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A STUDY ON COMMUTER SATISFACTION WITH ARTIFICIAL INTELLIGENCE (AI) IN KONKAN RAILWAY

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Abstract:

The Konkan Railway, stretching over 740 kilometers through diverse and challenging terrains, plays a vital role in connecting India's coastal regions. This railway faces unique challenges, including seasonal disruptions, varying passenger demands, and the need for improved service efficiency. This research focuses on "A Study on commuter satisfaction with Artificial Intelligence (AI) in Konkan Railway". AI technologies have the potential to transform traditional rail travel by offering timely information, minimizing service disruptions, and providing customized travel experiences that meet the needs of each individual passenger. By integrating AI-driven tools such as predictive analytics, machine learning models, chatbots, and recommendation systems, this study aims to optimize passenger services on the Konkan Railway. Real-time updates on train schedules, personalized journey recommendations, and automated assistance can help create a smoother and more convenient travel experience for passengers. The study uses data-driven methods to assess the effectiveness of these AI applications, evaluating their impact on passenger satisfaction, service efficiency, and overall travel convenience. The findings of this study reveal that AI-driven technologies significantly contribute to improving service delivery, reducing delays, and offering personalized travel options. Passengers benefit from dynamic ticketing, automated support, and customized travel suggestions, resulting in higher levels of satisfaction. The study shows that AI can help railways run more smoothly by predicting passenger demand and infrastructure needs, reducing costs, and using resources more efficiently. In conclusion, this study highlights AI's transformative potential in making the Konkan Railway smarter, more efficient, and passenger-centric. By incorporating AI-powered solutions, the railway can improve both the overall travel experience and its responsiveness to the needs of modern travelers', paving the way for a more connected and smarter transportation system.

Keywords: *Artificial Intelligence, Konkan Railway, Commuter satisfaction.*

Introduction: The Indian railway network, one of the world's largest, faces the constant challenge of improving efficiency, safety, and passenger satisfaction. In recent years, Artificial Intelligence (AI) has emerged as a promising tool to address these challenges. Railways are the backbone of transportation in India, providing

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affordable and efficient travel to millions of people. The Konkan Railway is one of India's most scenic and vital railway networks, connecting Maharashtra, Goa, and Karnataka. It plays a crucial role in transportation, catering to thousands of passengers daily. With the increasing demand for better services, technology has become a key factor in improving railway operations. One of the most advanced technologies making a difference today is Artificial Intelligence (AI). As technology advances, Artificial Intelligence (AI) is being integrated into railway operations to improve efficiency, safety, and customer experience.

AI is being used in many different areas of Konkan Railway services, including AI-powered ticketing systems that simplify the booking process and real-time train tracking systems that provide passengers with accurate and timely updates on train arrivals and departures. Furthermore, AI-powered security systems, such as surveillance cameras with facial recognition and crowd monitoring, ensure the safety and well-being of passengers. These innovations are expected to improve the railway's operational efficiency while also increasing commuter satisfaction by providing more personalized, responsive, and seamless travel experiences.

Assessing the effectiveness of AI applications requires an understanding of commuter satisfaction. Because it has a direct impact on ridership, public opinion, and the overall success of technological integrations, commuter satisfaction is a crucial component of the railway system's sustainability and expansion. Common issues like long waits, delayed trains, and poor customer service are intended to be addressed by the application of AI. But even with these developments, it's important to find out how commuters feel about the safety, convenience, and comfort of these AI-driven changes.

The purpose of this study is to evaluate how AI technologies affect Konkan Railway commuter satisfaction. It will examine how the travel experience is changing as a result of AI-powered advancements in security systems, track monitoring, signal systems, real-time train tracking, facilities for Senior citizens and Divyang passengers, predictive maintenance, and ticket booking. The goal is to identify whether these technologies are meeting the needs of passengers and improving their overall satisfaction. The research is to provide insights into how AI can be used to modernize railways while meeting commuters' expectations and optimizing service reliability and efficiency. Finally, a smarter, safer, and more effective future for Konkan Railway may be possible with the effective integration of AI, which would be beneficial to both the company and its passengers.

Review of Literature:

Sharma (2024), in her paper titled “AI in Indian Railways - Applications and Challenges” highlights the uses of AI in Indian Railways and understand the challenges and issues related to the uses of AI in Indian Railway. Including the parameters like Safety, Timelines of Trains, Ticketing and services.

Besinovic et. al. (2022), in their paper titled “A literature review of Artificial Intelligence applications in railway systems” presented a structured taxonomy to guide researchers and practitioners to understand AI techniques, research fields, disciplines, and applications, both in general terms and in relation to application of AI in railways like autonomous rails, maintenance and management of train traffic. The significance of ethics and the explanation of AI's potential in railroads were also covered.

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Neeraj Kumar & Abhishek Mishra (2021), in their article "Role of Artificial Intelligence in Railways: An Overview" Enhances the solution to the problem of infrastructure and the software with the integration of the internet for providing better services to the passengers. The objective of this work is to explore the role of AI in railway Transportation and addressing the challenges and limitations of AI applications in railway transportation.

Objectives of the Study:

1. To Study the uses of AI in the Konkan Railway.
2. To analyze the impact of AI on commuter satisfaction.

Current application of AI facilities in Konkan Railway:

1. **Rail Track Monitoring and Alert System (RTMAS)**

   Image processing is used to diagnose rail track deformations using Machine Learning (ML)/AI approaches. RTMAS is a cloud-based server solution designed to monitor the susceptible sections of railway tracks for occurrences such as tree falls, rock falls, soil slips, or any other obstructions.

2. **Alarm notifications**

   Advanced machine learning and AI algorithms are created and combined to handle image processing, image classification, and alarm notifications. The system employs cameras and ML / AI algorithms to surveil the susceptible cuts along the Konkan train lines, detecting any obstructions on the train track. It notifies the relevant engineers, resulting in enhanced safety and efficiency in transit along the Konkan sector.

3. **RailView module**

   The RailView module, positioned adjacent to the railway track, can integrate several cameras to offer 180-degree monitoring. It comprises a high-speed system for processing and analyzing images. The RailView system is a dedicated hardware platform designed to execute image processing algorithms in real-time efficiently.

4. **Specialized Digital Signal Processing**

   Specialized Digital Signal Processing (DSP) methods handle complicated and advanced picture applications, such as machine vision. After preprocessing, the recorded images are transmitted to the RailView High-speed AI/ML engine. AI will be utilized to analyze images and diagnose the status of rails. Once it detects any deformation, the identical photos will be transmitted to the central server via the 4G network to the RTMAS server.

5. **RTMAS server-side software**

   A secure and fast communication interface allows the RTMAS server-side software to register the trackside RailView device and retrieve real-time track images. The RTMAS cloud server has a high-performance GPU that utilizes advanced machine learning and artificial intelligence algorithms to process images and provide alerts efficiently.

6. **Regular and tailored reports**

   The RTMAS server software additionally offers regular and tailored reports to its users. The RTMAS server software provides a scalable solution for monitoring the rail lines for abnormal occurrences at the trackside.

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7. **Website:**

   Through https://konkanrailway.com/, KRCL provides information such as current train positions, passenger facilities and amenities, feedback forms for complaints and suggestions, tender enquiries, status of contractors/vendors bills, latest news/press releases, Tourism Information and updates related to recruitment notifications.

8. **Mobile Apps:**

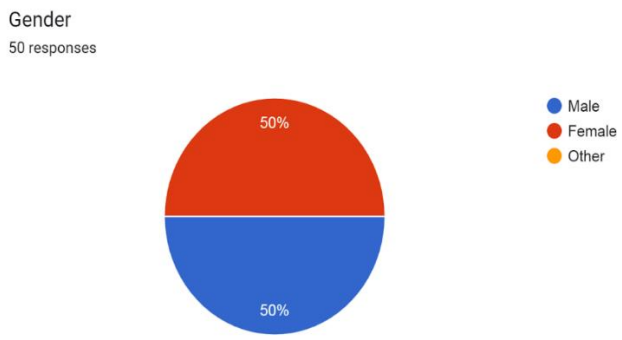
   Konkan Railway has launched its Train and Travel services KR Train App which provides information on Time Table of trains running on the Konkan route, current train position, tariffs of Roll-on-Roll-off services, Station Amenities, Passenger Helplines, medical facilities available in hospitals at nearby stations in the KR region. An internal app, KR-Karmi for employees to view their personal and official details, along with a dictionary of relevant contact details for disaster management and a provision to track contractor/supplier bill status. These applications are available on Google's Play Store and CDAC's Mobile Seva App Store.

Research Methodology:

The research is done on Konkan Railways. This study follows a descriptive research design, aiming to assess the role of AI in Konkan Railway and its effect on commuter satisfaction. It seeks to understand passengers' experiences, perceptions, and challenges related to AI-based services such as ticket booking, real-time train tracking, security etc. involves a combination of primary and secondary data collection methods. The secondary sources of data, namely online sources for newspaper news, research journals, articles, etc.to understand the AI with Konkan railways. To authenticate whether there has been an improvement in operation and services of Konkan railways after the introduction of AI, primary data was used. 50 Commuter that of 25 Male and 25 Female, were asked questions relating to AI based ticket booking, security systems, Track Monitoring ,application for Senior citizens and Divyang, etc. For this primary data was used. Questionnaires were sent in google form and the first 50 filled google forms received were analysed.

Data Analysis:

Graph No. 1 Gender



Interpretation: Out of total 50 respondents of commuters in trains, 25 were male and 25 were female responses were analysed

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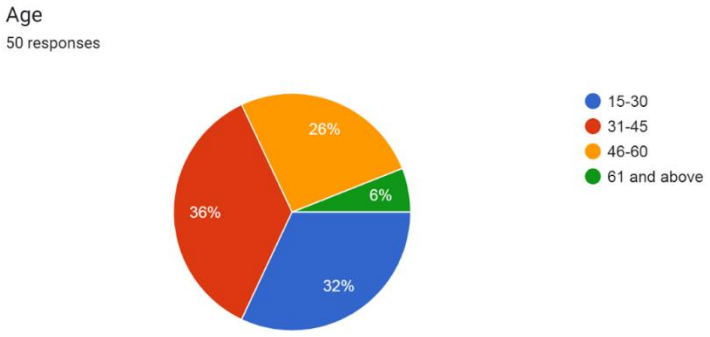
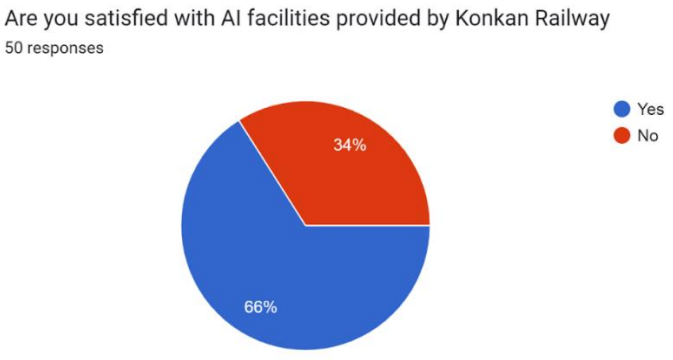
Graph No. 2 Age



Interpretation: The **pie chart** represents the **age distribution** of **50 survey respondents**.

- **31-45 years (Red - 36%)**: This age group forms the largest percentage of respondents, indicating that middle-aged commuters are the most frequent users of the service.
- **15-30 years (Blue - 32%)**: Young adults make up a significant portion, suggesting that working professionals' students and rely on Konkan Railway.
- **46-60 years (Orange - 26%)**: This group represents a moderate share, likely consisting of frequent travelers and working individuals.
- **61 and above (Green - 6%)**: The lowest percentage belongs to senior citizens, indicating that AI-based railway services might be **less used or needed** by this age group.

Graph No. 3 Level of Satisfaction



Interpretation: The pie chart represents the responses of 50 commuters regarding their satisfaction with AI facilities provided by Konkan Railway. 66% (Blue) - Satisfied: The majority of respondents (33 out of 50) are satisfied with the AI-based services provided by Konkan Railway. This suggests that most commuters value AI-powered services like automated ticket booking, real-time train tracking, and security monitoring. 34% (Red) - Not satisfied: However, a significant proportion of respondents (17 out of 50) are dissatisfied with AI services.

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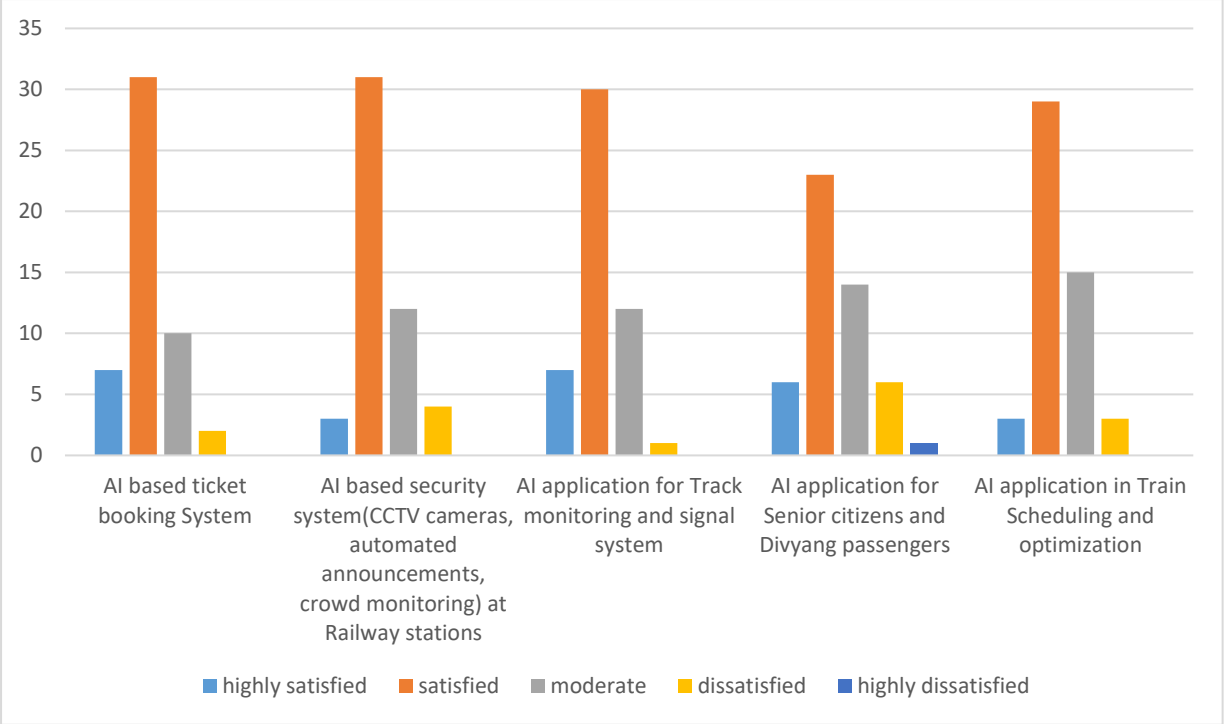
This implies that certain issues or challenges exist, such as technical flaws, a lack of usability, or insufficient AI implementation.

Graph No. 4 Level of Satisfaction on AI facilities offered by the Konkan Railway to the Passengers



Interpretation:

Categories (X-axis): The horizontal axis lists the different AI applications being evaluated.

Numerical Scale (Y-axis): The vertical axis represents the number of respondents.It ranges from 0 to 35.

High Satisfaction with Ticket Booking and Security: The "AI-based ticket booking System" and "AI-based security system" have the highest levels of satisfaction, with a significant number of respondents indicating "highly satisfied" (dark blue) and "satisfied" (red).

Moderate Satisfaction with Track Monitoring and Train Scheduling: The "AI application for track monitoring and signal system" and "AI application in train scheduling and optimization" have a moderate level of satisfaction. While there are still a large number of "satisfied" respondents, the proportion of "highly satisfied" is lower than for ticketing and security. There are also many "moderate" responses.

Mixed Response for Senior Citizens and Divyang Passengers: The "AI application for Senior Citizens and Divyang Passengers" has received a more mixed response. While there are "satisfied" respondents, there are also a significant number of "moderate" and "dissatisfied" or "highly dissatisfied." This highlights potential areas for improvement in catering to these specific passenger groups.

Findings:

AI Adoption in Konkan Railway is Generally Positive. The commuters are satisfied with AI-based services, indicating that AI enhances convenience in ticket booking, real-time train tracking, and overall travel experience.

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However, 34% of respondents expressed dissatisfaction, highlighting gaps in AI performance or accessibility. Majority of AI Users Belong to the Working-Age Group use AI-based services the most, indicating a high level of tech adoption among younger and working professionals. Only 6% of senior citizens (61+ years) engage with AI features, many commuters rely on AI-powered mobile apps, websites, and display boards to check train schedules, which helps in better travel planning. AI applications for tracking and scheduling trains receive moderate satisfaction. The AI service designed for senior citizens and disabled passengers receives mixed feedback, with significant space for improvement. Overall, while some AI implementations are successful, others require improvement to enhance the passenger experience, particularly for certain demographics.

Discussion:

The most popular AI-based services analyzed were real-time train tracking and AI-driven ticket booking. Commuters appreciate the convenience of checking train schedules, seat availability, and fare information online, which eliminates the need for physical ticket counters. However, some users express dissatisfaction with technical issues, slow response times, system errors, and occasional inaccuracies in train tracking. Some users lack awareness or proper guidance on how to take advantage of AI-powered features, resulting in a digital gap. A major concern raised by the findings is that AI systems in the Konkan Railway should be more user friendly and accessible. Passengers, particularly seniors and first-time users, struggle with complex digital interfaces, limited language support, and a lack of alternative AI-assisted services. To close this gap, Konkan Railway should consider implementing multilingual support, voice-based AI assistance, and simplified UI/UX designs. Many commuters believe that AI can be used to improve train scheduling, predict delays, and manage railway traffic better. AI-powered predictive maintenance and automated train monitoring could help reduce operational disruptions. Furthermore, AI-driven security systems such as CCTV surveillance, facial recognition, and automated alerts have the potential to significantly improve passenger safety, particularly during night time travel.

Conclusion:

The study on commuter satisfaction with AI in Konkan Railway reveals that AI has significantly enhanced travel convenience, efficiency, and accessibility. AI plays a vital role in enhancing commuter satisfaction. A majority (66%) of commuters are satisfied with AI-based services, particularly in areas like real-time train tracking and digital ticket booking. However, 34% of passengers remain dissatisfied, indicating room for improvement in technical reliability, user-friendliness, and accessibility for non-tech-savvy commuters. The findings suggest that AI adoption is highest among younger and working-age passengers (15-45 years), while senior citizens (6%) struggle with digital interfaces. This highlights the need for simplified, multilingual, and more inclusive AI solutions to cater to a diverse range of passengers.

The Konkan Railway has proven the successful application of AI in some areas, and with targeted efforts to address the identified shortcomings, they can improve the passenger experience and establish their position as an example in the use of AI in transportation.

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To maximize the benefits of AI, Konkan Railway should focus on technical improvements, better accessibility, and increased awareness are needed for wider adoption and efficiency in Konkan Railway. By addressing these gaps, AI can revolutionize the railway experience, ensuring smoother, safer, and more reliable travel for all passengers. Additionally, AI has the potential to improve train punctuality, safety, and operational efficiency. AI-powered predictive maintenance, automated scheduling, and security monitoring can help enhance overall railway performance.

References:

1. *Dr. Rashmi Sharma (2024), "AI in Indian Railways - Applications and Challenges"*
2. *Journal of Emerging Technologies and Innovative Research (JETIR) www.jetir.org (ISSN-2349-5162)*
3. *Bešinović, N, De Donato, L, Flammini, F (7 more authors) (2022). Artificial Intelligence in Railway Transport: Taxonomy, Regulations, and Applications. IEEE Transactions on Intelligent Transportation Systems, 23 (9). pp. 14011-14024, ISSN 1524-9050*
4. *Neeraj Kumar & Abhishek Mishra (2021), "Role of Artificial Intelligence in Railways: An Overview"*
5. *Gupta, S. & Sharma, P. (2021). Role of AI in Enhancing Railway Efficiency and Safety. International Journal of Transportation Studies, 15(2), 45-60.*
6. *Barti Jain (2020), The Penetration of Artificial Intelligence in Indian Railways. https://readwrite.com/the-penetration-of-artificial-intelligence-in-indian-railways/*
7. *Kumar, R. (2020). Artificial Intelligence in Transportation: A Future Perspective. Springer.*
8. *Patil, A. (2019). Smart Railways: AI, IoT, and Digital Transformation. IEEE Transactions on Intelligent Transportation Systems.*
9. *Indian Railways (2023). Digital Transformation in Railways: AI & Automation Initiatives. Ministry of Railways, Government of India.*
10. *Indian Express. (2023). AI-based rail ticketing & passenger safety: Challenges & opportunities.*
11. ***Konkan Railway Official Website (2024).*** AI-Enabled Services & Passenger Facilities. *www.konkanrailway.com*

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