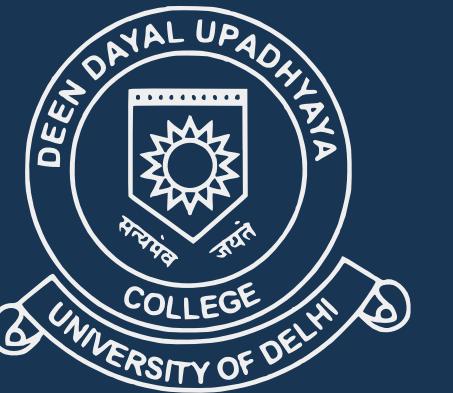


I-N  
Delhi Transport Corporation



# HACK4DELHI

Pitch Directly to the Government. Build for the Nation.

Team Name : Dominators

B.Tech- IT 2029

Indira Gandhi Delhi Technical University for Women  
(IGDTUW)

Members name and Affiliation:

- 1.) Swikriti Singh- Team Leader
- 2.) Sonali K. Jha- Team Member
- 3.) Ria Saraswat- Team Member



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# PROBLEM STATEMENT

Domain : Civic Tech



Delhi faces recurring water-logging during the monsoon season leading to traffic paralysis, infrastructure damage, economic losses, and public safety risks.

Despite the availability of rainfall data, drainage records, and complaint systems, municipal response remains largely inactive.

As a result, pump deployment, desilting, traffic diversion, and emergency response are often delayed, increasing citizen inconvenience and governance pressure.



The challenge is not rainfall – it is the lack of predictive, data-driven decision support for urban flood management.

Problem Statement: 4

Recurring Urban Water-Logging & Lack of Predictive Monsoon Preparedness in Delhi

TRAFFIC PARALYSIS



INFRASTRUCTURE DAMAGE



LACK OF PREDICTIVE PREPAREDNESS



LACK OF PREDICTIVE PREPAREDNESS



DELAYED RESPONSE (PUMPS)



CITIZEN INCONVENIENCE & GOVERNANCE PRESSURE



Current  
problems!



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# SOLUTION

## SOLUTION DESCRIPTION

- INTEGRATED PLATFORM COMBINING GIS, RAINFALL, DRAINAGE, COMPLAINTS, AND SENSOR DATA.
- PREDICTS AND MAPS WATER-LOGGING HOTSPOTS AT WARD AND ZONE LEVELS.
- ASSESSES MONSOON PREPAREDNESS USING DATA-DRIVEN SCORING.
- PROVIDES REAL-TIME RISK VISIBILITY FOR MUNICIPAL AUTHORITIES.
- ENABLES PROACTIVE PLANNING AND EARLY RESPONSE THROUGH ACTIONABLE INSIGHTS.

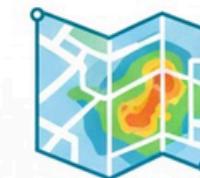
Unlike traditional flood maps or post-event reporting tools, this system focuses on predicting governance failure before visible flooding occurs, enabling preventive action rather than reactive response.

WHAT  
MAKES  
US  
DIFFERENT ?



This solution transforms monsoon management from reactive response to predictive urban governance.

## Core Components



GIS-based city dashboard with ward-wise water-logging risk heatmaps



Ward-wise risk heatmaps



Monsoon Preparedness  
Bach ihs ward



Predictive risk engine  
Uses rainfall, elevation, elrainage, condition, and historical complaints



Monsoon Preparedness Index (MPI)  
Scoring for each ward and zone



Low-cost IoT sensing modules  
(drain/road water-level sentinels) for realme alerts



Decision support system  
Pump, desilting, traffic management



Citizen reporting interface  
Geo-tagged water-logging feedback



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# ARCHITECTURE

THE SYSTEM FOLLOWS A FIVE-LAYER MODULAR ARCHITECTURE :

## FRONTEND:

NETLIFY-HOSTED, INTERACTIVE  
MAP, DASHBOARD, CITIZEN REPORT

## BACKEND:

HANDLES API REQUEST, DATA  
AGGREGATION, AI INTEGRATION (RISK  
COMPUTATION LOGIC)

## DATABASE:

STORE REAL TIME DATA AND HISTORIC  
DATA, FLOOD HOTSPOT, CITIZEN REPORT

## AI ANALYTICS ENGINE:

PROCESS BACKEND DATA TO COMPUTE DRAIN  
CHOCKING PROBABILITY, FLOOD  
HOTSPOT, MONSOON PREDICTNESS INDEX GROUND-  
LEVEL RISK

## CLOUD

## INFRASTRUCTURE:

MONGODB CLOUD FOR DATABASE HOSTING





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## FRONTEND

- HTML-STRUCTURE
- CSS-STYLING
- JAVASCRIPT-SCRIPT&API
- MAP LIBRARIES-INTERACTIVE MAPS(LAYERS,ZOOM, MARKERS)
- NETLIFY-FRONTEND HOSTING & DEPLOYMENT

## BACKEND

- NODE.JS-SERVER-SIDE RUNTIME
- EXPRESS.JS-REST API FRAMEWORK
- RESTFUL API-DATA COMMUNICATION
- RENDER DEPLOYMENT

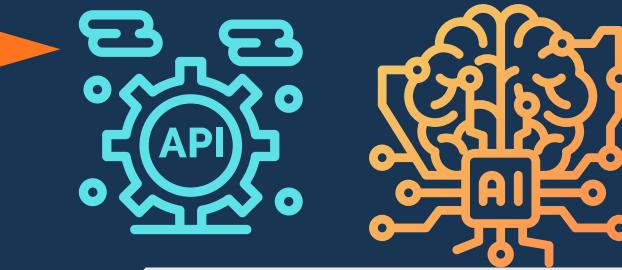
## DATABASE

- MONGODB- SQL DATABASE
- MONGOCOMPASS -STORING JSON DATA



## AI ANALYTICS

- RULE BASED+ML LOGIC
- 1) DRAIN CHOCKING PROBABILITY(PRE-RAIN)
- 2) FLOOD HOTSPOT IDENTIFICATION
- 3) STATISTICAL RISK SCORING MODELS



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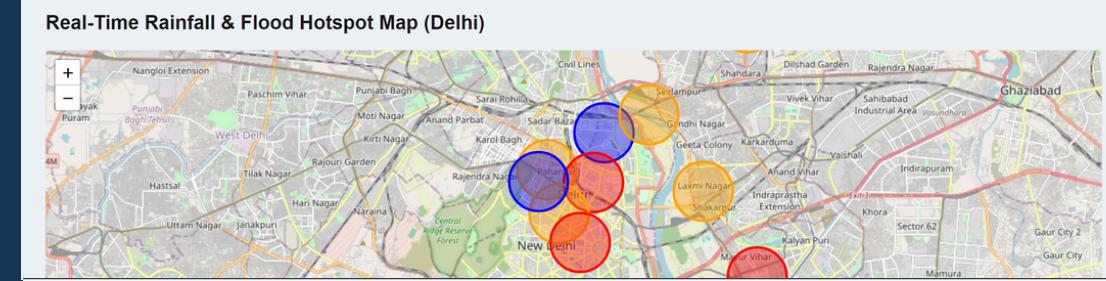
## Our Frontend

Delhi Monsoon Command & Intelligence System  
AI-Driven Ward-Level Flood & Drain Failure Prediction Platform

Rainfall Status (IMD)  
Heavy Rain Alert

High Risk Wards  
1

System Status  
Active



Monsoon Preparedness Index (MPI) — Ward Level

Ward	Zone	MPI	Flood Risk
Lajpat Nagar	South	36	High
Karol Bagh	Central	55	Medium
Rohini	North	63	Low
Dwarka	South West	46	Medium
Shahdara	East	53	Medium

AI-Based Drain Choking Probability (Pre-Rain)

Ward	Tree Density	Market Density	Choking Risk
Lajpat Nagar	8	6	High
Karol Bagh	4	9	High
Rohini	6	3	Medium
Dwarka	5	5	Medium
Shahdara	7	7	High

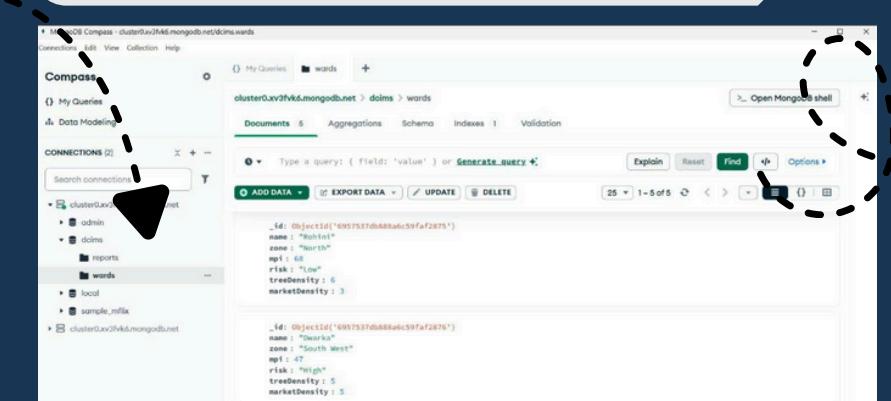
## Our Prototype



## Hardware



## Database





# FEATURE/USP

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## KEY FEATURES

- 1.) Ward-Level Monsoon Preparedness Index
  - Quantifies readiness of each ward.
- 2.) GIS-Based Risk Mapping
  - Colour-coded visualization of water-logging risk across Delhi .
- 3.) Extreme Rainfall Simulation
  - Allows authorities to stress-test the city before rainfall events .
- 4.) Action Recommendation Engine
  - Suggests desilting, pump deployment, and traffic planning .



CLEAR, MINIMAL,  
AND  
AUTHORITATIVE  
USER  
EXPERIENCE

FOCUS ON  
PREDICTING  
FAILURE NOT  
JUST  
FLOODING

DECISION-  
CENTRIC  
INTERFACE  
DESIGNED FOR  
OFFICIALS, NOT  
DEVELOPERS

COMBINES  
ANALYTICS,  
SIMULATION,  
AND ACTIONS  
IN ONE  
PLATFORM



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# REFERENCES/LINKS

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## REFERENCES (OFFICIAL DATA SOURCES)

1.) Rainfall data- <https://mausam.imd.gov.in/>

2.) Delhi Wards & Zones Information-  
<https://mcdonline.nic.in/portal/zones>

3.) Delhi Disaster Management Authority-  
<https://ddma.delhi.gov.in/ddma/floods>

4.) IEEE ML Based Rainfall Prediction-  
<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=10320349>

## LINKS (OUR PORTAL)

1.) Full stack Live Web Application : Dominators

<https://dmcis-teamdominators.netlify.app/>

The website responds after 10-15 seconds(Backend loading time)

2.) Frontend Repository - GitHub

<https://github.com/swikritidominators/DMCIS-FRONTEND>

3.) Backend API Live

<https://dmcis-backend.onrender.com/>

4.) Backend Repository - GitHub

<https://github.com/Sonali8706/DMCIS-Backend>

5.) Database Platform MongoDB Atlas

[mongodb+srv://ria\\_db\\_X5:RiaDatabase%402026@clusterr.h5qmjjo.mongodb.net/DMCIS?retryWrites=true&w=majority](mongodb+srv://ria_db_X5:RiaDatabase%402026@clusterr.h5qmjjo.mongodb.net/DMCIS?retryWrites=true&w=majority)

6.) Hardware Flipbook link-

<https://flipbookpdf.net/web/site/dd06c9330100d48afe00ff206e2a8d731fd24873202601.pdf.html>



# THANK YOU

Video Demonstrating our Website-

[https://drive.google.com/file/d/1CxIQBuUcHhsGD-uIFwRnv9hLKsBLhAKU/view?  
usp=sharing](https://drive.google.com/file/d/1CxIQBuUcHhsGD-uIFwRnv9hLKsBLhAKU/view?usp=sharing)

[https://drive.google.com/file/d/1w\\_DgqqotpYofCMQ6h1fDiCBKArW5ndEo/view?  
usp=sharing](https://drive.google.com/file/d/1w_DgqqotpYofCMQ6h1fDiCBKArW5ndEo/view?usp=sharing)