WAREHOUSE TRIP PLANNER

Ubiquitous Computing

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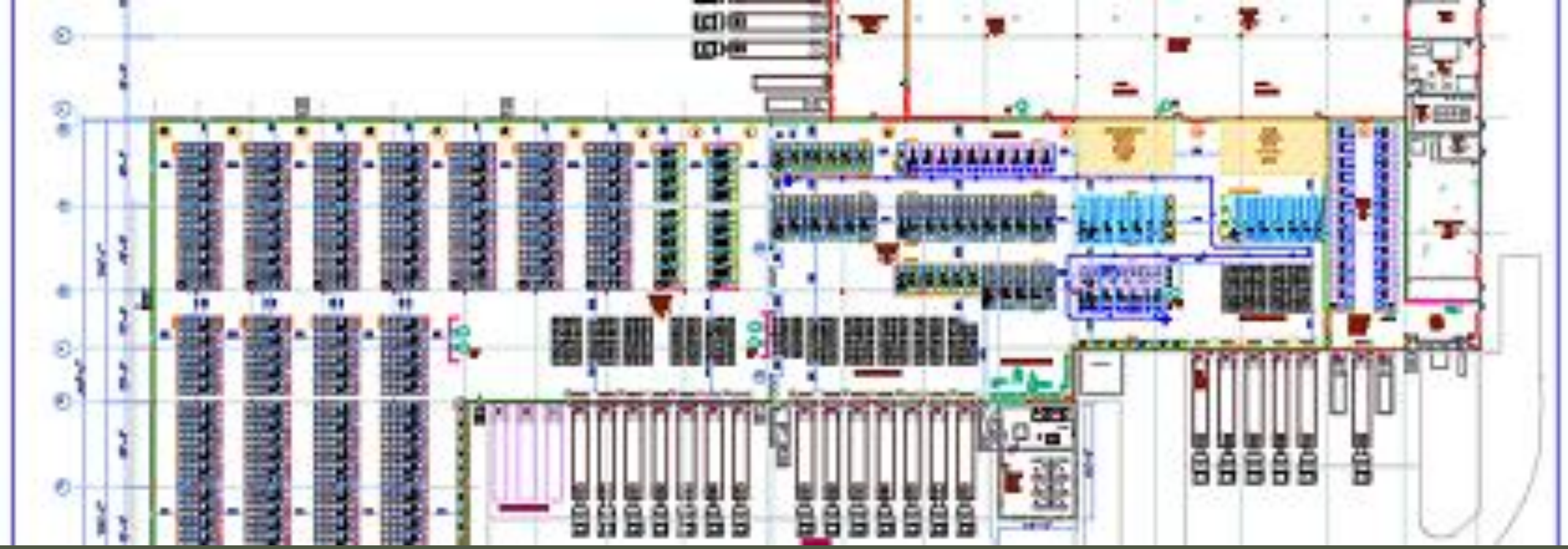


GOAL OF THE PROJECT

Optimize the operator trip to pick the goods in a given layout **context-aware** warehouse

Improve user's working experience

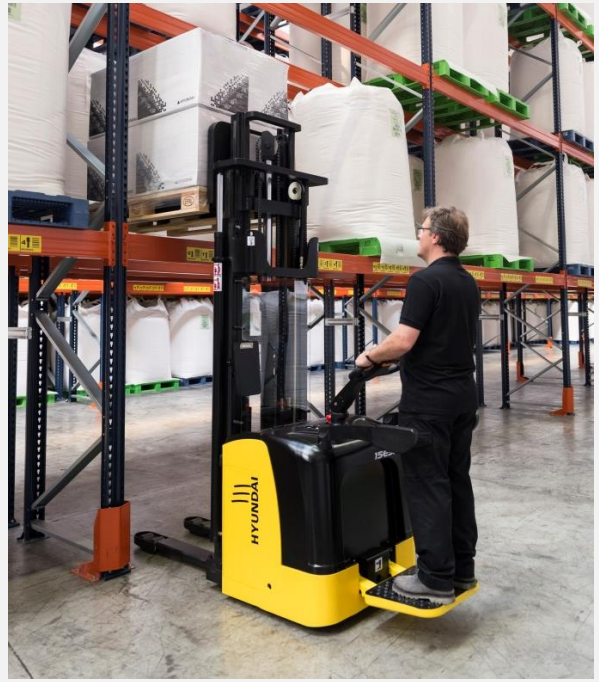
Save money for the company

WHAT WE NEED

1. Forklift operator
2. Plant layout
3. **RFID** location systems
4. Central processing system

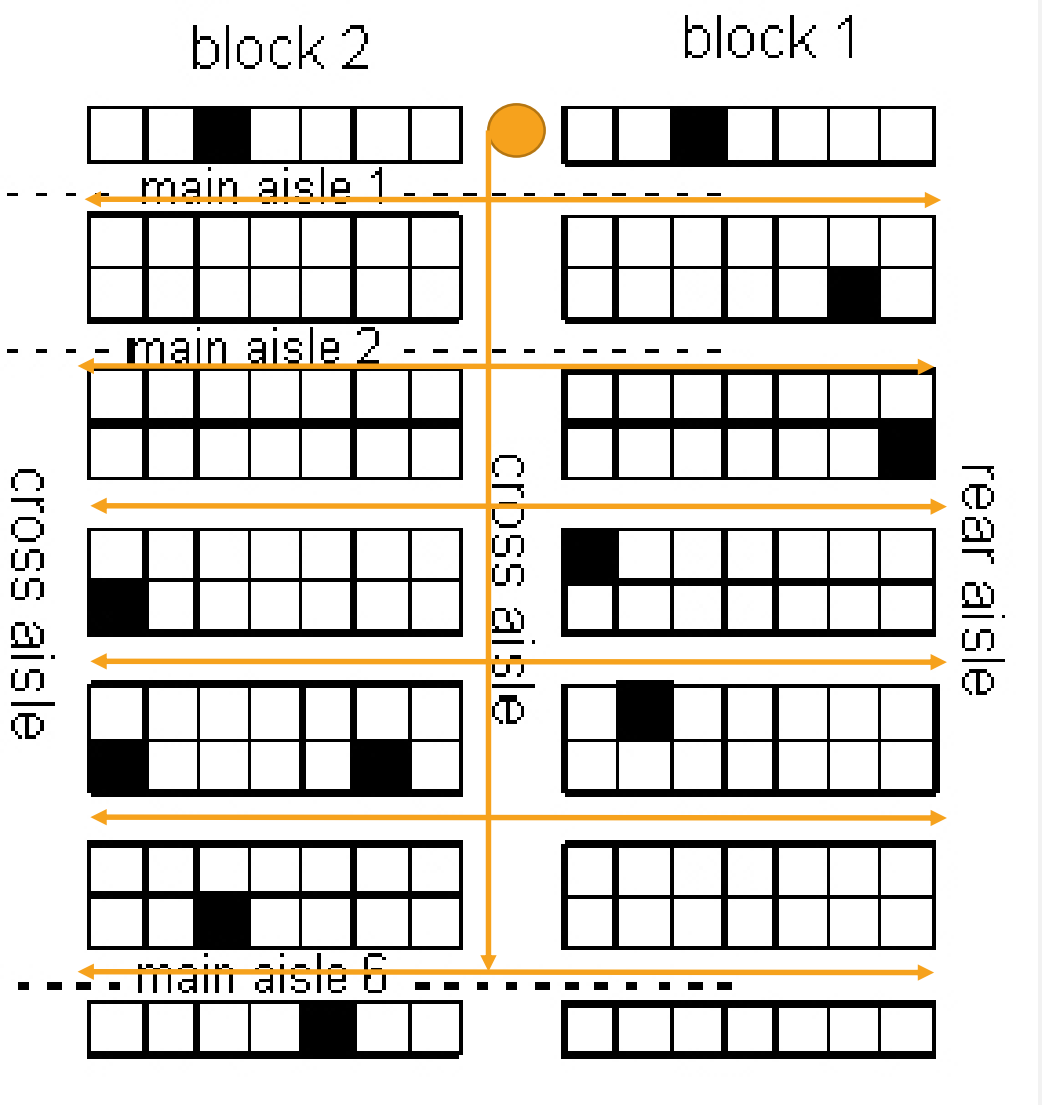
1. FORKLIFT OPERATOR

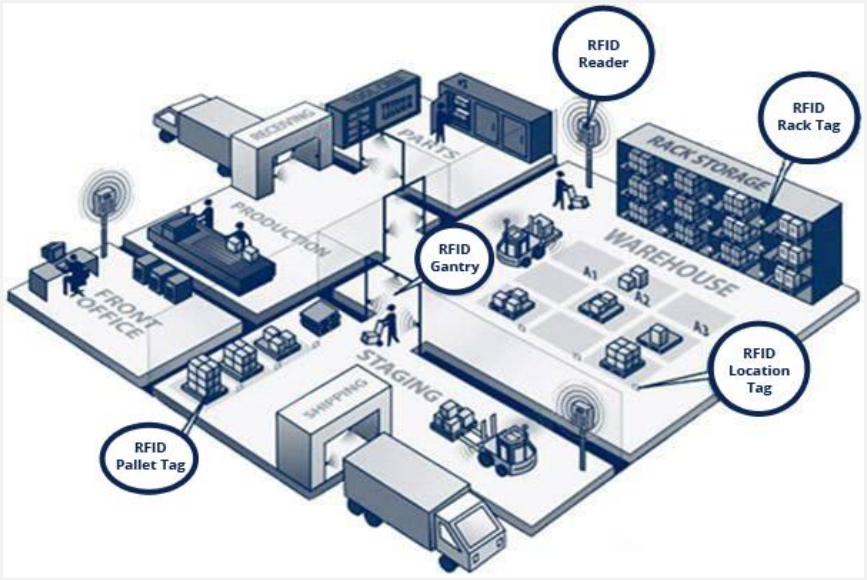
- The Forklift operator is the user that benefits from this service.
- He has a tablet installed in his forklift that tells him the fastest (not shortest) way to the type of product he is looking for
- The Forklift always starts its path from a fixed point in the warehouse

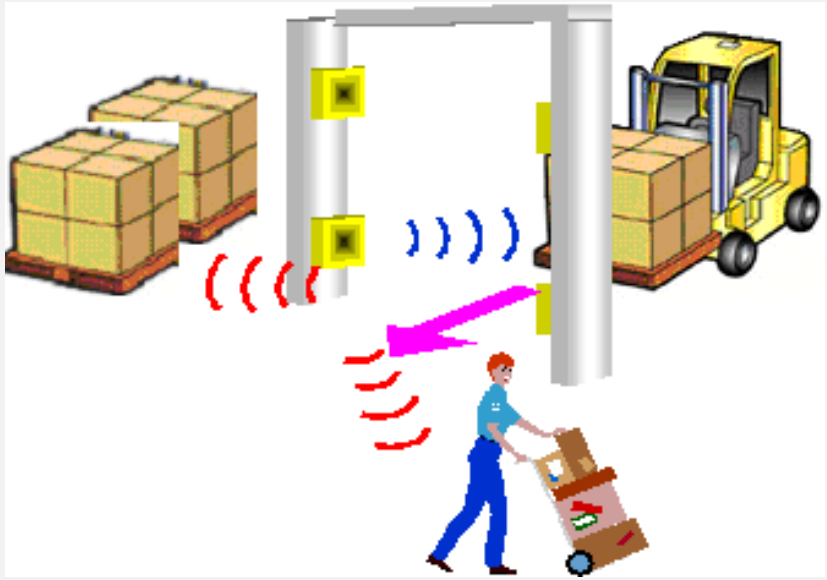


2. OUR PLANT LAYOUT

- Two main blocks
- Elements stored in shelf racks
- Every square is same-sized
- Possible paths are fixed
- Main assumption: picking products at high levels costs extra-time (penalty factor)
- Trade-off between minimizing horizontal distance and vertical distance







3. RFID LOCATION SYSTEM

Different solution discussed and already available in the market.

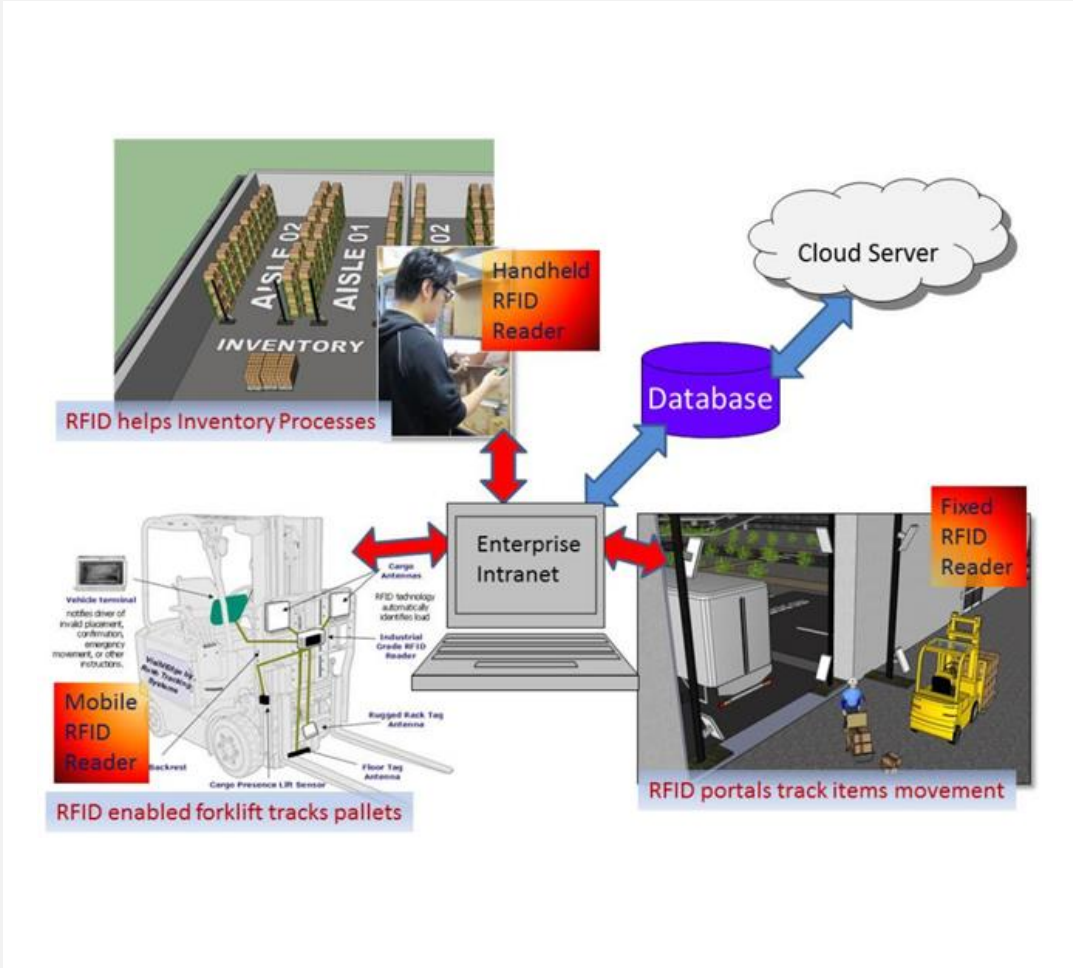
We assume that the goods position in the warehouse is constantly monitored via this RFID sensor system.

The information exchanged with the RFID tag is the product ID. The context infers the position of that box through triangulation of the antennas.

The warehouse is context-aware in the sense that it knows what and where it contains with no extra human input, every input and output of goods is automatic.

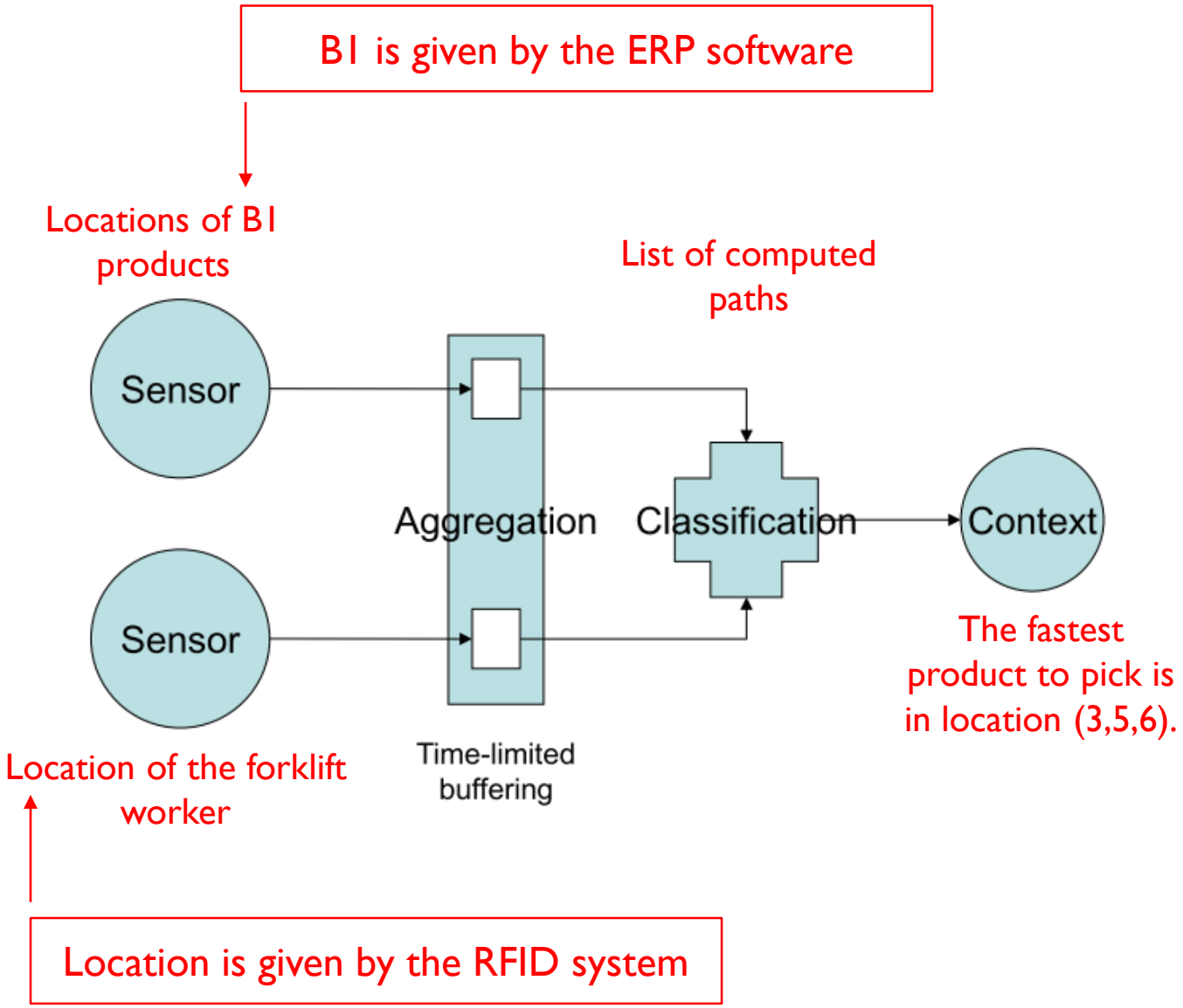
4. CENTRAL PROCESSING SYSTEM

- This environment needs a central processing system with a database to keep track of all changes. This is accessible through the Enterprise Intranet in the reality.
- For our purposes we neglected this ulterior element of complexity.
- The system pre-calculates all the possible paths to reach a product type and when one operator request for one product it shows how to get it in the format:
  - Go straight for 2 aisle
  - Turn on your right aisle
  - Go straight for 3 box slots
  - Pick on level 3 at your left.



UBIQUITOUS COMPUTING ANALYSIS

- Sensors
- Classification model
- Context

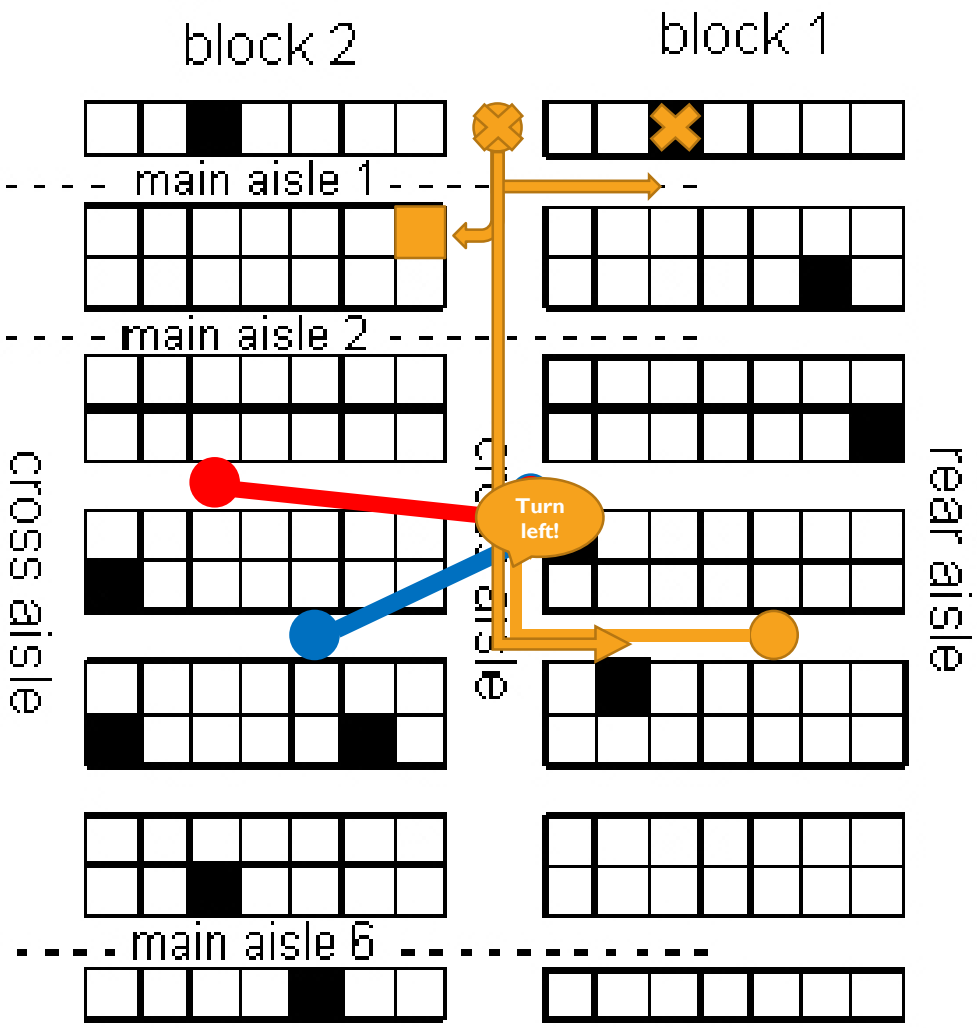


CONTEXT-AWARENESS

Sensible to modifications of:

- Locations of boxes
- Location of the forklift worker
- Number of forklift workers

Dynamic routing indications



FOR THE FUTURE: EXPANDING THE ROUTING SYSTEM TO EVERYTHING

Tracking, through RFID, not only goods but also:

- Important working tools
- People (responsibles)
- Everything useful

From the system's login page people could access only the location and directions of the resource of their competency.

Less waste of time and better work experience