



# DATABASE DESIGN

## - Chip Manufacture



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

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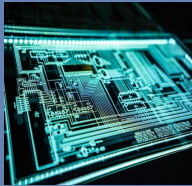
Implementation

**04**

Full Display



### 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

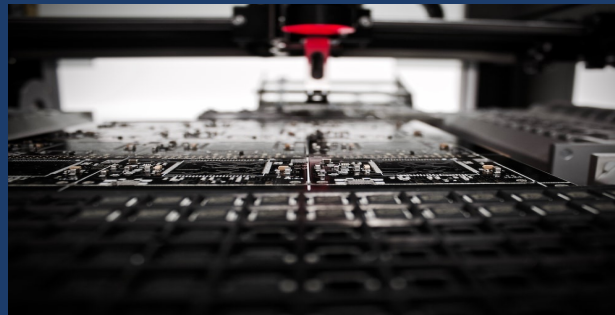
- predefine data format
- design database structure using ER-diagram
- transfer input data to the back-end
- design order distribution algorithm and update the database in real-time
- create web pages to display public production information for both consumers and plant owners

## 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

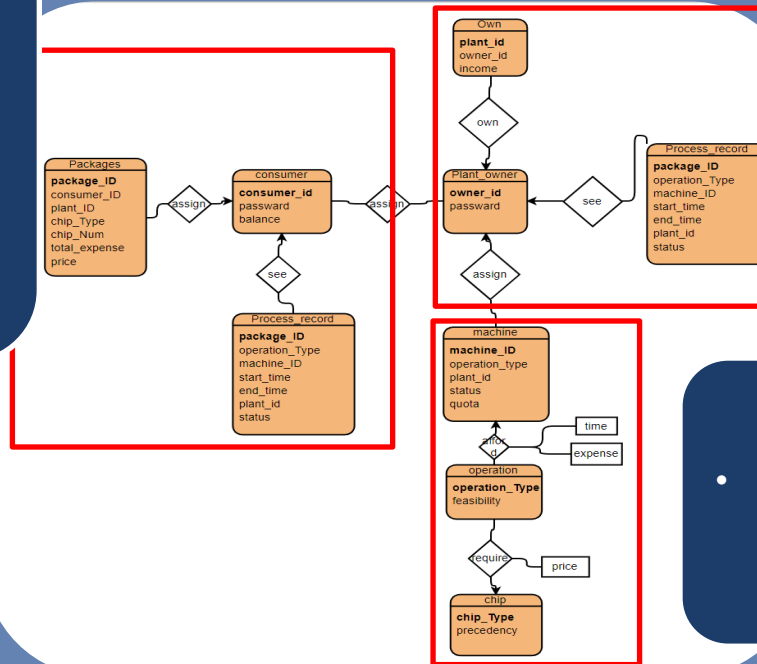
- package register information
- process record: order belong to which machine and under which operation step

## plant owner

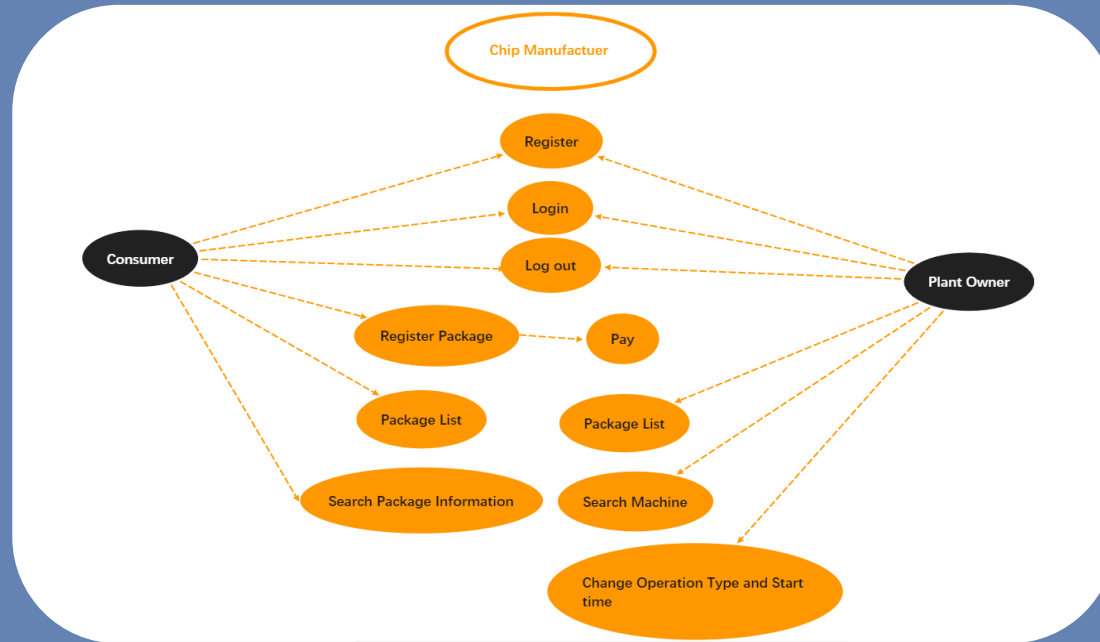
- own plant
- have machine
- process record: which machine operates which chip type

## behind info

- Relations between chip type , plants, machines and operations



## Functionality outline



## Register &amp; Log in

## Register Information

**Register**

## Register Information

Select the Plant ID of your plant

**Register**

Consumer Register Plant Owner Register

## LOGIN

**Login Consumer****Login Plant**

## 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\*

Select Start Time\*

Select Operation Type\*



## Home page – plant owner

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

Select Machine ID\*

3

3  
2  
1

---

Select Operation Type\*

design-import

design-import  
etch\_A  
etch\_B  
bond\_A  
bond\_B  
drill  
test

- Apply results

Apply

Changed success!

or

Apply

The operation type is not available, please choose again!

## Register package – consumer

**Register**

### Register your package

Chip type

Chip number

Plant

**Register Package**

- drop-down box

Chip type

chip type

a  
b  
c  
d  
e  
f

Chip type

chip type

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12

Choose plant

select chip  
type



enter chip  
number



choose  
plant if  
necessary

## Payment page

Pay

Package Information

Package ID	Chip Number	Chip Type	Plant	Price	Balance
6341	10	c	6	240.0	1000000.0

Pay

Return

Balance calculation

Pay

Pay success!

Return

Pay

Your balance is not available, payment fails.

Return

## Home page – consumer

- Package list

**Your Packages**

### Package List

Package ID	Chip Type	Chip Number	Plant	Price
6015	d	4	7	144.0
6290	d	1	11	36.0
13546	d	4	1	144.0
66591	c	4	8	115.2
105370	c	4	8	115.2

- Package details

**See Details**

### Package Details

Choose package ID

Package ID	Start time	Operation type	Status
89629	5645	bond_A	FINISHED
89629	5402	design-import	FINISHED
89629	5773	drill	FINISHED
89629	5500	etch_A	FINISHED
89629	5891	test	FINISHED

- drop-down box

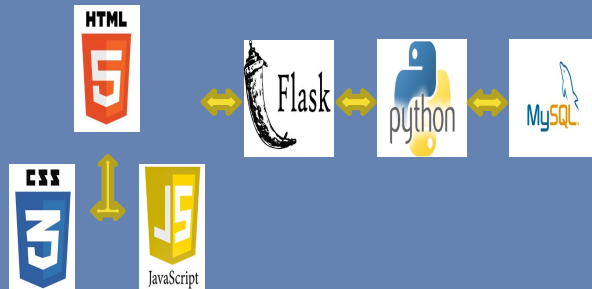
**See Details**

### Package Details

Choose package ID

Package ID	Status
6015	
6290	
13546	
66591	
105370	

## Technologies

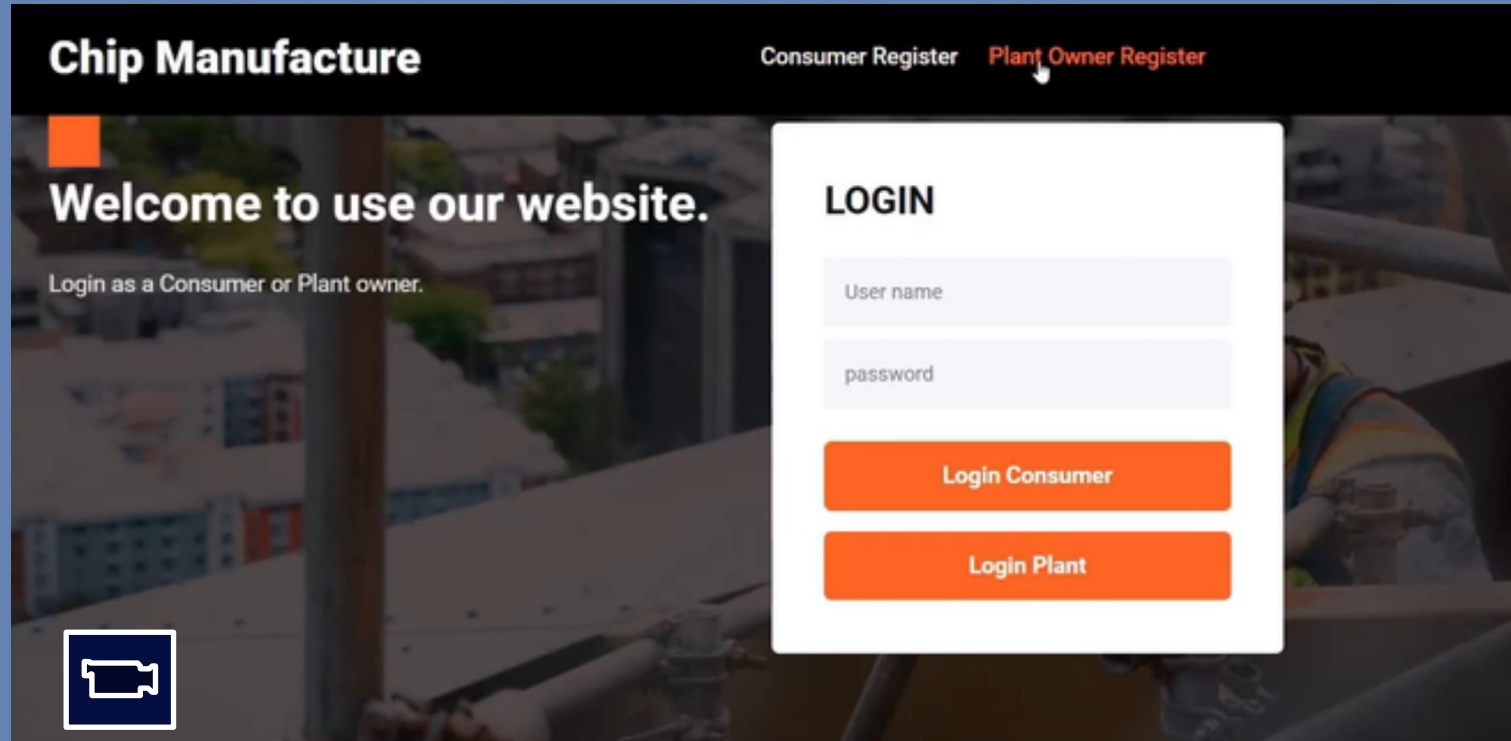


## Highlights

- **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
```



The screenshot shows a web application for 'Chip Manufacture'. The header is dark with the title 'Chip Manufacture' on the left and two links, 'Consumer Register' and 'Plant Owner Register', on the right. The 'Plant Owner Register' link is highlighted in red. The main content area has a background image of a factory. On the left, there is a welcome message: 'Welcome to use our website.' followed by 'Login as a Consumer or Plant owner.' and a small orange square icon. On the right, there is a white login form titled 'LOGIN'. The form contains two input fields: 'User name' and 'password'. Below these fields are two orange buttons: 'Login Consumer' and 'Login Plant'. In the bottom left corner of the page, there is a small icon of a chip inside a square frame.

# 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