CONTROL SYSTEM FOR INCREASING THE EFFICIENCY OF MODERN ELEVATOR SYSTEMS

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INTRODUCTION

- Man Desire for comfort lead him to inventions and discoveries
- Elevator, one of the remarkable invention
- Today, Efficiency matters
- Max output with Least power and minimum time.

Capsule Elevators

Why is the Need

Shortcoming

- Long Waiting Time
- Long Riding Time
- High Power Consumption

Elevator Rush

Objective

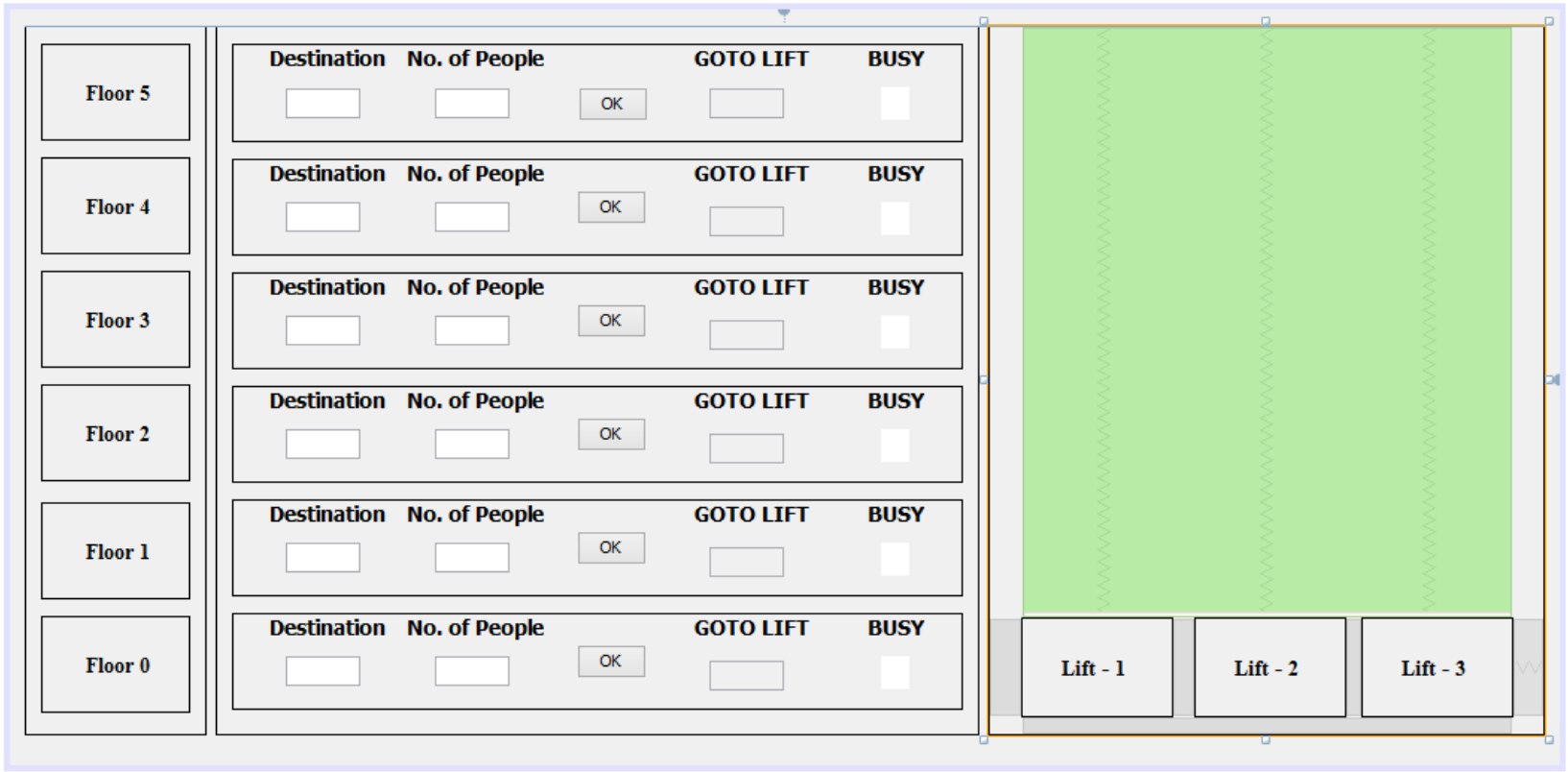
- Our objective is to simulate and increase the overall working efficiency of existing elevator system using Lab View software and JAVA.

- Advantage: TRAVELLING TIME & thus POWER CONSUMPTION is reduced

Intelligent Elevator Control System

- Controls analogous to human reasoning via fuzzy logic

Control System



CRITERIA

- To minimise the waiting time of passengers at a floor.
- To minimise the time passengers need to spend in an elevator.
- To minimise crowding in the elevator.
- To minimise travelling distance of each elevator.

Formulae

- 1) RD: RELATIVE DISTANCE

  RD= 0 (if lift is on way of called floor)

  IF STATIONARY

  RD= |STATIONARY FLOOR- CALLED FLOOR|

  else

  RD= |NEAREST DESTINATION FLOOR- CALLED FLOOR|

- 2) WT: WAITING TIME OF CALLER

  Time an elevator takes from its current location to called floor

  Assuming elevator takes 1 unit of time b/w 2 floors then,

  WT= |CURRENT LOCATION - CALLED FLOOR|

- 3) FS: FREE SPACE OF ELEVATOR

  FS= Total capacity - Current load of lift

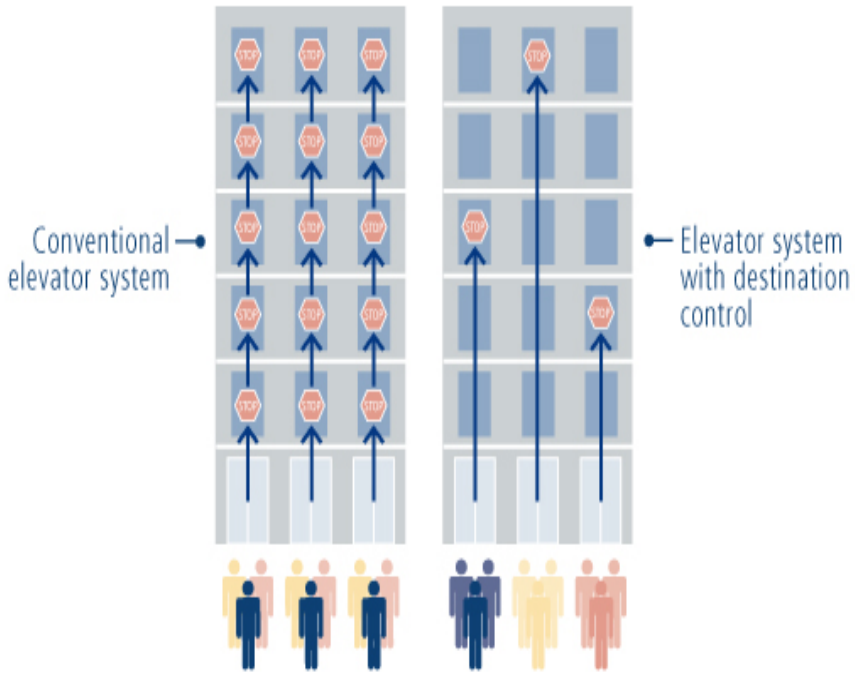
Fuzzy Rules

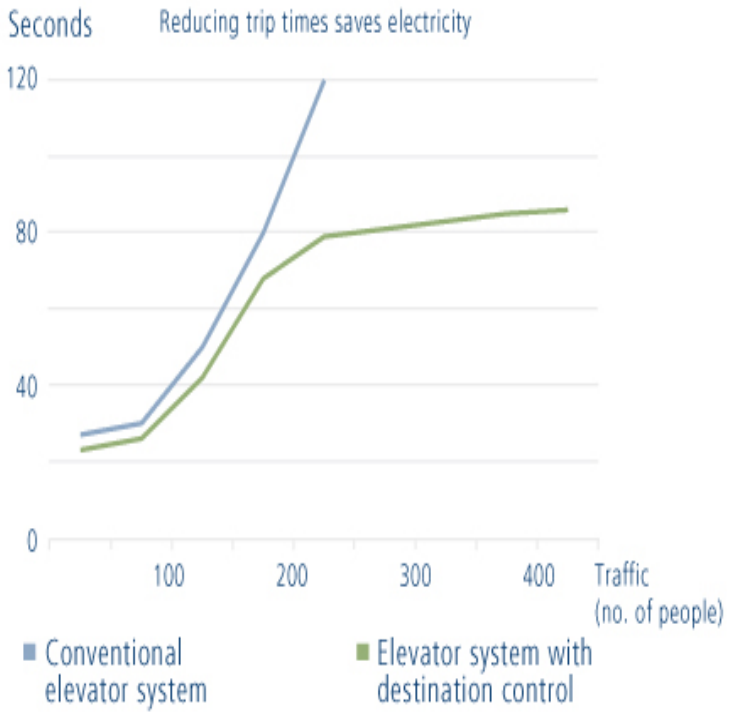
S. No.	IF	ATTRIBUTE	THEN	ATTRIBUTE
1	RD	Low	Priority	High
2	RD	Med	Priority	Med
3	RD	High	Priority	Low
4	WT	Short	Priority	High
5	WT	Med	Priority	Med
6	WT	Long	Priority	Low
7	FS	Small	Priority	Low
8	FS	Med	Priority	Med
9	FS	Large	Priority	High

Lab View Calculations Demo

JAVA
Simulation Demo

Results


Destination control principle
Conventional elevator system
Elevator system with destination control


Seconds
Reducing trip times saves electricity
120
80
40
0
100
200
300
400
Traffic (no. of people)
Conventional elevator system
Elevator system with destination control

Conclusion

- By this we conclude that there is still very much scope in the improvement of the current elevator systems.
- By using Fuzzy Rules and giving priorities to the Elevators, we determine the best elevator to the input hall call from the control system.
- This saves time of the people and in turn power consumption.

Scope

- If implemented on large scale, it can be a cost effective solution in near future.
- It can be incorporated with Image Processing tools to automatically count the number of people waiting for an elevator

Thank You!