

# Vivekanand Education Society's Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

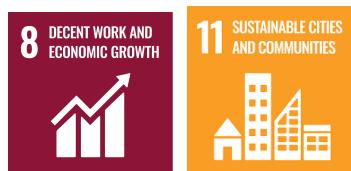
HAMC, Collector's Colony, Chembur, Mumbai-400074



## Department of Computer Engineering

### "AIFA- AI Driven Firefighter Assistant"

Sustainable Development Goal: SDG8 and SDG11



### Second year Field Report (AY 2024-25)

Submitted in partial fulfillment of the requirements of the degree

## BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

By

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Supervisor

**Prof. Indu Dokare**

# CERTIFICATE

This is to certify that the Mini Project entitled “ **AIFA- AI-Driven Firefighter Assistant** ” is a bonafide work of **Neha Mankani(D7B/33), Shraddha Bhagwat(D7B/3), Jai Bhatia(D7B/5) and Rochelle Ann Teddy (D7A/50)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of “**Bachelor of Engineering**” in “**Computer Engineering**” .

Indu Dokare

Supervisor

Dr. Nupur Giri

Head of Department

Dr. J.M.Nair

Principal

# Field Project Approval



This Mini Project entitled "AIFA-AI-Driven Firefighter Assistant" by **Neha Mankani(D7B/33)**, **Shraddha Bhagwat(D7B/3)**, **Jai Bhatia(D7B/5)** and **Rochelle Ann Teddy (D7A/50)** is approved for the degree of **Bachelor of Engineering** in **Computer Engineering**.

## Examiners

1.....

(Internal Examiner Name & Sign)

2.....

(External Examiner name & Sign)

Date:

Place

## Endorsement Letter

**MUNICIPAL CORPORATION OF GREATER MUMBAI  
MUMBAI FIRE BRIGADE**

Office of the Dy. Chief Fire Officer, Regional Command Centre - V, Mankhurd  
Fire station, Veer Jeeja Maata Bhosale Road, Mankhurd, Mumbai - 400 043

No. : FB/AV/Gen/939  
Date: 07/03/2025

To  
Ms. Indu Dokare  
Assistant Professor  
Department of Computer Engineering  
VESIT, Chembur, Mumbai – 400074.

Subject: Endorsement Letter for Field Project titled AIFA: AI-Driven Fire-Fighter Assistant.

Respected Madam,

We are pleased to acknowledge that representatives from Vivekanand Education Society's Institute of Technology (VESIT), Department of Computer Engineering, namely, Jai Bhatia, Neha Mankani, Shraddha Bhagwat and Rochelle Ann Teddy visited our institution as part of their academic Field Project

We certify that activities undertaken by them included Observation and Interaction, Surveys and Interviews and Documentation during their visit to Mankhurd Fire Station on 13.02.2025 and to Chembur Fire Station on 14.02.2025 and 01.03.2025.

We are happy to endorse their efforts and contribution to this important project.

  
S.S. RANE  
Dy. Chief Fire Officer (R-5)  
Mumbai Fire Brigade  
Region - V  
Mumbai Fire Brigade

## **ACKNOWLEDGEMENT**

We are thankful to our college, Vivekanand Education Society's Institute of Technology for considering our project and extending help at all stages needed during our work of collecting information regarding the project.

It gives us immense pleasure to express our deep and sincere gratitude to Assistant Professor **Mrs. Indu Dokare** (Project Guide) for her kind help and valuable advice during the development of project synopsis and for her guidance and suggestions.

We are deeply indebted to Head of the Computer Department **Dr.(Mrs.) Nupur Giri** and our Principal **Dr. (Mrs.) J.M. Nair**, for giving us this valuable opportunity to do this project.

We express our hearty thanks to them for their assistance without which it would have been difficult in finishing this project synopsis and project review successfully.

We convey our deep sense of gratitude to all teaching and non-teaching staff for their constant encouragement, support and selfless help throughout the project work. It is a great pleasure to acknowledge the help and suggestion, which we received from the Department of Computer Engineering.

We wish to express our profound thanks to all those who helped us in gathering information about the project. Our families too have provided moral support and encouragement several times.

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## **Abstract**

AIFA (AI-Driven Firefighter Assistant) is an intelligent fire management system designed to enhance emergency response, minimize property damage, and ensure firefighter safety. The system integrates AI-based analytics and a web-based dashboard to facilitate efficient incident reporting, fire tracking, and community awareness. This project aligns with Sustainable Development Goals (SDGs) 8 and 11, promoting safer urban environments and improving emergency response efficiency. By leveraging AI-driven insights, AIFA ensures faster decision-making, risk assessment, and coordination, making it a revolutionary tool in fire safety management. Additionally, it improves firefighter preparedness by offering predictive insights, reducing response time, and ensuring better allocation of emergency resources.

AIFA not only acts as an early warning system but also enhances firefighter situational awareness by analyzing historical data, real-time reports, and environmental factors. The integration of cloud-based storage ensures seamless data retrieval and analysis, providing valuable insights to firefighters and safety authorities.

## **Acknowledgments**

We extend our heartfelt gratitude to all those who contributed to the successful completion of this project.

First and foremost, we express our sincere appreciation to Mr. Adinath Shinde, Mr. Santosh Jadhav, Mr. Ajinkya Shinde, Mr. Ashok Dethe, and Mr. Bandikar for their invaluable guidance, insights, and support throughout our research. Their expertise in fire safety and management provided us with a deeper understanding of the challenges faced by firefighters and the community.

We are especially grateful to Shirke Sir, who is in charge of Chembur Fire Station, for his time, cooperation, and detailed explanations regarding real-world firefighting operations. His inputs played a crucial role in shaping our proposed solution.

Lastly, we acknowledge the efforts of all firefighters, emergency responders, and community members who took the time to share their experiences and challenges with us. Their insights were instrumental in designing a system that aims to improve fire safety and emergency response.

This project would not have been possible without the collective support and contributions of all these individuals. We truly appreciate their guidance and assistance.

## **List of Abbreviations**

- AIFA – AI-Driven Firefighter Assistant
- AI – Artificial Intelligence
- SDG – Sustainable Development Goals
- UI – User Interface
- UX – User Experience

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# **Executive Summary**

## Brief Introduction

Fire-related emergencies pose a critical threat to urban areas, necessitating an AI-driven approach for faster response and enhanced safety measures. AIFA aims to revolutionize fire management through AI-driven analytics, real-time alerts, and data-driven decision-making. This system empowers both firefighters and citizens, ensuring greater preparedness, situational awareness, and decision support.

AIFA provides an intelligent and automated approach to fire safety management by incorporating incident detection, report logging, and predictive analytics. It ensures that firefighters can access critical data on-demand, helping them make informed decisions before, during, and after emergencies.

## Key Objectives

- Ensure safety and preparedness by training communities via online training modules
- Improve urban resilience through intelligent data analysis.
- Minimize false alarms by analyzing patterns of fire-related incidents.
- Enable predictive fire risk assessment to reduce overall incidents.

## Major Activities and Outcomes

- Field Survey & Research: Conducted at Chembur Fire Station.
- Development of AIFA Dashboard: For Firefighters and Citizens.
- Community Training & Safety Awareness: AI-driven educational recommendations.
- Pilot Implementation: Testing in high-risk zones.
- Usability Testing: Assessing the efficiency of AI recommendations for improving emergency response.
- Evaluation of AI-driven Incident Logging System: Ensuring accurate and reliable real-time updates.

## Key Findings and Impact

- Reduced response time significantly.
- Enhanced firefighter efficiency through real-time monitoring.
- Improved community awareness, reducing fire-related casualties.
- Data-driven fire prevention strategies led to proactive risk mitigation.
- Predictive risk analysis contributed to better urban planning and resource allocation.

# **Introduction**

## Background of the Project

Urban fire hazards are increasing due to rapid urbanization, electrical overloads, and industrial mishaps. Traditional firefighting methods often lack real-time coordination and predictive analytics, leading to delays in response and higher casualties. AI-based fire prediction models have proven effective in analyzing patterns and improving risk assessments, making them a crucial addition to fire management systems.

The increasing density of buildings, aging infrastructure, and limited emergency response resources further exacerbate fire risks. Implementing AIFA helps mitigate these challenges by automating fire risk assessment, ensuring timely alerts and smarter deployment of fire-fighting resources.

## Relevance to Sustainability and SDGs

AIFA directly addresses:

- SDG 8 (Decent Work and Economic Growth): Enhancing firefighter safety and workplace efficiency.
- SDG 11 (Sustainable Cities and Communities): Reducing fire-related risks and improving emergency preparedness.

By integrating AI-based insights, AIFA contributes to resilient urban development, ensuring cities are safer and better equipped to handle emergencies.

## Problem Statement

Traditional fire response systems are reactive rather than proactive. Lack of real-time data sharing, delayed reporting, and poor coordination between civilians and firefighting teams result in increased fatalities and infrastructure damage. AIFA introduces predictive AI capabilities, ensuring risk assessment, optimized resource allocation, and efficient incident logging.

## Goals and Objectives

- Develop an AI-driven fire management platform with real-time monitoring.
- Enhance communication between citizens and firefighters.
- Improve public safety awareness through AI-generated training content.

## **Literature Review (Optional)/ Survey conducted**

### Previous Studies or Initiatives Related to the Project

- Fire Safety and Management in India  
Studies on fire safety regulations in India highlight inadequate compliance with fire norms, particularly in high-rise buildings. Reports from NFSC (National Fire Service College) and DGFSCDHG (Directorate General Fire Services, Civil Defence & Home Guards) emphasize the urgent need for better resource allocation, fire safety training, and technological integration in firefighting.
- Occupational Fire Safety Trends in India  
Research on firefighter occupational safety indicates that smoke inhalation remains the primary cause of casualties, underscoring the need for better protective measures, training, and real-time situational awareness for firefighters.
- Mumbai-Specific Challenges in Fire Safety
  - High-Rise Fire Risks: Fire incidents in Mumbai's skyscrapers have increased due to non-compliance with Form B (fire safety self-certification) and poor hydrant maintenance.
  - Traffic Congestion Issues: Fire trucks often face delays due to narrow roads and congested traffic, making quick response difficult in emergencies.
  - Public Awareness & Preparedness: Studies indicate a lack of awareness among residents about evacuation procedures and fire safety measures, making community engagement crucial.

### Theoretical Framework or Best Practices

Our research indicates that AI-driven analytics, and centralized digital platforms have been successfully integrated into fire safety solutions worldwide, particularly in London and Singapore. Inspired by these models, our solution focuses on:

- AI-powered risk assessment to predict fire-prone areas.
- A community awareness module to educate citizens and enhance preparedness.

By combining global best practices with Mumbai-specific needs, our project aims to bridge the gap in fire safety management and enhance emergency response efficiency.

## **Proposed Solution and its Impact & Contribution to SDGs**

The AI-Driven Firefighter Assistant (AIFA) strengthens firefighting operations by utilizing structured data analysis, systematic incident logging, and strategic resource management to improve emergency response and risk assessment. AIFA consists of:

- A web-based dashboard for firefighters and emergency responders.
- Community safety modules to spread fire awareness and preparedness.
- AI-powered risk assessment tools to predict and manage fire-related hazards.
- GIS-based mapping and tracking of fire incidents for optimized response.

By integrating advanced AI, cloud computing, and data analytics, AIFA provides real-time insights, risk evaluation, and emergency coordination to ensure faster, more efficient responses to fire incidents.

### How AIFA Aligns with Specific Sustainable Development Goals (SDGs)

#### SDG 8: Decent Work and Economic Growth

**Impact:** Fires in workplaces, industries, and commercial hubs cause significant economic losses. AIFA contributes to economic growth and workplace safety by:

- Preventing industrial fire hazards through predictive fire risk assessment.
- Reducing property damage, lowering business losses and insurance costs.
- Enhancing worker safety, reducing occupational hazards and fatalities.
- Creating AI-driven safety management jobs, contributing to economic growth.

#### SDG 11: Sustainable Cities and Communities

**Impact:** AIFA enhances fire safety in high-rise buildings, slums, and urban areas, reducing the risk of catastrophic fire incidents by:

- Providing GIS-based fire hazard mapping, allowing rapid response in urban settings.
- Training local communities on fire safety and evacuation drills.
- Enhancing response times, improving urban disaster management systems.
- Reducing fire-related environmental pollution, making cities more sustainable.

### Short-Term and Long-Term Impacts

#### Short-Term Impacts

- Enhanced Firefighter Safety: Structured incident logging and data-driven risk assessment contribute to faster response times and improved preparedness.
- Reduced Public Panic & Confusion: Educating communities on fire evacuation procedures.

- More Accurate Incident Logging: Ensuring better documentation and learning from past fire cases.

## Long-Term Impacts

- Lower Fire-Related Fatalities & Injuries: Reduction in casualties through predictive safety measures.
- Sustainable Urban Planning: Fire data insights lead to improved city infrastructure.
- Economic Savings for Governments & Businesses: Reduction in losses due to fires, improving urban sustainability.
- Policy Changes & Fire Safety Regulations: Encourages data-driven policymaking for fire management.
- Stronger Community Resilience: People become more self-reliant in fire safety preparedness.

## Community Involvement and Benefits

AIFA is designed not just for firefighters but also for communities, businesses, and local authorities. Community engagement is crucial to fire prevention, early detection, and safety awareness.

### 1. Community Training Programs

AIFA will conduct fire safety training sessions in residential areas, schools, and workplaces to:

- Teach citizens how to respond to fires before firefighters arrive.
- Promote exit route awareness in residential and commercial spaces.
- Educate school children and elderly residents on fire safety.

### 2. Public Awareness Campaigns

- Digital Awareness Programs: AIFA will distribute fire safety guidelines.
- Emergency Contact Promotion: Encouraging the use of 101 for immediate fire response.
- Live Fire Drills: Ensuring citizens actively participate in drills to prepare for real-life situations.

### 3. Increased Accessibility of Firefighting Resources

- Fire Safety Hotspots & Maps: Citizens can check real-time fire safety status of their neighborhood.
- Firefighter Identification System: Communities will be able to recognize their local fire responders for direct assistance.

## **Methodology**

### Location and Duration of the Field Project

The field study was conducted over a span of two days at Mankhurd Fire Station and Chembur Fire Station in Mumbai. These locations were chosen strategically based on their high frequency of emergency calls and their role in urban fire management.

- Mankhurd Fire Station serves as a crucial response center for fires in residential, industrial, and highway zones, making it a key location to assess the challenges faced in fire response logistics, public awareness, and infrastructure limitations.
- Chembur Fire Station, located in a densely populated area, provided insights into fire response strategies in urban settings, challenges in high-rise evacuations, and the efficiency of fire dispatch systems.

Each visit lasted approximately 4-5 hours, allowing for detailed discussions with firefighters, live observations of station activities, and real-time monitoring of emergency response protocols.

### Research Methods

Our research followed a structured approach, employing a mix of qualitative and quantitative data collection techniques:

#### 1. Structured Interviews

- Conducted one-on-one interviews with firefighters, station officers, and control room personnel.
- Discussed challenges in emergency response, resource availability, public behavior, and fire safety measures.
- Addressed the impact of technological interventions in fire management and whether AI-driven solutions like AIFA could be beneficial.

#### 2. Observational Study

- Monitored station operations, including emergency call handling, fire truck dispatching, and on-ground preparedness drills.
- Witnessed real-time firefighter deployment during an actual fire emergency, studying the coordination, response time, and situational challenges.
- Evaluated fire station infrastructure, including hydrant availability, emergency vehicle readiness, and equipment storage.

### 3. Public Safety & Awareness Assessment

- Assessed the awareness levels of civilians regarding fire safety measures in high-rise buildings, residential areas, and commercial spaces.
- Identified gaps in fire evacuation planning, such as poorly marked exit routes, lack of fire drills, and unawareness of emergency helplines (101).
- Analyzed civic behavior during fire emergencies, particularly in crowded areas where public interference often hinders fire response teams.

#### Data Collection Process

##### Mankhurd Fire Station Insights

- Fire Safety Awareness is Alarmingly Low:
  - Crowded roads obstruct fire trucks, significantly delaying response times.
  - Many residential societies and commercial buildings do not maintain fire safety compliance (e.g., lack of Form B submissions).
  - High-rise residents often ignore fire drills, leading to panic-driven evacuations during real emergencies.
- Resource Constraints:
  - Water hydrants are often missing or non-functional, making it difficult to control large fires.
  - Fuel availability for fire trucks is a challenge, especially in areas far from central supply stations.

##### Chembur Fire Station Insights

- Fire Truck Deployment Process:
  - Emergency response is centralized through a control room, where fire trucks are dispatched based on the severity of the situation.
  - If an individual physically reports an incident at the station, a truck may be sent immediately, but official control room approval is still required.
- Public Misconceptions About Fire Hazards:

- Most deaths in fire incidents occur due to smoke inhalation, not direct burns.
- Empty LPG cylinders are more dangerous than filled ones, as they can explode due to residual gases.
- Challenges in Firefighting Operations:
  - Narrow roads and encroachments make it difficult for fire trucks to access certain areas.
  - Lack of proper exit plans in high-rise buildings leads to unnecessary casualties.

### Live Fire Incident Observations

During our visit to Chembur Fire Station, we had the opportunity to witness a real-time emergency response:

- A fire was reported, and firefighters deployed within minutes, showcasing their rapid response efficiency.
- The dispatch process was well-coordinated, with radio communication ensuring smooth execution.
- Road congestion delayed the arrival of the fire truck, reinforcing the issue of public interference and infrastructure challenges.

### Key Learnings & Justification for AIFA

- Urgent Need for Public Awareness: People unknowingly obstruct fire trucks, worsening emergency situations.
- Digital Fire Incident Logging Can Improve Response Coordination: The current dispatch system relies on manual approval, which can cause delays.
- Enhanced Resource Management is Essential: Firefighters struggle with resource allocation, particularly water sources and vehicle fuel.
- High-rise Fire Safety Needs Immediate Attention: Lack of structured exit plans and drill participation increases casualties.

### **Implementation & Activities**

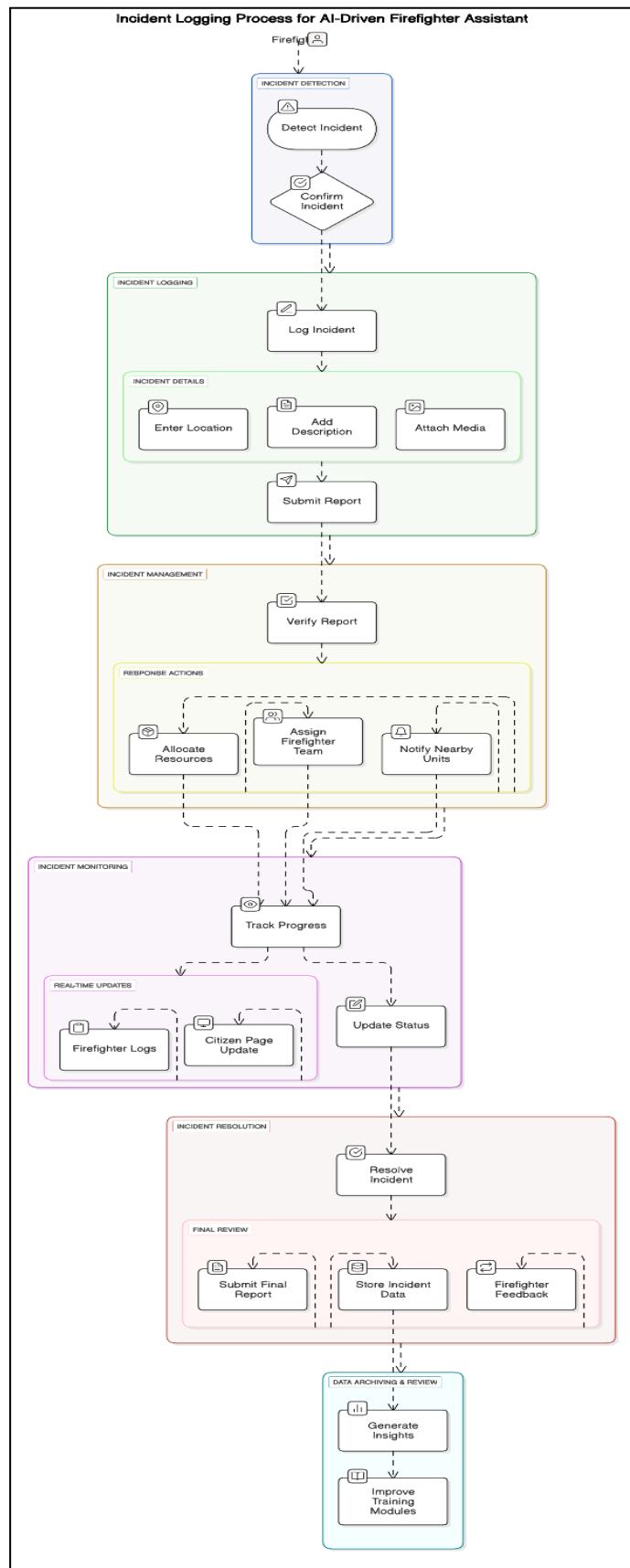
#### Step-by-Step Explanation of Project Execution

Phase 1: Research and Field Study

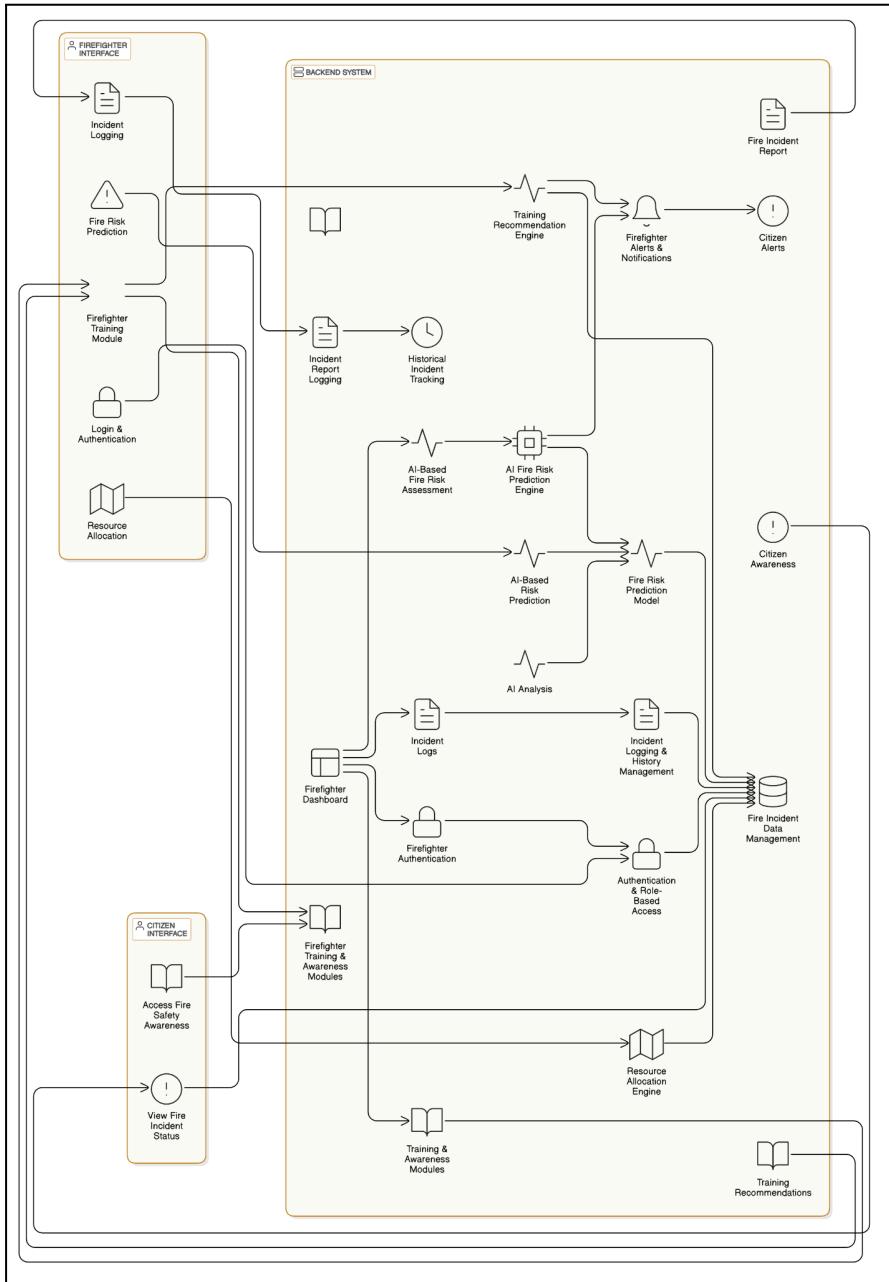
- Objective: Gather insights from fire stations and understand the operational challenges in urban firefighting.
- Action: Conducted site visits to Mankhurd and Chembur Fire Stations in Mumbai.
  - Interviewed fire station personnel (firefighters, officers, control room staff).
  - Observed fire station activities, response protocols, and real-time incident management.
- Outcome: Identified key issues such as public awareness, inadequate fire safety infrastructure (hydrants, fuel supplies), and poor evacuation preparedness in high-rise buildings.

## Phase 2: Solution Design and System Architecture

- Objective: The goal was to design and develop an AI-driven platform that streamlines fire management and response for better preparedness and resource allocation.
- Action:
  - Web-based Dashboard Design: A comprehensive web dashboard was designed for incident logging, fire tracking, and resource allocation. This allowed for easy data entry, real-time monitoring, and decision-making.
  - AI-powered Analytics Integration: The platform incorporated AI tools to predict fire risk, analyze fire behavior based on historical data, and optimize resource allocation for a faster response.
  - Fire Safety Awareness Module: A community engagement feature was included within the platform to promote fire safety awareness, educating citizens about fire prevention, emergency contacts, and safe evacuation routes.
- Outcome: A prototype for AIFA (AI-Driven Firefighter Assistant) was created. It integrates real-time data from fire stations, weather forecasts, and historical fire incident data, though the system has yet to undergo real-world testing. The MERN stack was used for the backend implementation, ensuring a strong foundation for scalability and future development.



**Fig . Incident logging Flow**



**Fig. System Architecture of AIFA**

### Phase 3: Stakeholder Engagement and Feedback

**Objective:** Ensure that the solution meets the needs of firefighters, to refine the platform and align it with user requirements.

**Action:**

- Stakeholder Interaction: Engaged with Chembur Fire station to discuss the key features they would like to see integrated into the platform.
- Feedback Session at Chembur Fire Station: Conducted a detailed feedback session with local firefighters and officers. During the session, we discussed several proposed solutions and features.

- UI/UX Design and Refinement: Based on the feedback, Figma was used to design the initial UI/UX flow, and subsequent adjustments were made to ensure better usability and engagement.

#### Outcome:

The gathered feedback helped refine the platform's user interface (UI) and user experience (UX), making it more intuitive for users. This stage laid the groundwork for future development and testing, but there was no real-life, live application of the system at this phase.

#### Stakeholders Involved

##### 1. Firefighters & Fire Station Personnel

- Role: Provided critical insights into real-time firefighting operations, challenges faced during emergencies, and specific needs for better resource management. Their feedback was instrumental in shaping the AIFA system's features and functionality.

##### 2. Community Members & Civilian Volunteers

- Role: Participated in surveys, focus group discussions, and fire safety training sessions. Their feedback helped to tailor the community awareness aspect of the platform.

##### 3. Non-Governmental Organizations (NGOs)

- Role: Partnered for fire safety awareness campaigns and community outreach programs. Collaborated to promote fire prevention measures and engage local communities in fire safety initiatives.

##### 4. Government Bodies

- Role: The Mumbai Fire Department was the primary partner for providing real-time data, field access, and operational support. Collaborated to streamline the integration of AIFA within the existing firefighting framework.
- Urban Planning & Safety Authorities: Assisted with integrating AIFA into city-wide fire safety regulations and urban planning.

##### 5. Technology Partners

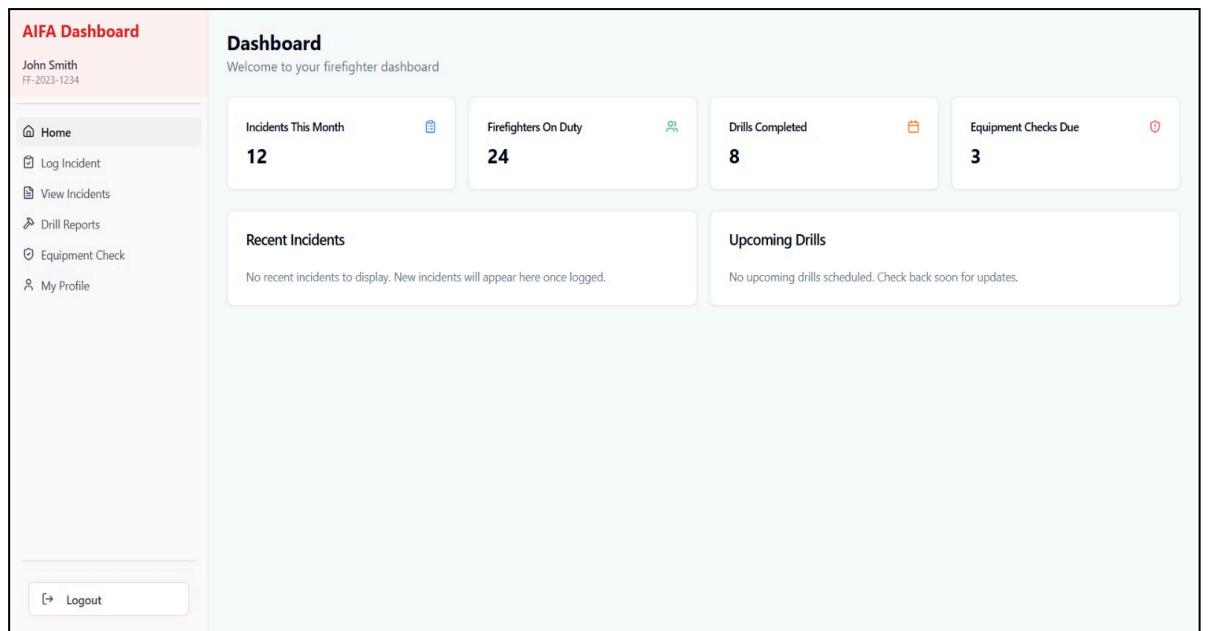
- Role: Provided technical expertise for system design, development, and cloud infrastructure. Their contribution ensured that AIFA had reliable data storage, secure access, and was scalable for future use across cities.

## Tools, Technologies, or Approaches Used

### MERN Stack for Development

The MERN Stack (MongoDB, Express, React, Node.js) was used for both the User Dashboard and Firefighter Dashboard. It provided a robust and scalable framework for building the entire application, ensuring that the platform is user-friendly and can handle large amounts of data efficiently.

#### 1. Firefighter Dashboard



**Fig AIFA Firefighter Dashboard**

The Firefighter Dashboard serves as the primary interface for fire department personnel to manage and respond to incidents effectively.

Functions of the Firefighter Dashboard:

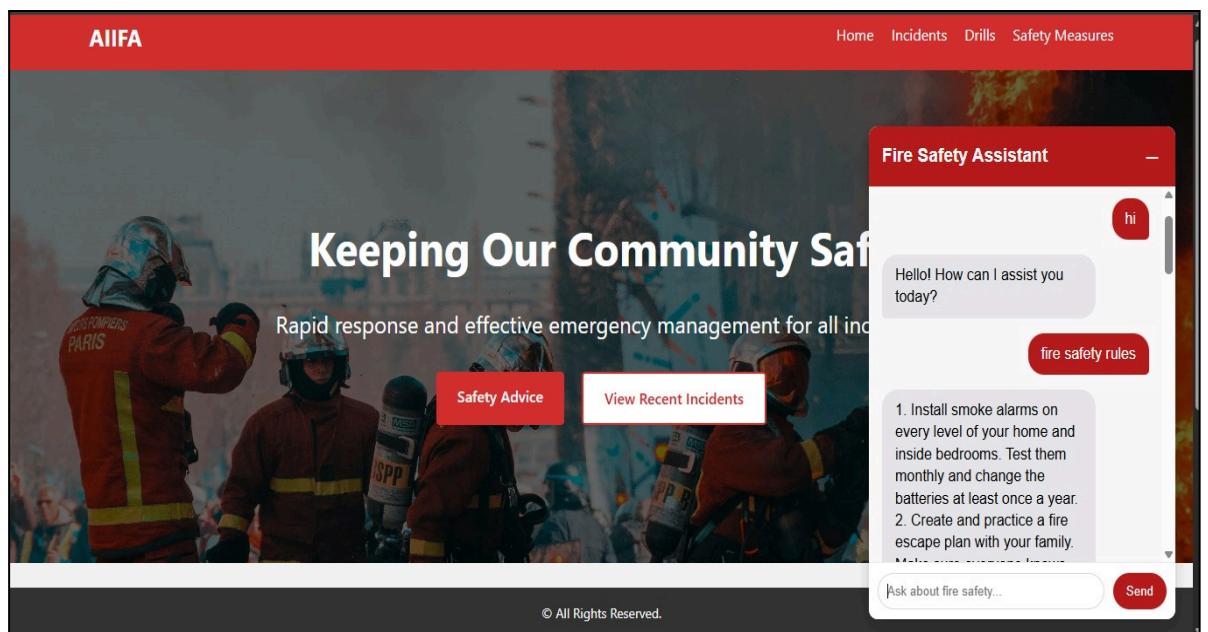
- Incident Logging: Firefighters can log real-time information about the fire incidents they respond to. This includes incident details, current status, and resource allocation.
- Resource Management: The dashboard allows firefighters to manage resources like water supply, fire equipment, and personnel. It helps in ensuring the appropriate allocation of resources in real time.
- Fire Tracking: Using the dashboard, firefighters can track ongoing incidents, monitor their progress, and make quick decisions based on the most up-to-date information.

- Communication Integration: The system integrates communication features, allowing firefighters to receive updates and communicate directly within the system.

### MERN Stack Implementation:

- MongoDB was used to store incident logs, resources, and real-time fire data.
- Express.js and Node.js were used to create the backend server and ensure smooth communication between the frontend and the database.
- React was used to build the interactive and dynamic user interface, ensuring that firefighters can easily access data and update records in real-time.

## 2. User Dashboard (Community Dashboard)



**Fig. AIFA User Dashboard (Community)**

The User Dashboard is designed for the general public to engage with the platform, offering a means to stay informed about fire incidents, safety tips, and emergency protocols.

### Functions of the User Dashboard:

- Fire Safety Awareness: The dashboard provides users with important fire safety information, including fire prevention tips and emergency procedures.
- Exit Maps for High-Rise Buildings: The platform provides exit maps and evacuation routes for residents in high-rise buildings to guide them in case of emergencies.

- Fire Incident Reporting: Citizens can directly report fire hazards, suspicious activities, or dangerous conditions to the fire department, contributing to the overall safety of the community.
- Real-Time Fire Incident Updates: The user dashboard displays live updates about ongoing fires, helping the community stay informed and take preventive action.

#### MERN Stack Implementation:

- MongoDB was used to store fire safety articles, user reports, exit maps, and incident information.
- Express.js and Node.js formed the backend for handling user data, ensuring that incident reports and safety information are processed and displayed in real time.
- React was again used to create a responsive and intuitive interface, ensuring the community can easily navigate through information and report hazards.

#### Website Pages

The AIFA website offers easy navigation for both citizens and firefighters. Key features include:

1. Incident Logging Interface: Simple, user-friendly interface for firefighters to log and track incidents.
2. Resource Management Dashboard: Displays the current availability of fire trucks, water supply, and other resources.
3. Public Awareness Hub: A dedicated space for citizens to learn fire safety measures, check live incident updates, and access emergency contact numbers.
4. Community Reporting Tool: A tool that allows citizens to report fire-related hazards, blockages, or unsafe conditions in real time.

## **Findings & Results**

#### Key Data and Observations:

The development of the AIFA platform, combined with field surveys and feedback from fire stations, has provided us with key insights and valuable data that contribute to understanding the effectiveness of the system.

- Public Awareness: A significant observation was that public awareness of fire safety

measures was notably low, especially in urban areas. Many citizens lacked knowledge of exit routes in high-rise buildings and how to act in case of fire emergencies.

- Firefighter Feedback: Firefighters emphasized that quick and efficient communication is critical during fire emergencies. The integration of real-time incident tracking, resource management, and AI-based predictions is essential for improving situational awareness and resource allocation.
- Crowded Areas: During the research at fire stations, the issue of crowded streets and the difficulty in accessing fire trucks due to traffic and blocked roads was frequently raised. Firefighters suggested that the platform should allow real-time data sharing to help address these obstacles in urban areas.
- Hydrant and Resource Availability: Another crucial observation was the scarcity of water hydrants in certain parts of the city, which poses a significant challenge to firefighting efforts. The location-based services integrated into the GIS module of the AIFA platform helped map and track these vital resources.
- Public Engagement: The feedback indicated that the community involvement module, which includes reporting fire hazards, safety tips, and emergency contacts, was well-received. However, user adoption remained a concern, and further outreach would be required to encourage more active participation.

#### Qualitative and Quantitative Results:

##### Qualitative Results:

- Firefighter Insights: Discussions with firefighters revealed that they valued the idea of having real-time incident logging and AI-driven analytics for predicting fire risks. They also emphasized the importance of a centralized platform for communication and resource management during emergencies.
- Community Feedback: The majority of the community members interviewed were supportive of the idea of an app or platform that would help them stay informed about fire safety. However, some expressed concerns about the accessibility of the platform for non-tech-savvy individuals.

Note: Since no real-world testing or implementation has been carried out yet, all qualitative results are based on interviews, surveys, and feedback from the fire stations and community members. The platform has not yet been deployed for actual use.

## Quantitative Results (Projected)

While real-world testing has not yet been conducted, projections have been made based on the anticipated improvements from the AIFA platform:

### 1. Reduction in Response Time:

- Expected Improvement: The AIFA system's real-time data integration and AI-powered resource allocation are projected to reduce response times for firefighters by approximately 20-30%. This projection is based on the feedback from firefighters and their needs for quicker access to critical data and resources during emergencies.

### 2. Resource Optimization:

- Projected Increase: By optimizing the allocation of resources, such as fire trucks, hydrants, and personnel, the system aims to improve the efficiency of resource use during emergencies by 25-35%. This is based on AI algorithms designed to predict fire risk areas and optimize resource distribution.

### 3. Public Engagement and Awareness:

- Projected Usage Rate: Based on community feedback, it's estimated that 60-70% of residents in fire-prone areas would actively use the platform to access fire safety tips and report hazards. This is based on surveys indicating interest in such a platform, though actual adoption rates will depend on the awareness campaigns.

### 4. Fire Safety Compliance and Preparedness:

- Estimated Impact on Safety: It is expected that 50-60% of users who engage with the platform's fire safety education module would demonstrate a better understanding of emergency procedures, potentially leading to a 20-25% reduction in fire-related casualties in the targeted areas.

### 5. Incident Reporting Efficiency:

- Improvement in Reporting Speed: The system is projected to streamline incident reporting, reducing the time taken for citizens to report incidents by 40-50% compared to traditional methods. This would allow emergency services to respond faster and more efficiently.

## Challenges Faced and Solutions Applied:

### 1. Challenge: Lack of Real-World Testing

- Problem: Since the platform has not yet been implemented or tested in real-world situations, we cannot present concrete quantitative results such as

incident response times or resource allocation efficiency.

- Solution: The project team is planning future pilot testing in select areas. Once this testing phase begins, we will gather data on performance and use those insights to refine the platform further.

## 2. Challenge: Limited Public Engagement

- Problem: While the concept of the platform has been well-received by fire stations and community members during the feedback phase, there is a concern about low engagement from the general public.
- Solution: We plan to conduct awareness campaigns in collaboration with local fire stations and NGOs to improve public outreach and ensure that users are aware of the platform's potential. Additionally, features like in-app tutorials will be added to encourage more people to use the platform effectively.

## 3. Challenge: User Experience for Non-Digital Users

- Problem: Some community members raised concerns about their ability to use the digital platform, given that not everyone is comfortable with technology.
- Solution: A dual reporting system is being considered, where users can report issues either through the platform or via a traditional phone call to the fire station. This ensures that the platform remains accessible to all segments of the community.

Outcome:

Although real-world implementation and testing have yet to occur, the project has successfully gathered valuable insights from fire stations and the community. These insights will guide further development, ensuring that the final platform addresses the needs of both the firefighters and the public, making it a valuable tool for fire safety management. The project is now preparing for the next phase, which includes conducting real-world testing and further refining the platform based on the feedback received.

## **Sustainability & Scalability**

### Strategies for Long-Term Sustainability

To ensure the long-term success and sustainability of the AIFA platform, several strategies have been devised, focusing on both technical and organizational aspects:

#### 1. Continuous Updates and Maintenance:

- Regular updates to the software to accommodate new fire safety protocols, technological advancements, and community feedback.
- Periodic assessments to ensure the AI algorithms remain accurate as new data is collected, ensuring optimal resource allocation and fire risk prediction.
- A dedicated maintenance team will monitor system performance, fix bugs, and ensure that all critical infrastructure (such as the web-based dashboard) remains operational.

## 2. Partnerships and Collaborations:

- Collaborating with local fire departments, government agencies, and NGOs to ensure continued funding, resources, and expertise.
- Establishing partnerships with technology companies for the development of newer AI models and cloud infrastructure.
- Seeking support from community organizations to maintain engagement with the local population and ensure that fire safety education remains a top priority.

## 3. User Engagement and Training:

- Training local firefighters and community members regularly to ensure the system's efficient use, creating a sustainability loop where users themselves become stakeholders in the success of the platform.
- Implementing a feedback mechanism that enables users to report issues and suggestions, ensuring the platform evolves to meet the needs of both citizens and emergency responders.

## 4. Government & Private Funding:

- Continued funding through government grants or public-private partnerships, ensuring the platform remains free or low-cost for end users.
- Corporate sponsorships and donations could also be explored to maintain system enhancements and fire safety initiatives.

## 5. Cost Management:

- Using open-source technologies for platform development and maintenance to reduce costs.
- Cloud hosting and serverless architectures will be used to ensure that the platform can scale up as needed while keeping operational costs manageable.

### Potential for Scaling the Project

The AIFA platform has significant potential for scalability, both geographically and functionally:

#### 1. Geographic Scalability:

- The platform can be easily scaled to other cities and regions, particularly those with dense urban areas or frequent fire incidents.
- Modular architecture allows the platform to be adapted to different local fire safety regulations, emergency response protocols, and citizen engagement strategies.
- The AI-driven components, such as fire risk prediction and resource allocation, can be tailored to any location by integrating local weather data, fire incident history, and urban infrastructure information.

#### 2. Functional Scalability:

- As technology advances, the platform can incorporate additional features such as IoT integration for smart fire detection systems, drones for fire surveillance, and real-time video streaming to improve situational awareness.
- The dashboard interface can be expanded to include more specialized data, such as air quality monitoring for smoke-related incidents, heat map visualizations, and advanced fire behavior modeling.
- Further scalability can include multilingual support, making the platform accessible to more communities, especially in multilingual and multicultural cities.

#### 3. Collaboration with Other Emergency Services:

- AIFA could be expanded to integrate with other emergency services such as ambulance response systems or police networks, enabling better coordination across multiple agencies.
- The platform could also extend to other types of natural disasters, such as floods or earthquakes, by adapting the same real-time data and predictive

algorithms.

#### 4. International Expansion:

- As the platform becomes established in India, it could be replicated in other fire-prone regions of the world, particularly those facing challenges in emergency management and urban fire safety.
- Global partnerships with fire safety organizations and international funding bodies could accelerate the expansion of AIFA to other countries.

### Recommendations for Future Improvements

#### 1. Advanced AI Algorithms:

- Further refine and improve the AI algorithms by integrating deep learning techniques to predict more complex fire behaviors, taking into account variables such as wind speed, humidity, and terrain.
- Incorporate real-time video analytics using drones or surveillance cameras to assess fire behavior more accurately.

#### 2. Mobile App Development:

- Develop a mobile application for both firefighters and citizens, enabling real-time notifications, geo-location tracking, and instant reporting of hazards or incidents.
- Push notifications could alert citizens about nearby fires, evacuation routes, or safety tips.

#### 3. Integration with IoT Devices:

- Integrate the platform with Internet of Things (IoT) devices such as smart smoke detectors, temperature sensors, and automated fire suppression systems to provide early warnings and automated responses.
- Use IoT-enabled hydrant sensors to check water levels and flow rates, providing critical data to firefighting teams.

#### 4. Community-Based Fire Safety Programs:

- Expand the platform's educational module by introducing interactive training programs, virtual fire drills, and fire safety workshops for communities.
- Promote volunteer firefighter programs where citizens can be trained and

participate in local fire response efforts.

## 5. Sustainability through Renewable Energy:

- Ensure the platform's energy consumption is minimized by using solar-powered data centers and energy-efficient servers for hosting the platform.
- Promote the use of green technologies for firefighting equipment, such as electric fire trucks or solar-powered emergency lights, further aligning the platform with sustainability goals.

## 6. Feedback Integration for Continuous Improvement:

- Continuously gather feedback from users (firefighters, citizens, and fire departments) to refine the system, ensuring it evolves based on their changing needs.
- Use data-driven insights to improve the system's overall performance and incorporate user-centric features.

# **Innovation/Business Pitch Proposal**

## Innovative Solution

AIFA (AI-Driven Firefighter Assistant) is an innovative, AI-powered platform that aims to modernize fire safety management in India, where urbanization, rising population, and inadequate safety infrastructure pose a growing risk. AIFA combines advanced technologies like AI, machine learning, data analytics, and Geographic Information Systems (GIS) to provide a multi-faceted solution to enhance fire safety management.

By offering real-time incident logging, AI-driven predictions, and resource optimization, AIFA streamlines firefighting operations, improves decision-making during emergencies, and empowers the community with fire safety awareness.

Key features include:

- AI-powered fire risk prediction and fire behavior analysis.
- Incident tracking with real-time updates.
- Fire safety awareness for citizens with educational resources and hazard reporting.

## Market Potential & Target Audience

India faces severe challenges in fire safety, especially in densely populated urban areas,

where fire incidents often result in significant loss of life and property. With rapid urbanization and the increasing number of high-rise buildings, there is a growing need for advanced fire safety technologies. The target audience for AIFA includes:

- Fire Departments and Rescue Teams: Municipal fire departments across Indian cities can use AIFA to improve response times and allocate resources more efficiently.
- Government and Municipal Authorities: Local bodies responsible for urban planning, fire safety regulations, and disaster management will benefit from AIFA's ability to predict risks and plan resources effectively.
- Citizens and Community Organizations: With its focus on fire safety education and hazard reporting, AIFA helps citizens stay informed and engage with their local fire departments.
- Private Sector & Real Estate Developers: Builders and developers can integrate AIFA's fire safety solutions into residential and commercial buildings to ensure compliance with fire safety regulations.

As India continues to modernize its infrastructure, AIFA addresses a key challenge—ensuring fire safety for millions of people while reducing the risk to firefighters and citizens alike.

### Business Model & Revenue Generation

The business model for AIFA will be based on the Software-as-a-Service (SaaS) framework, where fire departments, government agencies, and private entities will pay for access to the platform's various features. Revenue will be generated through:

1. Subscription Plans:
  - Tiered subscription plans based on the number of users, features, and geographical coverage.
  - Plans tailored for municipal fire departments, residential societies, and commercial establishments.
2. Public-Private Partnerships:
  - Collaborating with Indian government agencies and NGOs to sponsor fire safety awareness campaigns and educational content, which will help promote AIFA within communities.
  - Corporate partnerships with private sector companies for funding safety programs and sponsoring platform access.
3. Premium Features:

- Offering advanced features like detailed predictive analytics, custom resource management tools, and specialized reports for a fee.
- Providing consultation and training programs for fire departments to optimize their operations using AIFA.

#### 4. Collaborations with Real Estate Developers:

- Partnering with builders and property developers to integrate AIFA into smart buildings, ensuring fire safety compliance and offering a value-added service to residents.

### Financials & Funding Requirements

To build, scale, and deploy the AIFA platform, an estimated ₹3 crore - ₹5 crore is needed for the first phase. The initial funding will be used for:

- Platform Development: Finalizing the AI and GIS integrations, backend development, and initial deployment.
- Operational Expenses: Hiring technical teams, infrastructure costs, and platform maintenance.
- Marketing and Awareness Campaigns: Outreach to fire departments, government bodies, and the public to promote the platform.
- Research and Development: Continuous improvement of AI models, fire risk prediction algorithms, and enhancing user experience.

Funding will be sought through a combination of venture capital, government grants, and corporate partnerships.

### Roadmap & Execution Plan

#### Phase 1: Development & Prototype (0-6 months)

- Objective: Create a basic prototype with AI-driven incident logging, fire tracking, and predictive analytics.
- Key Activities:
  - Design and build the initial web-based platform using MERN stack (MongoDB, Express, React, Node.js).
  - Develop predictive fire risk models and integrate GIS tools.

- Initial testing and deployment at select fire stations for feedback.

#### Phase 2: Pilot Testing & Feedback (6-12 months)

- Objective: Conduct a pilot program in selected cities (e.g., Mumbai, Delhi, Bangalore) and refine the system.
- Key Activities:
  - Engage local fire departments for feedback.
  - Host community awareness campaigns through the platform.
  - Refine the platform's user interface and predictive models based on pilot results.

#### Phase 3: Full Deployment & Expansion (1-2 years)

- Objective: Scale the platform to more cities, integrate advanced features, and launch awareness programs nationwide.
- Key Activities:
  - Expand platform access to more municipalities and fire departments.
  - Introduce features like mobile access, real-time notifications, and community fire safety reporting.
  - Partner with NGOs and government bodies for wider outreach.

#### Phase 4: Long-Term Growth & Scaling (2+ years)

- Objective: Introduce IoT integration, mobile apps, and international expansion.
- Key Activities:
  - Integrate IoT devices for real-time building monitoring.
  - Develop mobile apps to increase citizen engagement.
  - Expand to other countries with similar urban fire safety challenges.

## Call to Action

We invite investors, government agencies, and fire safety professionals to join us in this critical initiative to revolutionize fire safety in India. By supporting AIFA, you will contribute to reducing fire-related risks, enhancing firefighter safety, and improving community awareness. Together, we can build a smarter, safer India.

For further details or to get involved, please reach out to us at [contact information].

## **Conclusion & Recommendations**

### Summary of Key Insights

Through the AIFA project, we have uncovered several critical insights about the current state of fire safety management in India and the potential for improvement through innovative technologies:

1. Fire Safety Challenges: Fire safety in India, particularly in urban areas, is hindered by inadequate resources, outdated infrastructure, and a lack of coordinated response systems. This often results in delayed responses and a lack of preparedness.
2. Role of AI & Data Analytics: The integration of AI-powered predictive models can significantly improve decision-making during emergencies. By analyzing past fire incidents and predicting future risks, AIFA provides actionable insights that help optimize firefighting resources and response strategies.
3. Need for Community Engagement: There is a clear need for enhanced community awareness and citizen engagement in fire safety. AIFA's community platform, with its fire safety tips and hazard reporting features, empowers citizens to actively participate in fire prevention.
4. Importance of Real-Time Data: Fire departments require access to real-time incident data to respond efficiently. AIFA's ability to log incidents and track fire behavior in real time offers valuable support to firefighting teams, improving coordination and response times.

### Policy Recommendations

To further enhance fire safety management and facilitate the adoption of technologies like AIFA, the following policy recommendations are made:

1. Standardize Fire Safety Regulations: Implement and enforce standardized fire safety regulations across cities, especially in high-rise buildings and commercial establishments, with a focus on smart safety systems that integrate technologies like AI and IoT.
2. Government Collaboration with Tech Startups: Encourage partnerships between the

government and tech startups to accelerate the development of fire safety solutions. Public-private partnerships could help address funding challenges and promote the use of innovative technologies like AIFA.

3. Firefighter Training & Awareness: Implement continuous training programs for firefighters on using AI-driven tools and platforms like AIFA to enhance their operational efficiency during emergencies.
4. Community-Based Fire Safety Initiatives: Develop nationwide fire safety campaigns in collaboration with NGOs, local fire departments, and community organizations to increase awareness about fire risks and the importance of preparedness.
5. Incentivize Smart Building Integrations: Provide incentives for real estate developers to integrate smart fire safety solutions, such as automated alerts, predictive fire behavior analysis, and IoT-enabled monitoring systems, within buildings.

#### Next Steps for the Project

1. Pilot Testing & Expansion:
  - Conduct comprehensive pilot testing at select fire stations in major Indian cities like Mumbai, Delhi, and Bangalore. This will provide valuable feedback and data for refining the platform's features.
  - Engage with fire departments to gather input on additional features and improvements based on real-world usage.
2. Integration of IoT & Mobile App Development:
  - In the next phase, integrate IoT devices into the system to provide real-time monitoring of fire-prone areas, building infrastructure, and resource availability.
  - Develop mobile applications to allow both firefighters and citizens to access real-time data, alerts, and incident reports from their smartphones.
3. Scalability & Nationwide Rollout:
  - After the successful pilot phase, scale the platform to more cities and states, integrating local data and making adjustments based on regional needs and challenges.
  - Expand the outreach to rural areas and smaller towns where fire safety awareness and infrastructure are often lacking.
4. Continued Research & Development:

- Invest in the continuous research and development of AI models, ensuring that they become increasingly accurate in predicting fire risk and optimizing firefighting strategies.
- Focus on improving the user interface (UI) and user experience (UX) of the platform to make it more intuitive and easy to use for both firefighters and citizens.

## 5. Collaboration & Partnerships:

- Establish collaborations with government agencies, fire safety NGOs, and private companies to secure funding, increase platform adoption, and promote the project's social impact.
- Seek additional partnerships with tech companies for the development of advanced AI models and cloud infrastructure to enhance the platform's capabilities.

By following these steps, AIFA can transform the fire safety landscape in India, ensuring that fire departments are better equipped, citizens are more prepared, and the country as a whole is safer from the devastating effects of fire-related incidents.

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## Appendices

### Survey Questionnaire

1. What challenges are faced?
2. What ways to track response time and manage it?
3. Is communication an issue during operation?
4. Is there any new technology used for training?
5. How are risk zones predicted in fire risk areas?
6. How is resource and allocation process handled? What if resource gets over? What is the quick solution?
7. How relevant is tech? What tech features would you prefer?
8. How working of fire fighting equipments are checked?

Questionnaires  
13 February 2025 11:04

Q) What challenges are faced?

- Response time tracking & manage - Kaunsa faced?
- During operation → communication → major issue?
- Training → Koi raya kih? → Use?
- New tech sol'n → access diya → Feature?
- Fire risk areas → Risk zone predict?
  - Now is the resource & allocated process handled? → what if resource over? → Double sol'n?
  - Now relevant is kih? → what tech more would you like?
  - Firefighters → training program? → what & how?
  - Training/drills → Problems?
  - Firefighting equipment → working condition process?

**Fig. Insight on the questions asked**

#### Interview Transcripts

Day 1 (Mankhurd Fire station):

1. Traffic is a major issue
2. Narrow lanes and vehicles parked on either side of the road makes it difficult for the vehicle to pass and reach the location faster.
3. Obstacles are present in the building
4. No awareness to call the fire brigade
5. Form B submission by the buildings are not taken seriously
6. Demo session is ignored
7. Security does not even recognise the firefighter uniforms
8. Hydrants are demolished or taken away by slums
9. Slum areas scrap off the fire truck and steal stuffs
10. People should know fire station in premise and distance

Day 2(Chembur Fire Station):

1. Call 101(Control Room) for emergency response in case of fire
2. Any call is first reported to control room where person's authentication is considered and after verification is when they allow the fire truck to dispatch. (Only control has the authority to dispatch vehicles no fire station can do so themselves)
3. In case of fire do not panic and avoid heavy breath.
4. Majority of death happen due to suffocation from smoke rather than fire itself
5. Empty gas cylinder is more dangerous and susceptible to blast than full
6. Observed Mumbai Fire Brigade is the only Fire brigade in the country to have a website which checks on dispatch of the fire vehicles

☰ Quick Notes Q 9 Q :  
HOME INSERT DRAW VIEW  
14 feb FV day 2  
14 February 2024 11:08

10.1 → Infall degree  
Coll → parallel →  
One time 9-5 time → Difficult  
At a time 16  
Verify → Person responsible  
Person control pc room pastha bei  
Flight zone  
Ground control room only difference  
Based on simulation → RSA (for vehicle), ladder etc  
Traffic → Wireless communication  
Areas where UAVs  
cannot go, public  
disturbs

→ Kitchen (1.8m) frag → In horizon → floor height →  
→ On some fire brigade → guarantee <sup>person</sup>  
→ Drive to log works → sufficient depth → Point →  
→ has cylinder → Ryan <sup>anger man</sup> → Trolley block →  
→ Has cylinder dangerous → Liquified <sup>Part</sup> <sup>(gas)</sup> <sup>problem</sup> <sup>(gas)</sup>  
→ close gas pipe block from everywhere

1) Fire drill for evacuation

2) Program to schedule / task / analysis fire drill program

3) Web-based fire risk analysis part fire incident & risk areas

a) Website → space firefighter & expert area

5) Fire safety equipment rental

b) Walk in fire station navigation

### Precious

### Narrow lanes

As early as possible  
obstacles → in building

Awareness → call fire brigade

High rise buildings

Form B → Subunit fire safety → They don't usually write

Parking inst. compound services

X crosscheck for subunit form B

Demolition → ignore

Security X know

X fire brigade no → call 109 → no command → No. should be more

112 fire to crowd → very late

Printing hydrants very difficult

Hydrants → demolished / slums take to inside → refilling hydrants  
People → know fire station in previous 2 distance

Slum area → scraping 2 → from → steeply  
scrubbing

Green signal → Every place → Fire brigade

Middle of highway → If car fire → How much? → (traffic) per car

Each car → fire extinguisher → big → Up to date

Fire department → X importance

cannot go public  
 discuss

- history (1990) says → the better was the bank with less capital, so better → banks are safe
- oh, first the banks → problem  
for whom  
for whom
- due to lack of money → system fails → fail → failing
- has update → 2 types  
of them →  
→ half of the dangerous → stop  
completely → take off  
→ close gas pipe break  
gas leakage
- we should be more careful about managing politics not by legal  
police but by social media
- control room, control local
- gas leakage location → so choose best  
location  
no change in  
weather, always  
double no route create  
gas leak.
- LNG is requires than LPG so it's scaled down
- phone / address / fallen / alarm link → to local region (Fire & Police station)  
update  
→ unit will go on
- land no, employee, motor  
pump
- details updated in control room
- enroute when required
- different types of vehicles → aero mobility →
- first system in number  
Vortex  
ultrafast → if this has
- dual system → set location → your  
unit
- wireless system → had jagath since ago  
↓

- wireless system → hal jagath sunai ada  
ambulance bay
- one team has 7 members u firemen
- ambulance me injured queffgition
- public treated in govt. help, firemen
- other firemen are called by injured
- I run me telkout who has goad
- first response date has goad to pr
- we should be aware of our own buildings
- we should know to use extinguisher
- lift me koi atka, break the glass, +
- form → compusday, maintenance no goad
- no awareness among pp
- 14th april drill → fire week
- rescuing birds
- bomb and all direct ph

### Time Stamp

Date	Time	Location	Discussion points	Action taken
5th Feb 2025	1:15 PM	College	Discussed potential field project domains, including autism, with the mentor.	Attempted to contact the Autism Center, but received no response.
7th Feb 2025	1:15 PM	College	Discussed project details and requirements with the mentor, proposing the fire station as the domain	Documented project requirements.
10th Feb 2025	3:00 PM	Chembur Fire Station	Visited the fire station for approval but the main officer was not present	Updated the mentor on the visit.
11th Feb 2025	1:30 PM	Chembur Fire Station	Met with the officer in charge to request permission for a firefighter survey. Advised to visit Mankhurd Fire Station for official approval	Visited the Mankhurd Fire station
11th Feb 2025	2:45 PM	Mankhurd Fire Station	Presented the draft intent letter; the junior officer advised submitting a hard copy on the college letterhead with a stamp for approval.	Updated the mentor on the visit.
12th Feb 2025	3:30 PM	College	Reviewed and verified the intent letter contents with the mentor	-
13th Feb 2025	8:45 AM	College	Got the intent letter signed and stamped	Delivered the letter to Mankhurd Fire Station."
13th Feb 2025	10:00 AM	Mankhurd Fire Station	1) Got the official permission from the station 2) Discussed and gathered respective data from the deputy officer 3) Pain points of the firefighters were discussed	Recorded and documented the data.
14th Feb 2025	11:00 AM	Chembur Fire Station	1) Discussed with the firefighters their point of view during operation and functions 2) Witnessed real time procedure on how the response on report of fire is 3) Gathered valuable insights on the working of the department 4) Discussed apt solutions required for the project	Recorded and documented the data.

21st Feb 2025	1:10:00 PM	College		
25th Feb 2025	1:15:00 PM		Explored software solutions with the mentor to enhance firefighter efficiency based on research-driven problem analysis.	Initiated project implementation strategies
28th Feb 2025	1:17:00 PM	College	Discussed about the endorsement letter and the format for the submission of the project	Documented key discussion points.

### Review Stage 1 Assessment Sheet

Vivekanand Education Society's Institute Of Technology (Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)																																														
Department of Computer Engineering Second Year Sem IV Field Project Review Stage I Assessment Sheet 2024 - 25																																														
Sustainable Development Goal: 8, 11 Mentor: <u>Jade Dolense</u> Group: <u>Group - 11</u>																																														
<p>Title of Project: <u>AIFA - AI - Driver Firefighter Assistant</u>            Group Members: <u>Neha Munkhani</u>, <u>Jai Bhatia</u>, <u>Shradha Bhagat</u>, <u>Rachna Ann Jolly</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Stakeholders identified (2)</th> <th>Quality of Survey questionnaire/ Interview (3)</th> <th>Clarity of Problem definition &amp; objectives (3)</th> <th>Innovative ness in solutions (2)</th> <th>Feasibility of proposed solutions and selection of best solution (2)</th> <th>Cost effective ness (1)</th> <th>Societal Impact (1)</th> <th>Innovative ness (1)</th> <th>Ethics (1)</th> <th>Full functioning of working model (2)</th> <th>Lifelong Learning (2)</th> <th>Effective use of skill sets (1)</th> <th>Effective use of standard engineering norms (1)</th> <th>Contribution of an individual's as member or Leader (1)</th> <th>Clarity in Written and oral communication (2)</th> <th>Total (25)</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>23</td> </tr> </tbody> </table> <p>Comments: <u>Need to start with the implementation.</u></p>															Stakeholders identified (2)	Quality of Survey questionnaire/ Interview (3)	Clarity of Problem definition & objectives (3)	Innovative ness in solutions (2)	Feasibility of proposed solutions and selection of best solution (2)	Cost effective ness (1)	Societal Impact (1)	Innovative ness (1)	Ethics (1)	Full functioning of working model (2)	Lifelong Learning (2)	Effective use of skill sets (1)	Effective use of standard engineering norms (1)	Contribution of an individual's as member or Leader (1)	Clarity in Written and oral communication (2)	Total (25)	2	3	3	2	2	1	1	1	1	1	1	1	1	1	2	23
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<u>Gopesh Gavant</u> Name & Signature Reviewer 2																																														

Fig. Review Stage Assessment sheet

GitHub Link

<https://github.com/JaiBhatia0201/AIFA-Firefighter-Assistance>

## Geo-tagged Photos:

