DATABASE DESIGN
- Chip Manufacture

CSC3170-Project-Option1-Branch1-Normal-Group 14:

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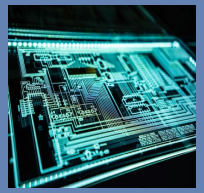
Main Task of our program:



Option 1 --
Branch 1– Normal

- Implement an **application** with a database system
- **Assign** real-time chip manufacturing orders to plants with different production capacities.

Task Breakdown

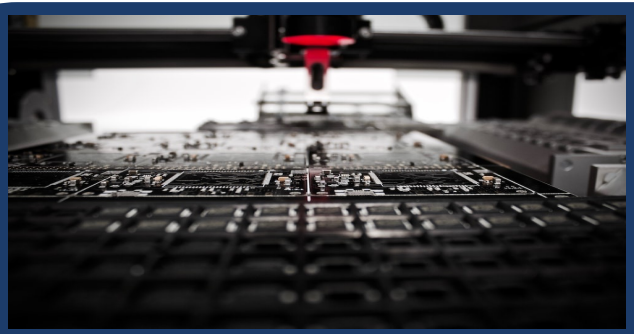
- predefine data format
- design database structure using ER-diagram
- transfer input data to the back-end
- design order distribution algorithm and update the database in real-time
- create web pages to display public production information for both consumers and plant owners

Predefined data

- **machine information**:
  number of machines, maximum production quota
- **chip types**:
  selling prices, full operation steps
- **operation steps** for a certain type of chip:
  precedency, required time, expenses

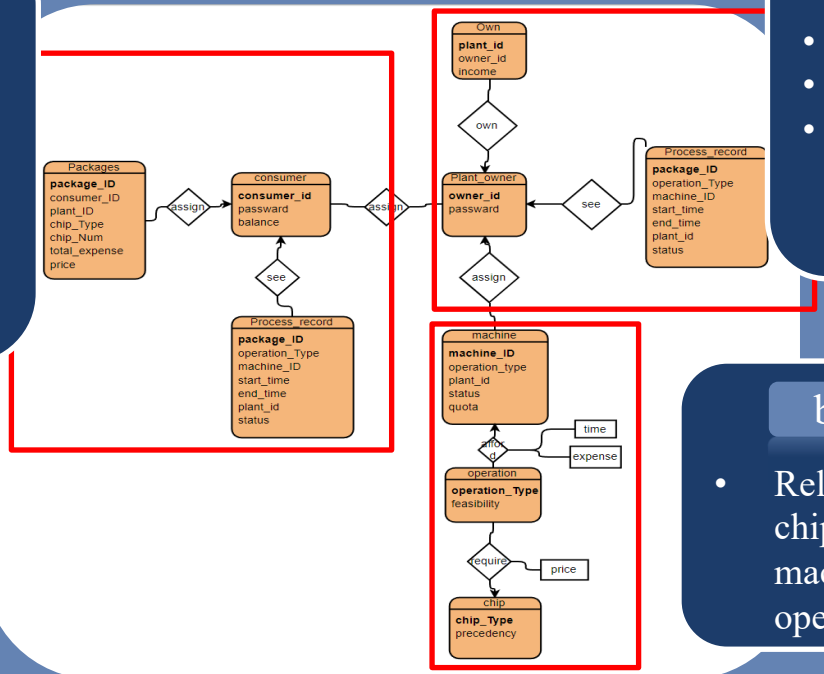
```
INSERT `Operation_machine_cost`(`machine_id`,`operation_type`,`time`,`expense`)
(1,"design-import",10,10),
(1,"etch_A",15,15),
(1,"etch_B",5,5),
(1,"bond_A",13,15),
(1,"bond_B",12,12),
(1,"drill",12,12),
(1,"test",10,10),
```

Distribution logic



- **Task:**
  - ➢ allocate input packages with planned start time
  - ➢ change operation type for certain machine if packages under production shifted
  - ➢ terminate one operation for certain machine
  - ➢ terminate one operation for certain package

ER diagram



consumer

- package register information
- process record: order belong to which machine and under which operation step

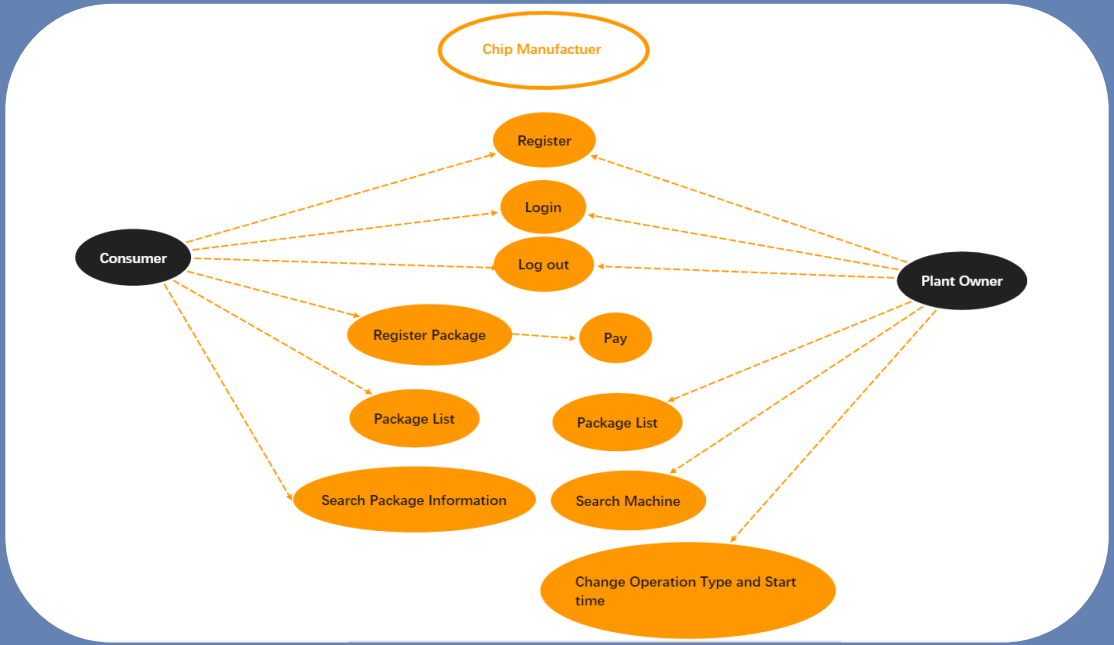
plant owner

- own plant
- have machine
- process record: which machine operates which chip type

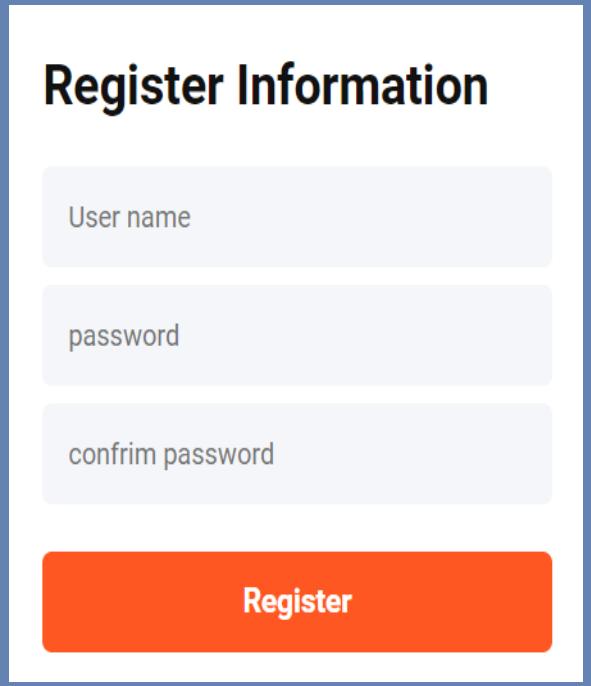
behind info

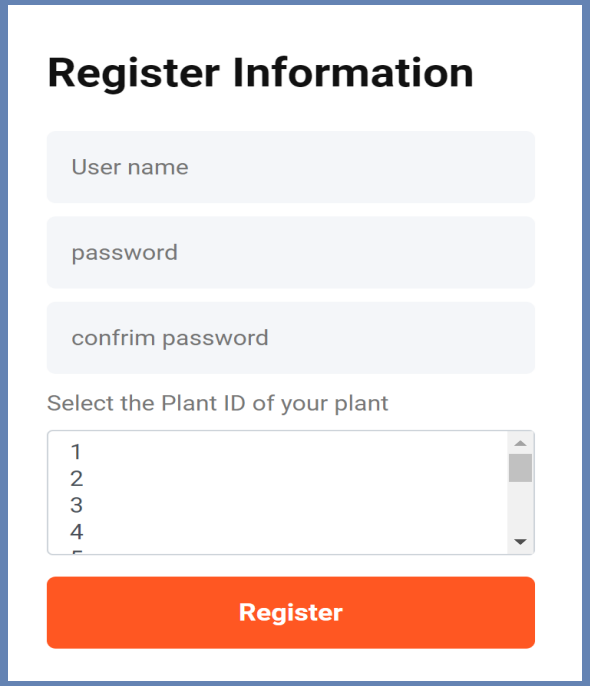
- Relations between chip type , plants, machines and operations

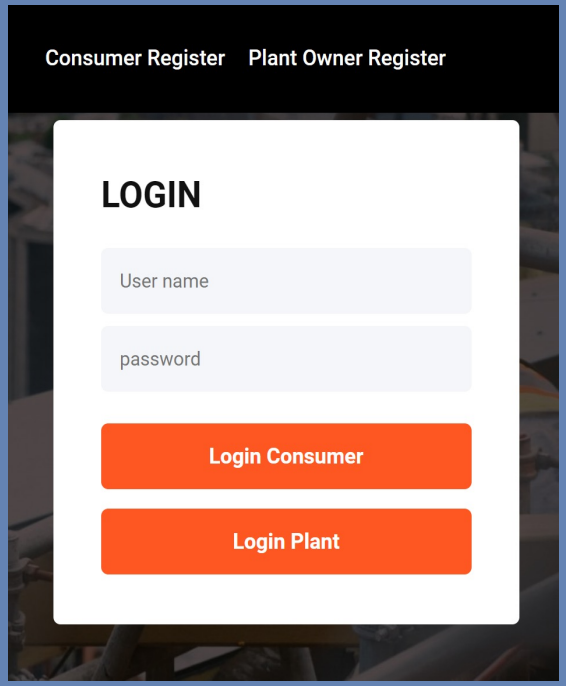
Functionality outline



Register & Log in







Home page – plant owner

Package List

Here is the package list of your factory.

Package ID	Chip Type	Chip Number	Consumer	Start Time	Status
1	a	3	1	4	OCCUPIED
2	a	3	1	3	OCCUPIED
3	a	3	1	2	OCCUPIED

Machine Status

Here is the machine status of your factory.

Machine ID	Status	Operation Type	Start Time	Estimated End Time
3	OCCUPIED	design-import	4	5
2	OCCUPIED	drill	3	5
1	OCCUPIED	bound_B	2	5

Change Start Time / Operation Type

You can change the start time or the operation type of a machine.

Select Machine ID*

3

Select Start Time*

Enter start time*

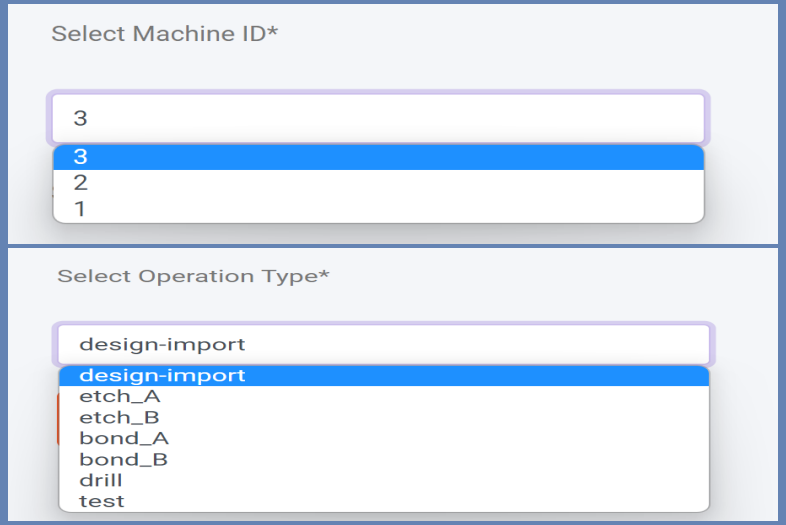
Select Operation Type*

design-import

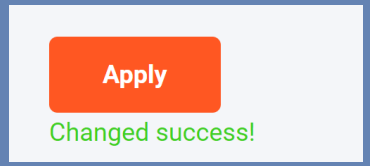
Apply

Home page – plant owner

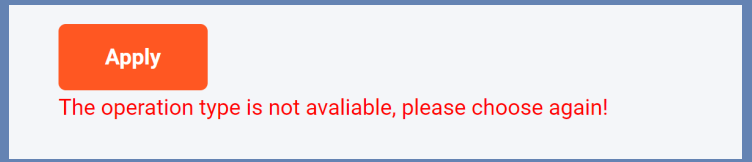
- change machine start time/operation type
- drop-down box



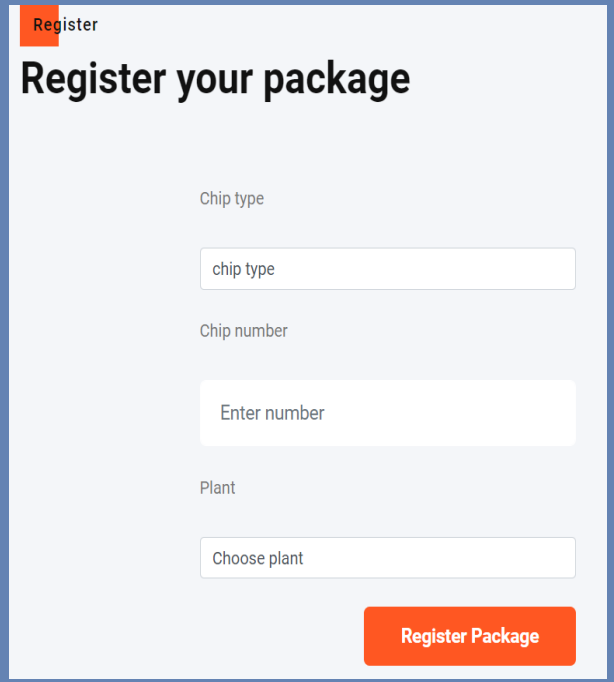
- Apply results



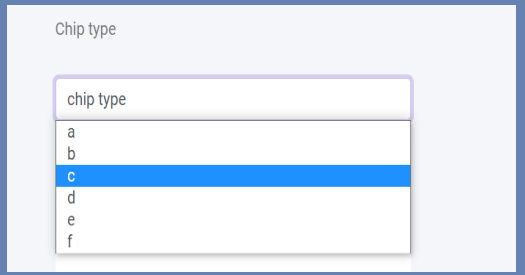
or

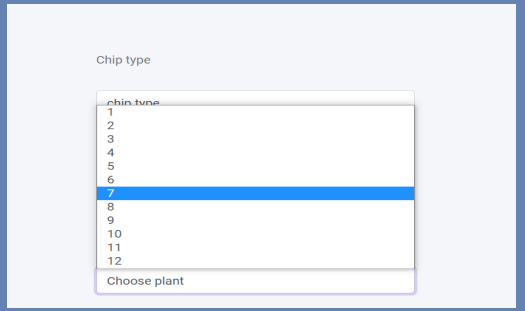


Register package – consumer



- **drop-down box**



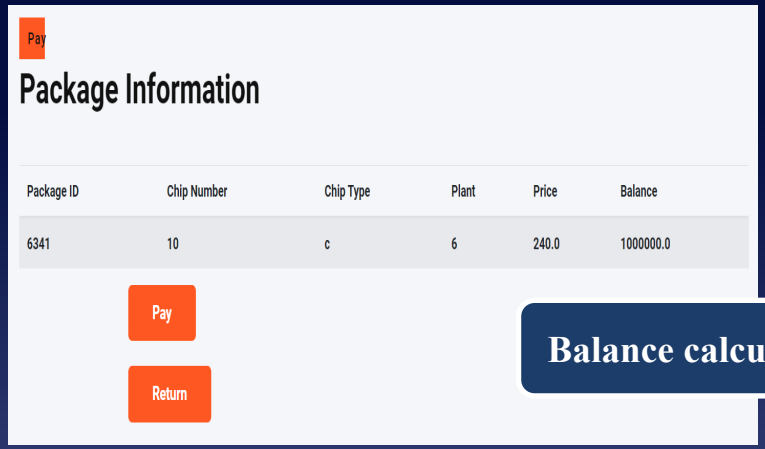


select chip type

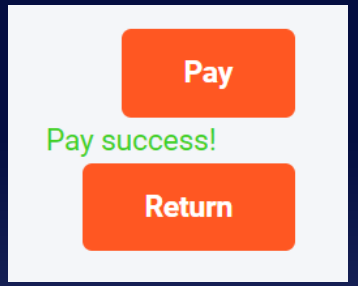
enter chip number

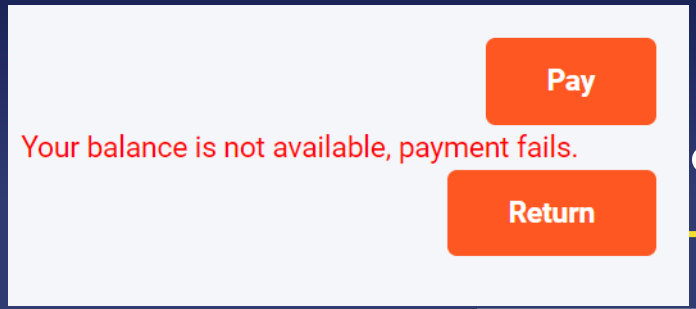
choose plant if necessary

Payment page



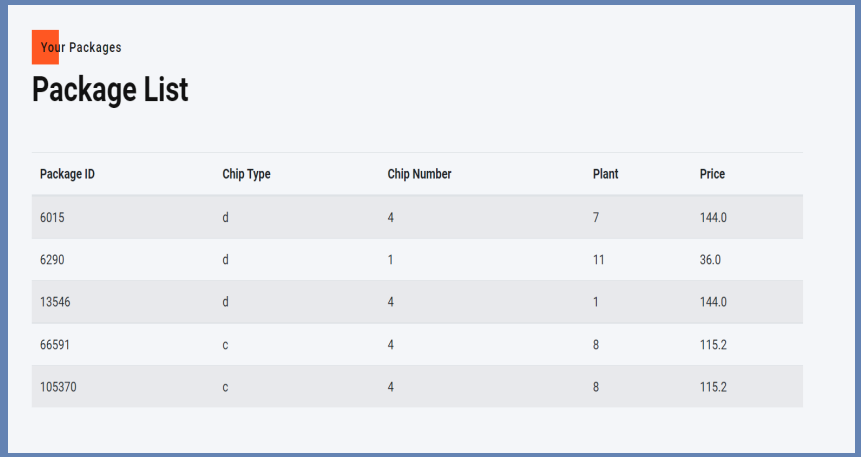
Balance calculation



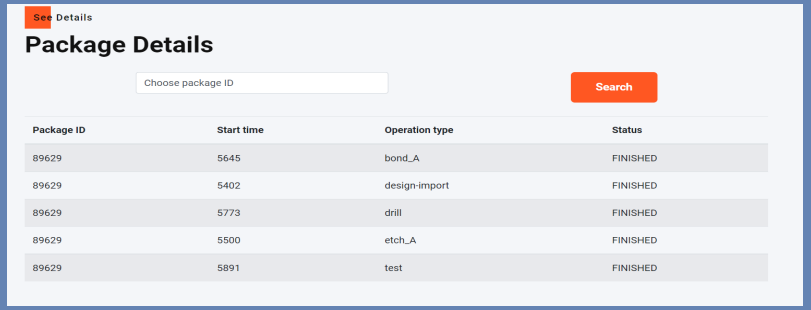


Home page – consumer

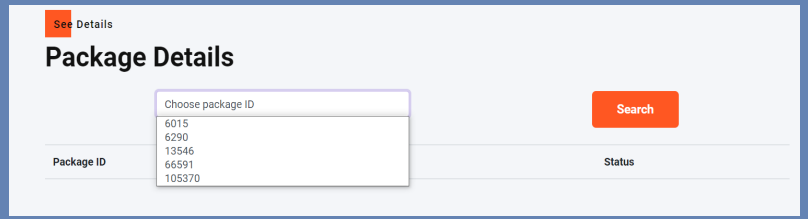
- **Package list**



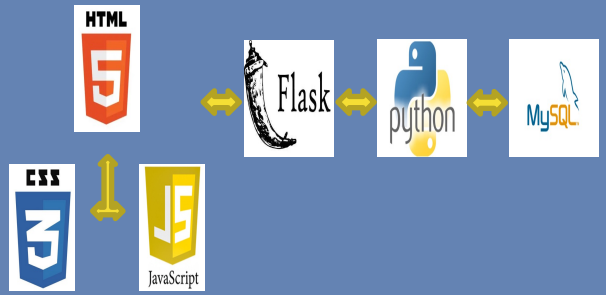
- **Package details**



- **drop-down box**



Technologies

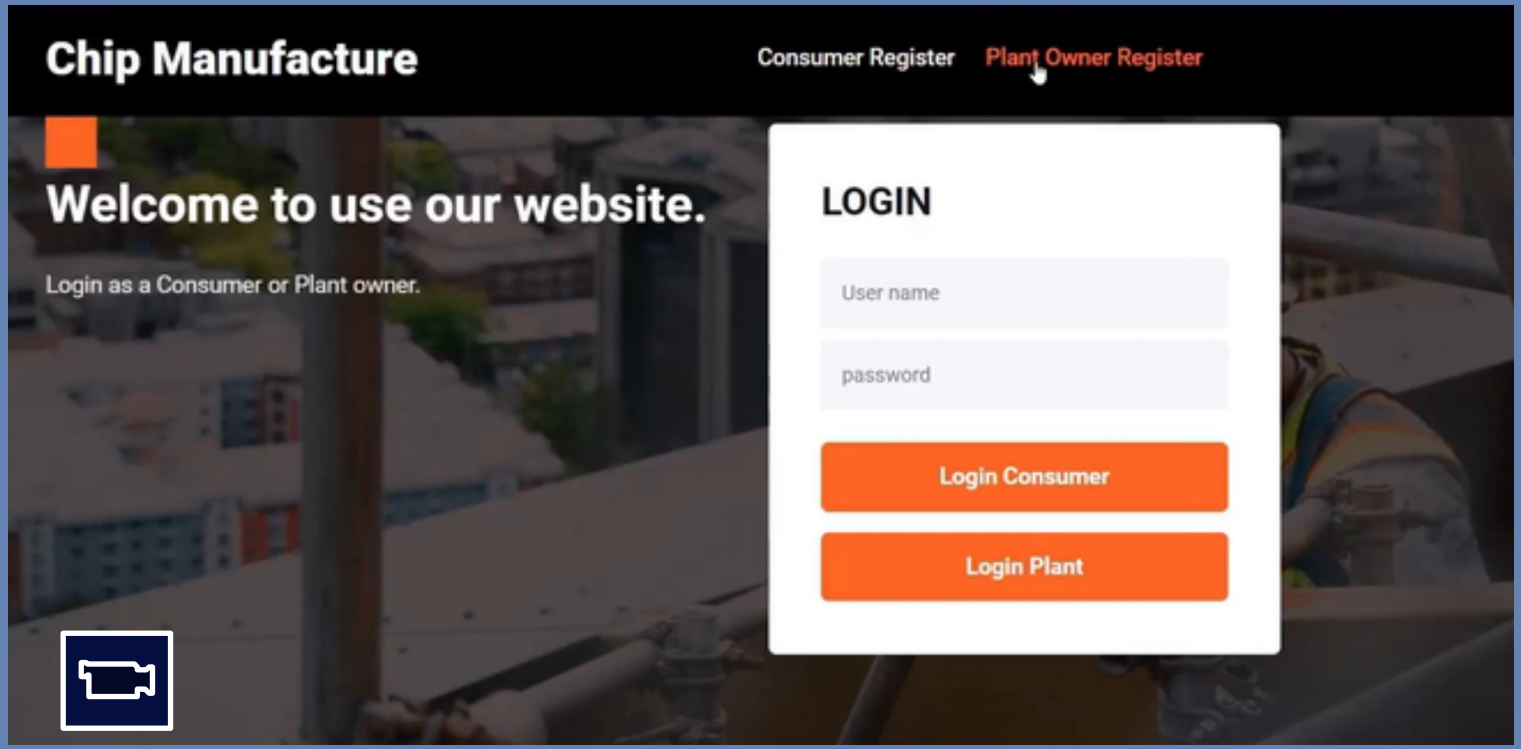


Highlights

- **Waiting list management**: overflow package will be allocated to one plant and wait until there exists spare machines to handle it.
- **Matching with real-time**: An order will be put into a **priority queue** with a time stamp.

```
time_queue = queue.PriorityQueue()

def search_call():
    cur_time = int((time.time() - global_start_time)*100)
    while (time_queue.empty() == False):
        next_exe = time_queue.get()
        if(next_exe[0] > cur_time):
            time_queue.put(next_exe)
            break
        handle(next_exe)
        if(time_queue.empty()):
            break
```


Chip Manufacture
Consumer Register
Plant Owner Register
Welcome to use our website.
Login as a Consumer or Plant owner.
LOGIN
User name
password
Login Consumer
Login Plant