, factual, and relevant information. Review Content in this research included key characteristics like accuracy, completeness, objectivity, credibility, and reliability—characteristics previously identified as paramount to establishing consumer trust (Mudambi & Schuff, 2010; Filieri, 2015). Additionally, information diagnosticity theory (Park et al., 2007; Pan & Zhang, 2011) indicates that such characteristics assist in mitigating uncertainty in the indirect product experience contexts of online settings. In new digital economies such as India, where online transaction trust is in the developing stages, content-bundled reviews act as cognitive anchors for consumers, enabling them to make informed and confident choices. This is also corroborated by current research from Li et al. (2021), which highlighted the increasing need among Indian consumers for fact-based, comprehensive reviews grounded on actual experience.

Closely behind Review Content was the construct of Review Expression, which also ranked high using all analytical methods. It is a dimension encompassing metrics like readability, tone, emotional engagement, coherence, and consistency in review composition. Its impact highlights the significance of how information is delivered in influencing its perceived usefulness and persuasiveness. The relevance of Review Expression rings true with narrative transportation theory (Green & Brock, 2000), which holds that affectively powerful and linguistically involving messages would be better internalized and believed by readers. Clearly expressed reviews not only are easier to grasp but also more memorable and convincing (Zhang et al., 2018; Ghose &

Ipeirotis, 2010). Studies by Pereira et al. (2020) also discovered that emotional tone and expressive language strengthen the psychological effects of reviews, boosting customer engagement and memory. In culturally rich markets such as India where language universality and emotional appeal may be quite different, the capability of a review to consistently and precisely convey meaning becomes essential. Therefore, Review Expression supports Review Content by making the latter more digestible and interesting, hence strengthening its effect.

Review Context, which was lower in ranking compared to the others, still played an important role in shaping consumer attitudes. This dimension captures the situational and personal context of the reviewer, such as his experience with the product, demographic signals, and usage situation. Even if it did not top the rankings, it's worth lies in its capacity to tailor the review experience. Based on social identity theory (Tajfel & Turner, 1986), customers are more likely to believe reviews when they find the reviewer to be comparable to themselves. Contextual cues like these boost relatability and lower psychological distance, further augmenting perceived review credibility (Filieri & McLeay, 2014; Willemsen et al., 2011). Context also functions as an external cue according to cue utilization theory (Olson & Jacoby, 1972), enabling consumers to determine review relevance based on environmental and individual cues. Given a diversified market such as India, where customers vary extensively in terms of language, place, and internet literacy, context provides meaning-enhancing value by enabling users to evaluate whether a review is relevant to their own situation. While less powerful than content or expression, contextual richness adds depth to interpretation of reviews and facilitates personalization of e-commerce experiences.

Review Design & Accessibility was found to be the least impactful construct, indicating that interface design and navigational attributes, although significant, are not paramount to determining review quality judgments by consumers. This result differs from previous studies highlighting the importance of website usability and aesthetics in promoting engagement (Chevalier & Goolsbee, 2003; Liu et al., 2021). The findings of this study, however, indicate a change in user behavior, such that experienced online consumers focus on informational value rather than visual presentation. This view is consistent with the Technology Acceptance Model (TAM) (Davis, 1989), specifically the function of perceived ease of use as a facilitator and not a motivator. A good review interface may facilitate access and navigation but does not necessarily change fundamentally the

consumer's assessment of review credibility or usefulness. As Racherla and Friske (2012) point out, the interface acts more as a facilitator, allowing consumers to effectively find and process high-quality content. Review Design & Accessibility has a secondary but essential role, backing up rather than leading perceptions of review quality.

Overall, the findings indicate a clear hierarchical framework for prioritizing understanding of online review quality from the consumer's point of view. Review Content and Expression prevail because they both deliver cognitive clarity and emotional engagement, two vital elements needed to establish trust and support decision-making. Review Context adds richness to the process by adding personal touches and being relatable, while Design & Accessibility provides functional access to all of this information. This hierarchy is in favor of a multidimensional review quality and ratifies earlier models put forward by Filieri et al. (2021) and Zhang et. al (2022), whose forte is to highlight the need for incorporating structural, informational, and experiential aspects in the evaluation of consumer-generated content. The consistency of findings across several analytical methods further supports the validity of this prioritization and provides pragmatic implications for marketers, e-commerce platform developers, and policy makers with an interest in maximizing consumer trust in online settings.

Practical Implications

The results of this research provide several significant implications for e-commerce sites and companies that seek to maximize the utility of customer reviews. Perhaps most importantly, Review Content was the most impactful aspect in determining consumer attitudes. This highlights the value of focusing on the content of reviews versus cosmetic design factors. Sites need to invite users to leave detailed, specific, and real accounts of their product or service experience. One of the effective approaches is to use smart prompts or question-based templates (e.g., "What did you like best?", "How might we improve?", "How was the delivery experience?") to nudge reviewers into writing richer and more informative content. These prompts both lower the reviewer's cognitive burden and guarantee that the end review covers essential informational needs of prospective buyers.

To further enhance content quality, e-commerce companies may use authenticity validation mechanisms, including AI-based anomaly detection systems that detect extremely vague, suspiciously positive, or repetitive reviews. Verified purchase labels, content moderation with credibility analysis,

and voting features from the community can also enhance review believability and credibility, which are central aspects of high-quality review content.

Of secondary significance, Review Expression addresses how well the content is expressed. While content narrates the story, expression makes it tell it. Sites can promote writing that is effective in being brief, readable, and interesting. Readability software that evaluates writing as being good or bad in aspects such as grammar, tone, and complexity can be incorporated into the process of submitting reviews to give reviewers real-time suggestions. Moreover, sites could have reviewers use natural language prompts within review writing (e.g., "Attempt to describe your impression of using this product") to encourage more readable and emotionally engaging text. Reviewer training or rewarding high-expression-quality posts (e.g., those that receive upvotes or are marked as helpful) can also improve overall review readability.

While Review Context was listed lower, even it has some impact on consumer interpretation. Review forms need to be designed by platforms to make customers share contextual information, e.g., frequency of use, reason for purchase, or familiarity with the product. A few check-box fields like "First-time buyer," "Frequent user," "Gift purchase" can enable readers to better identify themselves with the experience of the reviewer and understand how relevant their own situation is with respect to the review. Contextual indicators make reviews seem more personalized and hence more convincing.

Though Review Design & Accessibility contributed the least in relative terms, it is still a facilitative enabler of review success. Platform design's job needs not be to dominate content, but rather to enable its discovery, navigation, and understanding. Companies should invest in easy-to-use interfaces that allow reviews to be sorted by rating, date, reviewer type, or keyword. Design decisions such as mobile-first design, collapsible review areas, visual signals (e.g., review highlights, star histograms), and progressive disclosure (e.g., preview snippet with "Read More" links) can contribute to how easily people interact with review content.

In effect, these results reaffirm that content quality should be paramount, with expression, context, and design synergizing to optimize review utility. E-commerce sites should thus follow a content-oriented, holistic approach, coordinating technical features and design of user experience to augment—not replace—the informational and argumentative ability of well-written customer reviews.

Limitations

While this study provides valuable insights into the determinants of review quality within the Indian e-commerce context, it is not without limitations. First, the research was conducted on a specific demographic group, which may limit the generalizability of the findings. The perceptions and behaviors observed may not fully represent those of consumers from other regions, cultures, or age cohorts. Future studies should consider more diverse and representative samples to improve external validity and capture broader consumer perspectives.

Second, although the study focused on the critical features influencing review quality, it did not account for potential variations across different product categories. Products differ in how they are evaluated—experience goods (e.g., hotels, travel services) often rely more on subjective evaluations, whereas search goods (e.g., electronics, apparel) are typically assessed through objective specifications. As a result, the importance of specific review features may differ by product type. Future research could explore whether and how the salience of review quality attributes varies across these product categories.

Third, the study employed a cross-sectional design, offering a static view of how review quality influences consumer perceptions at a given point in time. However, in real-world scenarios, consumer opinions may evolve as new reviews are continuously posted. A longitudinal approach could provide a richer understanding of how review exposure over time shapes consumer attitudes and decision-making.

Lastly, the use of convenience sampling may introduce sampling bias, as it potentially excludes individuals who do not engage with online reviews. To capture a more holistic picture, future studies should aim to include both active and passive review users, and investigate possible barriers to online review usage.

Conclusion and Future Scope

This study advances the understanding of online review quality by empirically validating a multidimensional framework within the Indian e-commerce context. It reveals that review quality is not a single attribute, but a combination of interconnected dimensions—both informational and structural—that together shape consumer perceptions and influence purchasing behavior. The findings suggest that improving review effectiveness requires a holistic approach that addresses the content, presentation, and credibility of reviews.

The study, therefore, opens gateways for future research. Longitudinal studies should be initiated to find out how consumer

responses to online reviews are changing with time, particularly when AI-generated and voice-based reviews are widely being accepted. These investigations could in return provide clues as to how such technological changes Mold consumer behavior.

Cross-cultural studies may even return a deeper understanding as they consider how cultural norms and communication preferences influence the perception of review quality. This will force e-commerce platforms to accommodate their review strategy when selling in various markets. In addition, demographic variables such as age, level of education, and income can be considered to give insight into how different classes of consumers evaluate and then respond to review content.

In addition to the above, psychological aspects like trust, cognitive load, and risk aversion can be considered to get better clarity on why certain elements within a review strongly appeal to certain consumers. Such insights can help in the creation of review systems that foster trust, engagement, and facilitating decision-making.

In conclusion, while this research admits its constraints, it posits itself as an excellent launching pad for future research and practice. Researching areas noted in this work will allow for the development of more credible, user-focused review systems that enhance the consumer online experience and lead toward educated buying decisions.

Appendix -A

SL No.	Dimension	References	Scale Items
1	**Accuracy**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Accu1: The reviews produced correct information for the product Accu2: The information obtained from the reviews was error-free Accu3: The information was accurate for the product
2	**Objectivity**	Hussain et al. (2017)	Obj1: I believe the reviewers' emotions affect their quality of experience Obj2: I believe unusual events can affect their quality of experience Obj3: I believe the reviews written by normal people contain less bias than reviews written by the editors of the platform
3	**Credibility**	Prendergast et al. (2010); Smith & Vogt (1995)	IC1: I think the reviews are convincing IC2: I think the reviews are strong IC3: I think the reviews are credible
4	**Reliability**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Reli1: User reviews are trustworthy Reli2: User reviews are reliable
5	**Factuality**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Fact1: Reviews are based on specific facts Fact2: Reviews are objective Fact3: Reviews are logical
6	**Adequacy**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Adeq1: The amount of information in the reviews was sufficient for my decision-making Adeq2: The reviews covered enough aspects of the product Adeq3: The reviews provided an adequate level of detail
7	**Completeness**	Yang et al. (2005); Cheung et al. (2008); Luo et al. (2013)	Compl1: The reviews provided complete information about the product Compl2: The reviews addressed all my concerns Compl3: The reviews included multiple perspectives on the product
8	**Diagnosticity**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Diag1: The reviews helped me evaluate product quality Diag2: The reviews helped me compare different product options Diag3: The reviews guided me in choosing a suitable product
9	**Timeliness**	Wixom & Todd (2005)	Time1: The reviews were posted at the right time for my decision Time2: The reviews were updated to reflect recent changes Time3: The reviews reflected current product experiences
10	**Understandability**	McKinney et al. (2002); Park et al. (2007);	Under1: The reviews are easy to read Under2: The language in the reviews is simple and clear Under3: I could understand the meaning of the reviews without difficulty

11	**Interpretability**	Park et al. (2007);	Inter1: The message of the reviews is easy to interpret Inter2: The reviews present ideas in an interpretable way
12	**Conciseness**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Conc1: The reviews convey a lot of information in few words Conc2: The reviews are not unnecessarily lengthy Conc3: The reviews are compact yet informative
13	**Relevancy**	Xu et al. (2013); Jiang & Benbasat (2004); Zhao et al. (2018)	Rele1: The reviews contain information relevant to my needs Rele2: The content of the reviews matched my decision-making requirements Rele3: The reviews were focused on important aspects of the product
14	**Attractiveness**	Mudambi & Schuff (2010); Ohanian (1990)	Attr1: The reviews are visually appealing Attr2: The presentation of the reviews makes them interesting to read Attr3: The format of the reviews encouraged me to read them in detail
15	**Ease of Use**	Bailey & Pearson (1983); Davis (1989)	Ease1: It is easy to locate relevant reviews Ease2: I can quickly navigate to reviews I want to read Ease3: The review system is user-friendly

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Analyzing the Impact of User Generated Content on the Generation Z's Purchase Intention of Fashion Apparels in India

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Abstract

The study examines how user-generated content (UGC) impacts the purchase intentions of Generation Z consumers in India's fashion apparel sector. It examines four key dimensions of UGC—perceived credibility, quality, quantity, and relevance—and explores consumer attitude as a mediating factor. Data collected from 594 respondents were examined in two stages first through Confirmatory Factor Analysis (CFA) and secondly through Structured Equation Modelling (SEM), with mediation effects tested via bootstrapping. Findings reveal that consumer attitude is a full mediator between purchase intention and perceived quality, and partially mediates the effects of other UGC components. With 69% of participants following fashion brands on social media and having made purchases influenced by UGC, the results highlight the strategic value of credible, high-quality, and relevant UGC.

Key words: ***User-Generated Content (UGC), Generation Z, Purchase Intention, Fashion Apparel, Perceived Credibility***

Introduction

Technological advancements and the widespread use of social media have significantly transformed consumer behavior, especially within the fashion industry. For Generation Z—digital natives who have grown up in a

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connected world—user-generated content (UGC) has emerged as a key driver of purchase intentions. In India's rapidly expanding fashion market, where online apparel sales have surpassed $100 billion, the role of UGC is particularly prominent (Bharadwaj, 2024).

Social media platforms such as Instagram, Snapchat, Facebook, and YouTube provide spaces for users to share personal fashion experiences, opinions, and product reviews, thereby shaping peer perceptions and influencing purchase decisions (Bharadwaj, 2024; Lee & Lee, 2021).

UGC, often seen as more authentic and trustworthy than marketer-generated content (MGC), serves as a form of "social proof" that is highly persuasive among Generation Z consumers (Lee & Lee, 2021). Its visual, interactive nature further enhances its role in digital marketing strategies within the fashion sector (Pfeuffer & Phua, 2021). Authenticity is a core reason why UGC is more effective than MGC. Generation Z values transparency and is quick to dismiss content perceived as overly commercial. Peer reviews, testimonials, and social media style posts offer firsthand insights into product fit, durability, and appeal—attributes that strongly influence fashion-related purchasing decisions (Wang et al., 2023). UGC spans a variety of formats, including Instagram photos, YouTube product reviews, and hashtag discussions, all of which help mitigate perceived risks by presenting real-life usage (Shetu, 2023).

Influencers play a central role in the UGC ecosystem by cultivating parasocial relationships with their audiences. These one-sided emotional connections make their endorsements more relatable and trustworthy than traditional celebrity advertising (Pfeuffer & Phua, 2021; Lee & Lee, 2021). For Generation Z, peer validation is critical, and influencers—viewed as peers rather than celebrities—can significantly impact buying behavior. Indian Generation Z consumers are highly engaged, brand-conscious, and digitally active. UGC supports their evaluation of both functional attributes (e.g., durability, quality) and emotional appeals (e.g., style, self-expression), aligning closely with their purchasing motivations (Kansra, 2014). The growing inclusivity of digital fashion spaces further enables a sense of community, allowing consumers from diverse backgrounds to participate in trend-driven dialogue and consumption (Shi et al., 2023).

Research over the years has shown that user-generated content (UGC) tend to influence buying decisions more than brand-created content (MGC). Goh et al. (2013) pointed out that UGC usually comes off as more credible, mostly because it does not have commercial motives. Pfeuffer and Phua (2021) also noted that the relatability in UGC helps reduce consumer doubts and hesitation. Generation Z—those born roughly between 1997-2012 are currently the largest generation worldwide, and their digital-first lifestyle has reshaped how fashion retail works (Shetu, 2023). For them, it's not just about self-expression; they're also looking for real engagement with brands and communities (Archana et al., 2024).

Generation Z has moved towards fast-paced content, platforms like Instagram Reels and YouTube Shorts. It has changed how brands communicate (Ngo et al., 2023). Marketing isn't just about visibility anymore; it is about share of mind. This has given rise to "micro-celebrities". These are individuals who have small dedicated following as compared to widely known celebrities, these influencers often feel more believable (Shetu, 2023; Basile et al., 2024), which makes their content more persuasive.

Theoretical Framework and Hypotheses Development

User-Generated Content (UGC) and Purchase Intention

User-generated content has become one of the most trusted sources of information for today's consumers. It is different from conventional advertising because it is created by regular people sharing real opinions and experiences. That makes it feel more authentic. Whether it's a review, a personal post, or a product-related comment, this kind of content helps others figure out what is actually worth buying (Schivinski and Dabrowski, 2014; Schumann et al., 2014). It gives an extra bit of social proof people need before committing to purchase. This is especially true in fashion, where brands that work UGC into their strategy tend to get better customer engagement and loyalty. Instagram, in particular, makes UGC even more powerful by showing products in real-life settings. Peer influence and perceived norms play a big role in people's choices because realness matters more than ever, UGC has become a foundation of good digital marketing.

H1: User-Generated Content (UGC) positively influences purchase intention.

Interesting Content and Purchase Intention

The kind of content brands share online makes a difference. Content that is eye-catching, enjoyable, and worth spending time on helps brands stand out and build better connections with people. In the middle of all the noise online, brands that manage to create content that looks good, feels relevant, and actually entertains; whether it's videos, blogs, or interactive stories; it has a way better chance at getting noticed (Koiso-Kanttila, 2004; Rowley, 2008; Holliman, 2014). This kind of content also helps shape how people feel about the brand and keeps them coming back.

When content actually lines up with what consumers care about, it makes the brand experience memorable, leading to a purchase (Ahmad et al., 2016; Hollebeek & Macky, 2019). Consumer involvement theory also backs this up. The more interested people are in the content, the more likely they are to act on it.

H2: Interesting content has a positive significant impact on purchase intention.

Perceived Enjoyment and Purchase Intention

Perceived enjoyment has a huge impact on how people behave when shopping online. When someone actually enjoys the content, they're looking at then they're more likely to participate in it; share it and feel good about the brand behind it. This emotional connection helps build a bond between the user and the brand, which often leads to a purchase (Agarwal & Karahanna, 2000).

When people have a fun or satisfying experience, they're more open to what the brand is saying and less likely to doubt it. In the fashion space, UGC that entertains, makes people remember the brand and want to interact again. Hedonic motivation theory explains this by saying that people naturally chase things that feel good, and those positive feelings guide their buying behavior. So, if a brand can make UGC that people actually enjoy, they're more likely to win over new customers and keep them engaged.

H3: Perceived enjoyment affects purchase intention positively.

Perceived Usefulness and Purchase Intention

Perceived usefulness is another key factor contributing to purchase intention especially if that information comes from user-generated content. If people feel like a post, review, or tutorial actually helps them figure out if the product's right for them, they're more likely to trust the brand and go ahead with the purchase. Real stories from other users help answer practical questions and reduce doubts.

Useful content helps shape positive opinions and leads to more buying decisions (Moon and Kim, 2001; Chen et al., 2002). This fits right in with the Technology Acceptance Model (TAM), which explains how perceived usefulness influences behavior. In the fashion world, helpful UGC like styling tips, honest feedback about the fabric, or sizing details acts as a guide. Platforms like YouTube, TikTok, and Instagram take this even further by making these user-driven insights more visual and relatable. Basically, the more helpful the content is, the more likely people are to trust it and buy.

H4: Perceived usefulness positively influences purchase intention.

Involvement of Celebrity and Purchase Intention

Celebrities still have a mass following when it comes to shaping opinions and buying habits. Whether they're reviewing a product, collaborating with a brand, or just posting about it casually, their involvement tends to make a brand look more desirable and trustworthy. This ties in with source credibility theory, which says that people are more likely to believe and be persuaded by someone who seems knowledgeable and likable (Ohanian, 1990).

Research by Dyson and Turco (1998) and Pringle (2005) adds that celebrities often lend an aspirational value. Consumers want to be like them, so they're drawn to the brands they use. In fashion, especially, this influence is amplified. People aren't just buying clothes; they're buying into a lifestyle. On platforms like Instagram and YouTube, where celebrities directly engage with fans through things like styling videos or unboxing reels, their voice carries even more weight. Parasocial relationship theory explains this by saying that people feel like they "know" celebrities, which makes their posts feel more personal and persuasive. So, when brands get celebrities involved in UGC, it really does help boost engagement, loyalty, and, eventually, purchases.

H5: The participation of a celebrity in UGC has a significant positive effect on purchase intention.

Perceived Quality and Purchase Intention

Perceived quality refers to how good people think a product is. It has a big influence on whether or not they'll buy it. In the digital world, UGC plays a huge part in shaping that perception. Before spending money, most consumers look for reviews, pictures, or personal stories

from others to check if the product's actually worth it. When UGC includes detailed reviews, clear photos, or honest opinions, it builds trust and helps people feel more confident in the brand (Yang et al., 2005).

In fashion, user-posted pics, try-on guides, and feedback about things like durability and fit really help customers decide. These real-life insights help reduce any guesswork or uncertainty. And because today's consumers care more about authenticity than flashy ads, brands that highlight high-quality UGC tend to stand out. They don't just look reliable, they feel trustworthy, which help people to buy.

H6: Perceived quality has a positive impact on purchase intention.

Perceived Risk and Purchase Intention

UGC helps reduce the risk in a lot of cases, but sometimes it can also make people more hesitant, especially if it includes bad reviews, mixed opinions, or unclear information. Mieres et al. (2006) pointed out that people are constantly looking for signs that something won't go wrong, and if they spot anything off in the content, it makes them worry even more.

Concerns about fit, color, quality, or misleading images are often viewed as perceived risks. Risk goes up even more if UGC talks about slow delivery, unhelpful customer service, or tough return policies. Risk-aversion theory explains why people tend to walk away from purchases that feel even slightly uncertain. That's why brands need to manage UGC smartly—responding to complaints, being transparent, and showing reliable content keep that hesitation low and trust high.

H7: Perceived risk negatively affects purchase intention.

Perceived Credibility and Purchase Intention

Credibility's one of the integral aspects that makes UGC work. If people think a review or testimonial is honest, they're more likely to trust the brand behind it. It's not just about the words, it's about who is saying them, how consistent the stories are, and whether or not it feels real. Müller et al. (2018) and Ohanian (1990) both emphasized that UGC only has value when the source is seen as reliable and unbiased.

People often look for clues in how personal, detailed, and open the UGC is. The more a post feels like someone genuinely sharing their experience (good or bad), the more trust it earns. On the other hand, overly polished or obviously

paid content tends to backfire. Especially in fashion, where quality and satisfaction can vary so much, consumers really need to feel confident before buying. So, when UGC feels credible it helps buyers feel safer making that decision.

Research Methodology

Sample Framework

Generation Z consists of individuals between the ages of 13 to 28 years. Therefore, data was obtained only from respondents born between 1997 to 2011, who actively follow fashion brands on social media. They engage with user-generated content (UGC) connected to fashion clothes. To ensure consistency and reliability, several alterations were made to suit all objects within the context of this study. All scale items were graded using a Seven-Point Likert Scale, where 1 related to "Strongly Disagree" and 7 referred to "Strongly Agree."

Table 1: Respondent Profile

Variables	Categories	Frequency	Percentage
Sex	Male	345	58.08
	Female	249	41.92
	Total	594	100
Age	13-17	22	3.07
	18-23	381	64.10
	24-28	191	32.01
	total	594	100
Family Income	less than 2.5 lakhs	219	36.09
	2.5-5 lakhs	121	20.40
	5-10 lakhs	111	18.07
	10-15 lakhs	88	14.08
	above 15 lakhs	55	9.03
	total	594	100
Do you follow fashion brands on social media?	yes	594	100
	no	0	0
	total	594	100
Have you ever purchased fashion apparel after seeing user-generated content?	yes	589	99.15
	no	5	0.85
	total	594	100

Method of Analysis

The research employs IBM SPSS AMoS 23 for analysis. An online survey is distributed to collect responses efficiently. Study was conducted in two phases, 1. Confirmatory Factor Analysis (CFA) and 2. Structured Equation Modelling (SEM) to test the hypotheses.

Analysis

First, the sample's demographic profile is examined. The proposed hypotheses have been tested using SEM. Prior to that, each construct's validity and reliability were examined. Thus, first, CFA was used to determine several of the Modification indices. The validity of convergent and discriminant analysis was then evaluated. Max RH confirmed that the different items in a construct were internally consistent.

Goodness of Fit Indices

Table 2: Goodness of Fit Indices

Fit Indices	Observed Values	Recommended values
CMIN/DF	2.52	< 3
CFI	0.961	> 0.95
GFI	0.913	> 0.90
AGFI	0.891	> 0.80
RMSEA	0.051	< 0.06
PCLOSE	0.388	> 0.05
NFI	0.937	> 0.90
TLI	0.954	> 0.95

Convergent Validity and Reliability

Table 3: Validity Measures

Constructs	Indicator	Factor Loading	AVE	CR
Perceived Usefulness	PUD1	0.808	0.695	0.901
	PUD2	0.825		
	PUD3	0.849		
	PUD4	0.851		
	PDC1	0.829		0.847
Perceived Credibility	PDC2	0.865	0.581	
	PDC3	0.858		
Interesting Content	INTC1	0.845	0.645	0.900
	INTC2	0.81		
	INTC3	0.767		
Perceived Risk	PDRSK1	0.713	0.67	0.859
	PDRSK2	0.754		
	PDRSK3	0.806		
	PDRSK4	0.773		
Intention to search	INTS1	0.78	0.724	0.887
	INTS2	0.855		
	INTS3	0.838		
Involvement of celebrity	INVC1	0.803	0.681	0.865
	INVC2	0.81		
	INVC3	0.825		
	INVC4	0.805		
	INVC5	0.774		
Perceived Quality	PDQ1	0.781	0.614	0.827
	PDQ2	0.807		
	PDQ3	0.762		
Purchase Intention	PI1	0.825	0.652	0.849
	PI2	0.817		
	PI3	0.814		

Constructs	Indicator	MSV	Cronbach α
Perceived Usefulness	PUD1	0.736	0.902
	PUD2		
	PUD3		
	PUD4		
Perceived Credibility	PDC1	0.653	0.851
	PDC2		
	PDC3		
Interesting Content	INTC1	0.814	0.901
	INTC2		
	INTC3		
Perceived Risk	PDRSK1	0.662	0.859
	PDRSK2		
	PDRSK3		
	PDRSK4		
Intention to search	INTS1	0.770	0.888
	INTS2		
	INTS3		
Involvement of celebrity	INVC1	0.735	0.869
	INVC2		
	INVC3		
	INVC4		
	INVC5		
Perceived Quality	PDQ1	0.814	0.828
	PDQ2		
	PDQ3		
Purchase Intention	PI1	0.770	0.853
	PI2		
	PI3		

Discriminant Validity

Table 4 Discriminant validity of each Construct:

Paths	1	2	3	4	5	6	7	8
1	**0.834**							
2	0.671	**0.762**						
3	0.775	0.708	**0.803**					
4	0.747	0.693	0.778	**0.819**				
5	0.828	0.681	0.773	0.791	**0.851**			
6	0.734	0.744	0.787	0.759	0.769	**0.825**		
7	0.814	0.760	0.802	0.813	0.794	0.803	**0.784**	
8	0.808	0.746	0.801	0.788	0.808	0.758	0.748	**0.808**

Common Method Variance

Finally, CMV was examined using Harman's Single-Factor Test using principal component analysis without rotation (Podsakoff & Organ, 1986). The test results suggested that a single component explained 32.7% of the total variation, which is below the 50% threshold. Therefore, CMV was found to be under control and did not pose a serious danger to the validity of the findings.

Confirmatory Factor Analysis

The Confirmatory Factor Analysis (CFA) was conducted using AMOS to assess the reliability and validity of the measurement model. The analysis includes many latent components, each represented by various observed signs. The standardized factor loadings in the model were all over 0.60, indicating a robust connection between the observable variables and their associated latent constructs. In the CFA, the highest factor loading was 0.90, and the lowest loading 0.60, which is well within the acceptable range. This suggests the items in the model has good convergent validity. Also, measurement errors were pretty minimal, further adding to the model's strength.

When looking at how the constructs relate to one another, the correlation values ranged between 0.67 and 0.90. The strongest link, at 0.90, was between Perceived Digital Content (PDC) and Interest (INTS), meaning they share a lot of variance. Still, since nothing crossed the 0.90 mark, the model has maintained discriminant validity.

Model fit indicators showed alignment between the proposed structure and the actual data. The RMSEA value came out to 0.051, which is under the accepted limit and means the model fits the data well. The CFA confirms the model is reliable and valid both ways. This validation clears the path to move ahead with Structural Equation Modelling (SEM) to explore the relationships more deeply.

Structured Equation Modelling

The SEM analysis in this study looked at how factors Perceived Usefulness of UGC (PUD), Informativeness of UGC (INTC), Perceived Risk (PDRSK), Interest (INTS), Involvement (INVC), and Perceived Digital Quality (PDQ) link up with Purchase Intention (PI). The

purpose was to see if the hypothesized relationships and the findings showed a strong, statistically significant associations.

To make sure the model was a good fit for the data, several indicators were checked. The Chi-square to degrees of freedom ratio (χ^2/DF) was within the preferred range (below 2.00). The CFI passed the 0.95 benchmark, and both the GFI and AGFI were over the 0.81 cutoff, suggesting a fairly good fit. RMSEA was below 0.06. Therefore, the model is deemed fit.

To validate the constructs, AVE, CR, and Cronbach's α were used. PUD, INTC, INTS, and INVC all had AVE values above 0.50 and CR above 0.70, which shows they were both valid and internally consistent. Constructs Perceived Risk and Perceived Digital Quality also passed these checks, confirming they had a meaningful role in explaining purchase intention.

As per the regression weights PUD, INTC, INTS, and INVC derived positive and impactful values, while PDRSK had a negative effect on purchase intention. This aligns with expectations. All relationships are statistically significant, with p-values below 0.05. Individual indicators were also checked, and they all showed strong relationships with their respective constructs.

Findings:

The study reveals that Generation Z does not simply scroll through digital content without engagement. Rather, they pay close attention to reviews, influencer recommendations, and authentic user opinions before making purchase decisions. This finding highlights the growing importance of peer-led digital discourse in shaping consumer behavior.

Table 5: Standardized Regression Weights

Path	Estimate	S.E.	C.R.	P Value
PI ← PUD	0.17	0.03	3.798	***
PI ← INTC	0.17	0.034	3.761	***
PI ← INTS	0.20	0.032	4.43	***
PI ← PDC	0.36	0.031	7.556	***
PI ← INVC	0.21	0.034	4.719	***
PI ← PDRSK	0.12	0.032	2.583	0.01
PI ← PDQ	0.31	0.037	6.28	***

The results from SEM indicate that trust in brands that utilize user-generated content (UGC) plays a significant role in determining purchase intentions among Generation Z consumers. The presence of customer testimonials, influencer endorsements, and posts from regular users helps create a perception of transparency and relatability. These characteristics align closely with the values of Generation Z in the digital environment.

It is noteworthy that environmentally conscious members of Generation Z are more inclined to support brands that communicated ecological responsibility through their UGC. However, a clear intention to purchase sustainable fashion items does not always result in actual purchase. Higher prices and limited availability often demotivate the consumers.

Peer influence also emerged as a major factor in decision-making. When fashion products appeared in the posts of friends, family members, or social media influencers, Generation Z is more likely to consider purchasing them. Therefore, for Generation Z, digital social interactions and community validation play an important role in apparel purchase.

Interestingly, specific factor like affordability and ease of access has a relatively smaller impact. Generation Z is willing to buy products promoted through UGC, but hesitates when pricing or accessibility did not meet their expectation.

The credibility of UGC has a substantial influence. Honest feedback, detailed customer testimonials, and user-submitted content helped participants judge the quality of products. Brands who maintain consistent communication across their digital platforms are more likely to build trust and loyalty among Generation Z consumers.

In summary, the study reinforces the integral role of UGC in shaping purchase intention among Generation Z in the fashion apparel in India. It also highlights the need for brands to support their UGC strategies with competitive pricing and maintaining authenticity. UGC alone may capture attention, but without addressing these additional factors, converting intention into actual sales can remain a challenge.

Research Implications

In the social circles of Generation Z of India, UGC has significantly changed India's fashion apparel market.

Generation Z consumers are highly active on platforms like *Instagram* and *YouTube*, where they do not only consume but also contribute by creating and posting content. This participation creates a sense of familiarity. This happens as peer-shared experiences provide relatable information while supporting social norms. Interestingly, UGC is perceived as more credible and authentic compared to branded content as it offers real-life perspectives that are absent in advertisements. This authenticity is crucial for building trust among Generation Z who are quick to dismiss content that appears inauthentic, AI generated or branded. Furthermore, social validation through peer recommendations, influencer posts, and detailed reviews impact fashion choices and generate broader attitudes. Generation Z believes that product purchase risk decreases as UGC provide firsthand information about quality, fit, and style.

The study of UGC's influence on Generation Z's purchase intentions opens several paths for academic research, particularly in digital consumer behavior and marketing communication fields. Employing advanced analytical methods such as Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) in current research validates that Generation Z's engagement with UGC is multifaceted. It combines attitudes toward content credibility, usefulness, risk perception, and influencer involvement. The full mediation effect of consumer attitude on perceived quality and partial mediation with other UGC dimensions suggest the need to study contextual cultural and technological moderating factors. Limitations of previous studies also suggest there is a need for longitudinal and cross-market studies. Additionally, the findings highlight the need for studies based on qualitative techniques.

For the Indian fashion apparel industry UGC plays a vital role. Brands must curate and facilitate credible, high-quality, and relevant content. This content can help to capture Generation Z's attention and subsequently drive purchase intentions. Companies cannot rely solely on traditional advertising. They must actively encourage customers to share genuine reviews, style posts, and other relevant information. Engagement with micro-influencers and the creation of brand communities is essential for long run relations with the Generation Z. Moreover, transparency and responding to negative UGC can further enhance brand trust and loyalty. Brands trying to

appeal to Generation Z, should ensure that their UGC highlights genuine commitments to sustainability, as this resonates with Generation Z values. Lastly, keeping track of UGC trends allow brands to improve their marketing strategies while aligning with expectations of Generation Z.

Limitations and Future Research Scope

First, the study focuses exclusively on Generation Z consumers within India. While this provides a detailed understanding of the behaviors of Generation Z, the results may not be generalizable to consumers from other age groups or geographies. Future studies should aim to include a broader demographic range to enhance the generalizability of findings.

Secondly, the study is cross-sectional in design. This limits our ability to observe how consumer attitudes towards UGC may evolve over the period of time. Considering that digital media habits and fashion trends are constantly shifting, a longitudinal approach would give a more accurate understanding.

Researchers can refine the limitations of this framework and broaden its application to gain more holistic insights into UGC's evolving role in digital consumer behaviour.

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Cracking the Code: SERVPERF Insights into Private Banking Client Satisfaction

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Abstract

This study provides a thorough investigation of customer satisfaction in private sector banks, using the SERVPREF model as a theoretical foundation. The SERVPREF model, which evaluates service quality on five dimensions tangibles, dependability, responsiveness, assurance, and empathy is a valuable tool for identifying and quantifying differences between client expectations and perceptions. Our research entails conducting a complete survey of consumers from prominent private sector banks to assess their experiences and satisfaction levels. We want to reveal important determinants of customer happiness and identify opportunities for improvement by using statistical approaches to the data we have gathered. The results show that, although private sector banks typically perform well in terms of tangibles and assurance, there are significant gaps in responsiveness that must be addressed. This research not only contributes to the current literature on service quality in the banking sector, while also providing actionable insights for bank management to improve customer happiness and loyalty In conclusion, the study highlights the importance of a balanced approach to service quality, emphasizing that consistent improvements across all SERVPREF dimensions are essential for achieving banking bliss and mmaintaining a competitive advantage in today's evolving financial services industry.

Keywords: ***Banking Services, SERVPREF model, Customer Satisfaction, Service Reliability, Empathy Response, Quality Service Assurance***

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Introduction

Service quality has emerged as a more contemporary and dynamic decision element in marketing philosophy. Banks' ability to react to changing needs is critical to their market survival (Alfred, 2017). For continued success, service organizations, notably banks, invest much in effectively finding out how to deal with external changes. Implementing rigorous standards of excellence is critical due to the assortment of benefits, both financial and otherwise, that accompany with a commitment to quality (Bhatia et al., 2015). The magnitude of satisfaction with the service can sometimes be seen as an indicator of the extent that the existing bank typically meets the requirements of the customer and how precisely the present bank approaches what the consumer considers the ideally suited bank (Damodaran, 2017). Several factors that might be having an influence on customer satisfaction tend to involve prices, the quality of the item, the service quality, as well as the company's overall credibility (Bhat, 2005). The emergence of an emerging class of technologically savvy private banking institutions has heightened competitive advantages in the banking business (Ayyappan & SakthiVadivel, 2013). In an exceptionally cutting-edge marketplace, non-price features such as excellent customer service become more important. For continuing flourishing and growth, emerging financial institutions have to possess an approach that prioritizes customers (Kamble et al., 2011).

Customer satisfaction shows a pivotal role in the banking industry, forming the foundation of trust, loyalty, and sustained growth. In a world where financial products and services are increasingly commoditized, the true differentiator lies in how well banks cater to the evolving needs of their customers.

At the core, customer satisfaction translates into confidence—a satisfied customer feels assured that their finances are secure and managed effectively. This sense of security builds loyalty, turning one-time clients into long-term advocates. Moreover, happy customers are more likely to recommend the bank to others, amplifying word-of-mouth marketing, which remains one of the most effective forms of promotion. In essence, customer satisfaction in the banking sector is more than just about delivering services—it’s about nurturing relationships and

evolving alongside the customer, ensuring that the bank remains a trusted partner in their financial journey. This main aim of this research was to find out the Service Quality of private sector bank's impact on customer satisfaction and which is the most effective variable that gives a competitive advantage to the private sector banks over their rivals.

Literature Review:

Customer happiness is a key characteristic that determines the long-term financial health and sustainability of a company in a market that is becoming increasingly competitive Customer satisfaction is determined by the different aspects of service excellence, specifically tangibility (actual infrastructure, furnishings, and the behaviour of personnel), reliability (the capacity to continually deliver what was promised support), responsiveness (a readiness to offer assistance customers along with providing immediate assistance), assurance (the expertise of staff members and the capacity they have to stimulate trust), and empathy (a concern and personalized attention the fact that the organization demonstrates to its customers) (Parasuraman et al., 1988).

Service quality as defined by scholars followed in two contradictory paradigms i.e. 'Dis confirmation paradigm' and 'Performance-based paradigm'. SERVQUAL and Weighted SERVQUAL are the most prominent models originating from this paradigm (Parasuraman et al., 1985). In contrast; the performance-based concept of service quality rejecting the dis confirmation paradigm, Instead SERVPERF was proposed and based entirely on performance measure (Taylor & Cronin Jr, 1994). The authors claimed that it was a more reliable and valid measurement model for service quality. They further compared four alternative measurement models SERVPERF, SERVQUAL Weighted SERVPERF and Weighted SERVQUAL, in their study found that SERVPERF (Performance only) model was more reliable (Cronin Jr & Taylor, 1992) and effective than the other three models, as it captures service quality nature adequately (Brady et al., 2002).

Banks must realize that customer services should be a strategic consideration in a competitive market. Banks in the private sector enable consumers to access better

goods and services. On the other hand, public sector banks have been able to effectively build the confidence of customers, but they have had difficulty delivering high-quality services to their ultimate customers (Pushkala et al., 2017)

The SERVPERF model, an extension of SERVQUAL, introduces the additional dimension of preferences, acknowledging that customer satisfaction is not solely determined by the objective quality of services but also by the alignment of services with individual preferences (Unuvar & Kaya, 2016). In the private banking sector, where personalized services are paramount, understanding and catering to client preferences become pivotal (Fragoso & Espinoza, 2017). Studies have highlighted the significance of incorporating customer preferences into the assessment of service quality, paving the way for the development of the SERVPERF model (Dabholkar et al., 1996).

In an era of digital banking, seamless and intuitive user experiences are non-negotiable. Customers expect more than just efficient service; they seek personalized interactions, quick problem resolution, and an innovative digital interface that simplifies their financial journey. When banks exceed these expectations, satisfaction rises, and so does customer retention (Vy & Tam, 2021). Conversely, poor service, unresponsive support, or rigid policies can quickly erode trust, pushing customers toward competitors. Therefore, banks must continuously innovate and invest in understanding customer needs through feedback mechanisms and data analytics (Al-Slehat, 2021).

Assurance:

In the banking industry, quality service assurance is the golden thread that weaves together trust, loyalty, and customer satisfaction (Ayinaddis et al., 2023). It acts as the silent promise that every interaction, whether in-person or online, will meet or exceed expectations. When banks deliver consistently high-quality service, they do more than just solve problems—they anticipate needs, create seamless experiences, and instill confidence (Supriyanto et al., 2021). A well-executed quality assurance strategy enhances the customer's journey, turning routine transactions into moments of satisfaction. From instant, hassle-free digital payments to

swift conflict resolution, each touchpoint becomes an opportunity to reinforce reliability. This builds a deep reservoir of trust, transforming satisfied customers into brand advocates (Aripin, 2023). However, the impact is even more profound when quality assurance identifies and mitigates pain points (Phi & Huong, 2023). It's not just about preventing errors, but about creating a flawless experience that feels effortless for the customer. In a competitive market, this attention to quality is a powerful differentiator, giving banks a distinct edge (Aripin et al., 2023). In essence, quality service assurance is the anchor of customer satisfaction in banking. It's the invisible hand that guides every interaction, ensuring that customers walk away feeling valued, secure, and willing to return time and again (Mintah et al., 2024). Therefore, based on the aforementioned findings, the present study put forth the following hypothesis:

H1: Assurance of Quality Service positively impacts Customer Satisfaction

Tangibility:

The tangibility part of service quality in banking is where the intangible character of services intersects with the physical, bridging the gap between client expectations and reality. It's in the feel of a bank's layout, the aesthetics of its mobile app, and even the comfort of its furniture. These seemingly small details are powerful signals that influence how customers perceive the overall service (Bungatang & Reynel, 2021). Tangibility aspects focus on a well-designed, modern branch—soft lighting, sleek counters, well-dressed staff, and comfortable seating. This instantly creates a sense of trust and reassurance, even before any interaction takes place. Similarly, a user-friendly app with a smooth interface and clear visuals evokes a sense of efficiency and ease (Usman, 2015). Customers, consciously or subconsciously, equate these physical elements with the institutes reliability and service quality (Ali et al., 2021). Tangible cues like printed brochures, branded merchandise, and even the quality of debit or credit cards all contribute to shaping the customer's experience. When done right, these elements foster positive emotions, reinforcing the idea that the bank is organized, professional, and values the customer (Nguyen et al., 2020). The tangibility aspect of service quality is the first

layer of impression-making, turning abstract trust into something customers can see, touch, and feel—enhancing satisfaction and loyalty (Yousafzai et al., 2003). Following these previously mentioned findings, the current study proposes the following hypothesis:

H2: Tangibility aspect of Quality Service positively impacts Customer Satisfaction

Empathy:

Empathy involves dealing with how service providers treat clients so that they may deliver individual attention to them. This dimension's characteristics include providing particular attention to clients, staff treating customers with great care, significantly valuing customer interests, employees understanding customer demands, and flexible operation hours (Setiono & Hidayat, 2022). A bank that empathizes, offering flexible solutions or simply reassuring words, builds a deeper connection (Ngo et al., 2020). This emotional bond cultivates trust and loyalty, as the customer feels valued as a person (Rajai & Modi, 2022). Empathy extends beyond individual interactions; it's reflected in how banks design their services—offering tailored products, simplifying processes, or being transparent in communication. These thoughtful gestures show that the bank truly understands and prioritizes customer well-being (Abdullah & Kasmi, 2021). Ultimately, empathy in service quality transforms customer satisfaction into loyalty. When customers feel heard and cared for, they stay, they recommend, and they trust the bank as a partner in their financial journey, not just a service provider (Shrestha, 2021). Thus, considering the earlier data, the present study put out the following hypothesis.

H3: Empathy aspect of Quality Service positively impacts Customer Satisfaction

Responsiveness:

Responsiveness is a service quality feature that refers to the ability of service providers to assist customers and provide services quickly. This dimension's features include notifying consumers concerning the accuracy of service delivery times, providing timely service to customers, being eager to assist customers, and being ready to react to client demands (Sudirjo et al., 2024). Responsiveness in the bank's ability to

swiftly answer questions, resolve issues, and address concerns, creating an atmosphere of care and reliability. In a fast-paced world, where time is precious, customers crave quick responses that show their needs are a priority (Aripin & Paramarta, 2024). A responsive bank, through a prompt call, message, or app notification, steps in quickly, easing anxiety before frustration sets in. This speed not only resolves the problem but reinforces the bank's seriousness to customer satisfaction. It shows that the bank values the customer's time and peace of mind (Awwad et al., 2024). Beyond problem-solving, responsiveness also involves proactively keeping customers informed—whether it's updates on transactions, service changes, or new offerings. This level of engagement builds trust and reduces uncertainty, leaving customers feeling secure and valued (Ananda et al., 2023). Responsiveness in banking isn't just about speed; it's about anticipation and attentiveness. When banks respond with agility, customers feel cared for and confident, deepening their satisfaction and loyalty in a competitive financial landscape (Mir et al., 2023). Therefore, based on the aforementioned findings, the present study put forth the following hypothesis

H4: Responsiveness aspect of Quality Service positively impacts Customer Satisfaction

Customer Satisfaction:

Customer satisfaction in banking is the foundation upon which trust and long-term relationships are built. It goes far beyond just delivering financial services—it's about creating an experience where customers feel valued, heard, and confident in their choice of bank. In an industry where products can often feel identical, satisfaction is the critical differentiator (Gonu et al., 2023). A satisfied customer is not just a loyal one; they become a bank's strongest advocate. When banks exceed expectations—whether through personalized service, seamless digital experiences, or proactive communication customers are more likely to suggest their bank to family and friends. This word-of-mouth marketing is invaluable, transforming satisfied customers into unofficial brand ambassadors (Almansour & Elkrghli, 2023). Happy customers are less likely to switch to competitors (Senanu & Narteh, 2023), and

they tend to invest in additional products and services, driving revenue (Tegambwage & Kasoga, 2024). Customer satisfaction in banking is about building a relationship of trust (Abdul Sathar et al., 2023). It turns transactional encounters into meaningful interactions, where the customer feels understood and supported (Sutriani et al., 2024). When banks prioritize this satisfaction, they don't just gain customers—they gain loyalty, advocacy, and sustainable growth in an ever-competitive market (Phi & Huong, 2023).

Based on above literature review the following model of study was developed

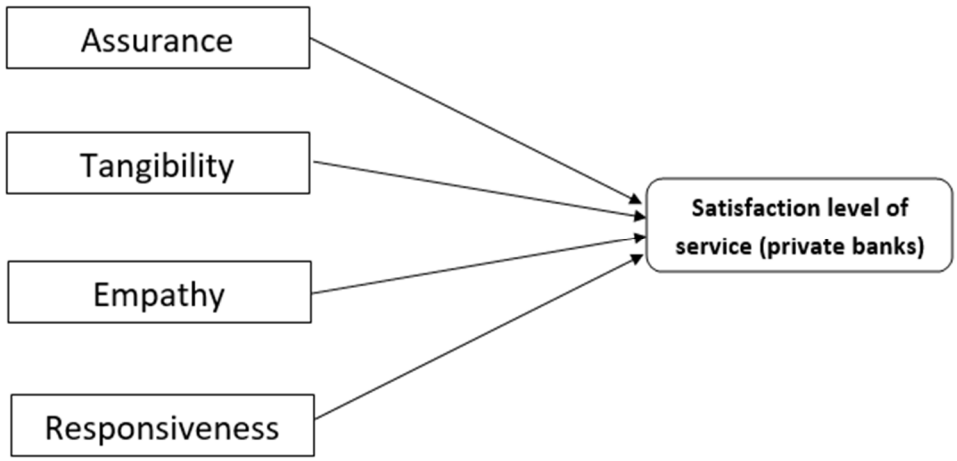

Figure 1. Conceptual model of Study

Research Methodology:

This study's major emphasis is on preliminary descriptive investigation that comes in numerous groups. A descriptive single cross sectional research design was formulated that helped to collect the initial data using a survey approach, followed by a forward stepwise research analysis. Customers should have at least one their accounts in at least one private bank in Ahmedabad City. A structured questionnaire was developed using the SERVQUAL paradigm. The information was gathered systematically using a questionnaire based on the "Likert Scale." 20 questions regarding Service Quality and customer Satisfaction

and a Likert scale with a maximum of five points are included in the survey. The study is descriptive since the banking industry is well established in India and there has been a lot of past research. Therefore, the study only included those who have used services of Private Sector Bank. The samples were collected using the "Snow Ball Sampling Method" as the responses were submitted from the friends and family and then by their friends and relatives. The Data was collected between May and June 2024 through a structed questionnaire. A total of 203 respondents submitted their responses out of which 14 responses were rejected due to various reasons and were not considered for analysis. The final data set of 203 responses was considered for final analysis.

Analysis & Interpretation:

Demographic Analysis:

The table no.1 below provides a demographic study of respondents based on gender, age, occupation, and yearly income. Out of 203 responses, 66% are male and 34% are female, demonstrating a clear male majority. The bulk of responders (38%) are between the ages of 26 and 35, with 31% in the 36 to 45 age range, 27% under the age of 25, and just 4% in the 46 to 60 age categories. This shows that the poll is aimed mostly at young people. When it comes to profession, 45% of respondents work in service-related occupations, making it the most common category. Businessmen account for 27% of the sample, while students and professionals make up 19% and 9%, respectively, suggesting a varied occupational dispersion but with a notable lean toward service and business-related sectors. The income distribution indicates that 48% of respondents earn between ₹2.5-5 lakh yearly, while 26% earn between ₹5-10 lakh. Only 6% of respondents make more than ₹10 lakh, while around 20% earn less than ₹2.5 lakh. This data indicates a middle-income majority among respondents, with a small proportion of high-income earners.

Table no. 1 – Demographic Analysis

Particular		Frequency	Per cent
Gender	Male	134	66%
	Female	69	34%
Age	< 25	55	27%
	26-35	78	38%
	36-45	62	31%
	46-60	8	4%
Occupation	Service	92	45%
	Student	38	19%
	Businessman	54	27%
	Professional	19	9%
Annual income	< 2.5 lakh	40	20%
	2.5 – 5 lakh	97	48%
	5 – 10 lakh	53	26%
	>10 lakh	13	6%
Total		**203**	**100**

Reliability Analysis:

Table 2 displays the results obtained after performing descriptive statistics on the mean and standard deviation of service quality characteristics as well as total customer satisfaction. These statistics were calculated using the data shown in Table 1. Empathy (M=4.57), assurance (M=4.01), tangibles (M=3.95), and responsiveness (M=3.01), in that order, are the service quality attributes that private sector bank customers value the most. However, the bulk of customers are contented with the quality of service offered by private sector banks.

Table 2 – Reliability Analysis

Particulars	Mean	S. D.	Reliability- alpha
Assurance	4.01	0.84	0.758
Tangibility	3.95	0.72	0.749
Empathy	4.57	0.65	0.804
Responsiveness	3.01	0.86	0.710
Satisfaction level of consumer	4.50	0.79	0.853

Cronbach's coefficient was used to determine the degree of internal consistency between several service quality measures and total customer satisfaction (Ashraf & Venugopalan, 2018). The empathy dimension was expected to be 0.804, the assurance dimension would be 0.758, the tangibility dimension would be 0.749, the responsiveness dimension would be 0.710, and the overall customer satisfaction would be 0.853. A reliability value of 0.70 or higher is often considered appropriate for exploratory research (Nunnally & Bernstein, 1994). All the dependability values are more than 0.70. As a consequence, the measures used in the current study are accurate and reliable.

Correlation between exogenous and endogenous variables

Table 3 displays the results of the inquiry into the correlation coefficient used to establish the relationship between consumer satisfaction and aspects of service quality. The correlation study revealed a moderately positive relationship between service quality measurements and total customer satisfaction.

Table – 3: Correlation between exogenous and endogenous variables

	Assurance	Tangibility	Empathy	Responsiveness	Satisfaction level
Assurance	**1***				
Tangibility	0.214**	**1***			
Empathy	0.358**	0.365**	**1***		
Responsiveness	0.201**	0.105**	0.514**	**1***	
Satisfaction level	0.367**	0.584**	0.412**	0.251**	**1***

The study also found a strong and positive association between five characteristics of service quality and customer happiness. The association between responsiveness and contentment was the smallest (r = 0.251; p0.02), whereas the link between tangibility and satisfaction was the most (r = 0.584; p0.00). Empathy and contentment exhibited the second strongest association (r = 0.412; p0.00), followed by assurance and tangibility. According to the results, timeliness is the most crucial feature of service quality, and tangibility, with the highest correlation coefficient value, is the most significant service quality practice in terms of influence on customer satisfaction. As a direct consequence of this, the study's null assumptions are confirmed.

Coefficient Value:

Table 4 shows the effect of a multiple regression experiment designed to examine how various service quality criteria impact overall customer satisfaction. The results show that the regression model is adequate to some degree, with an adjusted R2 of 0.63 and a multiple determination coefficient (R2) of 0.66. Both of these values are quite close to one. This demonstrates that the independent factors explain approximately 63.000% of the variation in the value of the dependent variable, Overall Customer Satisfaction (Service Quality Dimensions).

Table – 4 Coefficient value

Factors	Beta	t-value	Sig.
Constant	-0.120	4.521	0.51
Assurance	0.254	3.547	0.001
Tangibility	0.368	2.514	0.002
Empathy	0.514	3.698	0.000
Responsiveness	0.231	3.541	0.00
R square	0.747		
Adjusted R	0.740		
F	30.14		
N	209		

The F-statistic for the proposed model is 30.14, which is significant at the 1% level (p 0.05), showing that it is suitable. This implies that service quality indicators and overall customer satisfaction have a statistically significant correlation. The results reveal that consumer satisfaction as a whole with private sector banks is favourably and substantially influenced by the tangibles, responsiveness, reliability, and assurance components of service quality. This demonstrates a statistically significant association between total customer satisfaction and the quality – of – service parameters.

Finding & Conclusion:

Theoretical Contribution:

In banking, tangibility relates to the physical look of facilities, technology, and personnel behaviour, which all influence first impressions. An appealing branch or user-friendly app may increase client satisfaction. The SERVEPREF model measures five key dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. By knowing gaps in these domain, banks can identify where customer satisfaction may be lacking. In a highly competitive market, satisfied customers are more likely to remain loyal (Shrestha, 2021) and recommend the bank to others. Reliability, the foundation of trust, guarantees that banks regularly deliver on

promises such as speedy transactions and accurate financial advice, boosting client confidence. Responsiveness measures how quickly banks respond to questions, handle services, or resolve issues—speed is critical in an age of immediate financial requirements (Sutriani et al., 2024). Additionally, assurance refers to the competency and courtesy of bank staff, which gives consumers confidence that their financial affairs are in good hands. subsequently empathy, which is frequently forgotten, is about providing individualized services. Understanding unique consumer requirements, providing specialized solutions, and demonstrating genuine concern turns routine transactions into mutually beneficial relationships (Ngo et al., 2020). The SERVEPREF model is vital in the banking industry for its structured approach to understanding and improving service quality. By focusing on both tangible and intangible aspects of service delivery, banks can reduce service gaps, enhance customer satisfaction, and build lasting relationships with their clients, ultimately leading to increased trust, loyalty, and market share in the competitive financial services sector.

Managerial Implications:

In the banking sector, service quality is critical, with a direct influence on customer happiness, loyalty, and business accomplishments. The SERVPREF model, which focuses on five essential dimensions—tangibility, reliability, responsiveness, assurance, and empathy—provides a solid foundation for assessing service quality in this industry. Incorporating the SERVPREF characteristics into regular banking processes not only satisfies current clients but also gives you a competitive advantage by encouraging long-term loyalty. As digital advancements alter banking, the combination of high-tech efficiency and high-touch service guarantees that banks not only meet, but surpass, their customers' demand. In this sector, client satisfaction is a way of life rather than a goal. By applying the SERVQUAL model, banks can systematically identify service gaps, prioritize improvements, and tailor strategies to meet customer expectations. This not only enhances satisfaction and loyalty but also drives long-term success and stability in the competitive banking environment.

Limitations of the Study:

The truthfulness of the underlying data serves as the basis for the present inquiry. The sample units were drawn from a universe with a variety of characteristics. We received 203 replies due to time constraints, making it difficult to draw solid conclusions. Because the research was conducted in Gujarat, the findings cannot be extended to other locations. The research is biased since it is based on respondents' views (gathered via a questionnaire). On the other hand, the analysis and interpretation may be comprehensive since the questionnaire may have overlooked certain important factors. The dependability of the responder is also one of the constraints of the study, since the quality component is extremely subjective and perspective in nature, which might alter the findings.

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Best Practices in Waste Management: A Case Study of Petlad Municipality

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ABSTRACT

In a developing country and emerging economy like India, Urban Local Bodies (ULBs) play a crucial role in improving the standard of living of citizens as well as economic development. The Urban Local Bodies include multiple bodies, amongst which one is called Nagarpalika or Municipality, which has a structure adapted from British local governing bodies and play a crucial role in Industrial Development of the state as well as country. The case study was undertaken to study the best practice adapted by one of the Municipalities of Anand district. As Petlad Nagarpalika is highly significant in multiple ways, some key insights were found which were responsible for the achievement of the ULB in an exploratory context. The other Nagarpalikas can adopt some of the practices, especially in sanitation and waste management. It was also found that behavioral change in society can be a very important factor along with resources for successful implementation of new initiatives by the institution leadership.

Keywords: ***Best Practice, Waste Management, Sanitation, Municipality***

Introduction to ULBs and Petlad Nagarpalika

The history of municipal bodies in India is very long, which goes back to pre-British era. The first municipal body was set up in the town of Madras in 1688. Later, several other bodies were set up at different places (Local Government, n.d.). The constitution of India was amended in 1992 for 74th time through Nagarpalika Act and three kinds of municipal bodies were identified according to the urbanization and population. In the state of Gujarat, there are 159 Municipalities as per Urban Development and Urban Housing

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Department website of the state government till August, 2024. The term 'Nagarpalika' is used interchangeably with the term 'Municipality', here.

The 74th amendment in the constitution described the role of Municipalities in 1994. The 12th Schedule of the constitution outlines 18 specific functions, amongst which, only for five functions, municipalities were solely responsible. In four of them municipalities were implementing agencies and for some of them they were not even involved as well.

The roles and functions are as follows:

Urban Planning including Town Planning, Regulation of land use and construction of building, Slum improvement and upgradation, Roads and Bridges, Urban Forestry, protection of the environment and promotion of ecological aspects, Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded, Vital Statistics including registration of Births and Deaths, Planning for economic and social development, Urban poverty alleviation, Water Supply for domestic, industrial and commercial purposes, Public Health, Sanitation, Conservancy, Solid Waste Management, Provision of Urban amenities and facilities such as parks, gardens, playgrounds, Promotion of cultural, educational, and aesthetic aspects, Burials and burial grounds, crematoriums, cremation grounds, electric cremation grounds, electric crematoriums, Cattle pounds, prevention of cruelty to animals, Public amenities including street lighting, parking lots, bus stops and public conveniences, Regulation of slaughterhouses and tanneries, Fire Services.

The sources of funds are generally of two categories. a) Grants received from Central as well as State Government

b) ULBs own sources of revenue

About Petlad ULB

Petlad Nagarpalika is one of the eight municipalities of Anand district in the state of Gujarat. It was established in the year 1876. It is also called as one of the ULBs, which refers to Urban Local Bodies. It was recognized as municipality in 1955 and played a huge role in Industrial Development of the Gujarat state.

The total population of Petlad in the year 2015, was recorded as 59,763 as per the municipality website, out of which 43,825 people were literate and the rest were illiterate (Population, n.d.). There are a total of 15 wards in municipality area and more than 16,000 active properties as per the 2024-25 database of ULB. Since its establishment, the municipality has observed significant changes in terms of challenges and development.

The Petlad Nagarpalika is also well-known due to the association with the childhood of the well-known freedom fighter of India, Sardar Vallabhbhai Patel. Therefore, it has historical significance as well in terms of socio-cultural environment of the state and nation.

Petlad was one of the 11 municipalities of Anand district. In January 2025, the Anand Municipality has been converted to Municipal Corporation including two other municipalities as well. Hence, it is one of the eight Nagarpalikas now. The ULB is on the way to providing E- governance services for ease of living.

The Primary Challenge:

- When Ms. Hiral Thakar joined Petlad Municipality as the Chief Officer, she recognized some key issues as a lady officer. As waste management is considered as one of the key areas being managed by ULBs, one neglected part of different kinds of wastes was biohazards and if not disposed scientifically they can be a huge source of land pollution.
- When the waste was being collected, it was segregated in just two parts- dry waste and wet waste. People used to throw or dump the waste with the common household waste and it was exceedingly difficult to segregate it. Hence, It was decided to collect the bio-waste separately and disposed of scientifically.
- The other challenge was the behaviour of common citizens as well, in a section in terms of maintaining cleanliness and supporting municipal officials to implement the drive successfully.

Action Taken and Further Challenges

The municipality received a grant to purchase dustbins, handcarts and tricycles. The idea was presented by Ms. Thakar to purchase E rickshaw to collect waste for the purpose of segregation. They purchased seven rainbow colored e-rickshaws, from which, the yellow-colored rickshaw was allocated for sanitary waste only. The municipality purchased and installed 10 incinerators at various places for collection and disposition of diapers, sanitary pads etc. with the help of a few Self-Help Groups(SHG) and a couple.

The communication was done through social media sites and mobile apps as well as printed materials about the waste collection. In the beginning phase, the sanitary waste collection team was receiving around 20 to 25 calls in a day for collecting sanitary napkins. However,

within four months of the campaign, the number reached up to 200 calls per day.

There was another challenge being faced by the team. A woman complained about their community women's behaviour towards her regarding the task of bio waste collection. The women were treating her as if she was doing something which is untouchable according to the woman. However, gradually they accepted the work of the woman of the team and the problem was resolved.

Amongst all the municipalities of Gujarat, Petlad became the first one to start door to door service to collect waste sanitary pads & diapers and disposing off them scientifically. They also placed bins for bio waste from best out of waste and operated organic waste compost machines.

The municipality set up wet and plastic waste procession plant. It has its own capacity to convert organic waste into manure and plastic which can be used to generate energy. It has its own Plastic Pyrolysis Plant, which help to manage solid waste scientifically. The heavy plastic feed was transformed into Pyrolysis oil, which can be used as a low-cost fuel for diesel engines. From coconut waste, coco peat and coco fiber were produced and sold to market directly.

The municipality also converted the garbage vulnerable points into beautification points. Garbage vulnerable points (GVP) are those areas where the garbage gets piled up because of the constant dropping of garbage by the local residents, travellers, or passerby, or these spots must have had dustbins earlier (Case Studies, n.d.). During Swachh Survekshan 2020, entry point walls were printed with public slogans to push for the behavioural change towards saving water. The penalty was imposed on dumping the garbage in public places and reward was also provided to those who helped in following norms for it. The chief officer herself visited some household areas randomly to promote segregated waste as dry and wet waste during door-to-door waste collection process.

More than 30 vehicles used to collect the waste from different places and it was brought to the treatment plant, where the liquid waste is separated from the solid waste and it is converted to compostable materials through wind dry system.

With the help of Sewage Treatment Plant, Door to Door Advertisement campaign and best out of waste workshops, the municipality achieved significant recognition.

Awards and Recognition because of collective efforts for effective waste management

- In March 2019, Petlad Municipality achieved ODF++ status from the Urban Development Ministry, Government of India and also achieved the first rank in Gujarat in Swachh Sarvekshan, 2019 and 59th place in the country.
- In April 2019, it received 'HUDCO Award for Best Practices' to improve the living environment under the theme of sanitation from Housing and Urban Development Corporation Limited. The activity selected for the final nomination and award was 'Collection of used sanitary napkins and diapers on phone call and disposed of them scientifically'.
- In 2020 as well, Petlad municipality achieved ODF++ status and the Best Municipality award for Decentralized Solid Wate management under Janagraha City Governance Awards.
- Apart from that, in several areas like Slum Rehabilitation, Recycling Project, Environment conservation, Innovation and Best Practices the municipality was recognized.
- As per the compliance status report of Gujarat state submitted to National Green Tribunal in 2019, Petlad achieved 100% door to door collections and 99% waste segregation at household level and also 98% of wet, dry, sanitary hazardous waste processing was achieved.
- In Swatchhta Survekshan 2020, for the 2nd time. the ULB achieved the first rank in 'Innovation and Best Practices' (population between 50,000 to 1,00,000 category) in Gujarat and 19th rank in waste zone.

Methodology

The case study has been written based on unstructured interviews conducted with a couple of municipal officials with the support from the present Chief Officer. Some important insights which are mentioned here, were captured from the conversation with them. A few residents were also contacted to capture their insights as well regarding benefits they observed.

Key Observations from the Conversations

One key factor which came out in common through interactions with officials was the replacement of public places dustbins with door-to-door garbage collection. The chief officer at the time of campaigns during 2018-19, initiated several activities by considering the problems faced by the supervisors, standing at the on-ground places during

behavioral challenges and collecting feedback from citizens. The initiatives motivated the employees of sanitary and waste collection sections to make extra efforts for the desired support from the citizens. The new equipment has also been purchased for STP plant and renovation of toilet facilities is underway according to the sanitary inspector.

The citizens and beneficiaries, when asked about how Petlad municipality efforts changed the outcomes replied that the impactful change was visible and it started getting eyeballs after the chief officer Ms. Hiral Thaker was appointed. The problem of waterlogging and dumping of waste at public places was resolved significantly according the experience of residents.

The new STP plant which was established to segregate and recycle waste and to generate fuel from waste and operate waste collection vehicles with the same fuel was the game changing exercise, according to the residents. They also shared a common observation that the cleanliness is still maintained in general after the new chief officer was appointed and Petlad is not amongst the top ranks as earlier but it is undoubtedly the best performing ULB in the Anand district.

Conclusion:

All the Nagarpalikas were visited at least once and the interaction was done primarily with the official who was instructed by the chief officer or the chief officer himself. It was observed that amongst all the visits to different ULBs, Petlad officials were prompt and keener to assist regarding providing the necessary information. It was also observed that institutional leadership played a vital role in identification of the problem and solving it with the support of the community. Hence, these two factors institutional leadership and participation of community or citizens in the development were the major factors which were found to be the major causes behind the achievements. However, to which extent these factors can affect the performance of the ULBs be a subject for further research.

There may be several other factors as well which might not be considered either by officials or in the researcher's observation, which can be considered for further research.

To maintain the involvement of citizens more often and in continuity, the municipality needs to capitalize on digital infrastructure and mobile governance for a greater number of services offered.

It would be suggested to other municipalities of Anand, to adopt the best practices which are already tested and results proven.

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Accreditation Matters: A Systematic Literature Review of Quality Standards in Higher Education.

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Abstract

Ensuring quality assurance in the higher educational landscape has become a global priority, with accreditation identified as a key ingredient for maintaining and advancing educational standards. Accreditation contributes to quality standards by setting benchmarks and providing a structured framework for the evaluation and improvement of educational offerings. The Systematic Literature Review (SLR) paper explores the role accreditation has in enhancing quality in higher education institutions. The paper integrates insights from 849 scholarly articles sourced from Emerald and Science Direct databases. By examining diverse articles, it investigates how the accreditation framework impacts higher educational institutions' quality practices in academic performance and organizational quality, focusing on its role in promoting accountability and continuous improvement in educational outcomes.

The analysis discloses three key themes: Identification of principal research topics related to accreditation in higher education. analysis of accreditation as a driver in enhancing quality standards in post schooling education, and search for strategies to overcome challenges faced by higher educational institutions. This paper also pinpoints key challenges higher educational institutions face, including the requirements for adapting accreditation processes to accommodate fast-evolving educational scenarios and the demand for a transparent accreditation system.

Keywords: ***Accreditation, Higher Education, Quality***

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In summary, this review underscores the crucial influence of accreditation in higher education for developing quality assurance guidelines and supports detailed understanding into the best practices and methods for institutional quality enhancement. Future recommendations based on research focus on the exploration of connection between accreditation and educational performance, new approaches to accreditation, cross-cultural studies, and longitudinal studies of accreditation.

Introduction

Quality assurance sets the standards and accountability on the part of educational institutes. Its success is dependent on several factors including stakeholder's involvement, accreditation process effectiveness, and internal-external quality assurance dimensions. Out of all these criteria accreditation has prime role by offering a structured approach in evaluation of educational services. It is a tool through which transparency, accountability and ongoing improvement can be promoted and helps in strengthening the credibility and goodwill of HEIs. Accreditation processes vary across countries, regions, programs, and institutions, based on differences in educational systems, economic conditions, regulations, and cultural priorities. Thus, accreditation is defined as a process involving rigorous evaluation of academic programs based on factors like faculty credentials and experience, student support services, research and development opportunities, infrastructure, industry, and academic collaboration, an adaptation of green practices, etc. which collectively contribute to maintaining benchmarks of excellence and prepare students for the demands of global economy. One significant theory to consider here is of institutional isomorphism. Institutional isomorphism is the process through which institutions or organizations become homogenized over time. The concept introduced by (DiMaggio and Powell, 1983) was addressed through ground-breaking work by John Meyer and Brian Rowen, and Paul DiMaggio and Walter Powell as sociological institutionalism, an influential theory. Traditionally it was focused on explaining the similarity but after DiMaggio and Powell's work it focused on homogenization via the concept of isomorphism. Once the organizations models are institutionalized its leads to more and more similar. Accreditation act as ensuring the standards in higher education by ensuring that each institute has similar quality outcomes. The key to success or failure of institutional isomorphism is how closely its homogenized or diverge. If its homogenized it results into similar development models of institutions. But if it diverges then quality

outcomes in organizations will be different and subjective. The literature is majorly focused from U.S. and adaption of same by India, reflecting the standard accreditation systems and research output but lacks the generalizability as it cannot be similar for the world economy with emerging accreditation framework. This paper on literature review explores the multi-dimensional role of accreditation focusing on its impact on quality assurance, accountability of institutions, and educational outcomes.

Quality Assurance and Institutional Accountability:

According to (Mallikarjun and Naikar, 2023) accreditation ensures high standards and continuous growth by evaluating academic programs, faculty, student services, and infrastructure, thereby enhancing the credibility and goodwill of institutions. As per the research by (Tserendorj and Galindev 2024), external accreditation unveiled issues of inadequate involvement of stakeholders (employers and graduates) in designing courses and program improvement, universities tend to use accreditation activities merely as a tool to meet requirements rather than integrating them into the system, poor integration of courses and need to support students' participation in academics. From the research of (Mallikarjun and Naikar, 2023) through recognition of qualifications by accreditation it smoothens the student's migration and supports the institutions and employers by making degree more acceptable. According to (Duarte and Vardasca, 2023) accreditation has a significant role in enhancing quality standards by meeting the required defined standards. The review highlights that accreditation varies across countries and they promote competition, customer satisfaction, and transparency. Higher education institutes must adhere to established criteria and collaborate with accrediting bodies to smoothen the process.

Continuous Improvement and Innovation:

According to (Japee's, 2024) research explores the current state of quality in accreditation and identifies the areas of improvement that need to be addressed to enhance accountability and quality in higher education. This involves balancing standards, innovation, and ethics to ensure the holistic development of educational institutes. As per the research by (Tserendorj and Galindev, 2024) higher education institutions (HEIs) are encouraged to integrate quality assurance activities into their systems rather than using them just as a tool to fulfill accreditation criteria. This integration supports continuous improvement and innovation in educational services.

According to (Zhang, 2024) focuses on teacher accreditation standards, outlining methods and processes intended to improve the overall quality of education.

Enhancing Institutional Credibility and Reputation:

As per (Mallikarjun and Naikar, 2023) accreditation institutions benefit from enhanced credibility and reputation, as it provides a mark of approval. This recognition is crucial for student migration and validation by other institutions and employers. According to (Dr. Arvind Siddapuram *et al*., 2024), explore the increasing demand for higher education in India, specifically in Engineering Institutions for maintaining quality standards. It particularly emphasizes NAAC and NBA as tools for ensuring quality in education.

Global Perspectives and Challenges:

According to (Parscale et al., 2022) the accreditation process varies across countries and regions, with some systems being more effective than others. The United States has a well-established accreditation process and serves as a model for quality improvement. The accreditation system is diverse and dependent on several factors making it complex and difficult. No single system has exact outcomes. According to (Duarte and Vardasca, 2023) challenges related to bureaucratic burdens and the complexity of accrediting new and innovative courses can hinder the process. Institutions must work closely in collaboration with accrediting bodies to streamline processes and meet all necessary criteria.

While accreditation is key to enhancing the quality of educational outcomes, it is not without any challenges and limitations. Some higher educational institutes look at it as just a compliance aspect and don't consider the essence of true improvement in the educational landscape. Additionally, current research in the field of accreditation often fails to notice its role in supporting adaptable institutional practices that respond to the rapidly evolving digital learning environment. Furthermore, the bureaucracy in the process, political influence, and a lack of transparency in accreditation criteria can be challenging and result in time-consuming and resource wastage, especially for new institutions applying for new courses or newly launched program.

Given these gaps in existing literature, the research aims to answer the following Research Questions:

a) What are the main themes being researched around accreditation in higher education?

b) What are the principal research topics related to accreditation in higher education?

c) How does accreditation impact the quality development efforts in higher educational institutions globally?

d) What are the strategies to overcome higher educational institutions' challenges in accreditation?

The research paper explores the accreditation as a driver in improving the quality of education by analyzing its impact on internal practices, academic performances, and stakeholders (students, parents, teachers, policymakers, employers, industries, government, etc.) confidence. By analysis of findings from a comprehensive review of 849 research papers from databases like Emerald and Elsevier Scopus, the research provides a detailed understanding of accreditation's multi-dimensional role in quality assurance, identification of best practices, and giving recommendations for future research and policy decisions for higher education to effectively address the divide between the academics and corporates.

Theoretical framework:

Accreditation is a structured way to evaluate whether educational institutions and programs meet agreed-upon quality standards. The accreditation process is a benchmark for maintaining educational standards, promoting learning organizational culture, continuous improvements, and enhancing institutional reputation. According to (Accreditation for Universities, 2024) Accreditation can be broadly classified into two categories namely institutional accreditation where the institution is evaluated on different parameters while the other category of accreditation focuses only on programmatic evaluation known as programmatic accreditation. According to (Accreditation for Universities, 2024; EQAC ACCREDITATION - Accreditation of Educational Institutions, 2024; Ryan, 2024; and Accreditation Standards: Definition, Principles and Key Areas, 2024) Accreditation is important for quality assurance, trust and credibility, access to funding, and continuous improvement. Accreditation standards are thus crucial in setting the benchmark against which an organization or program will be evaluated. The accreditation standards are defined based on different reasons, such as regulatory body and framework, country, region, industry requirements, students' expectations, government guidelines, parents' requirements, changing job roles, etc. Thus, accreditation standards depend on institutional integrity, mission and objectives, teaching and learning quality, student support services, and faculty qualifications, which are key areas to consider when evaluating higher educational institutions.

According to (Accreditation Standards: Definition, Principles and Key Areas, 2024; Ryan, 2024) accrediting bodies are responsible for the development of standards, conducting evaluations, and granting accreditation status. These organizations are been often recognized and approved by the government's national educational departments or other relevant authorities to ensure credibility, trust, and power. Their key role is to provide higher standards and to motivate institutions to focus on achieving excellence through the fulfillment of requirements with established criteria. Hence, accreditation is crucial for bringing quality and standard, it also faces challenges related to innovation, cost, and equity. So, maintaining the balance between rigorous standards, flexibility, and innovation is a key consideration for accrediting bodies.

Research Methodology:

The review paper is based on the main goals presented through Research Questions (*RQ)*in the introduction section. The paper followed a well-defined approach where first, the identifying of the data source. The 'Emerald Insights' and 'Elsevier Scopus' datasets were chosen for the literature search. Secondly, it was decided to use the PRISMA protocol for a systematic literature review, (Selcuk, 2019). Thirdly, content-based research was conducted to analyze the content of the papers relevant to the role of accreditation in enhancing quality standards in higher education. Based on data, synthesis of inclusion and exclusion criteria, findings have been presented. Lastly, the ways to face the challenges of accreditations have been described.

According to (Guo et al., 2019; Monge and Soriano, 2023) Co-occurrence analysis is a technique for analyzing keywords through the initial data of selected publications with which all essential words may be viewed in a search field with its co-occurrences, by (Secinaro et al., 2022; Monge and Soriano, 2023). The first research question **(RQ1)**, which discovers the major topics related to accreditation in higher education, was addressed using co-occurrence analysis. As noted by Škare et al. (2022) and Monge and Soriano (2023), co-occurrence analysis of keywords—particularly within article abstracts—helps reveal thematic clusters. Each cluster represents a distinct, non-overlapping group of related terms that frequently appear together. The simultaneous presence of these terms within the abstract resulted in the formation of different clusters. The degree of interconnectedness among different terminologies was evaluated based on the frequency of their co-occurrences. The VOS viewer software serves to establish relationships and visualize scholarly literature derived from the emerald insights

and Elsevier Scopus databases. The VOS viewer software can illustrate the evolution and emerging publication patterns within a specific academic discipline over time. According to (Biggi and Giuliani, 2020; Monge and Soriano, 2023), the software helps to identify key terminologies and to analyze their co-occurrences across the entire corpus of articles (799) through the investigative process. The final result of this analysis is the grouping of terms into clearly defined prime themes contributing to cluster formation which are explained in detail in the next section.

The PRISMA Framework and the Systematic Literature Review (SLR) Approach.

According to (Moher et al., 2015; Monge and Soriano, 2023) a Systematic Literature Review (SLR) was carried out to understand the role of accreditation in higher education using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. A systematic review was performed to identify relevant literature related to the role of accreditation in enhancing the quality of higher education and a summary was presented, fairly and rigorously, by (Chaudhary et al. 2021; Monge and Soriano, 2023) to identify boundaries of existing research and potential for future research. The following section highlights the methodology in a step-by-step format based on the PRISMA flow chart illustrated in the identification, screening, eligibility, and inclusion stages.

Identification Stage: The identification stage includes database selection, search strategy, and results section which is described below:

a. **Database Selection:** The database selected for the analysis was from Emerald insights and Elsevier Scopus because of its extensive collection of peer-reviewed research articles on accreditation, quality assurance, and higher education.
b. **Search Strategy:** The search was based on keywords identified related to the accreditation. The search string used was “Accreditation” and “Quality” and “Higher Education Institutions” for all open-access research articles from years 2014-2024 to capture recent advancements in accreditation practices, including digital learning standards and global harmonization efforts. Both databases were searched using advanced filters for peer-reviewed articles, journal papers, research articles, review articles, and conference abstracts.
c. **Results*:*** The preliminary search produce a total of 849 articles. (Total of 334 articles from Emerald insights and 515 articles from Elsevier Scopus

databases). These articles were exported to Systematic Review aid Rayyan.

Screening Stage: The screening stage includes two steps namely duplicate removal and title and abstract screening which are explained below:

a. **Duplicate Removal:** A total of 50 articles found to be duplicates were identified and removed using the Rayyan feature. This left 799 unique articles for further screening.
b. **Title and Abstract Screening:** Further screening was done on 799 remaining articles to assess their relevance. Only articles meeting inclusion and exclusion criteria were included in literature review.

Inclusion Criteria:

- The research was based on how the accreditation drives the quality of higher education, using government and industry standards. All study designs (quantitative, qualitative, or mixed) were included.
- Research based on how accreditation affects quality assurance in higher education and builds stakeholders' trust.
- The articles discuss regional or international variations in accreditation practices. The general population for the study includes higher educational institutions from any country or location irrespective of its size, number of students, or programs.
- Research studies related to the evaluation or ranking of higher educational institutions.

Exclusion Criteria:

- The research study focused on K-12 or schooling education.
- Studies relevant to accreditation or evaluation for vocational or technical training programs as they focus on industry-specific certifications rather than the broader academic accreditation framework.
- Papers related to the program accreditation rather than institutional accreditation.
- The studies related to quality improvement did not address accreditation.
- Research-based solely on internal quality evaluation such as faculty, students, employers, policymakers, industries, etc. unless linked to accreditation.

Eligibility Stage*:* Eligibility was determined through three stages: comprehensive full-text review, application of selection criteria, analysis of screening process.

a. **Full-Text Review:** A total of 85 full-text research articles that passed the title and abstract screening were

retrieved for in-depth study. Each article was evaluated against the predefined inclusion and exclusion criteria. Articles that did not present empirical evidence or failed to offer a detailed examination of accreditation practices related to improving quality in higher education institutions were excluded.

b. Inclusion and Exclusion Criteria: The inclusion and exclusion of research articles

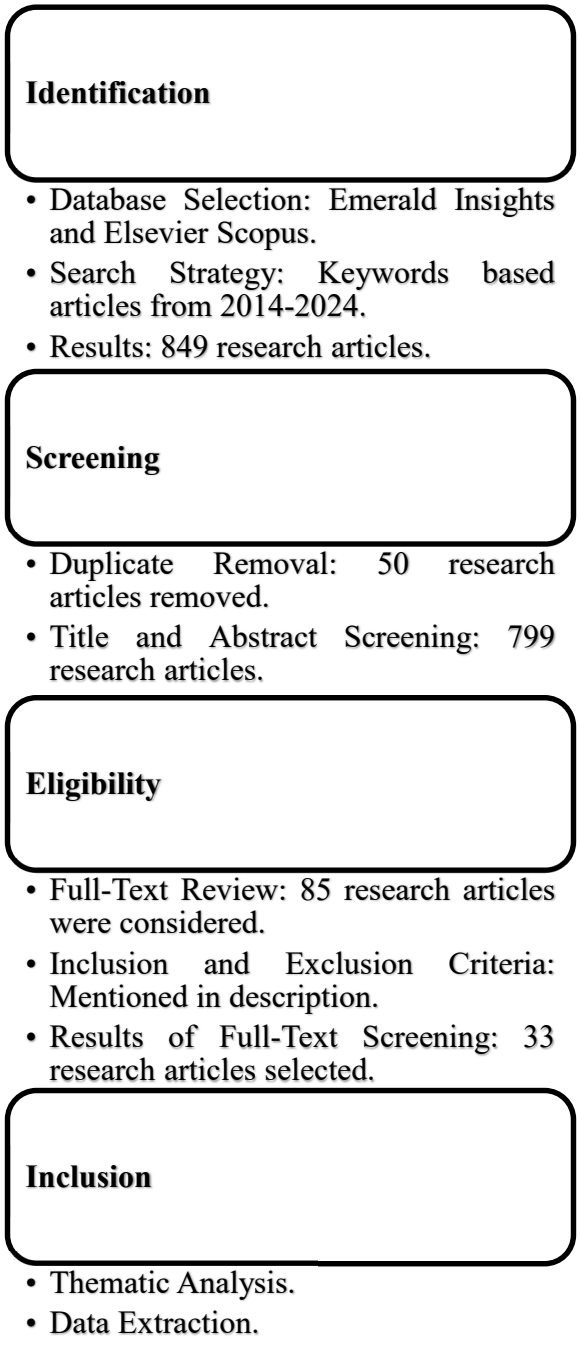

Figure 1: Systematic Literature Review Methodology Using PRISMA Flow Diagram

in full-text review was also based on above mentioned criteria only.

c. **Results of Full-Text Screening:** After full-text review, **52 articles** were excluded based on the above criteria. This left a final pool of **33 articles** for inclusion in the systematic review.

   Inclusion Stage: The 33 articles selected for the systematic review were analyzed thematically. Data extraction focused on identifying the following:

   a. The role of accreditation in enhancing the quality of higher education.
   b. The principal themes related to accreditation in HEIs.
   c. Effect of accreditation on quality development efforts and stakeholders.
   d. Challenges & strategies related to HEIs in accreditation.

Results & Discussion:

RQ1: What are the principal research themes related to higher education accreditation?

The primary research topics related to accreditation in higher education include quality assurance and standards, globalization and internationalization, service quality, and institutional reputation, curriculum and program development, stakeholder engagement and satisfaction. According to (Rafique et al., 2023; & Rivza et al., 2015) accreditation is considered a standard or benchmark for ensuring academic excellence. It is a mechanism to maintain and enhance the quality of education. As per (Chui et al., 2016; Yeravdekar and Tiwari, 2014) accreditation processes are different all around the world and depend on the government, country, accrediting agencies, etc. The role of globalization and internationalization is again a key factor shaping higher educational quality. As higher educational institutions strive to get global accreditation and face stiff competition at the international level accreditation becomes a significant factor in aligning with global standards and practices. According to research by (Chui et al., 2016; Yung et al., 2024) higher educational institutions continuously strive in the global market and are hence required to give due weightage to the fulfilment of stakeholders' expectations. Primarily satisfaction of students' expectations is of utmost importance as

they are the direct users of the educational services. Accreditation is linked with quality enhancement and institutional goodwill. It is seen as a medium to improve its reputation and by which educational institutions can appeal to prospective stakeholders and students making it attractive. A study by (Rafique et al., 2023; Anafinova, 2020) describes how curriculum designing and program development are being impacted by accreditation. Higher educational institutions are required to be relevant in terms of fulfilling the expectations of students and stakeholders which in turn demands timely updating of courses and curriculum to meet the evolving industries' requirements. According to (Thompson-Whiteside, 2016; Yung et al., 2024) accreditation also relies on the satisfaction of various stakeholders namely students, alumni, and employers. By catering to the expectations of different stakeholders' educational institutions ensure that they are responding to their needs and requirements of them resulting in overall satisfaction and a fulfilling experience. Moreover, the co-occurrence analysis was carried out using VOS viewer to identify the recurring keywords related to accreditation, quality, and higher education. The resulting output presented four different clusters denoted in different colours described below.

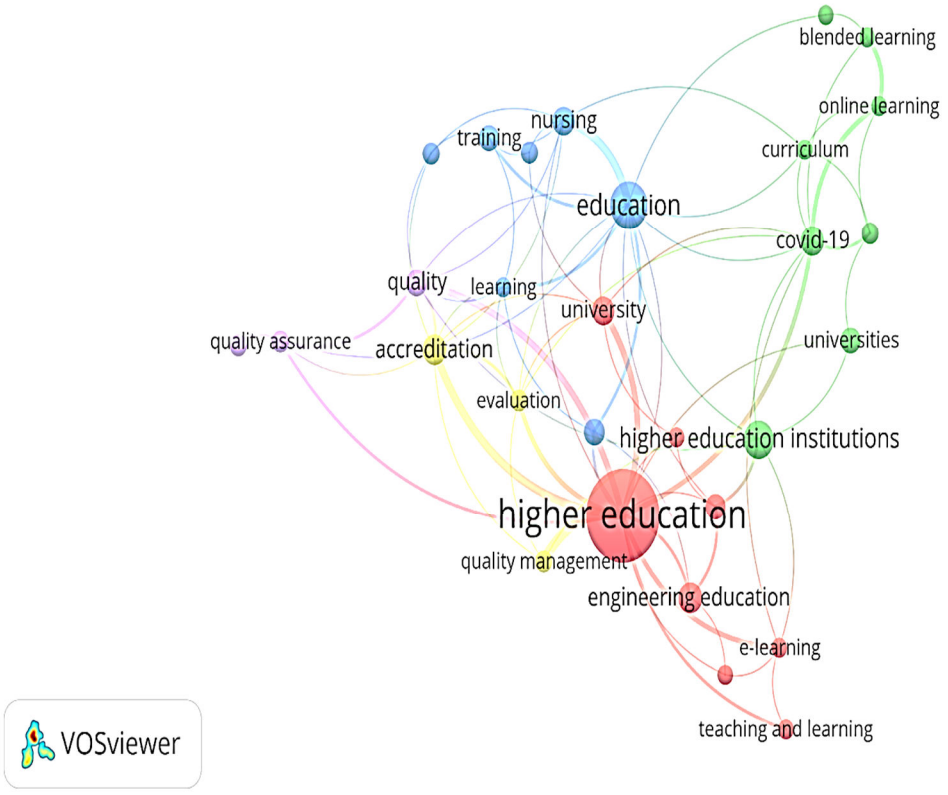

Figure 2: Co-occurrence analysis of Accreditation and Quality Assurance in Higher Education.

Cluster 1: Higher Education Curriculum and Learning.

The cluster highlights the key terms related to higher education and includes 'quality', 'quality assurance', 'university', 'higher educational institutions', 'engineering education', 'e-learning' and 'teaching-learning'.

Cluster 2: Institutional and Educational Impact.

The next cluster focuses on organizational and institutional areas of accreditation processes which includes 'education', 'learning', 'training', 'nursing'.

Cluster 3: Engineering Education and Specialized Fields.

Another cluster focuses on 'engineering education', linking it with 'nursing' and 'trading'. The cluster is discipline focused targeting accreditation in technical or professional fields.

Cluster 4: Covid-19 Influence.

The cluster encompasses terms like 'universities', 'curriculum', 'online-learning' and 'blended-learning' which got impacted by Covid-19.

RQ2: How does accreditation impact the quality development efforts in higher educational institutions globally?

According to (Rafique et al., 2023) accreditation has a significant role in quality development efforts for higher educational institutions. It helps enhance academic quality as educational institutions are required to meet specific quality benchmarks, which improves the quality of education and brings better experience and academic integrity. This is of utmost need for continuously improving educational standards in university education. Even accreditation supports higher education institutions in creating synergy with international benchmarks and criteria for quality, thus enhancing their global image and making them competitive. According to (Ebekozien and Aigbavboa, 2022) the alignment of higher education with the world market is quintessential as it attracts students and faculty from India and the world and nurtures educational institutes to collaborate globally. Even accreditation is crucial for program and curriculum development. As per (Rafique et al., 2023), accreditation necessitates those academic institutions review and update their curriculum to meet the evolving demands of industries. This will help educational programs and courses to be all contemporary fulfilling global requirements and help in improving graduates' employability. Focusing on accountability and excellence benefits the students and results in a stronger educational

ecosystem, ensuring institutions are more responsive to evolving societal and economic challenges. Accreditation also impacts winning the confidence and trust of stakeholders, including students, teachers, parents, employers, and policymakers, by ensuring they meet the required standards. According to research by (Zhang and Patil, 2017; Ebekozien and Aigbavboa, 2022), trust is of key importance as it brings credibility and legitimacy to educational institutions, which helps in student enrollment and institutional reputations. According to (Rafique et al., 2023) support accreditation will help in maintaining rigorous quality standards to make institutions sustainable to educational excellence. Accrediting and maintaining quality standards will not only be advantageous to institutions but also develop a culture of continuous improvement, encouraging academicians to innovate and adapt their teaching methods to serve students better. Despite the benefits, accreditation also brings challenges like insufficient funding and inadequate skills. Another view by (Rafique et al., 2023) is that accreditation processes are getting multi-disciplinary and include academic and administrative processes for holistic quality development efforts.

RQ3: What are the strategies to overcome higher educational institutions' challenges in accreditation?

Higher education accreditation brings challenges and barriers, institutions are required to adopt strategies to overcome the same. According to (Ebekozien and Aigbavboa, 2022) universities and higher educational institutions must have strategic planning and optimum utilization of scarce resources to address funding challenges. This requires setting clear goals and an integrative approach to resource usage to meet accreditation standards effectively. Furthermore, curriculum design and staff-student ratio are also a challenge. Curriculum once designed with errors leads to implementation issues. The curriculum should focus on bringing synergy between academics and corporations with the fulfilment of industry requirements. Even the staff-student ratio needs to be managed to bring quality to education. Another strategy is to adopt multidisciplinary approaches. An interdisciplinary approach means integrating different academic disciplines to provide detailed educational programs that align with accreditation standards. According to (Rafique et al., 2023) another crucial strategy is to create a robust internal and external quality assurance system. These systems will lead to continuous improvement and compliance with accreditation criteria to maintain educational standards. By continuous focus on improvements through updating curricula and internal evaluations,

institutions can remain relevant in equipping students with the competencies needed to succeed in the professional world. In contrast, external quality assurance mechanism such as peer reviews and accreditation audits, provide an objective assessment of educational institutions. As per (Zhang & Patil 2017) higher education institutes should win the confidence of their stakeholders by building trust and confidence. Accreditation achievements and quality standards should be communicated to enhance credibility. Communication on accomplishments can be done through regular reports, open forums, and collaborative initiatives that involve all stakeholders in the educational process. According to (Zhang & Patil, 2017) provide insights on addressing funding challenges and better utilization of resources. Financial resources can be optimized through a collaborative approach with industry and government. Through leveraging finance through collaboration higher education institutions can focus on long-term growth. As per (Thompson-Whiteside, 2016) suggests a strategy for governance and bringing transparency to decision-making to address local requirements and enhance performance. Governance plays a key role in the accreditation process and promotion of long-term sustainability. According to (Ebekozien and Aigbavboa, 2022) focus on the continuous professional development of teachers and staff members with skills needed to deliver high-quality education and fulfil accreditation requirements. The investment in skills development empowers the employees to stay abreast with current market trends along with being more knowledgeable in their respective fields of study. This in turn led to the creation of innovative leaders who inspire future generations.

Thus, the above strategies collectively contribute to addressing the difficulties faced by higher education in achieving accreditation, ultimately improving the standards of quality and educational outcomes.

Future Scope of Study:

Further studies should be based on establishing a direct correlation between accreditation and improvements in educational outcomes, such as students' career development, employability, and success. Understanding the relationship between accreditations and improvements can bring tangible benefits to accreditation. According to (Smith & Jones, 2020; Thompson et al.,2 019), explore the variations in accreditation standards across different regions and their impact on higher educational institutions' performance. As the markets and economy are advancing which

demand new skills and accreditation should incorporate the same. New and innovative approaches to accreditation should have consideration of digitalization and global trends. Even it also includes virtual and non-traditional educational providers. These enhancements not only result in ease of access but also ensure accreditation is apt and relevant in the digital world. As the world has become a global village attention must be given to accreditation across different cultural and international studies developing an understanding of how different regions implement accreditation. By welcoming such initiatives of global accreditation higher education institutions can very well integrate accreditation processes with global best practices, ultimately contributing to quality enhancement and the development of trust among stakeholders. Furthermore, longitudinal studies in explores accreditation impact on educational quality and drives innovation in university education.

Another major future research can be on institutional isomorphism of accreditation resulting into homogenized and divergent organizational development. The limitation of the research is it considered the accreditation systems of U.S. as benchmark and under presented the emerging accreditation frameworks which can significantly contribute in higher education quality. So the further research can be focused on studying the similarity and difference of accreditation and from developed framework to developing framework too. Accreditors should also develop the standard framework for digital learning environment to ensure the quality of outcomes (Lee & Kim, 2023).

Conclusion:

The literature paper titled “Accreditation Matters: A Systematic Literature Review of Quality Standards in Higher Education.” intends to examine the multidimensional approach of accreditation on educational quality. Utilizing the PRISMA framework, this paper study identifies, screens, and analyses the relevant literature from prominent academic databases, specifically Emerald Insights and ScienceDirect, covering a time frame from 1st January 2014 to 15th October 2024. The initial search yielded 849 articles based on the keyword combination “Accreditation" AND "Quality" AND "Higher Education Institutions." After the removal of 50 duplicate articles, the remaining 799 articles were the subject of application criteria. The inclusion criteria and exclusion criteria were applied and inclusion criteria focused on internal quality assurance processes, regional and international accreditation, and the role of accreditation in quality enhancement. The exclusion criteria were to filter out research on studies related

to K-12 education and vocational training and papers that do not focus on accreditation. Finally, 33 articles were considered for final synthesis, revealing critical insights into accreditation's role in the quality enhancement of higher education. Through detailed analysis, the paper underscores the important role of accreditation in promoting quality standards in higher education, while giving future areas of further research.

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