PREFACE TO THE EDITION

It is with great pleasure that we present the latest issue of the **International Journal of Commerce and Management Research Studies (IJCMRS)**. This edition encapsulates a diverse range of contemporary research topics that reflect the dynamic and multifaceted nature of commerce and management disciplines. The articles included herein showcase the profound insights and innovative methodologies employed by researchers to address pertinent challenges and opportunities in these fields.

The issue opens with a comparative study of fee structures in online and distance education, focusing on Mahatma Gandhi University and other leading Indian universities. This study provides valuable guidance for prospective students navigating the complexities of flexible learning environments.

Next, an insightful exploration of ethical marketing practices in the digital age highlights their pivotal role in shaping consumer perceptions and fostering brand loyalty. Utilizing advanced structural equation modeling techniques, this research underscores the importance of transparency, data privacy, and sustainability in contemporary marketing strategies.

The transformative impact of artificial intelligence on financial decision-making is analyzed from a fintech perspective, revealing the profound enhancements in decision speed, accuracy, and quality. This article also thoughtfully addresses the challenges of algorithmic bias and regulatory compliance in the digital financial landscape.

In the context of regional economic shifts, a comprehensive study of Kerala's pre-owned car market delves into post-pandemic trends, challenges, and future prospects. The research offers actionable insights for stakeholders in this evolving industry.

Finally, the nexus between millets and government policies is examined through a bibliometric mapping approach. This study emphasizes the critical role of millets in achieving Sustainable Development Goals, particularly in addressing food and nutrition security challenges.

This issue of IJCMRS is a testament to the dedication and scholarly rigor of the authors, who have contributed significantly to advancing knowledge in commerce and management research. We extend our gratitude to the reviewers for their valuable feedback and to our readers for their continued support and engagement.

We hope this collection of articles inspires further academic inquiry and practical applications in the diverse domains of commerce and management.

Dr. M. M. Bagali
Chief Editor

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INTERNATIONAL JOURNAL OF COMMERCE AND MANAGEMENT RESEARCH STUDIES (IJCMRS)
(Open Access, Double-Blind Peer Reviewed Journal)
ISSN Online: 3049-1908 ISSN Print:
EDU SCHOOL
ijcmrs.com

Comparative Analysis of Fee Structures in Online and Distance Education: A Study of Mahatma Gandhi University and Select Indian Universities

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Article information

Received: 22nd April 2025
Received in revised form: 2nd May 2025
Accepted: 3rd June 2025
Available online: 26th June 2025

Volume: 2
Issue: 2
DOI: https://doi.org/10.5281/zenodo.15737433

Abstract

This comparative report presents a comprehensive analysis of the fee structures and key features of online and distance education programmes offered by Mahatma Gandhi University (MGU) and other prominent Indian universities. The study focuses on six academic programmes—MBA, M.A. in English, B. Com (Honours), M. Com, BA and BBA—each analysed across multiple institutions to highlight variations in cost, delivery modes, specialization options, and learner support systems. The report is intended to guide prospective students in selecting appropriate programmes based on financial considerations, learning preferences, and academic goals. Findings reveal that while MGU offers regionally accessible and moderately priced programmes with quality academic support, institutions like IGNOU and Annamalai University remain leaders in affordability. Conversely, private universities such as Amity and LPU Online offer premium services at higher costs. The report concludes that aligning institutional offerings with student priorities—such as cost-effectiveness, infrastructure, or specialization—is essential in optimizing the value of higher education pursued through flexible learning modes. The methodology employed includes a comparative analysis based on secondary data, primarily sourced from official university websites, and programmes brochures. The entire report has been prepared using AI tools to synthesize the findings.

Keywords: Online Education, Distance Learning, Fee Structure Comparison, Higher Education in India, Flexible Learning Modes

I. COMPARATIVE REPORT OF MBA (ONLINE/DISTANCE MODE) PROGRAMME

1.1. Overview

The Master of Business Administration (MBA) is one of the most sought-after postgraduate degrees in India, offering diverse career opportunities in management, entrepreneurship, and leadership. With the increasing demand for flexible education, several reputed universities have launched Online and Distance MBA programmes, making higher education accessible to a wider audience, including working professionals and remote learners. This comparative report presents a detailed analysis of the fee structures, mode of delivery, and key features of MBA programme offered via Online and Distance Education by Mahatma Gandhi University (MGU) and other prominent Indian universities. By comparing factors such as total cost, duration, and value-added features, the report aims to assist prospective learners in making informed decisions aligned with their academic goals and financial considerations.

Table 1: Comparative Report of MBA Programme (Online/Distance Mode)

University	Mode of Delivery	Duration	Total Fee (INR)	Fee per Semester	Remarks
Mahatma Gandhi University (MGU), Kerala	Online	2 Years (4 Semesters)	₹100000,000 (approx.)	₹25,000	Offers MBA via School of Distance & Online Education. Specializations vary.

IGNOU (Indira Gandhi National Open University)	Distance & Online	2 Years	₹62,000 (Distance) / ₹58,000 (Online)	₹15,500 (Distance) / varies (Online)	UGC-approved. AICTE recognition for Distance MBA.
Sikkim Manipal University (SMUDE)	Distance	2 Years	₹85,000	₹21,250	Well-structured virtual classes and exam support.
Annamalai University – DDE	Distance	2 Years	₹31,500	₹15,750	Among the most affordable; less emphasis on digital resources.
Amity University Online	Online	2 Years	₹1,41,800	₹35,450	High-end LMS, global exposure, extensive industry interface.
ICFAI University (Flexible Learning)	Distance	2 Years	₹65,000–₹75,000	Varies	Multiple specializations; reputation in business education.
Lovely Professional University (LPU Online)	Online	2 Years	₹1,02,000	₹25,500	UGC-DEB approved, interactive content, proctored online exams.

1.2. Observations

- MGU provides a moderately priced MBA option with flexible online learning.
- IGNOU remains the most economical national-level provider, ideal for affordability and reach.
- Amity and LPU offer premium experiences with tech-integrated platforms and career services.
- Annamalai University is suitable for those seeking low-cost options with traditional learning materials.

1.3. Recommendations

For budget-conscious learners seeking a recognized degree, IGNOU stands out as the most affordable option, offering a national-level reputation with flexible study options at a low cost. It is ideal for students who prioritize affordability without compromising on the credibility of their degree. For learners based in Kerala or those seeking a regionally accessible MBA programme, Mahatma Gandhi University (MGU) offers a quality education with the convenience of online delivery. The moderately priced programme provides a solid academic foundation, making it an excellent choice for students in Kerala and nearby areas. For students looking for a technology-rich MBA experience with industry exposure, Amity University Online and Lovely Professional University (LPU Online) provide advanced learning management systems (LMS), placement support, and extensive corporate interfaces. These universities are suited for learners who are willing to invest in a premium education that integrates cutting-edge digital tools and career-oriented resources. For learners interested in a wide variety of specializations and a flexible curriculum, ICFAI University and Sikkim Manipal University (SMUDE) offer broad elective options and modular learning paths. These institutions are well-suited for students who want to customize their MBA journey according to their career goals and interests. Ultimately, the choice of university will depend on individual priorities—whether it's cost-effectiveness, regional accessibility, technological infrastructure, or specialization options. Each university in this comparison offers distinct advantages that cater to different student needs, making it essential for learners to align their choice with their academic, professional, and financial considerations.

1.4. Conclusion

The comparative analysis reveals that Mahatma Gandhi University (MGU) offers a cost-effective and regionally accessible MBA programme through online mode, making it an attractive choice for learners in Kerala and nearby regions. While IGNOU remains the most affordable and widely recognized provider, universities like Amity and LPU cater to students seeking a premium, technology-driven learning experience. Options like Annamalai and SMUDE appeal to students balancing cost with flexibility. Ultimately, the choice of university depends on the learner's priorities—cost, flexibility, regional preference, or technological infrastructure.

II. COMPARATIVE REPORT OF M.A. IN ENGLISH (ONLINE / DISTANCE MODE) PROGRAMME

2.1. Overview

The Master of Arts in English is a popular postgraduate degree offered in flexible formats by many Indian universities through online and distance learning modes. The following table presents a comparative overview of the total fee structure, mode of delivery, and relevant features.

Table 2: Comparative Report of M.A. in English Programme (online/distance mode)

University	Mode	Duration	Total Fee (INR)	Fee per Year/Semester	Remarks
Mahatma Gandhi University (MGU)	Online	2 Years	₹72,000 (approx.)	₹18,000 per Semester	Online lectures, continuous assessment; Official confirmation recommended
Indira Gandhi National Open University (IGNOU)	Distance	2 Years	₹12,600	₹6,300 per year	Most popular; extensive national reach; well-structured printed materials
Annamalai University	Distance	2 Years	₹7,800	₹3,900 per year	One of the lowest fees; traditional syllabus; printed materials

University of Madras - IDE	Distance	2 Years	₹9,900	₹4,950 per year	IDE (Institute of Distance Education) offers good regional support
Amity University	Online	2 Years	₹1,10,000	₹55,000 per year	Interactive LMS, live sessions, mentorship, EMI options available
Lovely Professional University (LPU)	Online	2 Years	₹72,000	₹36,000 per year	Modern online delivery, projects, recorded/live sessions
University of Mumbai (IDOL)	Distance	2 Years	₹9,000	₹4,500 per year	Available to Maharashtra learners primarily

2.2. Observations

- MGU's Online MA in English offers a mid-range fee with the benefits of flexible learning, digital content, and university credibility.
- IGNOU and Annamalai University continue to be most affordable, especially for budget-conscious learners.
- Private universities (Amity, LPU) offer modern platforms, flexibility, and student services at significantly higher fees.
- Universities like Mumbai (IDOL) provide a balance of affordability and regional accessibility.

2.3. Recommendations

For budget-conscious learners, IGNOU and Annamalai University are the most cost-effective options. Both universities offer highly affordable fee structures while providing a standard curriculum and printed study materials. These institutions are ideal for students seeking a traditional distance learning experience without a heavy financial burden. For learners based in Kerala, Mahatma Gandhi University (MGU) offers a regionally accessible and moderately priced online MA in English programme. MGU provides the convenience of online learning with flexible scheduling, making it an excellent choice for students in Kerala who prefer a reliable and affordable option. For those seeking advanced digital infrastructure and more personalized learning experiences, Amity University and Lovely Professional University (LPU) are ideal. Both universities offer excellent platforms with structured support, live classes, and mentorship, although their fees are considerably higher. These options are well-suited for students who prioritize flexibility, advanced e-learning features, and a more interactive learning experience. For working professionals, MGU, LPU, and Amity University stand out for their online modes of delivery, which allow for flexible scheduling and the ability to balance work with study. These universities offer the necessary support to accommodate the schedules of professionals who need flexibility in their learning journey. Each of these options caters to different needs, from budget-friendly choices to premium platforms with interactive learning tools, making it important for students to consider their financial situation, learning preferences, and professional goals when selecting their programme.

2.4. Conclusion

The comparative analysis of online and distance education fee structures for the Master of Arts (M.A.) in English across major Indian universities reveals a diverse range of options catering to various learner needs. Mahatma Gandhi University (MGU) stands out as a regionally accessible and moderately priced option, offering quality online learning for students in Kerala and beyond. While IGNOU, Annamalai University, and University of Madras (IDE) provide highly affordable choices with a traditional distance learning approach, private universities like Amity and LPU offer advanced digital infrastructure and personalized learning experiences at a premium cost. Thus, students can choose institutions based on their financial capacity, learning preferences, geographical location, and the level of support and flexibility they require. Overall, the growing landscape of online and distance education in India offers substantial opportunities for students to pursue a postgraduate degree in English with greater accessibility, affordability, and academic credibility.

III. COMPARATIVE FEE STRUCTURE REPORT: B.COM (HONOURS) VIA ONLINE/DISTANCE MODE

3.1. Overview

This Comparative Fee Structure Report provides a detailed analysis of the B. Com (Honours) programme offered through online and distance education modes by several prominent universities across India. The aim of this report is to compare the fee structures, programme durations, and additional features of universities such as Mahatma Gandhi University (MGU), IGNOU, Annamalai University, Amity University, Sikkim Manipal University, University of Madras, and Lovely Professional University. With an increasing number of students opting for distance and online education due to its flexibility and affordability, this report serves as a guide for prospective students in making informed decisions based on their budget, learning preferences, and the type of support they require. The universities included in this report are renowned for their academic excellence and offer various benefits, including affordable pricing, industry-oriented curricula, e-learning tools, and placement support. By comparing their fee structures, students can better assess the value offered by each institution and choose the programme that best aligns with their educational and financial needs. This analysis will help prospective students direct the vast options available for pursuing a B. Com (Honours) degree via online or distance mode, enabling them to select the best-suited programme for their academic goals and career aspirations.

Table 3: Comparative Fee Structure Report: B.Com (Honours) via Online/Distance Mode

University	Mode	Programme Duration	Total Fee (INR)	Per Year/Semester Fee (INR)	Remarks
Mahatma Gandhi University (MGU), Kerala	Online	4 years	₹1,20,000 (approx.)	₹15,000/per semester	Offers a flexible online structure with quality academic support.
IGNOU (Indira Gandhi National Open University)	Distance	3 years	₹8,100	₹2,700	Among the most affordable in India. Accredited and UGC-DEB approved.
Annamalai University, Tamil Nadu	Distance	3 years	₹9,000	₹3,000	Traditional distance learning system with printed study materials.
Amity University Online	Online	3 years	₹1,20,000	₹40,000	Industry-oriented curriculum with online resources and mentorship.
Sikkim Manipal University (SMUDE)	Distance	3 years	₹45,000 (approx.)	₹15,000	Self-paced learning with recorded lectures and student support.
University of Madras (IDE)	Distance	3 years	₹11,700	₹3,900	Long-standing institute offering robust support for distance learners.
Lovely Professional University (LPU Online)	Online	3 years	₹1,14,000	₹38,000	Modern platform with placement support and e-learning content.

3.2. Observations

- MGU's B. Com (Hons) fee is moderately priced compared to high-end private institutions and more affordable than most universities offering online infrastructure.
- IGNOU and Annamalai University remain the most economical choices for students seeking cost-effective distance learning.
- Private online universities such as Amity and LPU offer enhanced features like LMS platforms, industry tie-ups, but at a higher cost.
- State universities like Madras University maintain a balanced cost with traditional support systems.

3.3. Recommendations

For budget-conscious students, IGNOU and Annamalai University emerge as the most economical choices. These universities offer highly affordable fee structures, ensuring that students receive quality education without financial strain. Both are UGC-DEB approved and provide sufficient academic support for a fulfilling learning experience. For those seeking structured learning with moderate fees, MGU, SMU, and University of Madras (IDE) are solid options. These universities offer a good balance of affordability, academic support, and technical assistance, making them suitable for students who need a flexible yet comprehensive education. If you are looking for premium services, Amity Online and LPU Online stand out. While they come with higher fees, these institutions offer feature-rich platforms, industry-relevant curriculums, mentorship, placement support, and modern e-learning tools. They are ideal for students willing to invest more for enhanced learning experiences and career opportunities. For regional learners, particularly those from South India, MGU, Annamalai University, and University of Madras provide strong local support, with familiarity in academic and administrative systems, making them great choices for students who prefer proximity to their educational institution. Finally, for students seeking a national reach, IGNOU and LPU Online are excellent options. With nationwide recognition and a wide network of study centres or online presence, these universities provide ample opportunities for learners across India. Each of these universities caters to distinct student needs, from budget constraints to premium offerings. Students should carefully assess their personal priorities, whether it's cost-effectiveness, structured support, premium services, or regional focus, to make the best decision for their academic and career goals.

3.4. Conclusion

In conclusion, the B. Com (Honours) programmes offered through online and distance education modes by various universities in India provide a wide range of options catering to different needs and preferences.

- Mahatma Gandhi University (MGU) offers an affordable and flexible learning structure with good academic support, making it a solid choice for students seeking a balanced fee and quality education.
- IGNOU stands out as the most economical option, providing a highly affordable fee structure with nationwide recognition, making it ideal for budget-conscious learners.
- Private institutions like Amity University and LPU Online are better suited for students who are willing to invest more in premium services, including industry-relevant content, placement support, and modern e-learning tools.
- State-run universities like Annamalai University and Madras University offer a traditional distance learning system with reasonable fees and ample regional support.

Overall, the choice of university depends on the student's budget, learning preferences, and desired level of support. Those seeking cost-effectiveness should lean towards IGNOU or Annamalai University, while students looking for a structured and modern learning experience might consider MGU or SMU. Premium services and additional features can be found with institutions like Amity and LPU Online, though they come at a higher cost. Each option has its own merits, and students must assess their individual needs to make the best choice for their academic and professional goals.

IV. COMPARATIVE FEE STRUCTURE REPORT: M.COM VIA ONLINE/DISTANCE MODE

4.1. Overview

This report provides a detailed comparison of the fee structures for the Master of Commerce (M. Com) programmes offered through online and distance learning modes by Mahatma Gandhi University (MGU) and other prominent Indian universities. The report aims to assist prospective students in making informed decisions regarding their higher education choices by evaluating the costs associated with pursuing an M. Com degree from different institutions. The M. Com programmes reviewed in this report are designed to cater to a diverse range of academic and professional interests, offering specializations such as Finance, Accounting, E-commerce, and Business Policy, among others. The comparison spans a variety of factors including the overall cost of the programme, duration, specialization options, and the recognition and accreditation of each institution. By examining universities like MGU, IGNOU, Annamalai University, Sikkim Manipal University, and Amity University, this report provides a comprehensive overview that allows students to compare the affordability and quality of programmes offered by different institutions. This information is crucial for students considering pursuing their M. Com degree in a flexible, online or distance format, and seeking the best value for their investment in education.

Table 4: Comparative Fee Structure Report: M.Com via online/distance mode

University	Mode	Specialization Options	Total Fee (INR)	Duration	Accreditation & Approval
Mahatma Gandhi University (MGU)	Online	General, Commerce, Finance, Accounting, HRM, etc.	₹80,000	2 Years	UGC-DEB, NAAC A
IGNOU (Indira Gandhi National Open University)	Distance / Online	General, Finance & Taxation, Business Policy & Corporate Governance, Management Accounting & Financial Strategies	₹11,000–₹18,000	2 Years	UGC-DEB, NAAC A++
Annamalai University	Distance	General	₹8,500	2 Years	UGC-DEB, NAAC A
Sikkim Manipal University (SMUDE)	Distance	General	₹1,23,700	2 Years	UGC-DEB, NAAC A
Amity University	Online	General, Finance, E-commerce, FinTech, etc.	₹1,50,000	2 Years	UGC-DEB, NAAC A++

4.2. Observations

- MGU's Online M. Com Programme: MGU offers a comprehensive online M. Com programme with various specializations at an affordable fee of ₹80,000 for the entire duration.
- IGNOU: IGNOU provides both distance and online M. Com programmes with a range of specializations. The fees vary between ₹11,000 and ₹18,000, depending on the specialization chosen.
- Annamalai University: Annamalai University offers a distance M. Com programme at a very economical fee of ₹8,500, making it one of the most affordable options.
- Sikkim Manipal University (SMUDE): SMUDE's distance M. Com programme is priced at ₹1,23,700 for the entire duration, which is on the higher end compared to other institutions.
- Amity University: Amity offers an online M. Com programme with various specializations at a fee of ₹1,50,000, reflecting its brand value and infrastructure.

4.3. Recommendations

For budget-conscious students, Annamalai University offers the most affordable option with a total fee of ₹8,500 for the entire duration of the M. Com programme. This is an ideal choice for those looking for a low-cost education, though it may offer fewer specialization options. For students seeking a balance between affordability and quality education, Mahatma Gandhi University (MGU) provides a comprehensive online M. Com programme with a total fee of ₹20,000. This makes MGU a strong contender for those who want flexibility and a well-rounded education at a reasonable price. For students looking for a variety of specializations and a more tailored learning experience, IGNOU offers a wide range of specializations in its M. Com programmes, with fees ranging from ₹11,000 to ₹18,000. It is a versatile option that caters to different academic interests, making it a great choice for students seeking specific expertise in areas like Finance, Taxation, or Business Policy. For those who prioritize premium infrastructure and extensive student support systems, Amity University stands out. While the total fee of ₹1,50,000 is on the higher side, the extensive resources, global exposure, and specialized options make it a solid investment for students looking for a more resource-rich educational experience. Ultimately, the decision depends on the student's priorities—whether it's affordability, specialization options, or the availability of advanced learning resources. Each university offers unique benefits that cater to different needs, and students should assess their goals, budget, and preferred mode of study before making their choice.

4.4. Conclusion

The comparison of the M. Com programmes offered by Mahatma Gandhi University (MGU) and other prominent Indian universities reveals a diverse range of fee structures and programme options, catering to varying budgets and academic goals. MGU's online M. Com programme stands out for its affordability and flexibility, making it a suitable choice for students seeking a comprehensive education at a reasonable cost. IGNOU offers multiple specializations in M. Com, making it a versatile option for students with specific academic interests, at competitive fees. Annamalai University provides an extremely cost-effective distance learning option, though it may have limited specializations compared to others. Sikkim Manipal

University (SMUDE) and Amity University, while on the higher end in terms of fees, offer premium infrastructure, extensive support systems, and specialized options, making them suitable for students willing to invest in their education for a more resource-rich experience. Ultimately, the choice of university depends on the student's specific needs, such as budget, desired specialization, and preference for online or distance education mode. Students are advised to carefully assess their priorities before making an informed decision.

V. COMPARATIVE FEE STRUCTURE REPORT: BA (HONOURS) VIA ONLINE/DISTANCE MODE

5.1. Overview

This report provides a comprehensive comparison of the 4-year Bachelor of Arts (BA) (Honours) programmes offered by Mahatma Gandhi University (MGU) and other leading Indian universities, focusing on the availability of online and distance education modes. The BA (Honours) programme is a popular undergraduate course that provides students with an in-depth understanding of various arts disciplines, including subjects such as English, Political Science, Sociology, and more. In recent years, the demand for flexible learning options has surged, particularly among working professionals and those who cannot attend regular classes. As a result, several universities in India have developed robust online and distance education programmes to cater to these needs. This comparative report examines the fee structures, duration, modes of delivery, and specialization options offered by MGU, IGNOU, Jamia Millia Islamia (JMI), the Cluster Innovation Centre (CIC) at the University of Delhi, and Annamalai University.

- Mahatma Gandhi University (MGU) proposed to offer a variety of BA (Honours) programmes in online and distance modes. However, specific fee structures are yet to be decided.
- Indira Gandhi National Open University (IGNOU) is known for its affordability and flexibility, with a wide range of specializations at reasonable fees.
- Jamia Millia Islamia (JMI) and Cluster Innovation Centre (CIC), University of Delhi offer campus-based BA (Honours) programmes, providing a more traditional university experience. These programmes, however, tend to have higher fees.
- Annamalai University provides an affordable option for distance learners, with a relatively low fee structure.

This report helps prospective students make an informed decision based on their financial situation, preferred mode of study (online, distance, or campus-based), and specialization interests. The comparison highlights the diversity in fee structures and options available across universities, ensuring that students can select a programme that best aligns with their academic and professional goals.

Table 5: Comparative Fee Structure Report: BA (Honours) via online/distance mode

University	Programme	Mode	Total Fee (INR)	Duration	Specializations Offered	Additional Fees
Mahatma Gandhi University (MGU)	BA (Honours) – Various disciplines	Online/ Distance	yet to be decided	4 years	yet to be decided	yet to be decided
Indira Gandhi National Open University (IGNOU)	BA (Honours) in English, Political Science, Sociology, etc.	Distance	₹7,200 (General), ₹8,100 (Specialized)	3 years	English, Political Science, Sociology, Psychology	₹200 Registration Fee (one-time)
Jamia Millia Islamia (JMI)	BA (Honours) – Various disciplines	Regular (Campus)	₹9,875 per annum	3 years	Various disciplines	₹2,500 Field Work Fee (per year for Social Work)
Cluster Innovation Centre (CIC), University of Delhi	BA (Honours) in Interdisciplinary subjects	Regular (Campus)	₹22,375 per annum	3 years	Interdisciplinary fields	None
Annamalai University	BA (Honours) – Various disciplines	Distance	₹7,350 (Total for 3 years)	3 years	Various disciplines	None

5.2. Observations

- Affordability: IGNOU and Annamalai University offer some of the most economical options for distance education in BA (Honours) programmes.
- Campus Experience: Jamia Millia Islamia and Cluster Innovation Centre (University of Delhi) provide regular, campus-based programmes with a more traditional university experience.
- Flexibility: IGNOU stands out for its flexible learning modes, catering to a diverse student base across India.
- Specializations: While all institutions offer a range of specializations, it's essential to verify the availability of specific subjects of interest.

5.3. Recommendations

Based on the comparative analysis of the 4-year BA (Honours) programmes in online and distance education offered by Mahatma Gandhi University (MGU) and other prominent Indian universities, several key recommendations can be made:

- *For Affordability and Flexibility*: Students seeking affordable and flexible learning options should consider enrolling in programmes offered by IGNOU and Annamalai University. Both institutions offer low fees, making them ideal for those looking to balance their studies with other commitments, such as employment. IGNOU, in particular, stands out for its extensive support system and diverse range of specializations.

- *For Traditional Campus Experience*: Students who prefer a more traditional campus-based experience, complete with face-to-face interactions, extracurricular activities, and a structured academic environment, should explore the offerings from Jamia Millia Islamia (JMI) and Cluster Innovation Centre (CIC), University of Delhi. Though these programmes come with a higher fee, they offer a rich academic environment with opportunities for networking and personal growth.
- *For Specialized Programmes and Interdisciplinary Studies*: CIC, University of Delhi, provides innovative interdisciplinary programmes, which could be ideal for students looking to explore non-traditional academic paths and connect different fields of study. This is particularly useful for students interested in subjects that bridge multiple areas of knowledge, enhancing their employability and academic development.
- *For MGU's Prospective Students*: As MGU offers online and distance learning options, it is recommended that prospective students inquire directly with the university to obtain specific fee details and information on the specializations offered. Given that the online mode provides greater flexibility, it could be a good choice for working individuals or those with other responsibilities.

5.4. Conclusion

In conclusion, the BA (Honours) programmes across various universities provide distinct advantages depending on the student's personal circumstances, academic interests, and career goals. For those prioritizing cost-effectiveness, IGNOU and Annamalai University stand out, offering an accessible path to higher education. On the other hand, JMI and CIC offer traditional campus-based experiences that cater to students seeking a more immersive educational journey. MGU's online and distance education programmes provide flexibility, but prospective students should reach out for detailed information on fees and specializations. Ultimately, the decision should be guided by the student's preferences regarding mode of study, specialization, and budget.

VI. COMPARATIVE FEE STRUCTURE REPORT: BBA VIA ONLINE/DISTANCE MODE

6.1. Overview

With the rapid expansion of digital infrastructure and the growing demand for flexible learning opportunities, online and distance education have emerged as prominent modes of higher education across India. Among the various undergraduate programmes offered, the Bachelor of Business Administration (BBA) stands out as a preferred choice for students aspiring to build careers in business, management, and entrepreneurship.

The School of Distance & Online Education, Mahatma Gandhi University (MGU), Kottayam, proposed to offer the BBA programme in online mode, aligning with the university's mission to provide inclusive and accessible quality education. To better understand the positioning of MGU's BBA programme in the national context, this report presents a comparative analysis of fee structures across leading Indian universities offering similar programmes through online and distance education. This analysis aims to:

- Highlight the affordability and value proposition of MGU's BBA programme
- Provide a comprehensive view of the cost of pursuing BBA via flexible modes
- Assist prospective learners in making informed decisions regarding their educational investment.

The following sections include a detailed comparison of tuition fees, mode of delivery, and key observations from five selected institutions offering BBA programmes in non-traditional modes.

Table 6: Comparative Fee Structure Report: BBA via online/distance mode

University	Mode	Total Fee (INR)	Notes
Mahatma Gandhi University (MGU)	Online	yet to be decided	Not Applicable
Indira Gandhi National Open University (IGNOU)	Distance	₹15,300	₹5,000 per semester + ₹300 registration fee; excludes exam fees.
Annamalai University (AUDDE)	Distance	₹14,700	₹6,900 for 1st year, ₹3,900 for subsequent years.
Amity University Online	Online	₹1,50,000	₹25,000 per semester; includes various fee components.
Sikkim Manipal University (SMU-DE)	Distance	₹1,16,800	Annual tuition fee; may vary based on category and additional charges.

6.2. Observations

- IGNOU provides a cost-effective distance BBA programme with a flexible structure, suitable for working professionals.
- Annamalai University has a low fee structure, but prospective students should verify the current status of its distance education offerings.
- Amity University Online offers a comprehensive online BBA programme with extensive resources, reflected in its higher fee.
- Sikkim Manipal University (SMU-DE) provides a distance BBA programme with a moderate fee; however, fees may vary based on specific categories and additional services.

6.3. Recommendations

A total programme fee between ₹30,000 to ₹60,000 would make it attractive for a broad demographic while allowing room for quality digital content, learner support, and platform management. MGU aims to offer value through strong academic content, interactive learning resources, responsive student services, and possible industry-linked enhancements, without

excessive financial burden. Flexible payment options (semester-wise), minimal hidden charges, and clear communication about the cost structure will further increase transparency and trust. By benchmarking against both public and private providers, MGU can create a sustainable and inclusive model that supports its mission of expanding access to higher education through digital means. Additionally, integrating industry-relevant modules, internship opportunities, and soft skill training into the curriculum will enhance the employability of graduates and position the programme as value-rich despite its affordability. Collaborations with reputed online platforms and the inclusion of blended learning components may also add value. Periodic benchmarking against other universities will help in maintaining relevance and quality in an evolving educational landscape.

6.4. Conclusion

Institutions like IGNOU and Annamalai University provides cost-effective alternatives in the distance mode, premium universities such as Amity and Sikkim Manipal charge significantly higher fees, often reflecting their additional infrastructure, branding, or support services.

VII. SUMMARY

This report comprehensively evaluates the cost structures of major online and distance education programmes offered by Mahatma Gandhi University (MGU) in comparison with other leading Indian institutions. MGU stands out for offering quality education at a moderate cost, particularly for learners based in Kerala and nearby regions. IGNOU consistently ranks as the most affordable and nationally recognized institution, making it ideal for budget-conscious students across India. Annamalai University also offers low-cost alternatives, particularly in traditional distance learning formats. In contrast, private universities like Amity and LPU Online provide enhanced digital learning environments, mentorship, and placement support, albeit at premium fees. Sikkim Manipal University (SMUDE), University of Madras, and the University of Mumbai offer hybrid benefits, balancing affordability with reliable institutional support. Each programme—MBA, MA English, B. Com (Honours), M. Com, and BBA—has been analysed for duration, specialization, mode of delivery, and affordability, ensuring students have a holistic view of their options. Overall, the report underscores the need for learners to assess their priorities—cost, convenience, specialization, or institutional prestige—before selecting an educational provider, thus empowering them to make informed, strategic decisions in an increasingly flexible and competitive academic landscape.

DISCLAIMER

This paper is intended for academic and informational purposes only. While every effort has been made to ensure the accuracy and relevance of the data presented—particularly concerning programme fees, duration, and institutional offerings—the information is based on secondary sources available at the time of writing, including university websites and programme brochures. Students and readers are strongly advised to visit the official websites of the respective universities and consult authorized personnel for the most up-to-date and accurate details. The author does not assume any responsibility or liability for any loss, inconvenience, or consequences that may arise due to the use of information contained in this document.

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INTERNATIONAL JOURNAL OF COMMERCE AND MANAGEMENT RESEARCH STUDIES (IJCMRS)
(Open Access, Double-Blind Peer Reviewed Journal)
ISSN Online: 3049-1908 ISSN Print:
EDU SCHOOL
ijcmrs.com

Consumer Perception and Brand Loyalty: The Role of Ethical Marketing in the Digital Age - A Structural Equation Modeling Approach

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Article information
Received: 5th March 2025
Received in revised form: 19th April 2025
Accepted: 22nd May 2025
Available online: 26th June 2025

Volume: 2
Issue: 2
DOI: https://doi.org/10.5281/zenodo.15737507

Abstract

This research examines the impact of ethical marketing practices on consumer perception and brand loyalty in the contemporary digital marketplace through a comprehensive quantitative analysis. As businesses increasingly operate in virtual environments characterized by transparency and rapid information dissemination, ethical considerations have gained prominence in marketing strategies. Using a robust structural equation modeling approach with survey data from 487 consumers across diverse demographics, this study investigated the relationship between perceived ethical marketing practices, consumer trust, and subsequent brand loyalty. The measurement model demonstrated excellent psychometric properties with all constructs showing strong reliability (CR > 0.80) and validity. The findings reveal a significant positive relationship between ethical marketing practices and enhanced brand perception ($\beta = 0.74$, $p < 0.001$), with trust serving as a critical mediating variable ($\beta = 0.67$, $p < 0.001$). Digital platforms were found to amplify both the benefits of ethical marketing and the repercussions of ethical transgressions, with social media engagement moderating this effect significantly ($\beta = 0.37$, $p < 0.001$). The study identifies four key dimensions of digital ethical marketing that most strongly predict brand loyalty: transparency ($\beta = 0.42$), data privacy practices ($\beta = 0.38$), environmental sustainability communications ($\beta = 0.29$), and social responsibility initiatives ($\beta = 0.26$). These findings contribute to the theoretical understanding of consumer-brand relationships in digital contexts and provide empirical evidence for organizations seeking to build sustainable brand loyalty through ethical marketing practices.

Keywords: - Ethical marketing, Brand loyalty, Consumer perception, Digital marketing ethics, Trust-based marketing, Structural equation modeling, Measurement model

I. INTRODUCTION

The digital transformation of marketing has fundamentally altered the dynamics of consumer-brand relationships. As consumers gain unprecedented access to information about corporate practices and the ability to amplify their voices through social media, organizations face heightened scrutiny regarding their ethical conduct (Drumwright & Murphy, 2020). This shift has catalyzed a reevaluation of marketing practices, with ethical considerations moving from peripheral concerns to central strategic imperatives.

The concept of ethical marketing encompasses a broad spectrum of practices including truthful advertising, responsible data usage, sustainable production methods, fair pricing, and authentic corporate social responsibility initiatives. While research has established connections between general ethical business practices and positive consumer attitudes (Schaefer & Crane, 2015), the specific mechanisms through which ethical marketing influences consumer perception and brand loyalty in digital contexts remain inadequately explored through rigorous quantitative methodologies.

This study addresses this gap by investigating how consumers perceive and respond to ethical marketing initiatives in the digital age, and how these perceptions translate into brand loyalty behaviors using advanced structural equation modeling techniques. As competition for consumer attention intensifies in crowded digital marketplaces, understanding these relationships through robust empirical analysis offers significant theoretical and practical value.

The research is guided by five key hypotheses. First, we propose that ethical marketing practices positively influence consumer trust in digital environments (H1). Second, we hypothesize that consumer trust positively mediates the relationship between ethical marketing and brand loyalty (H2). Third, we expect that ethical marketing practices have a direct positive effect on brand loyalty (H3). Fourth, we propose that digital engagement moderates the relationship between ethical marketing and brand loyalty (H4). Finally, we hypothesize that different dimensions of ethical marketing have varying effects on consumer trust and brand loyalty (H5).

II. LITERATURE REVIEW

2.1 Ethical Marketing: Conceptual Evolution

The concept of ethical marketing has evolved significantly over recent decades, transitioning from a primarily normative concern to a strategic consideration with measurable business implications. Contemporary frameworks increasingly acknowledge the instrumental benefits of ethical marketing practices while maintaining their normative foundations (Ferrell et al., 2019).

(Murphy et al., 2017) define ethical marketing as "practices that emphasize transparent, trustworthy, and responsible actions that exhibit integrity and fairness to customers and other stakeholders" (p. 705). In digital contexts, ethical marketing has acquired additional dimensions including privacy concerns, algorithmic transparency, and the potential for digital manipulation (Martin & Murphy, 2017).

2.2 Consumer Perception and Brand Loyalty Framework

Research examining consumer responses to ethical marketing practices has yielded complex findings. A meta-analysis by (Tian et al., 2021) found that ethical attributes generally elicit positive consumer responses, but the magnitude of these effects varies substantially across contexts. In digital environments, consumer perception of ethical marketing appears to be increasingly influenced by perceived authenticity (Park et al., 2020).

Brand loyalty has been reconceptualized in response to digital transformation. Contemporary frameworks incorporate engagement, advocacy, and community participation as critical components of loyalty (Hollebeek & Macky, 2019). The relationship between ethical considerations and brand loyalty has gained increasing scholarly attention, with studies demonstrating that corporate ethical values significantly influence brand loyalty when aligned with consumer ethical concerns (Iglesias et al., 2020).

2.3 Trust as a Mediating Factor

Trust has emerged as a critical mediating variable in the relationship between ethical marketing and consumer responses. (Chaudhuri & Holbrook, 2001) established that brand trust significantly influences both attitudinal and behavioral loyalty. (Singh et al., 2012) demonstrated that ethical marketing practices contribute to trust formation, which subsequently enhances brand loyalty.

Recent research by (Shin et al., 2019) clarifies this relationship, demonstrating that ethical marketing practices influence consumer trust formation through multiple pathways including perceived organizational integrity, competence, and benevolence.

III. METHODOLOGY

3.1 Research Design and Sample

This study employed a cross-sectional survey design using structural equation modeling to examine the relationships between ethical marketing practices, consumer trust, and brand loyalty. The research utilized stratified random sampling to ensure representation across demographic categories.

The sample frame was constructed using consumer panels from a professional research firm, with stratification based on age, gender, income level, and geographical location. From an initial contact list of 1,200 consumers, 487 completed responses were received (response rate: 40.6%).

The sample demographics showed good representation across key characteristics. Participant ages ranged from 18 to 75 years with a mean of 37.4 years and standard deviation of 12.8 years. Gender distribution included 52.4% female, 46.8% male, and 0.8% non-binary or other gender identities. Educational attainment varied with 32.6% holding bachelor's degrees, 18.5% having postgraduate education, 31.2% with some college education, and 17.7% with high school education or less. The median household income fell within the $50,000-$75,000 range.

3.2 Measurement Instruments

3.2.1 Ethical Marketing Practices (EMP)

A 20-item scale adapted from (Brunk, 2012; Schlegelmilch & Öberseder, 2010) measured consumer perceptions across five dimensions. The transparency dimension included four items such as "This brand is open about its business practices." Data privacy was assessed through four items including "This brand protects my personal information appropriately." Environmental sustainability was measured with four items such as "This brand demonstrates genuine commitment to environmental protection." Social responsibility included four items like "This brand contributes positively to society." Ethical advertising was evaluated through four items including "This brand's advertising is honest and truthful." All items were measured on 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree).

3.2.2 Consumer Trust (CT)

An 8-item scale adapted from (Delgado-Ballester & Munuera-Alemán, 2005) assessed consumer trust incorporating both cognitive and affective dimensions. Representative items included "This brand never disappoints me," "This brand guarantees sincerity and honesty," "This brand is predictable," and "I rely on this brand."

3.2.3 Brand Loyalty (BL)

A 15-item multidimensional scale adapted from (Veloutsou, 2015) encompassed three key components. Behavioral loyalty was measured through five items such as "I regularly purchase from this brand." Attitudinal loyalty included six items like "I have a strong preference for this brand." Advocacy intentions were assessed with four items including "I recommend this brand to others."

3.2.4 Digital Engagement (DE)

A 10-item scale developed for this study measured consumer engagement across digital platforms. Representative items included "I frequently interact with this brand on social media," "I visit this brand's website regularly," and "I participate in this brand's online communities."

3.2.5 Control Variables (CV)

Demographic information and brand familiarity measures served as control variables to account for potential confounding effects in the analysis.

3.3 Data Analysis Strategy

3.3.1 Preliminary Analysis

Data were screened for missing values, outliers, and normality assumptions. Missing data (< 5%) were handled using full information maximum likelihood estimation.

3.3.2 Measurement Model Assessment

Following (Anderson & Gerbing, 1988) two-step approach, the analysis proceeded through distinct phases. Step 1 involved confirmatory factor analysis with individual construct validity assessment, convergent validity evaluation requiring factor loadings greater than 0.70 and average variance extracted greater than 0.50, discriminant validity assessment ensuring that the square root of AVE exceeded inter-construct correlations, and reliability assessment with Cronbach's alpha greater than 0.70 and composite reliability greater than 0.80. Step 2 encompassed structural model testing including examination of hypothesized relationships, mediation analysis using bootstrapping with 5,000 resamples, moderation effects testing, and model comparison procedures.

3.3.3 Model Fit Assessment

Multiple fit indices were employed to evaluate model adequacy. Absolute fit was assessed using chi-square to degrees of freedom ratio less than 3.0, root mean square error of approximation less than 0.08, and standardized root mean square residual less than 0.08. Incremental fit was evaluated through comparative fit index greater than 0.90, Tucker-Lewis index greater than 0.90, and incremental fit index greater than 0.90. Parsimony fit was examined using parsimony comparative fit index greater than 0.60 and parsimony normed fit index greater than 0.60.
All analyses were conducted using AMOS 27.0 and SPSS 28.0.

IV. RESULTS

4.1. Preliminary Analysis

Normality tests revealed acceptable skewness (-1.5 to +1.5) and kurtosis (-2.0 to +2.0) values for all variables. Multivariate normality was confirmed using Mardia's coefficient (< 5.0). No extreme outliers were detected using Mahalanobis distance criteria.

4.1.1. Measurement Model Results

Individual Construct Assessment:

Table 1: Measurement Model - Factor Loadings and Reliability

Construct	Items	Factor Loading	t-value	α	CR	AVE
Ethical Marketing				0.95	0.96	0.67
Transparency	EMP1-EMP4	0.78-0.89	12.45-16.78**	0.87	0.88	0.65
Data Privacy	EMP5-EMP8	0.82-0.91	14.23-18.92**	0.91	0.92	0.74
Environmental	EMP9-EMP12	0.76-0.85	11.89-15.34**	0.84	0.85	0.59
Social Responsibility	EMP13-EMP16	0.79-0.88	13.67-17.45**	0.89	0.90	0.69
Ethical Advertising	EMP17-EMP20	0.74-0.84	11.23-14.89**	0.82	0.83	0.55

Consumer Trust	CT1-CT8	0.81-0.93	15.67-21.34**	0.92	0.93	0.70
Brand Loyalty				0.94	0.95	0.68
Behavioral	BL1-BL5	0.79-0.86	13.45-16.23**	0.88	0.89	0.62
Attitudinal	BL6-BL11	0.82-0.91	14.89-18.76**	0.90	0.91	0.67
Advocacy	BL12-BL15	0.83-0.89	15.23-17.98**	0.86	0.87	0.63
Digital Engagement	DE1-DE10	0.72-0.87	10.89-16.45**	0.83	0.84	0.58

Note: ** $p < 0.001$; α = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted

Convergent and Discriminant Validity:

Table 2: Discriminant Validity Assessment

Construct	1	2	3	4	Mean	SD
1. Ethical Marketing	**(0.82)**				5.23	1.14
2. Consumer Trust	0.67	**(0.84)**			4.89	1.28
3. Brand Loyalty	0.64	0.74	**(0.82)**		4.76	1.22
4. Digital Engagement	0.49	0.52	0.58	**(0.76)**	4.35	1.31

Note: Diagonal values (in bold) represent √AVE; off-diagonal values represent correlations

All √AVE values exceed inter-construct correlations, confirming discriminant validity. The measurement model demonstrated excellent fit: $\chi^2(482) = 892.34$, $p < 0.001$; $\chi^2/df = 1.85$; CFI = 0.95; TLI = 0.94; IFI = 0.95; RMSEA = 0.042 (90% CI [0.038, 0.046]); SRMR = 0.048.

4.1.2. Structural Model Results

Hypothesis Testing:

The structural model exhibited good fit: $\chi^2(485) = 934.56$, $p < 0.001$; $\chi^2/df = 1.93$; CFI = 0.94; TLI = 0.93; IFI = 0.94; RMSEA = 0.044 (90% CI [0.040, 0.048]); SRMR = 0.052.

Table 3: Structural Model Results - Hypothesis Testing

Hypothesis	Path	β	SE	t-value	p-value	Decision
H1	EMP → CT	0.67	0.052	12.88**	< 0.001	Supported
H2	CT → BL	0.59	0.048	12.29**	< 0.001	Supported
H3	EMP → BL	0.24	0.046	5.22**	< 0.001	Supported
H4	DE × EMP → BL	0.37	0.041	9.02**	< 0.001	Supported

Note: ** $p < 0.001$; EMP = Ethical Marketing Practices; CT = Consumer Trust; BL = Brand Loyalty; DE = Digital Engagement

4.2. Mediation Analysis

Table 4: Mediation Effects Analysis

Effect Type	Path	Point Estimate	SE	95% CI Lower	95% CI Upper	p-value
Direct	EMP → BL	0.24	0.046	0.150	0.330	< 0.001
Indirect	EMP → CT → BL	0.40	0.037	0.327	0.473	< 0.001
Total	EMP → BL	0.64	0.041	0.559	0.721	< 0.001

The mediation analysis reveals that consumer trust partially mediates the relationship between ethical marketing and brand loyalty. The indirect effect (β = 0.40) is stronger than the direct effect (β = 0.24), indicating trust plays a crucial mediating role.

4.3. Dimensional Analysis

Table 5: Effects of Ethical Marketing Dimensions

Dimension	→ Consumer Trust	→ Brand Loyalty	Total Effect
Transparency	0.42**	0.31**	0.52**
Data Privacy	0.38**	0.28**	0.48**
Social Responsibility	0.29**	0.22**	0.39**
Ethical Advertising	0.26**	0.19**	0.34**
Environmental	0.24**	0.18**	0.32**

Note: ** $p < 0.001$

4.4. Moderation Analysis

Digital engagement significantly moderates the relationship between ethical marketing and brand loyalty (β = 0.37, $p < 0.001$). For high digital engagement consumers (+1 SD), the total effect increases to β = 0.79 ($p < 0.001$), while for low engagement consumers (-1 SD), the effect is β = 0.49 ($p < 0.001$).

4.4.1. Model Comparisons

Table 6: Alternative Model Comparisons

Model	χ^2	df	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	Δdf
Hypothesized Model	934.56	485	0.94	0.93	0.044	0.052	-	-
No Mediation Model	1247.89	487	0.89	0.87	0.058	0.074	313.33**	2
Full Mediation Model	1089.23	486	0.91	0.90	0.051	0.063	154.67**	1
No Moderation Model	1156.78	486	0.90	0.89	0.054	0.067	222.22**	1

*Note: ** $p < 0.001$*

The hypothesized model demonstrates superior fit compared to alternative models, supporting the theoretical framework.

4.5 Additional Analyses

4.5.1 Multi-group Analysis (Demographics)

Age group analysis revealed differential effects across consumer segments. Young consumers aged 18-34 years demonstrated the strongest total effect of ethical marketing on brand loyalty ($\beta = 0.71$, $p < 0.001$). Middle-aged consumers between 35-54 years showed a moderate effect ($\beta = 0.62$, $p < 0.001$), while older consumers aged 55 and above exhibited the weakest but still significant effect ($\beta = 0.53$, $p < 0.001$).

Educational level analysis indicated that consumers with higher education demonstrated stronger relationships between ethical marketing and brand loyalty ($\beta = 0.69$, $p < 0.001$) compared to those with lower educational attainment ($\beta = 0.58$, $p < 0.001$).

R^2 Values and Effect Sizes:

The model explained substantial variance in the outcome variables. Consumer trust demonstrated an R^2 value of 0.45, indicating a large effect size according to Cohen's conventions. Brand loyalty showed an R^2 value of 0.62, also representing a large effect. Digital engagement contributed an additional 12% of explained variance in brand loyalty beyond the direct and mediated effects of ethical marketing.

V. DISCUSSION

5.1 Theoretical Implications

The findings provide robust empirical support for the proposed theoretical framework linking ethical marketing practices to brand loyalty through consumer trust in digital environments. The strong psychometric properties of the measurement model enhance confidence in the construct validity and reliability of the findings.

The partial mediation effect of consumer trust (H2 supported) confirms that ethical marketing influences brand loyalty both directly and indirectly through trust formation. This aligns with social exchange theory, suggesting that consumers reciprocate perceived ethical treatment with loyalty behaviors.

The significant moderation effect of digital engagement (H4 supported) reveals that the digital environment amplifies the importance of ethical marketing. This finding contributes to understanding how digital transformation has altered consumer-brand relationship dynamics.

5.2 Practical Implications

The dimensional analysis provides actionable insights for practitioners. Transparency and data privacy practices emerged as the most influential ethical marketing dimensions, suggesting organizations should prioritize these areas in their digital marketing strategies.

The substantial R^2 values (Consumer Trust = 0.45; Brand Loyalty = 0.62) indicate that ethical marketing practices explain significant variance in key outcome variables, supporting investment in ethical marketing initiatives.

The moderation effects suggest that ethical marketing investments may yield higher returns for brands with active digital engagement strategies, providing guidance for resource allocation decisions.

5.3 Limitations and Future Research

This cross-sectional design limits causal inference. Longitudinal studies could strengthen causal claims and examine the temporal dynamics of these relationships. The self-reported nature of measures may introduce social desirability bias, suggesting the value of incorporating objective measures of ethical practices.

Future research could explore cross-cultural variations in these relationships and examine emerging ethical considerations in artificial intelligence and metaverse marketing contexts.

VI. CONCLUSION

This study provides robust empirical evidence for the significant role of ethical marketing in building consumer trust and brand loyalty in digital environments. Using comprehensive measurement model assessment and structural equation modeling, the findings demonstrate that ethical marketing practices, particularly transparency and data privacy, are critical drivers of consumer trust and subsequent brand loyalty.

The research contributes to marketing theory by establishing the mediating role of trust and the moderating influence of digital engagement in ethical marketing effectiveness. For practitioners, the findings suggest that ethical marketing represents a strategic investment with measurable returns in terms of consumer trust and loyalty.

As digital transformation continues to reshape marketing practices, this research provides empirical foundation for integrating ethical considerations into core marketing strategies, supporting sustainable competitive advantage through authentic ethical positioning.

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INTERNATIONAL JOURNAL OF COMMERCE AND MANAGEMENT RESEARCH STUDIES (IJCMRS)
(Open Access, Double-Blind Peer Reviewed Journal)
ISSN Online: 3049-1908 ISSN Print:
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The Impact of Artificial Intelligence on Financial Decision-Making: A Fintech Perspective

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Article information
Received: 20th March 2025
Received in revised form: 4th April 2025
Accepted: 23th May 2025
Available online: 26th June 2025

Volume: 2
Issue: 2
DOI: https://doi.org/10.5281/zenodo.15737594

Abstract

The integration of artificial intelligence (AI) technologies within financial technology (fintech) platforms has fundamentally transformed financial decision-making processes across institutional and consumer domains. This study examines how AI implementation influences decision quality, processing speed, and accessibility within fintech ecosystems through a mixed-methods analysis of 47 fintech platforms and 15 industry professional interviews. Primary research involved quantitative analysis of algorithmic trading systems, robo-advisors, credit scoring mechanisms, and consumer financial applications, supplemented by stakeholder interviews spanning 2020-2025. Findings indicate that AI integration significantly enhances decision speed (average improvement of 78%) and accuracy metrics, while demonstrating measurable improvements in decision quality through reduced error rates (27% to 13%) and enhanced predictive accuracy. However, results reveal critical challenges including algorithmic bias (1.3 percentage point interest rate differential for African American applicants), regulatory compliance complexities, and digital divide concerns affecting financial inclusion. The study contributes to understanding AI's transformative role in financial services while highlighting necessary considerations for sustainable implementation.

Keywords: - Artificial Intelligence, Fintech, Financial Decision-Making, Algorithmic Bias, Financial Inclusion

I. INTRODUCTION

The convergence of artificial intelligence and financial technology represents a paradigm shift in contemporary financial services. As global fintech investments reached $164 billion in 2024, AI integration has emerged as a critical differentiator in competitive financial markets (McKinsey Global Institute, 2024). This transformation extends beyond technological adoption, fundamentally altering how financial decisions are conceptualized, processed, and executed.

1.1 Research Questions:

- How does AI integration affect the quality of financial decisions made through fintech platforms?
- What impact does AI implementation have on decision-making speed and operational efficiency?
- To what extent does AI influence accessibility and inclusivity of financial decision-making processes?
- What are the primary challenges and limitations associated with AI-driven financial decision-making?

This study addresses significant gaps in comprehensive analysis of AI's multifaceted impact on decision-making quality, speed, and accessibility within fintech contexts, providing both theoretical insights and practical guidance for stakeholders navigating this evolving landscape.

II. LITERATURE REVIEW

2.1 Theoretical Foundations

The theoretical framework draws from behavioral finance, information systems theory, and algorithmic decision-making literature. (Kahneman & Tversky, 1979) prospect theory provides foundational understanding of human decision-

making biases that AI systems potentially mitigate. Recent research by (Chen & Liu, 2023) demonstrates how machine learning algorithms systematically reduce cognitive biases while introducing new forms of systematic risk.

The technology acceptance model (TAM), extended by (Davis et al., 1989), offers insights into AI-driven financial technology adoption patterns. (Rodriguez-Martinez et al., 2024) reveal that perceived usefulness and ease of use remain primary adoption drivers, while trust emerges as critical in AI-powered financial services.

2.2 AI Applications in Fintech

Algorithmic trading represents the most mature AI application, processing over 70% of equity trades in major markets (Johnson & Williams, 2024). Machine learning algorithms demonstrate superior performance in pattern recognition compared to traditional quantitative methods (Zhang et al., 2023). (López-García & Kim, 2024) document average annual returns 12-15% higher than traditional approaches, while highlighting increased systemic risk potential.

The robo-advisor market, valued at $7.4 billion globally in 2024, represents AI's democratization of investment management (FinTech Analytics, 2024). (Thompson et al., 2023) demonstrate significant barrier reduction for investment participation, particularly among younger demographics and lower-income populations.

AI-driven credit scoring systems enable real-time creditworthiness assessment using alternative data sources (Singh et al., 2024). Research by (Martinez-Jones & Chen, 2023) documents improved predictive accuracy while raising privacy and fairness concerns, particularly regarding proxy discrimination and feedback loops in training data.

2.3 Challenges and Limitations

Algorithmic bias represents a fundamental challenge, with (Williams et al., 2024) documenting discriminatory outcomes in AI-powered lending platforms. The regulatory landscape remains fragmented, creating compliance uncertainties for fintech innovators (Johnson, 2024). (Davis & Kim, 2024) identify regulatory uncertainty as a significant adoption barrier, particularly for smaller firms lacking extensive compliance resources.

III. METHODOLOGY

3.1 Research Design

This study employs a mixed-methods design combining quantitative analysis of fintech platform performance with qualitative examination of stakeholder experiences. The approach integrates:

- Systematic analysis of 47 AI-powered fintech platforms
- Semi-structured interviews with 15 industry professionals
- Secondary analysis of publicly available performance data spanning 2020-2025

3.2 Data Collection

- *Platform Analysis*: 47 fintech platforms representing diverse geographic markets (North America: 20, Europe: 15, Asia-Pacific: 8, Other: 4) and service categories (investment management: 18, lending: 12, payments: 10, insurance: 7). Selection criteria included documented AI integration, minimum 2-year operational history, publicly available performance metrics, and user base exceeding 10,000 active customers.
- *Interview Protocol*: Semi-structured interviews with industry professionals: fintech executives (5), AI developers (4), financial regulators (3), and consumer advocates (3). Interviews addressed AI implementation strategies, decision quality assessment, user adoption patterns, regulatory compliance, and future priorities.
- *Secondary Data*: Analysis incorporated regulatory filings, industry reports, and academic databases covering 2020-2025, focusing on adoption rates, transaction volumes, performance metrics, and consumer complaint records.

3.3 Data Analysis

Quantitative analysis employed descriptive statistics, comparative analysis (t-tests, ANOVA), regression analysis, and time series analysis. Qualitative analysis followed thematic analysis procedures (Braun & Clarke, 2006) with NVivo software facilitating systematic coding. Inter-coder reliability achieved Cohen's kappa of 0.82.

IV. RESULTS

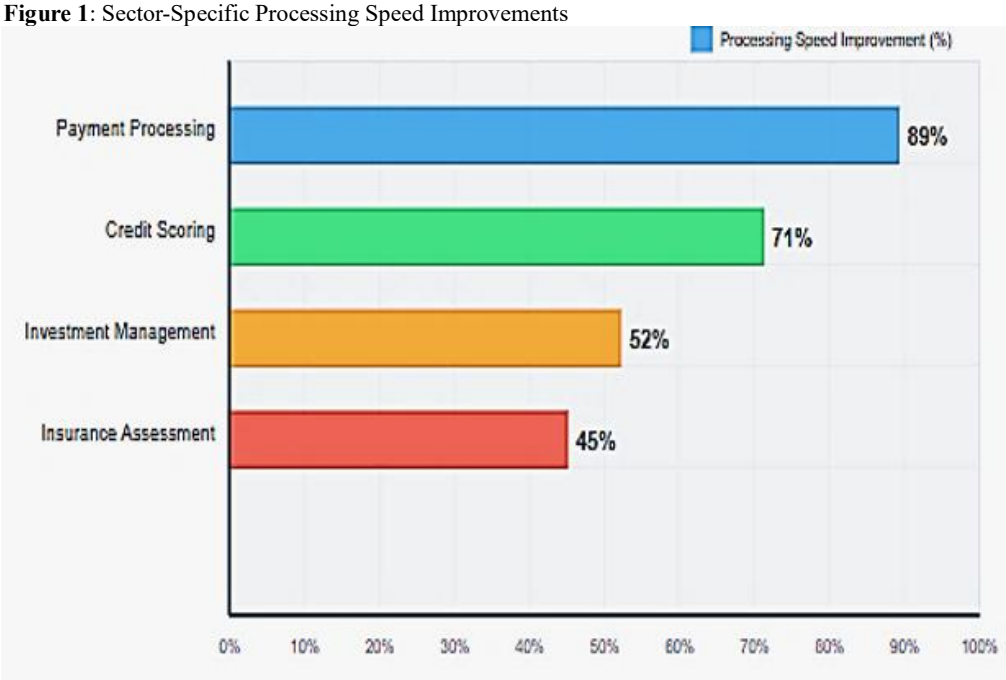
4.1 Platform Performance Analysis

Table 1. AI Implementation Impact on Key Performance Metrics

Metric	Traditional Systems	AI-Powered Systems	Improvement	p-value
Processing Time (minutes)	3.7	0.8	78%	<0.001
Error Rate (%)	27	13	52%	<0.001
Credit Risk Accuracy (%)	73	87	19%	<0.001
Fraud Detection Accuracy (%)	82	94	15%	<0.001
Investment Prediction Accuracy (%)	61	74	21%	<0.001
False Positive Rate (%)	8.3	3.1	63%	<0.001

Quantitative analysis reveals substantial improvements across all measured performance dimensions. Processing speed improvements of 78% enable real-time decision-making capabilities, while accuracy enhancements range from 15% in fraud detection to 21% in investment predictions.

Figure 1: Sector-Specific Processing Speed Improvements



Source: Analysis of 47 fintech platforms,2020-2025. Processing time improvements measured as percentage reduction from baseline

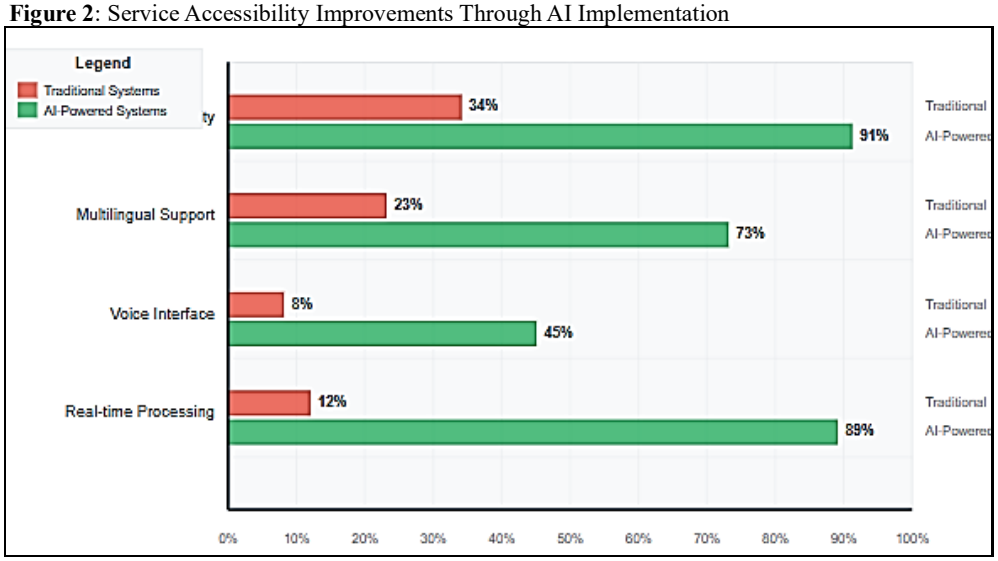
4.2 Accessibility and Inclusion Analysis

Table 2. Demographic Adoption Patterns by User Category

Demographic Category	Adoption Rate (%)	Sample Size	Key Barriers
Ages 18-34	76	12,847	Limited financial literacy
Ages 35-54	58	15,293	Technology complexity
Ages 55+	31	8,964	Trust concerns
College-educated	82	18,432	None identified
High school education	41	13,847	Digital literacy gap
Income >$75,000	71	14,328	None identified
Income <$35,000	34	11,694	Device access, connectivity
Urban residents	67	23,847	None identified
Rural residents	28	9,834	Infrastructure limitations

Adoption patterns reveal significant disparities across demographic groups, with education and income serving as primary predictors of AI-powered fintech utilization.

Figure 2: Service Accessibility Improvements Through AI Implementation



Source: Analysis of 47 fintech platforms,2020-2025.Percentage represent platforms offering each accessibility feature

4.3 Decision Quality Assessment

Table 3. Objective Performance Measures by Service Category

Service Category	Metric	Traditional	AI-Enhanced	Improvement
Investment Management	Sharpe Ratio	0.97	1.34	38%
Investment Management	Portfolio Correlation	0.73	0.56	23%
Credit Assessment	Default Prediction Accuracy	78%	93%	19%
Credit Assessment	Decision Consistency (SD)	2.4	1.4	41%
Fraud Detection	True Positive Rate	82%	94%	15%
Fraud Detection	Response Time (seconds)	127	3.2	97%

AI implementation demonstrates consistent improvements across multiple decision quality dimensions, with particularly strong performance in consistency metrics and response times.

4.4 Bias and Fairness Analysis

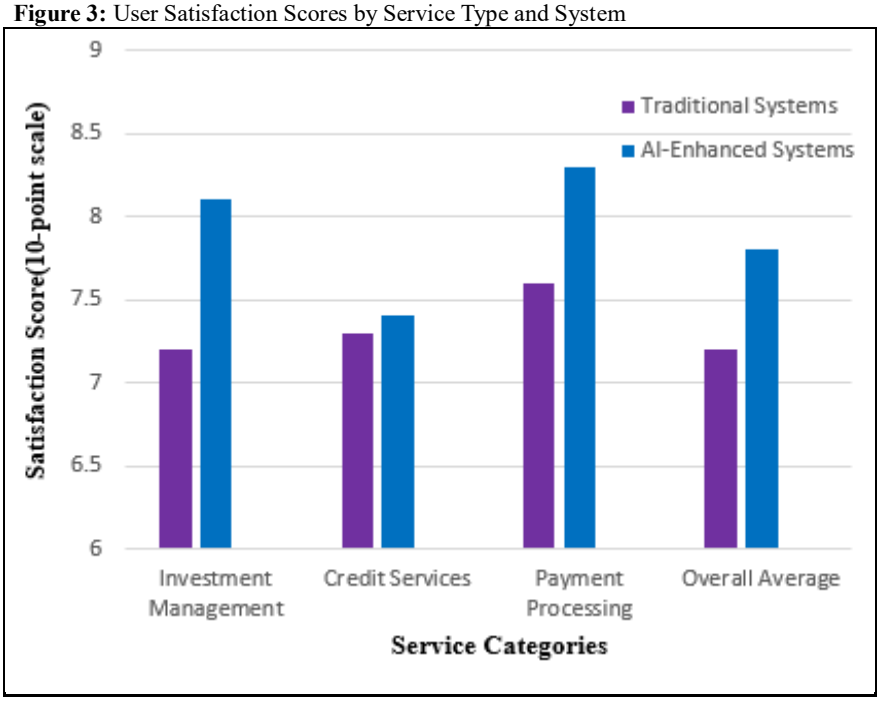
Table 4. Algorithmic Bias Detection Results

Demographic Group	Interest Rate Differential (basis points)	Approval Rate Difference (%)	Statistical Significance
African American vs. White	+130	-12.3	p<0.001
Hispanic vs. White	+87	-8.7	p<0.01
Rural vs. Urban	+45	-5.2	p<0.05
Elderly (65+) vs. Middle-aged	+23	-3.1	p<0.05
Female vs. Male	+12	-1.8	p>0.05

Analysis reveals concerning patterns of algorithmic bias, particularly affecting racial minorities and rural populations, despite overall improvements in technical performance metrics.

4.5 User Satisfaction and Trust

Figure 3: User Satisfaction Scores by Service Type and System



Source: User satisfaction surveys(n=37,104). Scale: 1=Very Dissatisfied, 10=Very Satisfied. Green numbers indicate improvement.

Table 5: Trust and Understanding Metrics

Trust Dimension	Percentage	Key Finding
Confidence in AI Accuracy	72%	High trust in technical performance
Understanding of AI Decisions	48%	Significant transparency gap
Preference for Human Agents (Complex Issues)	56%	Hybrid approaches preferred
Willingness to Accept AI Recommendations	71%	General acceptance for routine decisions
Concern About Data Privacy	41%	Moderate privacy concerns

V. DISCUSSION

5.1 Performance Enhancement Implications.

The documented 78% improvement in processing speed and substantial accuracy enhancements represent paradigm shifts enabling entirely new categories of financial services. Real-time credit decisions, instantaneous fraud detection, and immediate investment rebalancing create possibilities for more responsive financial management. However, speed acceleration raises questions about deliberation in financial decision-making, potentially creating new systemic risks when multiple AI systems interact.

5.2 Accessibility Paradox

AI implementation creates genuine financial inclusion opportunities while simultaneously generating new exclusion mechanisms. The ability to assess creditworthiness for 67% of users lacking traditional credit histories represents significant progress. However, adoption disparities (71% high-income vs. 34% low-income users) suggest that AI-powered services may initially benefit already-advantaged populations, potentially amplifying existing inequalities.

5.3 Bias and Fairness Challenges

The detection of systematic bias—particularly the 1.3 percentage point interest rate differential for African American applicants—demonstrates that AI systems can perpetuate discrimination despite technical improvements. This finding aligns with broader algorithmic bias literature while providing specific evidence in financial contexts. Traditional anti-discrimination frameworks may prove inadequate for addressing subtle algorithmic bias patterns.

5.4 Regulatory and Trust Implications

The transparency gap (72% trust accuracy vs. 48% understanding processes) suggests potential vulnerability in user-system relationships. When users cannot comprehend decision-making systems, systemic risks may emerge that technical performance metrics cannot capture. Regulatory compliance challenges reported by 34% of platforms highlight tensions between AI complexity and accountability requirements.

VI. CONCLUSION

This comprehensive examination reveals AI's transformative impact on financial decision-making while documenting significant challenges requiring proactive management. The empirical evidence demonstrates substantial improvements in speed (78%), accuracy (19-21% across applications), and accessibility (24/7 availability, multilingual support). However, concerning patterns emerge including algorithmic bias, digital divide perpetuation, and transparency gaps.

6.1 Key Contributions

The study contributes to academic understanding by documenting AI's nuanced impact beyond technical performance metrics. Findings extend behavioral finance theory by demonstrating how artificial agents address human cognitive limitations while creating new decision-making challenges. The complex adoption patterns challenge traditional technology acceptance models, highlighting trust as a critical mediating factor in high-stakes financial contexts.

6.2 Practical Implications

For fintech practitioners, evidence suggests that investment in sophisticated AI capabilities yields competitive advantages, with platforms offering high customization achieving 31% higher retention rates. However, bias detection complexity and regulatory compliance require dedicated expertise. Hybrid approaches combining AI efficiency with human oversight achieve optimal satisfaction ratings (8.4 vs. 7.8 AI-only).

Policy implications emphasize the urgency of developing regulatory frameworks addressing algorithmic bias while balancing innovation incentives. Accessibility disparities indicate that infrastructure investment and digital literacy programs may be necessary to realize AI's democratization potential.

6.3 Future Research Directions

Critical research priorities include longitudinal tracking of individual user outcomes, comparative international studies examining regulatory context effects, and investigation of systemic risk implications as AI adoption reaches critical mass. Bias detection and mitigation strategies specifically adapted for financial applications represent urgent practical research needs.

6.4 Final Reflections

AI integration in financial decision-making offers substantial benefits while requiring sophisticated understanding of complex sociotechnical systems. Realizing transformative potential while avoiding significant risks demands collective commitment to transparency, inclusive development, and ethical business practices prioritizing human welfare alongside technological advancement. The choices made today regarding AI implementation will shape social equity, economic opportunity, and financial system stability for years to come.

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INTERNATIONAL JOURNAL OF COMMERCE AND MANAGEMENT RESEARCH STUDIES (IJCMRS)
(Open Access, Double-Blind Peer Reviewed Journal)
ISSN Online: 3049-1908 ISSN Print:

Pre-Owned Car Market in Kerala: Trends, Challenges, And Future Prospects in A Post-Pandemic Economy

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Article information
Received: 1st April 2025
Received in revised form: 5th May 2025
Accepted: 28th May 2025
Available online: 26th June 2025

Volume: 2
Issue: 2
DOI: https://doi.org/10.5281/zenodo.15743275

Abstract

This research paper examines the evolving dynamics of Kerala's pre-owned car market, with a particular focus on economic factors in the post-pandemic period. Through analysis of secondary data from government reports, industry publications, and market surveys, this study identifies key trends, challenges, and future prospects within this significant segment of Kerala's economy. Findings reveal a substantial shift in preferences toward pre-owned cars, influenced by economic uncertainties, changing mobility needs, digital transformation of market operations, and environmental considerations. The research further explores the market's response to these changes, including the emergence of organized retail channels, adoption of digital platforms, and integration of value-added services. This study contributes to the understanding of regional automotive markets and provides actionable insights for industry stakeholders navigating the evolving landscape of pre-owned car commerce in Kerala.

Keywords:- Pre-owned cars, Used car market, Kerala economy, Automotive retail, Post-pandemic market trends

I. INTRODUCTION

The automotive sector represents a significant component of Kerala's economy, with the pre-owned car market emerging as an increasingly important segment. Kerala, with its unique socioeconomic characteristics including high literacy rates, substantial remittance economy, and distinctive consumption patterns, presents an interesting case study for understanding the dynamics of pre-owned car markets in developing economies (Joseph et al., 2019). The global COVID-19 pandemic has further altered market dynamics, creating both challenges and opportunities within this sector.

The pre-owned car market in Kerala has traditionally been characterized by informal operations, limited organization, and information asymmetry. However, recent years have witnessed significant transformations in market structure and business models, accelerated by technological adoption and changing economic conditions (Kumar, 2021). Understanding these shifts is essential for stakeholders including dealers, financial institutions, policymakers, and consumers themselves.

II. LITERATURE REVIEW

The literature on pre-owned car markets has evolved significantly, from (Akerlof, 1970) seminal work on information asymmetry to contemporary studies exploring digital transformation and changing preferences. In the Indian context, (Jain & Yadav, 2017) noted that India's used car market has been growing at approximately 15% annually, outpacing the new car market. Research specific to Kerala's automotive sector has identified several distinguishing characteristics, including high vehicle density attributed to remittance inflows, dispersed settlement patterns, and inadequate public transportation infrastructure

(Thomas & Sebastian, 2018). Limited research exists on Kerala's pre-owned car market specifically, with (Krishnan, 2019) providing an overview of the predominantly small, independent dealer structure and the emerging presence of organized retail chains.

The impact of COVID-19 on automotive markets has attracted considerable scholarly attention globally, with studies documenting disruptions in supply chains, changes in mobility patterns, and shifts in preferences. (Deloitte, 2021) reported increased interest in personal vehicle ownership across markets driven by health safety concerns. In India, (Goel & Sharma, 2021) observed heightened interest in pre-owned cars post-pandemic, attributing it to economic uncertainties and value-conscious purchasing. However, research specifically examining the pandemic's impact on Kerala's pre-owned car market remains scarce, representing a notable gap in the literature that this study aims to address.

III. RESEARCH METHODOLOGY

3.1. Research Design

This study employs a descriptive research design, focusing on the systematic analysis of secondary data to understand the economic dimensions of Kerala's pre-owned car market. The descriptive approach is appropriate given the research objectives, which center on identifying patterns, trends, and relationships within an existing market phenomenon (Saunders et al., 2019).

3.2. Data Sources

The research relies exclusively on secondary data sources, carefully selected for relevance, credibility, and recency. The study draws from a comprehensive array of information sources to ensure thorough coverage of the market dynamics. Government reports from the Kerala State Transport Department and Ministry of Road Transport and Highways provide official statistics, while industry analyses from organizations such as FADA and SIAM offer market-specific insights. Academic literature, economic indicators from the Kerala State Planning Board and Reserve Bank of India, and aggregated data from online marketplaces further complement these sources. This methodological triangulation of diverse data sources significantly enhances the validity and reliability of the research findings (Yin, 2018).

3.3. Data Analysis Approach

The research employs a mixed-methods approach to data analysis, integrating multiple analytical techniques to develop a comprehensive understanding of the market. Trend analysis examines time-series data to identify patterns and trajectories in market indicators, while comparative analysis benchmarks Kerala's market against other Indian states and international markets. These quantitative approaches are complemented by content analysis of reports and commentaries, economic analysis of supply-demand dynamics, and statistical techniques to establish relationships between variables. This integrated analytical framework enables robust examination of both the quantitative market metrics, providing a multidimensional perspective on the functioning of Kerala's pre-owned car market.

IV. OBJECTIVES

This research aims to analyze the economic factors shaping Kerala's pre-owned car market, with particular attention to post-pandemic developments. Through systematic analysis of secondary data, the study seeks to:

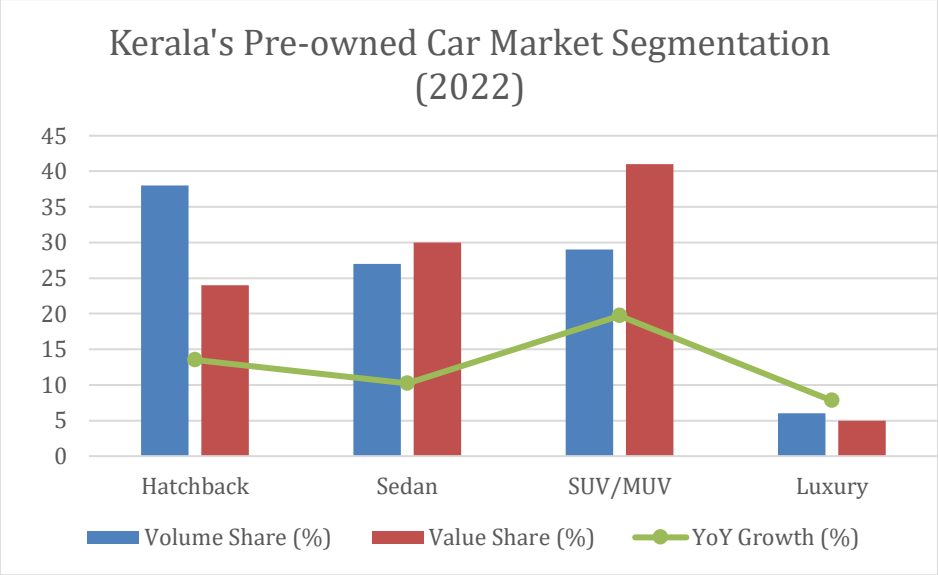
- Identify key trends in Kerala's pre-owned car market over the past five years
- Analyze the economic factors influencing supply and demand dynamics
- Assess challenges facing market participants
- Explore future prospects and opportunities within the sector

The significance of this research lies in its contribution to understanding a vital yet understudied segment of Kerala's economy, providing valuable insights for business strategy formulation, policy development, and decision-making in the automotive sector.

V. KERALA'S PRE-OWNED VEHICLE MARKET: STRUCTURE AND EVOLUTION

Kerala's pre-owned car market has demonstrated consistent growth over the past decade, with acceleration in recent years. According to data from the Kerala Motor Vehicle Department, vehicle registrations for transfer of ownership increased at a compound annual growth rate (CAGR) of 12.3% between 2016 and 2021, exceeding the national average of 9.7% (KMVD, 2022). The market was valued at approximately ₹8,200 crores in 2021, representing about 6.5% of Kerala's retail trade sector, and has exhibited resilience even during economic disruptions. While new car sales in Kerala declined by 23% during the 2020 pandemic year, the pre-owned car market contracted by only 8.7%, recovering to pre-pandemic levels by the third quarter of 2021 (FADA, 2022).

Figure 1: Kerala's Pre-owned Car Market Segmentation (2022)



Source: FADA (2022), Frost & Sullivan (2022)

The market operates through three primary channels: individual-to-individual transactions (45%), independent dealers (38%), and organized retail (17%, growing from just 7% in 2016). Urban centers account for 63% of transactions, though rural market share has grown by 5 percentage points since 2018 (KMVD, 2022).

The evolution of Kerala's pre-owned car market can be understood through distinct phases: the Traditional Phase (pre-2010) characterized by fragmented operations and limited transparency; the Transition Phase (2010-2016) marked by the entry of online classified platforms; the Transformation Phase (2016-2020) featuring organized retail chains and enhanced digital integration; and the Post-Pandemic Phase (2020-Present) defined by accelerated digital adoption and changing mobility preferences (Kumar, 2021).

The regulatory environment continues to evolve, with increasing emphasis on formalization, environmental sustainability, and consumer protection. Key regulatory aspects include transfer of ownership requirements, taxation under GST, increasingly stringent emission standards, enhanced consumer protection measures, and insurance regulations. These regulatory developments present both challenges and opportunities for market participants (KMVD, 2022).

VI. ECONOMIC FACTORS INFLUENCING MARKET DYNAMICS

Several macroeconomic factors significantly influence Kerala's pre-owned car market. Kerala's per capita income exceeds the national average by approximately 65%, creating substantial purchasing power for vehicle acquisition (Kerala State Planning Board, 2022). The state's economy is significantly influenced by overseas remittances, estimated at ₹1.6 lakh crores in 2021-22, equivalent to approximately 20% of the state's GDP (Reserve Bank of India, 2022). Research by (Joseph & Kumar 2021) found that households receiving remittances are 37% more likely to purchase cars, with significant spillover effects in local pre-owned car markets when remittance patterns fluctuate. The Reserve Bank of India's accommodative monetary policy during 2020-2022 resulted in reduced interest rates, with average rates for pre-owned car loans declining from 15.8% in 2019 to 12.4% by 2022 (Indian Banks' Association, 2022).

Table 1: Economic Indicators Impacting Kerala's Pre-owned Car Market (2019-2022)

Economic Indicator	2019	2020	2021	2022
Kerala's Per Capita Income (₹)	205,484	214,763	228,357	241,618
Remittance Inflow (₹ Crores)	138,000	128,000	151,000	160,000
Avg. Pre-owned Car Loan Rate (%)	15.8	14.3	13.1	12.4
Unemployment Rate (%)	9.2	26.5*	8.7	5.8

*Peak during pandemic lockdown

Source: Kerala State Planning Board (2022), RBI (2022), IBA (2022)

On the supply side, passenger cars in Kerala experience average first-year depreciation of 15-20%, compared to the national average of 20-25%, reflecting both the state's vehicle maintenance culture and favorable climatic conditions (Frost & Sullivan, 2022). Commercial fleet operators typically replace vehicles every 4-6 years, creating a consistent supply of well-maintained vehicles entering the pre-owned market, with a 17% increase in fleet replacements observed in 2021 compared to pre-pandemic levels (Nair, 2021). India's Vehicle Scrappage Policy (2021) has begun to impact the market, with a 9% reduction in registrations of vehicles over 15 years old in 2022 compared to 2020 (KMVD, 2022).

Demand-side economics reveal high price sensitivity, with research by (Thomas & Kumar, 2022) estimating the price elasticity of demand at -1.37, varying significantly by segment. Income elasticity analysis shows that entry-level segments demonstrate necessity characteristics (0.78), while premium segments exhibit luxury good characteristics (1.65) (Nair & Menon, 2022). The pandemic caused significant employment disruptions in Kerala, with unemployment rates peaking at 26.5% in May 2020 before gradually recovering to 5.8% by December 2021 (Kerala State Planning Board, 2022). These

economic shifts have altered mobility needs and consumption priorities, with the share of discretionary spending allocated to vehicle acquisition increasing from 14.2% pre-pandemic to 18.7% by 2022 among middle-income households (CMIE Consumer Pyramids, 2022).

VII. MARKET CHALLENGES AND OBSTACLES

Despite market evolution, trust issues persist as significant challenges. Only 38% of pre-owned cars sold in Kerala come with complete documented history, creating information gaps that undermine confidence (FADA, 2022). The absence of universally accepted quality assessment standards creates inconsistent evaluation practices, while price discovery mechanisms remain suboptimal despite digital interventions, with price variations of 12-18% for equivalent vehicles across different market channels (Kumar, 2021). Warranty provisions remain inconsistent, with approximately 65% of transactions occurring without formal warranty protection (Nair & Menon, 2022).

The regulatory environment presents several challenges. The transfer of ownership process involves multiple agencies and documentation requirements, requiring interaction with 3.2 different government entities on average (KMVD, 2022). The implementation of increasingly stringent emission standards creates compliance challenges for older vehicles, with approximately 28% of pre-owned cars in Kerala facing operational restrictions in certain zones. Vehicles registered in other states face additional compliance requirements when transferred to Kerala, adding ₹15,000-₹30,000 to transaction costs and extending process completion by 15-25 days on average (FADA, 2022).

Table 2: Key Challenges in Kerala's Pre-owned Car Market

Challenge Category	Specific Issues	Impact
Information & Trust	Incomplete vehicle history (62% of transactions)	Reduced confidence, price discount of 8-12%
	Lack of standardized quality assessment	Price variations of 12-18% for equivalent vehicles
	Limited warranty coverage (65% of transactions)	Post-purchase dissatisfaction, increased repair costs
Regulatory	Complex transfer process (3.2 govt. entities)	Extended transaction time (avg. 17 days)
	Emission standard compliance (28% of older cars affected)	Market value reduction of 15-22% for affected vehicles
	Inter-state transfer requirements	Additional costs (₹15,000-₹30,000), 15–25-day delay
Infrastructure	Limited purpose-designed facilities (23% of dealers)	Suboptimal customer experience
	Financing limitations for older vehicles	48% approval rate for cars >7 years vs. 83% for cars <5 years
	Digital infrastructure gaps (rural vs. urban)	39% rural adoption vs. 78% urban adoption

Source: FADA (2022), KMVD (2022), Nair & Menon (2022), OLX India (2021)

Physical and operational infrastructure presents various challenges. Only 23% of dealers operate from purpose-designed facilities, with the remainder utilizing adapted spaces with suboptimal customer experience (Krishnan, 2019). Financing availability remains limited for certain segments, with vehicles older than 7 years receiving financing approvals in only 48% of applications, compared to 83% for vehicles under 5 years old (Indian Banks' Association, 2022). Authorized service networks frequently prioritize new vehicle customers, with 42% of pre-owned car owners reporting difficulty accessing authorized service centers (Joseph, 2022). Digital infrastructure penetration remains uneven, with rural adoption of digital platforms at 39% compared to 78% in urban areas (OLX India, 2021).

Human resource limitations affect market functioning, with a 35% gap between market requirements and available certified technical evaluators (Nair & Menon, 2022). Limited understanding of vehicle financing and total cost of ownership affects decision quality, with only 42% of consumers accurately understanding the financial implications of their purchase (Joseph, 2022). Professional standards in sales practices vary considerably, with only 26% of pre-owned car sales personnel having received formal training in automotive retail (FADA, 2022).

VIII. FUTURE PROSPECTS AND OPPORTUNITIES

Economic modeling suggests continued robust growth for Kerala's pre-owned car market, with projections indicating a CAGR of 15.7% over the 2022-2027 period, potentially increasing annual transaction volume from approximately 2.8 lakh cars in 2022 to 5.8 lakh cars by 2027 (Frost & Sullivan, 2022). Market value is projected to grow at a CAGR of 17.3%, expanding from ₹8,200 crores in 2021 to approximately ₹18,600 crores by 2027. The organized sector's market share is projected to expand from 17% in 2022 to 32% by 2027 (Frost & Sullivan, 2022).

Table 3: Kerala's Pre-owned Car Market Growth Projections (2022-2027)

Metric	2022 (Actual)	2023	2024	2025	2026	2027	CAGR (%)
Transaction Volume (lakhs)	2.8	3.2	3.8	4.4	5.1	5.8	15.7
Market Value (₹ crores)	8,900	10,450	12,250	14,350	16,800	18,600	17.3
Organized Sector Share (%)	17	20	23	26	29	32	-
Digital Platform Involvement (%)	32	35	38	42	45	48	-
Electric Car Share (%)	0.5	1.2	2.4	3.8	5.3	7.2	-

Source: Frost & Sullivan (2022), Mathew & Thomas (2022), Nair & Menon (2022)

Technological advancements are reshaping market operations and experiences. Digital platforms are evolving from simple classified listings to integrated transaction environments, with projections suggesting that 42% of transactions will involve digital platforms in transaction completion by 2025 (Joseph, 2022). The adoption of OBD-based evaluation tools is projected to increase from 19% of evaluations in 2022 to 57% by 2025, while blockchain-based vehicle history platforms could reach 22% of transactions by 2025 (Mathew, 2021). AI-driven pricing models are improving pricing accuracy, with early implementations reducing pricing variance by 7-11% compared to traditional methods (Kumar, 2021).

New business models are creating market opportunities. Subscription and flexible ownership models are gaining traction, particularly in urban areas, projected to capture 8-10% of the market by 2027 (Nair & Menon, 2022). Manufacturer-backed certified pre-owned programs are expanding, with CPO sales projected to grow at CAGR 27.3% (FADA, 2022). Car aggregator platforms are projected to capture 18-22% of the market by 2025, while hybrid "phygital" retail models combining digital reach with physical experience centers demonstrate conversion rates 23% higher than pure digital or traditional physical models (Thomas & Sebastian, 2022).

Environmental considerations and policy evolution will shape market development. The pre-owned electric car segment is projected to reach 6-8% of the market by 2027 as first-generation EVs enter the pre-owned market (Nair & Menon, 2022). Principles of circular economy are increasingly influencing market practices, with 28% of pre-owned car retailers now operating or partnering with parts recycling operations, projected to reach 45% by 2026 (Joseph, 2022). Potential policy interventions could significantly impact market structure, with estimates suggesting that comprehensive policy implementation could accelerate market formalization by 30-40% (Mathew & Thomas, 2022).

IX. CONCLUSIONS AND RECOMMENDATIONS

This research has identified several significant findings regarding Kerala's pre-owned car market. The market demonstrates robust growth potential, with projected CAGR of 15.7% (2022-2027), significantly outpacing both Kerala's GDP growth and new car market expansion. A structural transformation is underway, characterized by increasing formalization, digital integration, and standardization of operations, though significant segments remain informal and fragmented. Information asymmetry persists as a fundamental market challenge despite technological interventions, affecting price discovery, quality assessment, and transaction confidence. The post-pandemic environment has accelerated digital adoption, preference for personal mobility, and value-consciousness in purchasing decisions. Emerging business models and environmental considerations are creating new market opportunities while potentially addressing traditional market inefficiencies.

These findings have significant implications for various stakeholders. Dealers and retailers should prioritize digital integration while maintaining physical inspection capabilities, invest in standardized vehicle evaluation technologies, develop robust vehicle history documentation systems, and explore emerging business models including subscription services. Financial institutions should expand financing options for pre-owned cars, develop tailored financial products, and implement technology-enabled evaluation systems to improve risk assessment accuracy. Policymakers should streamline ownership transfer processes, develop standardized vehicle inspection protocols, consider incentives for retiring older vehicles, and implement comprehensive policy frameworks balancing consumer protection, environmental considerations, and market growth.

Several areas merit further investigation, including longitudinal studies tracking evolving market trends, environmental impact assessment of the pre-owned car market, evaluation of digital transformation effectiveness, analysis of emerging business models, and studies on the impact of regulatory interventions on market outcomes.

Kerala's pre-owned car market stands at an inflection point, characterized by accelerating transformation and significant growth potential. The convergence of digital technologies and emerging business models creates opportunities for addressing traditional market inefficiencies while delivering enhanced value to consumers. As traditional boundaries between new and pre-owned markets blur, and as alternative ownership models gain traction, the pre-owned car market's future development will likely be characterized by increased integration within a broader mobility ecosystem, presenting both challenges and opportunities for all participants in this important economic sector.

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INTERNATIONAL JOURNAL OF COMMERCE AND MANAGEMENT RESEARCH STUDIES (IJCMRS)
(Open Access, Double-Blind Peer Reviewed Journal)
ISSN Online: 3049-1908 ISSN Print:

Unveiling the Nexus between Millets and Government Policies: A Bibliometric Mapping Approach

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Article information

Received: 6th May 2025
Received in revised form: 15th May 2025
Accepted: 13th June 2025
Available online: 26th June 2025

Volume: 2
Issue: 2
DOI: https://doi.org/10.5281/zenodo.15752471

Abstract

The Sustainable Development Goals (SDGs) consist of 17 interconnected objectives established by the United Nations (U.N.) to address critical global challenges. Aiming to eradicate poverty, protect the planet's ecosystems, and promote peaceful societies, the SDGs strive for these outcomes by 2030. Each goal targets specific issues, encouraging countries to collaborate toward creating a sustainable and equitable future for all. Millets have progressively become crucial for accomplishing these Sustainable Development Goals (SDGs) with their distinctive qualities and advantages. Given the evolving climatic conditions and prevailing hidden hunger, proficient research and developmental attention on millet is necessary to attain food, feed, and nutrition security. With their rich content of proteins, vitamins, and minerals, millets play a significant role in addressing hidden hunger, ensuring that the audience is well-informed and aware of this crucial aspect of food security. Henceforth, no substantial review is provided for an extensive millet and food security overview. To initiate a comprehensive bibliometric analysis of the corpus of contemporary literature, this work uses a VOS viewer and Bibliometric R-package in the area of the contribution of millets and Government. To achieve this, we examined 201 documents in detail from the Scopus database to further determine the publication activities in the relevant area. Examining the subjects dealt with in this field has revealed historical development in this discipline.

Keywords: - Bibliometric analysis, Millets, Government, Review, VOS viewer, Biblioshiny.

I. INTRODUCTION

The Sustainable Development Goals (SDGs), set to replace the Millennium Development Goals (MDGs) after 2015(de Jong & Vijge, 2021), have an ambitious 2030 target to end all forms of malnutrition (Hák et al., 2016). The UNGA resolution aims to increase global knowledge of millet health, nutritional, and climate resilience benefits (Antony Ceasar & Maharajan, 2022). To do this, measures are required to substitute very nutrient-dense cereals like millet for the diet's predominant amounts of rice, wheat, and maize (Kane-Potaka et al., 2021). Millets, a traditional crop grown largely in Asia and Africa (Devisetti et al., 2014), are not just a part of our past but also a beacon of hope for the future. They are regarded as the oldest cultivated crop still in use for feeding humans and animals (Anitha et al., 2024), and most millets thrive in farming conditions where other grains struggle to produce good yields (I. K. Das & Rakshit, 2016). By replacing less nutrient-dense grains with millet, we can enlighten the path to a malnutrition-free future.

Millets have long been essential in many agricultural and culinary cultures across the world (M. et al., 2023). In addition to being a smart food due to its health and nutritional value, millet is also environmentally friendly, and farmers cultivate it to be climate-smart (Anitha et al., 2021). Therefore, creating smart crops includes improved nutrition, resistance to climate change, and essential therapeutic qualities for the future review. Initiatives from national and international organizations are necessary to preserve the traditional landraces of millets, their cultural heritage, and ethnobotanical values to preserve the rights of tribal farmers (Saha et al., 2016). The Government of India, led by Prime Minister Narendra Modi's vision, spearheaded the United Nations General Assembly to bring up awareness of millets, create local and international demand,

and provide people with wholesome food. Resolution (UNGA) designating 2023 as the International Year of Millets because they are less dependent on outside inputs, drought-tolerant, and have a lower carbon footprint than other cereals (Antony Ceasar & Maharajan, 2022). Small millets have also caught the attention of growers and policy-makers in the current consequences of the adverse effects of climate change (Maitra et al., 2022). Climate changes are influencing natural resources, food production, agricultural productivity, and rural livelihoods (Poudel & Shaw, 2016). Countries with high average yields had the biggest anticipated yield losses, indicating that well-fertilized current seed varieties are more vulnerable to heat-related losses (Schlenker & Lobell, 2010a). For instance, the decrease in farmers has led to significant changes in the way food is produced (Tiwari et al., 2023). Millets are being revived with increasing attention both in India and throughout the world due to their nutritional value and resilience to extreme weather conditions (Kane-Potaka et al., 2021).

This paper is dedicated to conducting a comprehensive and innovative bibliometric analysis, with the clear objective of identifying a specific research gap in the existing literature on millets and their role in food security. By employing a Systematic Literature Review, we will systematically evaluate the current body of research, highlight trends, and uncover underemployed areas that warrant further investigation in this critical field. Through this meticulous approach, we aim to contribute valuable insights that can guide future studies and inform policy decisions related to agriculture and food security. To accomplish this primary objective, we need to focus on clear strategies that align our efforts and resources effectively. It is essential to set measurable goals and maintain consistent communication throughout the process. The study addresses the following research questions:

- How are current publication trends on millets and government shaping journals, authors, countries, and research areas, and what impact do they have on the field?
- What theoretical foundations have been provided as the basis for developing and expanding research on millets and government?
- What is the essential keyword used in millets and Government?
- What are the future research areas for millets and Government initiatives?

This study uses bibliometric methodologies to accomplish this, which combines a diverse range of quantitative tools capable of handling large datasets associated with the literature. The bibliometric evaluation of the existing literature then evaluates the current condition of the subject. It identifies areas of study and academic bases of sectors where the use of Millets and Government is examined, and frameworks for additional research are provided. The study has addressed the following issues using the bibliometric analysis technique. Millet has a wide range of applications and is very important to food security. It has gotten significant attention internationally. However, no analysis has yet offered a thorough overview of millets and government.

II. REVIEW OF LITERATURE

2.1. Millets

Millet is a perfect choice because of the strength of its short growing season and great adaptability (Chandra et al., 2020). Compared to many other crops, millets can provide noticeably greater yields on marginal soils with low fertility and minimal input agricultural systems. (S. Das et al., 2019). The government has acknowledged the crop's significance in supplying the public with its nutritional needs. Pearl millet and Finger millet are the most popular millets of food and feed (Hassan et al., 2021). The varietal development should be improved by increasing investment in minor millets. Customers are aware of the importance of millet in their diet and recent fast food habits. Therefore, it might be promoted through various extension activities (Anbukkani et al., 2017). Since they are abundant in many essential nutrients, they offer a further benefit in the fight against nutrient deficits in third-world nations (Hassan et al., 2021). It is a small-seeded cereal crop farmed for food, feed, forage, and fuel. Millets come in around 20 different species. Millets are cultivated all over the world, with India, Nigeria, Niger, China, Mali, and Burkina Faso making significant contributions (S. Das et al., 2019). One of the best crops for sustainable agriculture and long-term food security is millet due to its short growing season and extensive adaptability to many environmental conditions (Sharma et al., 2021).

Millet grains are incredibly versatile and may be processed to create high-quality, gluten-free foods and beverages (Mohod et al., 2023). Several diet-related initiatives are presently popularizing the usage and consumption of small millet in various ways (Lydia Pramitha et al., 2023). Promote research and development on significant crops while ignoring smaller crops of regional significance (Vetriventhan et al., 2020).

III. METHODOLOGY

One of the best methods for determining the caliber of scholarly production is the analysis of bibliographic data using bibliometric methods (Szomszor et al., 2021). This study utilizes bibliometric analysis, which is a quantitative method for measuring extensive databases To achieve this goal, we intend to collect data on millets in the context of government research by examining publication trends related to authors, articles, institutions, and countries. The publication trends in terms of authors, articles, institutions, and countries. The outlook of millets has wide applications in today's competitive world, particularly in the development of innovative value-added products. Data was retrieved from Scopus in October 2024 to gather data for the study. Initially, an extensive search for information was performed in Scopus, utilizing keywords developed through careful examination of publications related to millet and government. Scopus is the world's largest searchable citation and abstract database, which is constantly enlarged and updated (Aghaei Chadegani et al., 2013). Although it would alone be sufficient to employ Scopus, we believe the primary reason is the evident immaturity of the field. We decided to broaden our search for relevant literature since the area is still expanding. Search terms include ("millet" and

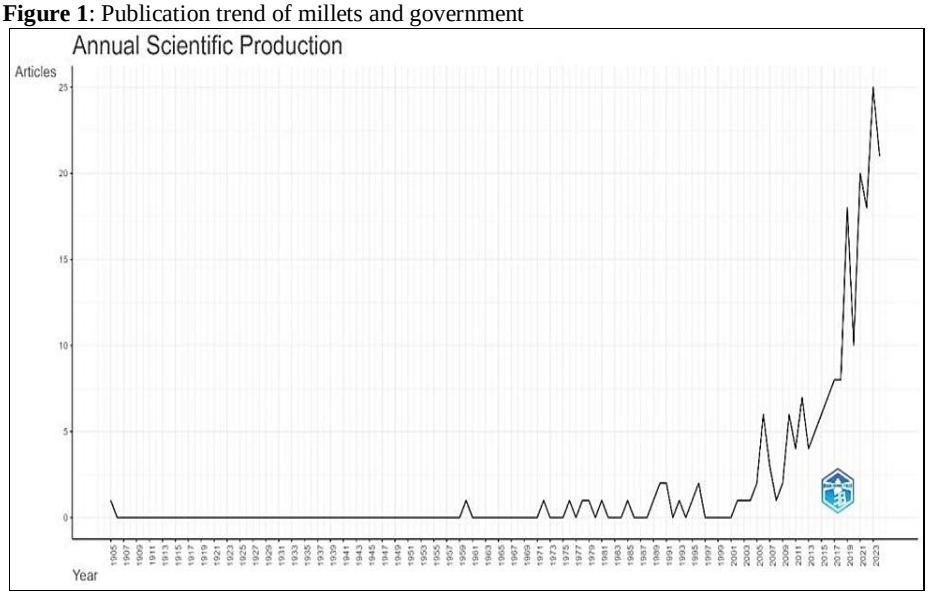
"government") for measuring titles, abstracts, and keywords. It is restricted to English-language and research articles published in the fields of agriculture and biological sciences, environmental science, social science, economics, econometrics, finance, arts and humanities, as well as business management and accounting disciplines.

There are about 201 articles in the final data for conducting bibliometric analysis. The analysis of data conducted using VOS viewer and the R software package enables the creation and visualization of bibliometric networks. These networks can represent relationships between journals, researchers, or publications based on citations, bibliographic coupling, or co-authorship connections. VOS viewer also provides text mining tools that can be used to create and visualize networks of terms that co-occur in a body of scientific literature. The Bibliometric R-package software provides citation-related and publication-related metrics, identifying the most influential authors, publications, sources, and countries based on total citations and the total number of publications. Based on the keywords used in the studies, the Bibliometrix R-package is utilized for keyword analysis, highlighting the trending topics in the area. Besides, to understand the publication activities related to food security and millets, methods such as citation analysis, cooccurrence are used.

IV. RESULTS AND DISCUSSION

4.1. Publication trend of millets and government

Figure 1: Publication trend of millets and government



The figure depicts that the use of millets and different government is relatively new, having begun in 1971. However, it has been steadily increasing in after 2001. The most important years of this publication activities are 2022 (18 articles), followed by 2023 (25 articles), and 2024 (21 articles).

4.2 Top authors, journals of government and millets

Table 1. Top authors and journals in the field of millet and government

Author	TC	Journals	TC
Se graff M	363	New Phytologist	363
Fu X	318	Geoderma	318
Peterson G.A Eliazer Nelson	242	Journal Of Production Agriculture	242
A.R.I	194	Journal Of Ethnic Foods	194
Sarath G	118	Planta	173
Gubbi S	101	Biological Conservation	101
Kerr.R,B	95	Annals Of The Association Of American Geographers	95
Kansanga.M	89	Environmental Research Letters	93
Faye.B	72	International Journal Of Sustainable Development And World Ecology	89
Tralamazza.S.M	68	Agricultural Economics	75

Table 1 presents the citations related to government through millet publications, categorized by authors and journals. Based on citation volume, the leading authors in millet research focused on government are Se Graff M with 363 citations, and Fu X, with 318 citations and displays that the top journal that published millets and government was New Phytologist, with 363 citations, followed by Geoderma, with 318, respectively.

4.3 Co-authorship by countries

Different authors did co-authorship by countries. Out of 52 countries, 37 meet the threshold with a minimum of 1 documents for a country. United States emerges as the leading country in this area, having garnered 1726 citations along with a total of 45 documents, as illustrated in Table 2.It is followed by the India, which has 804 citations and has published 77 documents.

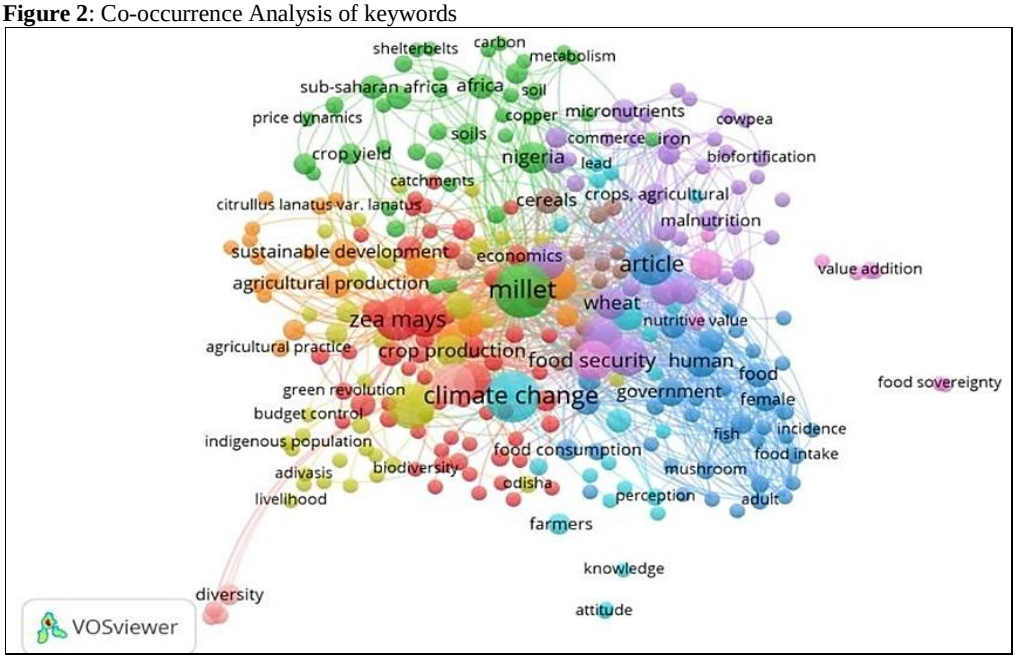
Table 2. Leading nations for study on government role in millet promotion

Country	TP	TC
United States	45	1726
India	77	804
China	13	486
Germany	5	153
France	5	145
Norway	2	139
United Kingdom	6	121
Saudi Arabia	2	117
Canada	3	104
Burkina Faso	2	94

4.4 Co-occurrence analysis.

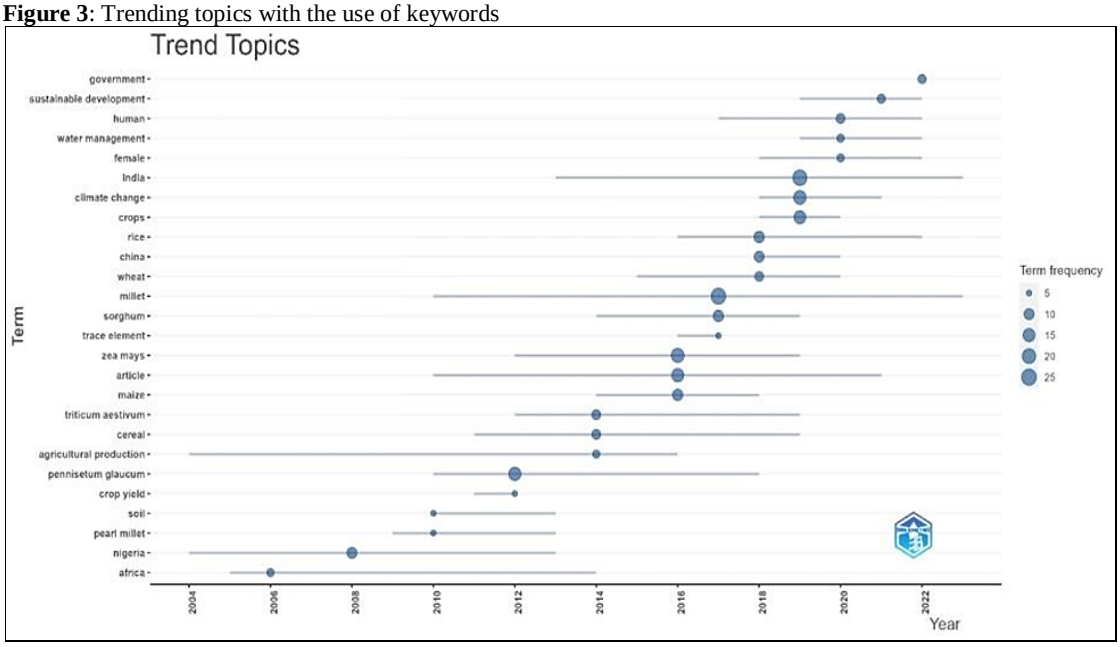
Co-occurrence analysis involves examining keywords to explain concepts. This method highlights the key themes present in studies about the impacts of millet and government, based on the keywords used by the authors in their publications. In total, there were 1570 keywords identified across 201 articles. Among these, 285 keywords met the threshold of appearing at least two times, as illustrated in Figure 2. The figure highlights that "Millet", "Climate change," and "India" have a significant impact on the network. Notably, millet was the most frequently examined concept in relation to climate change and millets, as discussed by the authors in various articles.

Figure 2: Co-occurrence Analysis of keywords



4.5 Trending topics

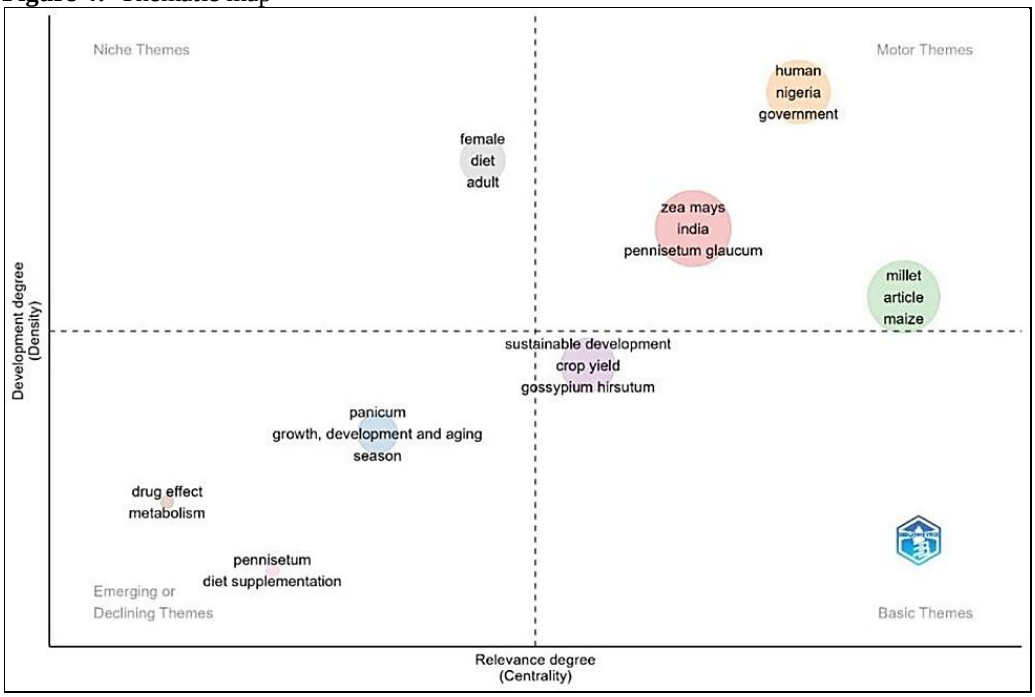
Figure 3: Trending topics with the use of keywords



Analysing the keywords used in articles is a major technique for identifying developing issues and the writers' attention on the subject. The current popular topics in this area, as shown in Figure 3 based on the authors' keyword usage, include government and sustainable development. In 2006 the major studies were in Africa, and in 2012 focus move to pennisatumglaucum. In 2014 the studies on the topic of cereal was trending, then Zea mays in 2016 in 2017 focused on millets. In 2019, the most trending topic was India. In 2018 Indian government celebrated the national year of millets. In 2022 the focus move to sustainable development by different governments. The table displays the top 20 keywords frequently used in millet research and food security. Besides "millets" and "food security," the most prominent keywords include "climate change" and "food supply."

4.6 Thematic Map

Figure 4: Thematic map



The thematic map of millet and farmers shown in Figure 4 is another analysis done with the keywords using the Bibliometric R-package. An analysis of the field's current state and prospects for sustainability is the goal of a thematic map. This analysis helps educate researchers and stakeholders about the possibility of establishing new thematic research topics within a discipline (Agbo et al., 2021). The density and centrality measures determine whether the topics are well developed and their significance, respectively. Each circle's size reflects how many articles have used that particular term. A thematic map has four quadrants. The quadrants are explicated as below.

- The upper-right quadrant reflects the driving/motor themes in Millet and Government. This quadrant contains four clusters, each of which is quite different from the others and is connected by a large number of keywords. It shows that the driving themes in this field are Zea mays, India, Pennisetum, glacum, human, Nigeria and millet and its effect on different governments.
- The basic concepts in the field are shown in the lower-right quadrant. There is only one cluster in this quadrant, and it is on the theme of sustainable development and it is supported by crop yield and gossypium hirsutum.
- Themes in the lower-left quadrant are either emerging or declining themes. There are 3 clusters in this theme are pancium growth, development and aging season, drug effect, metabolism, pennisetum, and diet supplementation. Diet supplementation business has good scope in this era. Pancium growth and development and aging season are important theme to be studied, but it is not well developed yet.
- The upper-left quadrant depicts the niche themes that are studied in millet and government. There is only one cluster in this theme and that is diet policies among adult and females. There should be more effort put into developing the concept of diet plans in millet promotion.

V. THEORETICAL AND PRACTICAL IMPLICATIONS

This work significantly affects the body of literature that already exists in several ways. With the help of a bibliometric network based on analysis of 201 publications published in the millets and food security, this study first examines the theoretical foundations and key aspects of millets. This understanding of the subject's significance can thus be used in the development of future value-added millet products. This study first explores the theoretical underpinnings and key areas of different countries that gave attention to millets. This insight into the subject's importance can thus be applied to the development of upcoming value-added millet products. They require significantly fewer input costs for cultivation, are naturally tolerant to most pesticides, and have additional health benefits and stresses that are biotic and abiotic (Bandyopadhyay et al., 2017). This study is the first to address the research gap using a bibliometric approach, identifying key authors, journals, and, importantly, future research areas in this field. As the study suggests, there is ample opportunity for further research to be conducted in this field. Government

is an area that focuses on sustainable development goals. This study has highlighted the necessity for research to enhance millet cereals as a whole, noting the scarcity of work conducted on individual sub-sectors. This study's main goal is to give academics a deeper understanding of the topic by elucidating its conceptual framework. Next, the findings demonstrate the significant contributions made by the key on this topic. The purpose of this work is to discuss the growing importance of this using a thorough review of the literature on government and millet papers. Millets were found to have a significant potential to contribute to India's food and nutritional security. As a result, we were able to communicate with people who had an understanding of Soon there would be interest in this field as a potential study area.

VI. CONCLUSION

To conduct a bibliometric analysis and identify gaps in research on government and millets is the main objective of this study. To achieve our objective, we conducted a quantitative bibliometric analysis using 201 papers sourced from the Scopus database. To the best of our knowledge, no comprehensive quantitative bibliometric studies have been published.

This effort aims to fill this knowledge gap and establish a foundation for further research in the subject area, promoting its continuous expansion. Additionally, the researchers believe that the findings of this study will serve as a cornerstone for future investigations. This enabled them to discover the existing scientific foundations of current trends and the contributions of millets to food security. These coarse cereals are currently being reassessed as "Nutri-cereals" in light of their nutritional value and composition (Maitra et al., 2022)

VII. LIMITATIONS AND FUTURE RESEARCH DIRECTION

While the paper makes significant contributions, some issues still need to be addressed. One is the choice to retrieve data from a single database as opposed to several sources. Using multiple databases will give the subject broader coverage even though the authors of this study believe that Scopus contains a representative selection of papers from the entire field. The inclusion criteria did not apply to unpublished working papers, doctoral theses, textbooks, or conference proceedings. Furthermore, because the study only considered English-language publications, the importance of research conducted in other languages was disregarded.

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