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Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

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AI-Enabled Fitness Solutions in Andheri and Jogeshwari

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Abstract

Artificial Intelligence is changing the fitness industry around the world by offering personalized workouts-based data, automatically tracking posture, and managing gyms more efficiently with smart technology. While large commercial gyms have broadly adopted AI, the level of adoption among local small-scale gyms in Mumbai remains uncovered. This research explore how AI-enabled fitness systems are being adopted in local gyms in Andheri and Jogeshwari, two growing suburban pockets of Mumbai. The study is fully based on secondary data, including industry reports, academic publications, and surveys about technology. The analysis highlights the opportunities AI provides such as personalized training, enhanced customer engagement, and making operations more efficient also identifies challenges like cost, digital literacy, and limited infrastructure. The study concludes by offering practical suggestions to accelerate AI adoption among small gyms, which can support technology growth and the local economy. This study addresses that gap by looking at secondary data specific to AI usage trends, consumer behaviour, and small business technology adoption. By focusing on Andheri and Jogeshwari, the research contributes localized insights that are important for policymakers, technology developers, and fitness entrepreneurs seeking to nourish digital inclusion in the fitness industry.

Keywords: Artificial Intelligence, Local Gyms, Fitness Technology, Small Enterprises, Mumbai Suburbs, Andheri, Jogeshwari, Digital Fitness, AI Adoption

1. Introduction

Artificial Intelligence (AI) has become a transformative force across industries, including healthcare, Shopping, education, and fitness. In the fitness industry, AI-enabled systems such as smart gym equipment, AI-based fitness apps, virtual trainers, and tools that track body data help people get real-time advice, tailor-made exercise plans, and better safety during workouts. In Indian metropolitan regions like Mumbai, the fitness industry consists largely of small gyms operating with limited trainers and limited capital. The areas of Andheri and Jogeshwari, located in the western suburbs, have witnessed a rise in independent fitness centres due to high youth population, working professionals, and changing lifestyles.



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Digital transformation is pushing small industries in India toward technology, and gyms are part of this shift. AI helps small fitness centres improve accuracy, reduce reliance on expert trainers, and provide personalized workouts. Yet limited capital, low tech awareness, and lack of trained staff restrict adoption in neighbourhood gyms. Understanding these barriers is essential for strengthening digital inclusion and improving service quality. This study examines how small gyms in these suburbs use AI tools, the challenges they face, and how adoption can be accelerated.

2. Statement of the Study

The fitness industry in India has expanded due to rising health awareness, social media influence, lifestyle diseases, and post-pandemic health alertness. Technologies such as wearables, AI coaching platforms, and motion-sensor equipment are influencing workout routines.

Andheri and Jogeshwari are heavily populated areas with a diverse mix of students, working professionals, and middle-income households. The region has experienced a growing number of small gym setups, including:

- Functional training gyms
- Personal training studios
- Women-only fitness centres
- Pilates
- Boxing
- MMA centres
- Calisthenics
- CrossFit
- Strength-conditioning gyms

Given increasing demand, AI-enabled fitness solutions could contribute importantly to service quality, customer retention, and operational efficiency.

3. Review of Literature

Hannan et al. (2021) They created and tested a complete portable smart fitness system that uses wearable sensors, like a gyroscope and EMG, to track workouts and give real-time posture advice through a virtual "trainer" Android app. The goal was to help people do exercises safely and correctly without needing a real trainer. They tested the system with volunteers doing two common exercises the T-bar back exercise and bicep curl using sensors attached in a wearable setup. The data was analysed using machine learning tools like K-Nearest Neighbour to tell if the posture was correct or not and to give feedback. The system had an accuracy of 89%, showing that AI can be a good tool for posture correction in a portable way. The study points out the advantages of AI-based exercise monitoring, such as making personalized training more accessible and lowering the risk of injuries. However, it also mentions that the current solution



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covers only a few exercises and hasn't been expanded to full-body or different types of workouts. This shows there's still a need for more research to test these systems on a wider range of exercises, over a longer period, and in real gym settings.

Lee, S. M., and Lee, D. (2020) They studied how things inside a person's mind, like what they know, their feelings, and their beliefs, and things outside, like technology and what others think, affect whether they actually use the devices, how much they think the devices can improve their health, and how likely they are to keep using them over time. The study used data from 288 people, including 129 healthcare workers and 159 regular people. They found that both the internal and external factors help people use the devices more, and that using the devices more makes people believe the devices help their health, which makes them want to keep using them. The study also found that healthcare workers had stronger connections between these factors than the general public. The paper points out that most previous research focused on whether people start using the devices, not on what happens after they start using them and how they keep using them over a long time, especially across different groups of people. The authors say that using the devices for a long time is important to get the health benefits, and they suggest that future research and practices should focus on improving the user experience, social influences, and making the devices easier to access to help people keep using them for longer.

Aldossari, M. Q., and others (2022) study about how the qualities of a mobile fitness app like how easy it is to use and how reliable it is along with the quality of the information in the app, such as how accurate and relevant it is affected how users set and track their fitness goals. This, in turn, influences how much they engage with the app and how well they perform. The researchers collected survey responses from users of mobile fitness apps (but the exact number of people who took part wasn't mentioned in the summary). They looked at how users' views on the app's quality, how often they set or track goals, and the results they reported were connected. The study found that when both the system and the information quality are high, users are more likely to set and track their goals, which helps them stay engaged and perform better. The authors also pointed out that previous studies often only looked at the technical features of apps, not the quality of the health and fitness content they offer. Also, there's not enough research on how to keep users changing their behaviour and staying with the app over a long time. The study suggests that app creators and researchers must treat both the quality of the content and the performance of the system as equally important if they want the apps to help users stay motivated and involved in the long run.

Parashar, Jain, and Ali (2023) looked into how AI technologies affect human fitness in their study called "Artificial Intelligence Impact on Human Fitness: Exploring Emerging Trends." They asked 100 people questions in a structured survey to find out how things like wearable tech, AI training programs, AI coaching, and AI fitness monitoring affect fitness results based on data. Their results showed that only AI fitness monitoring had a clear positive effect, but the



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other AI tools like wearables, coaching, and training programs didn't make a big difference in the data. The study also points out that there's not enough research on how wearable tech and AI coaching really help with fitness improvements. They say even though AI has a lot of potential, more research is needed to properly understand how effective it is in different areas of fitness.

Cao (2022) wrote an article called "Application of Smart Wearable Fitness Equipment and Smart Health Management Based on the Improved Algorithm." In it, they created a smart health system that uses the internet of things (IoT) and connects with wearable fitness devices. They also used better signal-processing methods to make the real-time tracking more accurate. The study used data made by the system instead of data from people. They tried out several ways to clean up the data and make it clearer, especially for things like speed, energy use, and weight. The results showed that the improved methods made the data more accurate and dependable, which made smart fitness tracking work better. However, the study also found that there's a missing part in how they looked at the user side. They didn't look at how people use the system, whether they keep using it over time, or if it actually helps them get healthier. The study ends by saying that future research should check how much this system really helps with fitness and health in real life.

4. Research Gap

Although previous studies have examined various parts of AI in fitness such as AI-based posture correction systems, psychological and technological factors influencing wearable device usage, the role of app quality in user engagement, the impact of AI-enabled monitoring on fitness outcomes and the technical efficiency of smart wearable systems these studies primarily focus on technology performance, user behaviour, or application design. None of them investigate how local small-scale gyms adopt AI, nor do they examine region-specific design of technology integration within urban suburb belt of India. Despite the speedy digital transformation of the fitness industry, there is a visible lack of research focusing on AI adoption in community-based neighbourhood gyms, especially in Mumbai.

There is also limited review addressing the readiness, affordability, digital awareness, and operational barriers faced by suburban gyms that operate with low amount of capital and minimal staffing. previous studies do not capture how local gym owners recognize AI, what specific challenges they face in affection, or how regional socio-economic characteristics shape their technology decisions. Moreover, research on region-wise AI adoption trends in the fitness sector is largely lacking, especially for micro-enterprises located in Andheri and Jogeshwari, two rapidly developing suburban pockets with unique demographics and business environments.

5. Objectives of the Study

1. To scrutinize the adoption of AI-enabled fitness systems in local gyms in Andheri and Jogeshwari.



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2. To identify opportunities generated by AI for small-scale fitness enterprises.
3. To analyse the challenges faced by local gyms in executing AI systems.
4. To deliver recommendations for improving AI adoption in suburban fitness centres.

6. Research Methodology

This study applies a descriptive and exploratory approach to examine how AI-powered fitness systems affect local gyms in Andheri and Jogeshwari. Descriptive analysis captures current market trends and situation, while exploratory analysis recognizes emerging challenges and opportunities for small, independent gyms. The study depends entirely on secondary data from reliable sources such as Statista, FICCI, IHRSA, government reports, academic articles, and industry whitepapers. These sources provide insights into market size, digital adoption, AI adoption, and issues faced by smaller gyms.

To interpret the data, the study uses trend analysis, content analysis, and comparative assessment. These methods help present a clear understanding of AI adoption in local gyms and its impact on services and business.

7. Opportunities for AI Adoption

AI helps enhance training quality through accurate rep counting, posture correction, and personalized routines, while also enhancing customer retention by showing clear progress that keeps members motivated. It helps to improve efficiency by automating renewals, attendance, and feedback, and strengthens competitiveness by offering smarter, more engaging training experiences than traditional low-tech gyms.

8. Challenges

Small gyms often face problems to adopt AI-based fitness tools because the equipment is expensive, trainers may lack the technical skills to use advanced systems, and these tools depend heavily on stable electricity and internet. When power or connectivity fails, workouts and monitoring can be disrupted. At the same time, some experienced trainers prefer relying on their own expertise rather than updated technology, which creates resistance and slows down the integration of AI in gym environments.

9. Findings

AI adoption in local gyms across Andheri and Jogeshwari remains uncovered but is gradually increasing. Most small gyms depend on basic AI tools such as fitness apps and wearables rather than advanced equipment. The main reason gyms aren't adopting AI widely is because it's expensive. Young people show stronger interest in AI-enabled fitness experiences, and gyms that implement AI report improved customer engagement and satisfaction.

10. Limitations

This study is based completely on secondary data, which restricts access to real-time perspectives from gym owners and users. The lack of availability of primary surveys limits



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deeper insight into on-ground challenges. Additionally, the findings are specific to the Andheri and Jogeshwari regions and may not fully cover other areas.

11. Recommendations

Small gyms can increase AI adoption by organizing **AI training workshops** for gym owners and trainers. Using **subscription-based AI solutions** rather than expensive equipment which can reduce costs. Government support through **MSME digital innovation schemes** can further ease AI adoption. Gyms should **collaborate with Indian AI fitness startups** for affordable technologies and promote **hybrid fitness models** that combine offline training with AI-based analytics.

12. Future Scope

Future studies could survey gym owners for real-time insights on AI use, compare suburban and urban adoption, examine the expenses and benefits of AI equipment, and track long-term effects on customer satisfaction, operational efficiency, and overall fitness and business growth.

13. Conclusion

AI-enabled fitness systems can modernize small gyms in Andheri and Jogeshwari by improving personalized fitness training, improves efficiency, and customer engagement. As digital awareness grows and AI becomes more affordable, helping these suburban gyms enlarge and upgrade their operations.

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