Smart Platform for Real-Time Construction Logistics and Resource Optimization

TEAM M063

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Problem Statement

Traditional construction logistics methods rely on static schedules and fragmented data, leading to delays, inefficient resource utilization, and poor real-time decision-making.

Objectives

Develop a smart web-based platform for real-time construction logistics management, scheduling optimization, and resource monitoring.

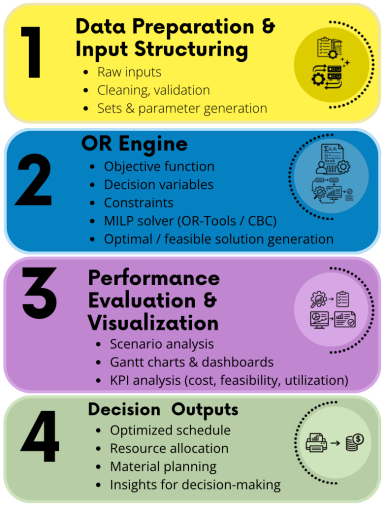
Constraints

1	Full compliance with SBC and site safety regulations
2	Secure local storage and controlled data access
3	Manual construction data updates only
4	Digital site map must cover major site zones and roads
5	System must operate under limited network conditions
6	Optimization results generated in real time
7	Position tracking accuracy depends on device capability
8	CPM schedule must contain zero constraint violations

Specifications

1	Scheduling feasibility ≥ 90%
2	≥95% of materials delivered on schedule
3	Dashboard response time ≤ 3 seconds
4	Full compliance with SBC and OSHA standards
5	CPM/PERT schedules accuracy ≥ 90%
6	System supports future expansion and scalability
7	Critical equipment utilization ≥ 85%

Prototype Design



Platform Interface

The developed web platform provides an integrated environment for real-time construction logistics management.
It includes three main user interfaces:

- Manager dashboard for monitoring performance and KPIs
- Worker interface for task execution and reporting
- Supervisor tools for validation and control

The system enables real-time tracking, decision support, and efficient coordination between all project roles.

Testing / Validation

Optimization model achieved:

- Cost reduction potential ≥ 15%
- Improved scheduling efficiency

System performance:

- Dashboard response ≤ 3 sec
- Real-time updates ≤ 5 min

Compliance:

- 100% adherence to SBC & OSHA

Results

- Reduced logistics delays
- Improved resource utilization
- Enhanced safety compliance
- Better coordination between teams

Conclusion

The proposed platform successfully integrates real-time tracking, optimization, and scheduling into a unified system.
It improves:

- Efficiency
- Cost performance
- Decision-making