



# **SMART ELEVATOR LOAD BALANCER**

**BATCH – 15**

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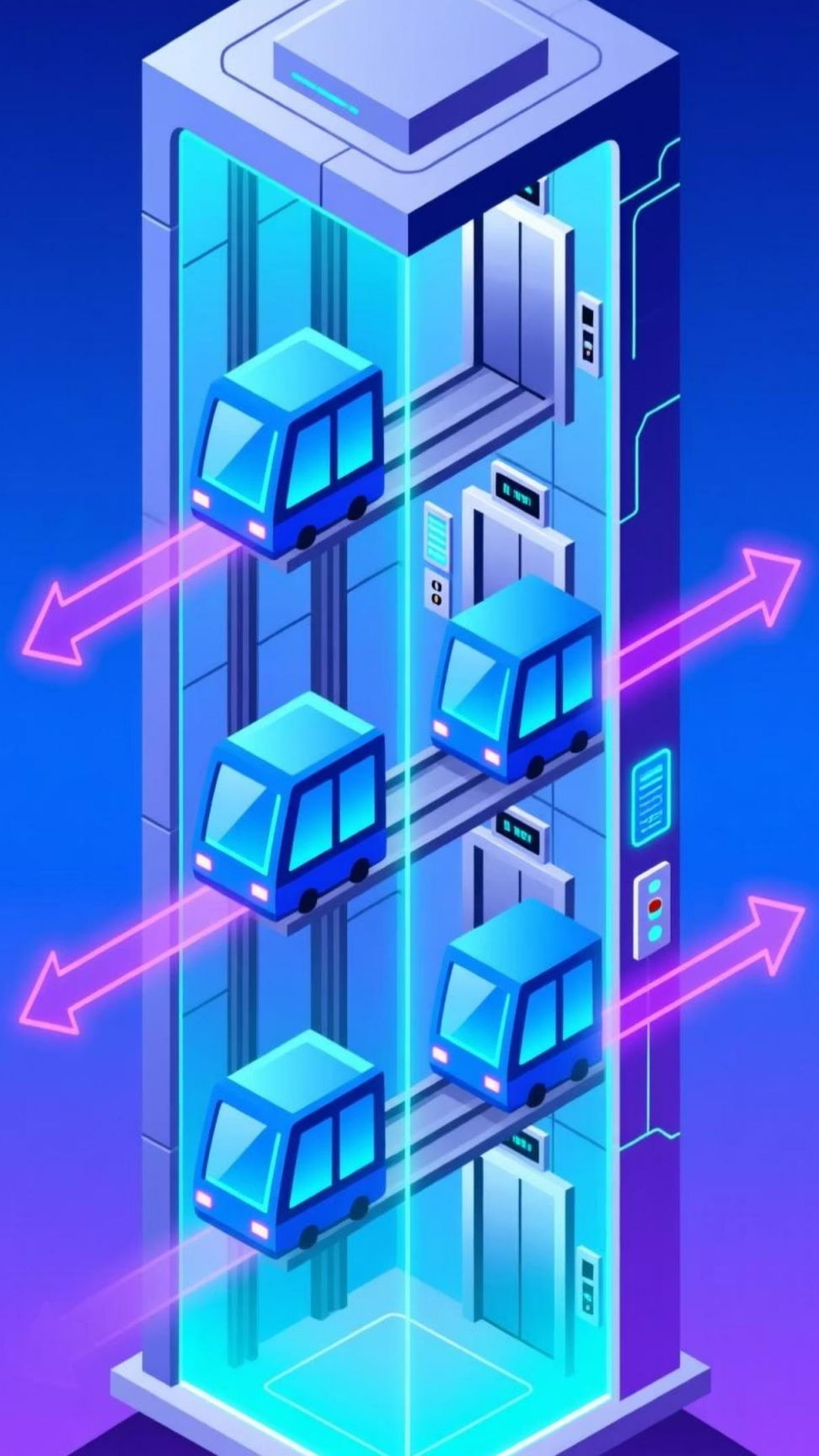
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## **Abstract:**

The Smart Elevator Load Balancer is an intelligent system designed to optimize elevator usage in multi-story buildings by reducing waiting time, avoiding overcrowding, and ensuring efficient energy consumption. Traditional elevators operate on simple request-response mechanisms, often leading to delays and uneven load distribution. This project applies smart algorithms to dynamically allocate elevators based on real-time parameters such as passenger demand, load capacity, floor traffic, and time of day. By balancing the load among multiple elevators, the system enhances user convenience, improves safety, and minimizes power usage, making it suitable for modern smart buildings and high-rise infrastructure.

# Smart Elevator Load Balancer: Making Elevators Smarter and Faster

Welcome to our presentation on the Smart Elevator Load Balancer. We'll explore how this innovative technology is revolutionising vertical transportation, making buildings more efficient and user-friendly.



# OBJECTIVE :

- 1.Reduce waiting time for passengers.
- 2.Distribute load evenly among elevators
- 3.Save energy by optimizing elevator trips.
- 4.Use smart algorithms/AI for faster decision-making.
- 5.Improve passenger comfort and satisfaction.
- 6.Enhance system efficiency during peak hours.
- 7.Support future smart building systems.



# What is a Smart Elevator Load Balancer?



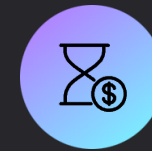
## Even Load Distribution

A system that helps elevators share the passenger load evenly across all available cars.



## Intelligent Dispatch

Uses advanced sensors and smart technology to decide which elevator to dispatch next.



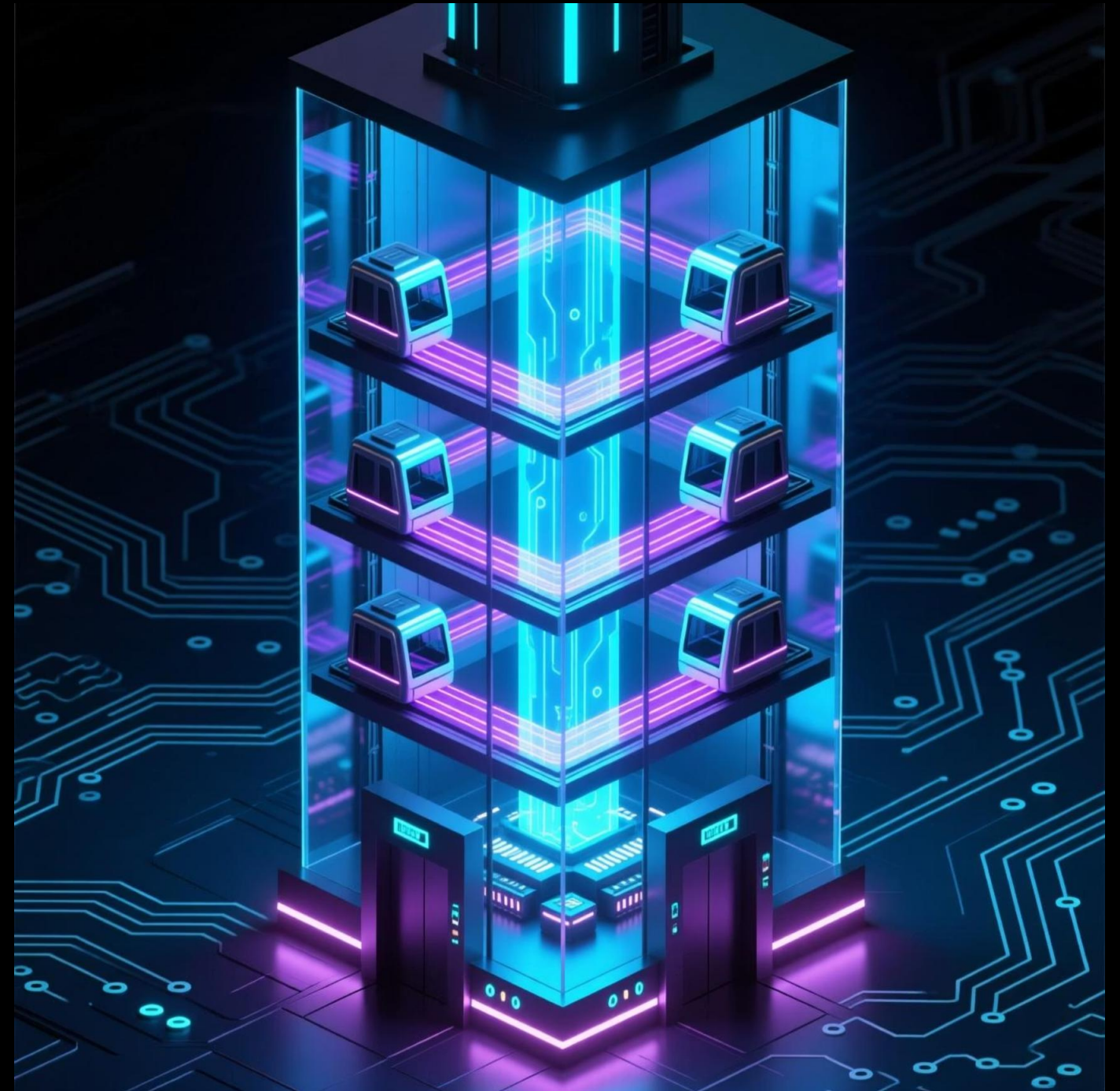
## Optimised Performance

Reduces waiting times and conserves energy by preventing overcrowding and unnecessary trips.

# Why Do We Need Load Balancing in Elevators?

## Addressing Common Challenges

- In busy buildings, elevators can become excessively crowded or lead to frustratingly long waits.
- Random button presses by passengers often result in delays and inefficient elevator movements.



The Solution



# How Does It Work? The Role of Load Sensors

01

## Real-Time Measurement

Load sensors precisely measure the weight inside each elevator car in real time.

02

## Occupancy Detection

They accurately detect whether an elevator is full, partially occupied, or empty.

03

## Informed Dispatch

This critical information empowers the system to intelligently decide which elevator should respond to a call next, ensuring optimal flow.



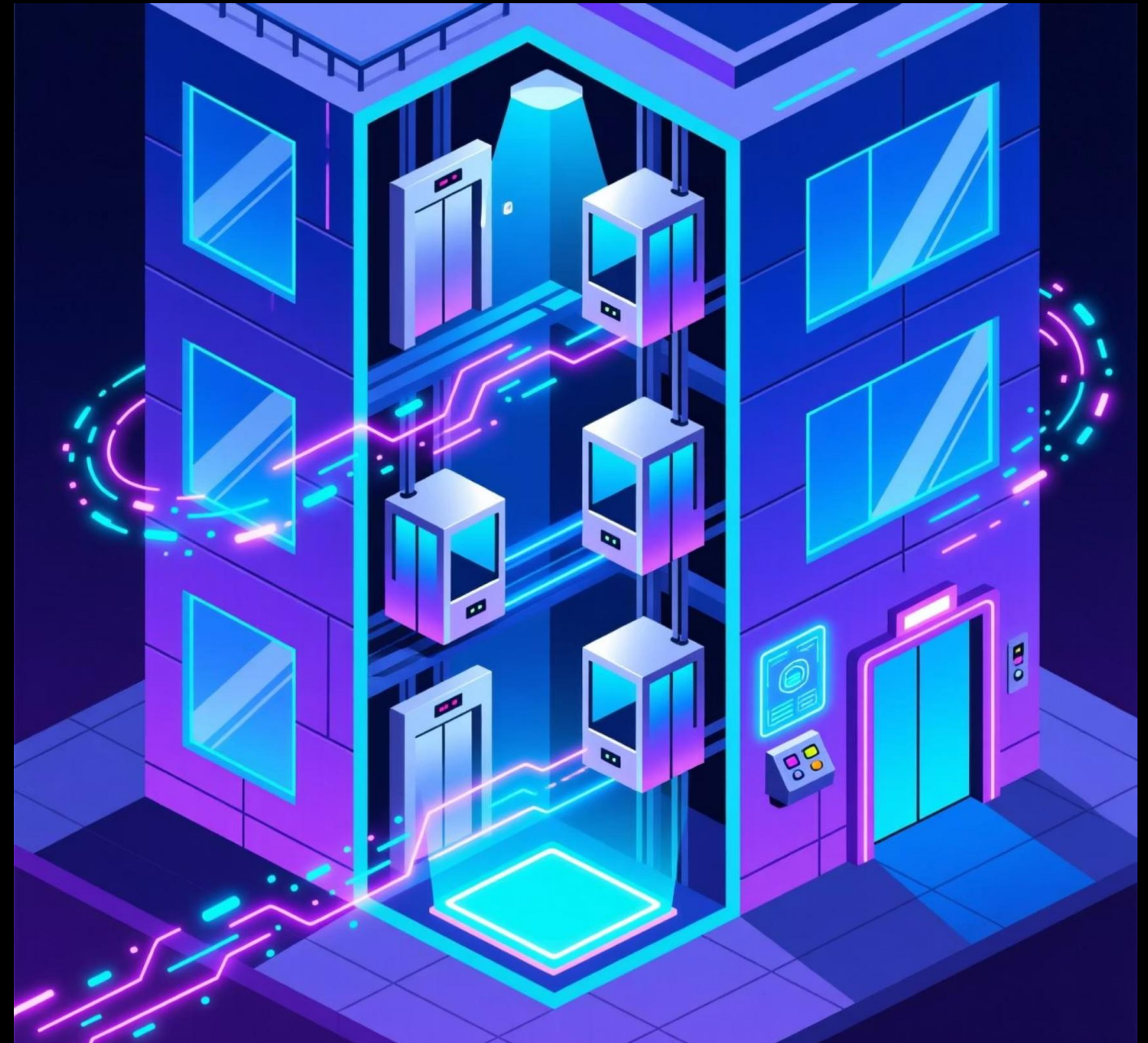
# Using Artificial Intelligence (AI) to Improve Efficiency

Studies indicate that AI-driven smart elevators can cut passenger wait times by up to 15% and reduce energy consumption by 20%.



## AI-Powered Optimisation

- AI continuously analyses passenger flow data and predicts peak demand patterns.
- It intelligently assigns elevators to specific floors to significantly reduce wait and travel times.





# The Smart Elevator System Components



## Load Sensors

Installed on elevator cables, these sensors accurately measure the car's weight.



## Central Control System

This powerful unit processes all incoming data and expertly controls elevator dispatch and movement.



## Data Analytics Module

Continuously tracks usage patterns, providing insights to further improve system performance and efficiency.

# Benefits of Smart Elevator Load Balancers



## Faster Service

Experience significantly reduced waiting times and quicker journeys.



## Energy Savings

Smarter trip planning and less unnecessary movement lead to considerable energy conservation.



## Enhanced Comfort

Improved passenger comfort and overall satisfaction through a smoother, more efficient experience.



# Real-World Example: Smart Elevators in High-Rise Buildings

- **High-Traffic Environments:** Ideal for bustling shopping malls, large hotels, and busy office complexes where heavy footfall is common.
- **Eliminating Invalid Calls:** Smart systems effectively avoid unnecessary elevator trips caused by accidental or erroneous button presses.
- **Operational Efficiency:** They substantially reduce operating costs and significantly enhance the reliability of elevator services.





# The Future of Smart Elevators

## IoT Integration

Seamlessly connects with Internet of Things (IoT) ecosystems for comprehensive building-wide energy management.

## Predictive Maintenance

Anticipates and prevents potential breakdowns before they occur, ensuring maximum uptime.

## Personalised Scheduling

Offers tailored elevator experiences based on individual user preferences and historical travel patterns.

# Summary: Smarter Elevators for Smarter Buildings

The Smart Elevator Load Balancer represents a significant leap forward in building management.

- Utilises **sensors and AI** to dramatically improve elevator service.
- Delivers tangible benefits: **saving time, energy, and money**, while ensuring a more comfortable passenger experience.
- The future of vertical transportation is undoubtedly **connected, efficient, and user-friendly**.

**Thank you for your attention!**

# REFERENCE

<HTTPS://1DRV.MS/W/C/E7F8C9649FDB3845/EUIKR5FVVE9GH8XOGZS-K1QB02BTD-E1PFT-L-1NEZ4S9G?E=JAXTEM>