Location Access Controller

The System: Basic Functional Requirements

- To control the accesses of persons to locations of a workspace.

- It is based on a (permanent?) authorization given to people

- We want to be sure that people which are present in a location are authorized to do so

The System: Basic Equipment Requirements (1)

- People are identified by means of magnetic cards

- For entering into a location people put their card in a card reader

- Card readers are equipped with two lamps: green and red

- When a person puts his card in the fence, then one lamp is lit

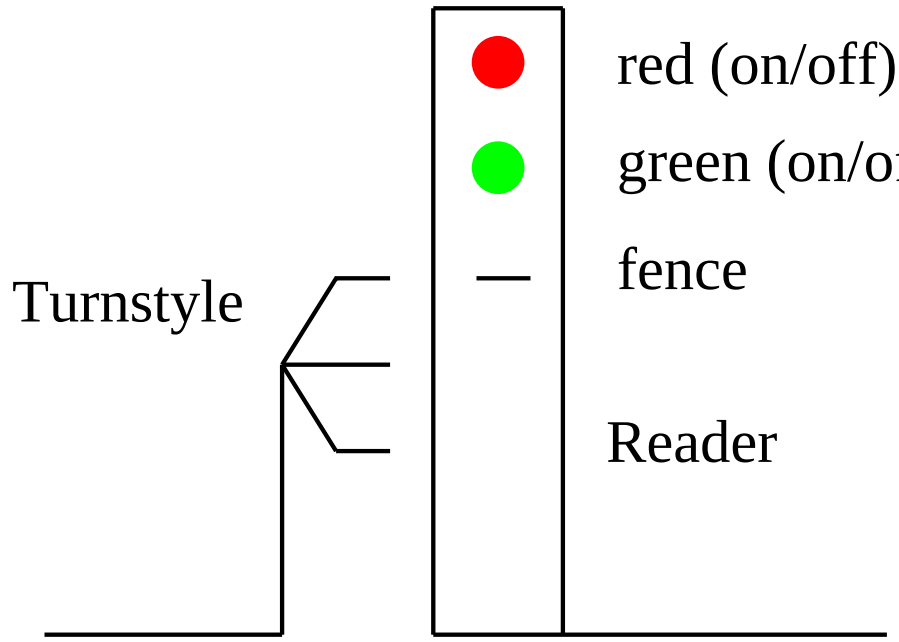
- When the green lamp is lit, it means the person is accepted

- When the red lamp is lit, it means the person is not accepted

The System: Basic Equipment Requirements (2)

- Each lamp has two status

- Each door is equipped with a turnstile which works one way only



BASIC

EQUIPMENT

The System: Basic Functional Requirements (3)

- When nobody is willing to move from one location to another, the corresponding turnstile is blocked

- In order to change location, a person first put his card in the fence of the corresponding card reader

Access Protocol (after introducing card in reader)

- If access is permitted
  - green light is turned on
  - turnstile is unblocked for 30 sec
    - Passing, or 30 sec elapsed
      - green light is turned off
      - turnstile is blocked again
- If access is refused
  - red light is turned on for 2 sec
  - turnstile stays blocked

Problems to be Solved During the Design (1)

- Many problems have not been solved in the requirements

- Sharing of control between Hardware and Software
    - A computer in each card reader?
    - A unique centralized computer?
    - A mixed situation with some “intelligence” in the card reader?

Problems to be Solved During the Design (2)

- Precise behavior of the equipment
  - Does the turnstile block itself after lamps are turned off?
  - Or does the turnstile wait for an order to do so?
  - Does the lamp system of each card reader have a local clock?
  - Is the fence obstructed after inserting a card into it?

- Answering these questions is important

- It will allow us to define the precise spec of the equipment we buy

Problems to be Solved During the Design (3)

- Tackling safety questions
    - The Requirement Document says nothing on this
    - Is it important or not?
    - If it is important, what are the precise safety questions?
    - Should we extend the Requirement Document?

Problems to be Solved During the Design (4)

- Synchronization problems
    - Requirements say nothing about the precise timing
    - Synchronization between the lamps and the turnstile
    - Which one comes first?
    - Is it important to know that?

Problems to be Solved During the Design (5)

- Functioning at the limits
  - Again, it is not treated in the Requirements
  - Introducing several cards successively into green card reader?
  - Introducing the same card quickly into different card readers?
  - Strange behavior of people must not be excluded

A Possible Refinement Strategy

-Intitial model: Persons and locations

- 1st refinement: Communicatons between locations

- 2nd refinement: Doors

- 3rd refinement: Card readers

- 4th refinement: Lights and turnstile