



# ADipIT01 – Software Engineering

## **COURSEWORK REPORT**

**Group Name:** Unity

**B.Sc. (Hons) Computer Science**

**Submitted date:** 11<sup>th</sup> February 2019

**Submitted to:** Lokesh Gupta

**Group Members :** Utsav Bajracharya  
: Ritesh Khambu Shrestha  
: Saman Khadgi

## MARKING SCHEME (TOTAL 100 MARKS)

**Student Id:**

**Student Name:**

The marks for this assessment are based on the following assessment criteria:

S.No.	Items	Max mark
1.	Overall Report.	<b>/20</b>
	<ul style="list-style-type: none"><li>• Introduction (a brief overview of the report)</li><li>• Summary</li><li>• Layout</li><li>• Format/Readability</li><li>• Page Numbers/TOC</li></ul>	 /10 /3 /2 /3 /2
2.	Individual Tasks	<b>/70</b>
	<ul style="list-style-type: none"><li>• Environmental model specification</li><li>• Internal model specification</li><li>• Design specification</li><li>• Testing specification/report</li></ul>	 /15 /15 /20 /20
4.	Assignment Diary (Continuous Assessment)	<b>/10</b>

## **Abstract**

This report demonstrates the development of structured software using Yourdon's method. We are given with the valley mart department store to demonstrate the software. We are required to make a computerized – based system for the stock management and billing process in the department store. Here in this report, we have made event list, context DFD, ERD, Middle level DFD, Upper level DFD, data dictionary and process specifications for the software. We have also done the testing of all the functions that are executed in the system.

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## **1. Introduction**

The system is full computerized system for the department store that has decided to upgrade stock management and billing process to an obsolete desktop-based system. This system is similar with the department store. Every function such as adding and updating products details, pricing, generating bills for each products sale must be executed. This system allows the user (staff and manager) to perform a task in more easily and effectively. This system can also be used in different sectors such as restaurants, hotels, mart and many more.

### **1.1. Requirements for the software development**

#### **Human Resource:**

- Utsav Bajracharya
- Saman Khadgi
- Ritesh Khambu Shrestha

#### **Hardware Resource:**

- Laptop
- Copy, pen, pencil, eraser.

#### **Software Resource:**

- Microsoft Word
- Draw.io
- Viber

### **1.2. Functional Requirement**

In software engineering, the function requirement is defined as the function of the system. These functions have input and output process. Functional requirement can be calculations, manipulation technical details, data manipulation and processing, and other specific functionality that define what a system is supposed to accomplish.

**Functional requirements are: -**

- i. Login
  - a. Staff login
  - b. Manager login
  
- ii. Staff role
  - a. Add items
  - b. Search item package
  - c. Add price
  - d. Billing
  
- iii. Manager role
  - a. Create package
  - b. Set item price expiry date
  - c. Make report
  
- iv. Billing
  - a. Get price
  - b. Add VAT
  - c. Deduct discount
  
- v. System role
  - a. Generate bill
  - b. Generate report
    - i. Daily/Monthly Sales report
    - ii. Minimum sales
    - iii. Maximum sales
  - c. Item to be reordered (where minimum order level exceeds)

### **1.3. Statement of purpose**

We are building up a computerized system for the department store that has decided to upgrade stock management and billing process to an obsolete desktop-based system. So, after analyzing and evaluating the operation, the system is similar with the department store. We must execute every function such as adding and updating products details, pricing, generating bills for each products sale. Firstly, a manager stores item details into the system such as name, category, quantity, expiry date, price. Secondly, the customer selects the items and brings up to the counter, then the staff checks the item and enter the product ID and add it to the bill. Thirdly, the system adds all the price of the items together along with 13% of vat to the total amount. And deducts discount (if any) from the total amount. After the bill is printed, the items in the stock is reduced. Fourthly, the report is generated. Report is based on daily sales, monthly sales and sale of each item. The system also lists the items with expired status, list the items to be reordered (whose minimum order level is exceeded), list the item with maximum and minimum sales.

This system is only able to be used by staff in the counter and reports are generally used by the manager in the store.

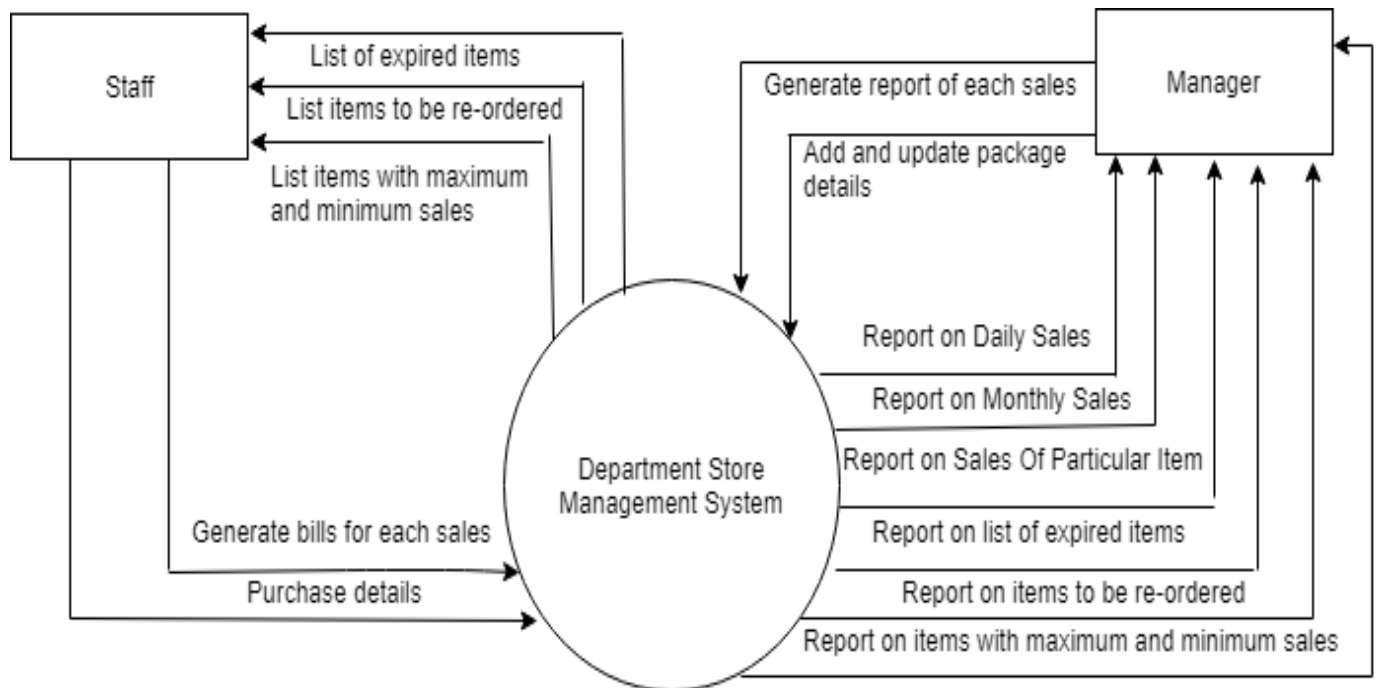
## **2. Environmental Model Specification**

### **2.1. Event list:**

- Manager entry login details
- System verifies login details.
- System displays error if login details are incorrect.
- System redirects to dashboard if the login is successful.
- Manager adds new item details in the system.
- Manager adds new package in the system.
- Manager sets price for the package.
- Manager sets expiry date for the package.
- Staff enters login details.
- System verifies login details.
- System displays error if login details are incorrect.
- System redirects to dashboard if the login is successful.
- Staff enters product details.
- System searches item package.
- System gets price.
- System generate total amount.
- System deducts discount if any.
- System adds 13% VAT.
- System prints bill.
- System deducts amount in the items stock.
- System generates daily sales report.
- System generates monthly sales report.
- System generates sales of particular items.
- System lists items with expired status.
- System lists item with maximum sales.
- System lists items with minimum sales.
- Manager updates item details.
- Manager updates package details.

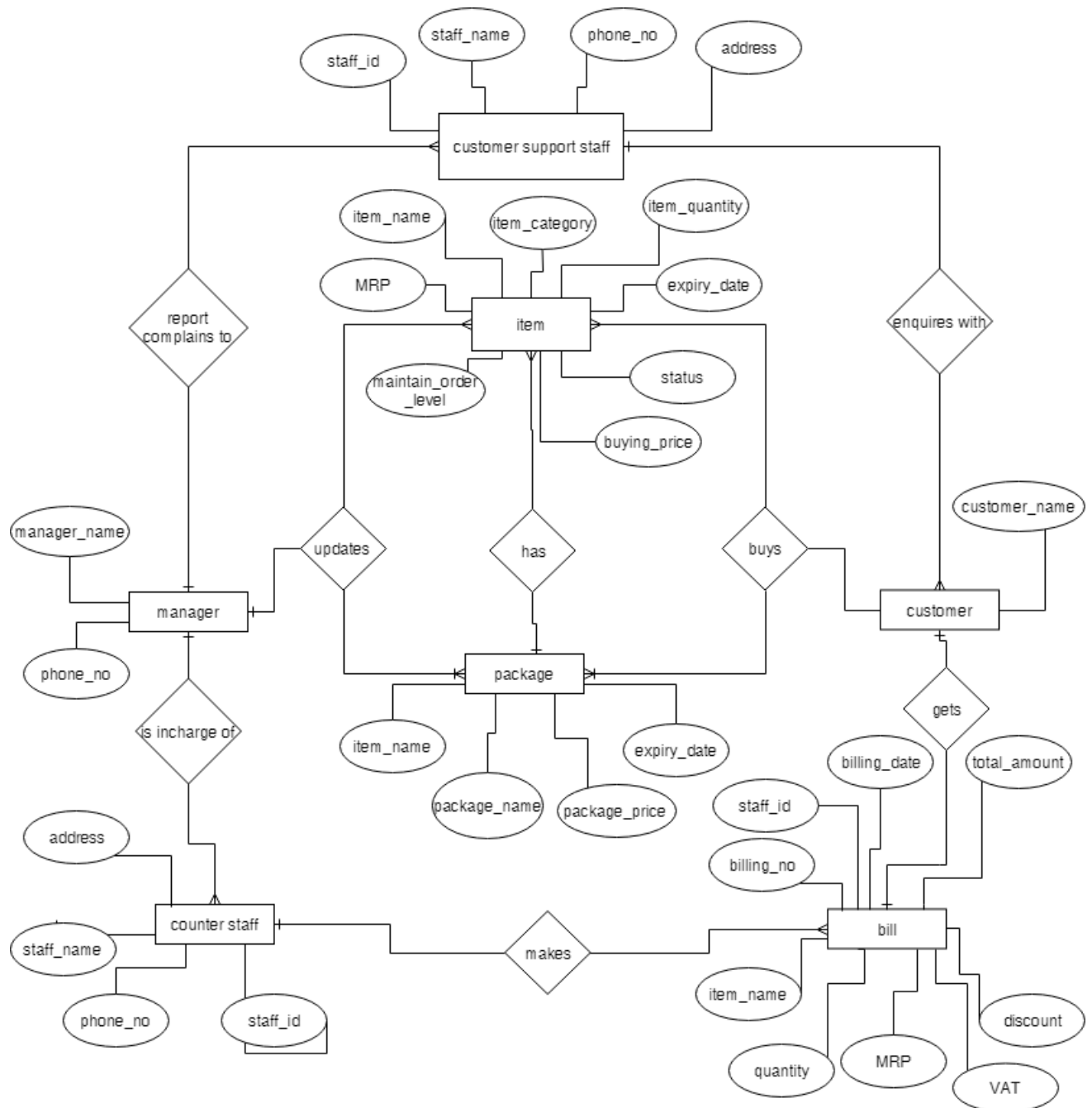


## 2.2. Context DFD (the top level 0)



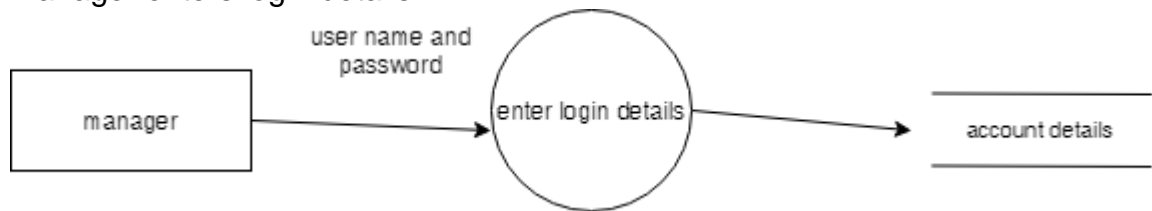
### 3. Internal Model Specification:

#### 3.1. ERD

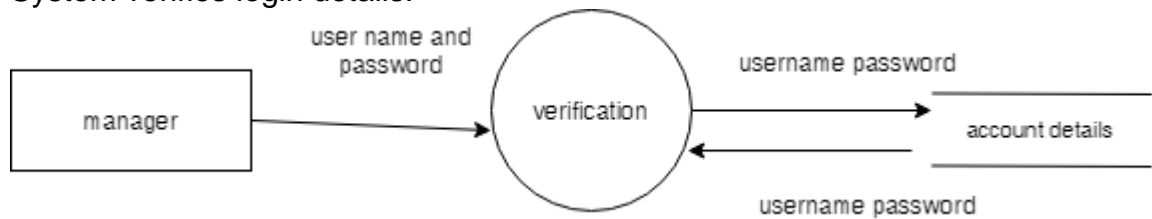


### 3.2. Middle level DFD fragments:

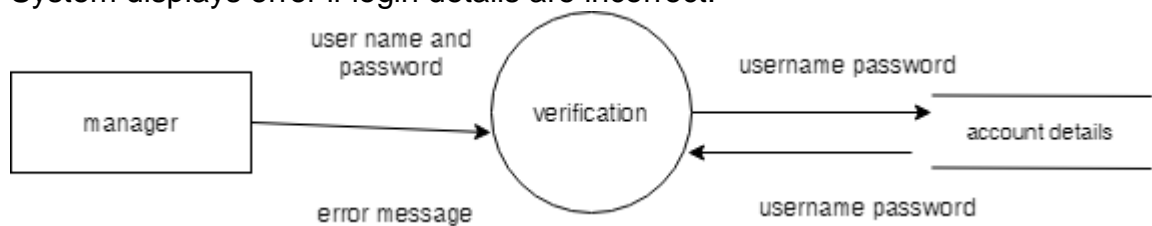
- Manager enters login details:



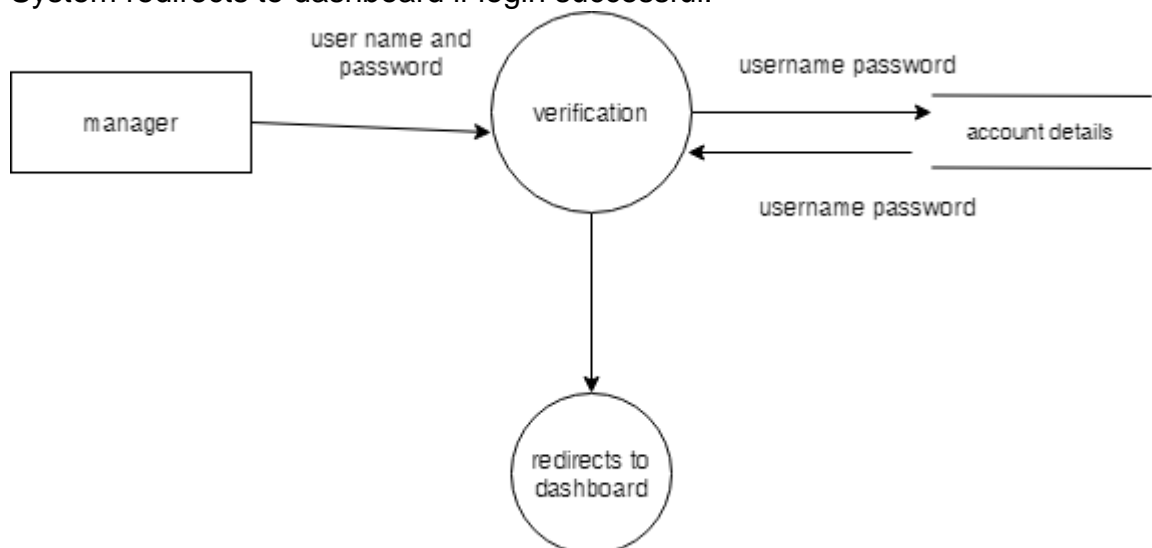
- System verifies login details:



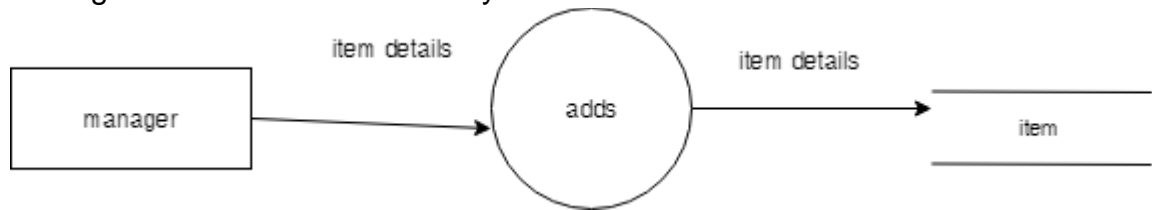
- System displays error if login details are incorrect:



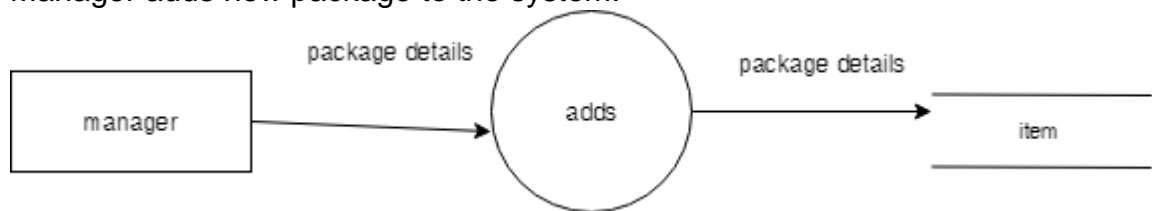
- System redirects to dashboard if login successful:



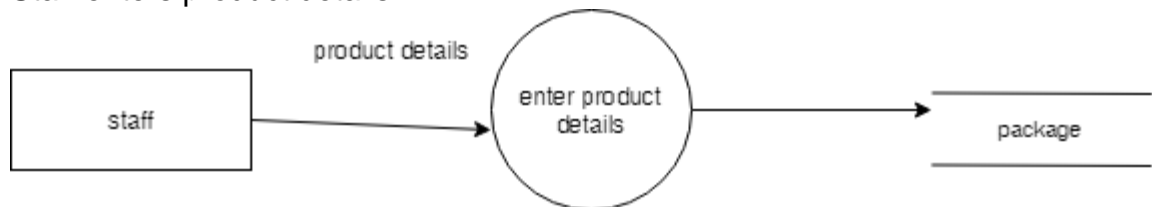
- Manager adds new items to the system:



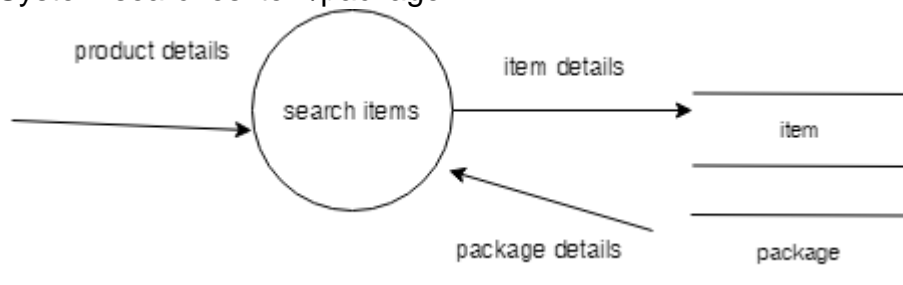
- Manager adds new package to the system:



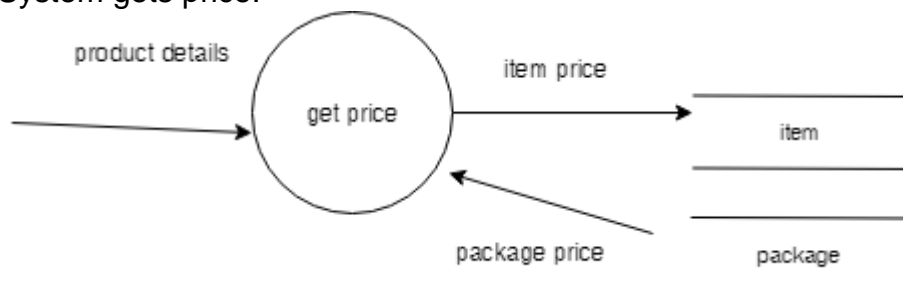
- Staff enters product details:



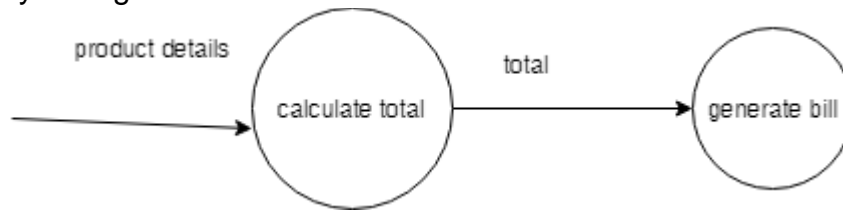
- System searches item/package:



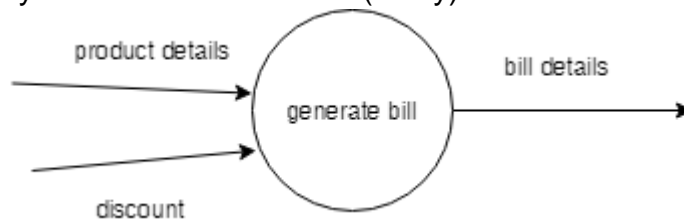
- System gets price:



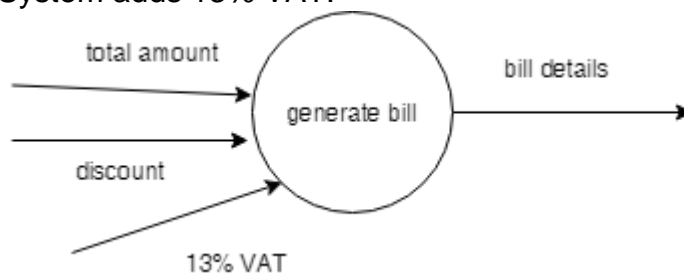
- System generates total amount



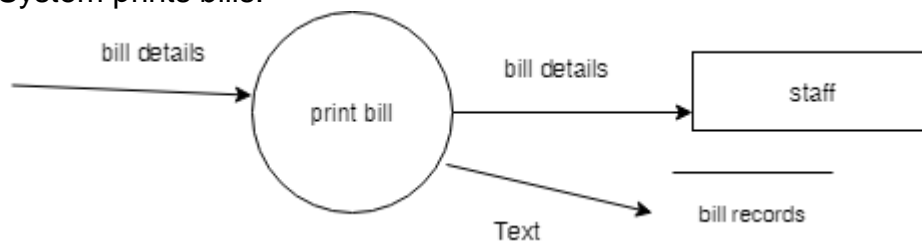
- System deducts discount:(if any)



- System adds 13% VAT:



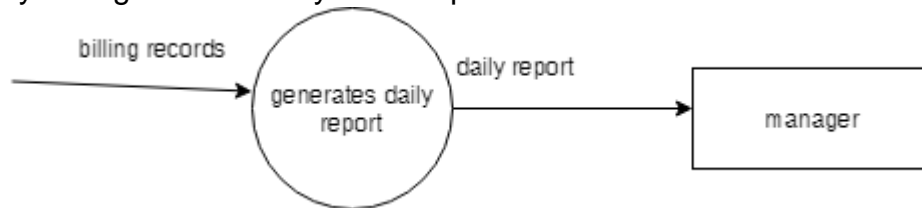
- System prints bills:



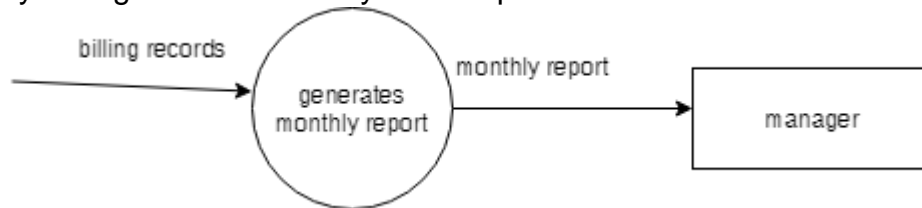
- System deducts amount in item stock:



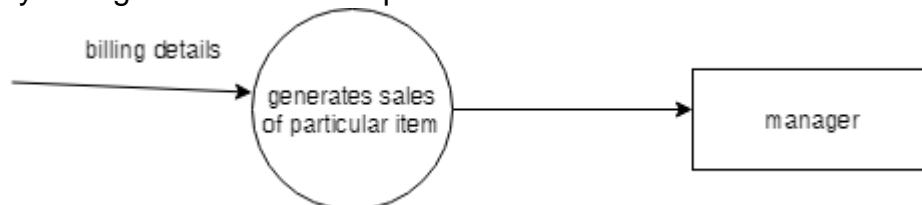
- System generates daily sales report:



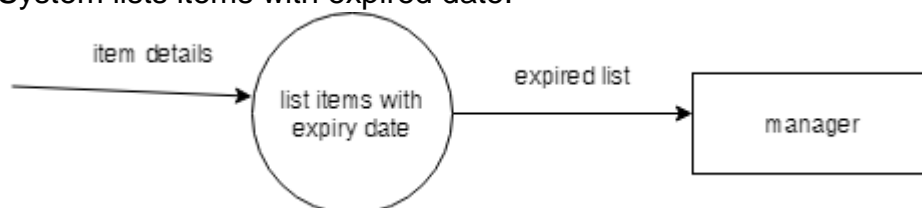
- System generates monthly sales report:



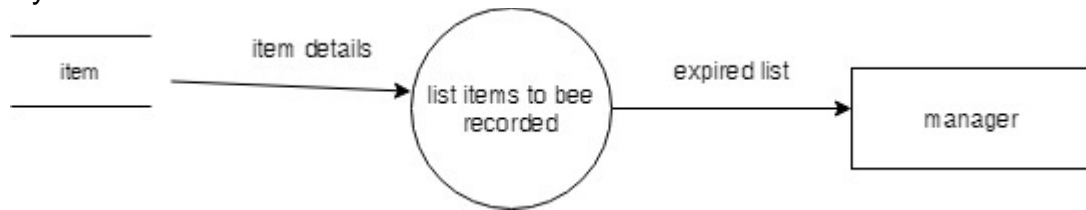
- System generates sales of particular items:



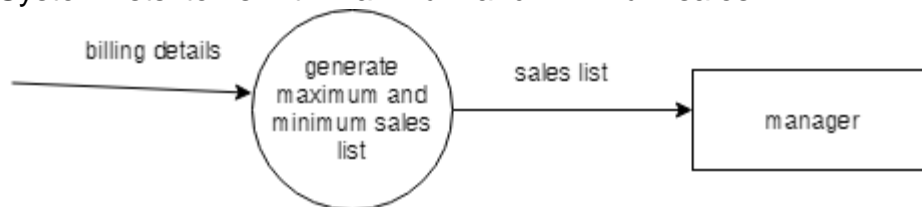
- System lists items with expired date:



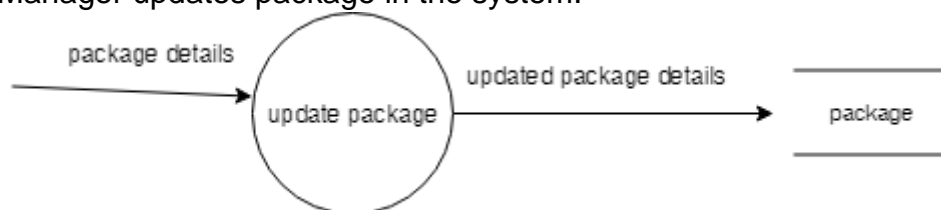
- System lists items to be recorded:



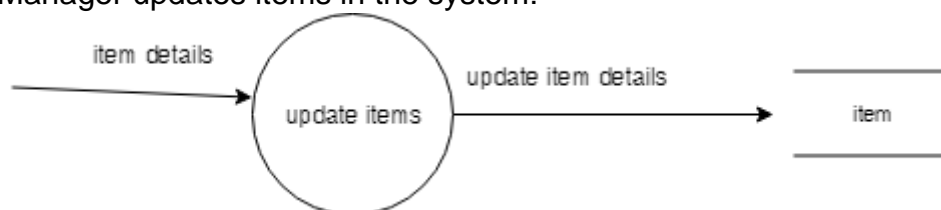
- System lists items with maximum and minimum sales:



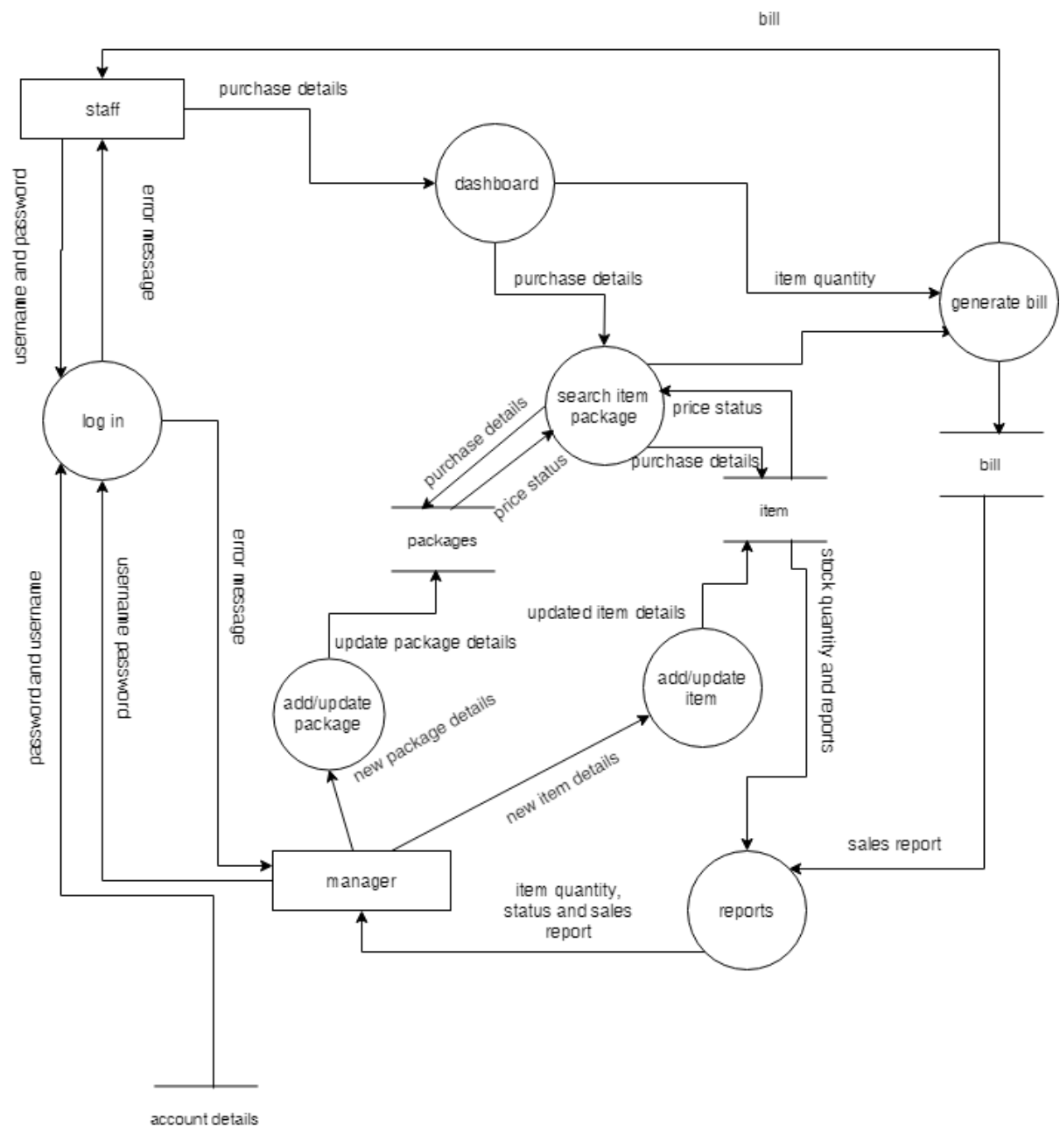
- Manager updates package in the system:



- Manager updates items in the system:

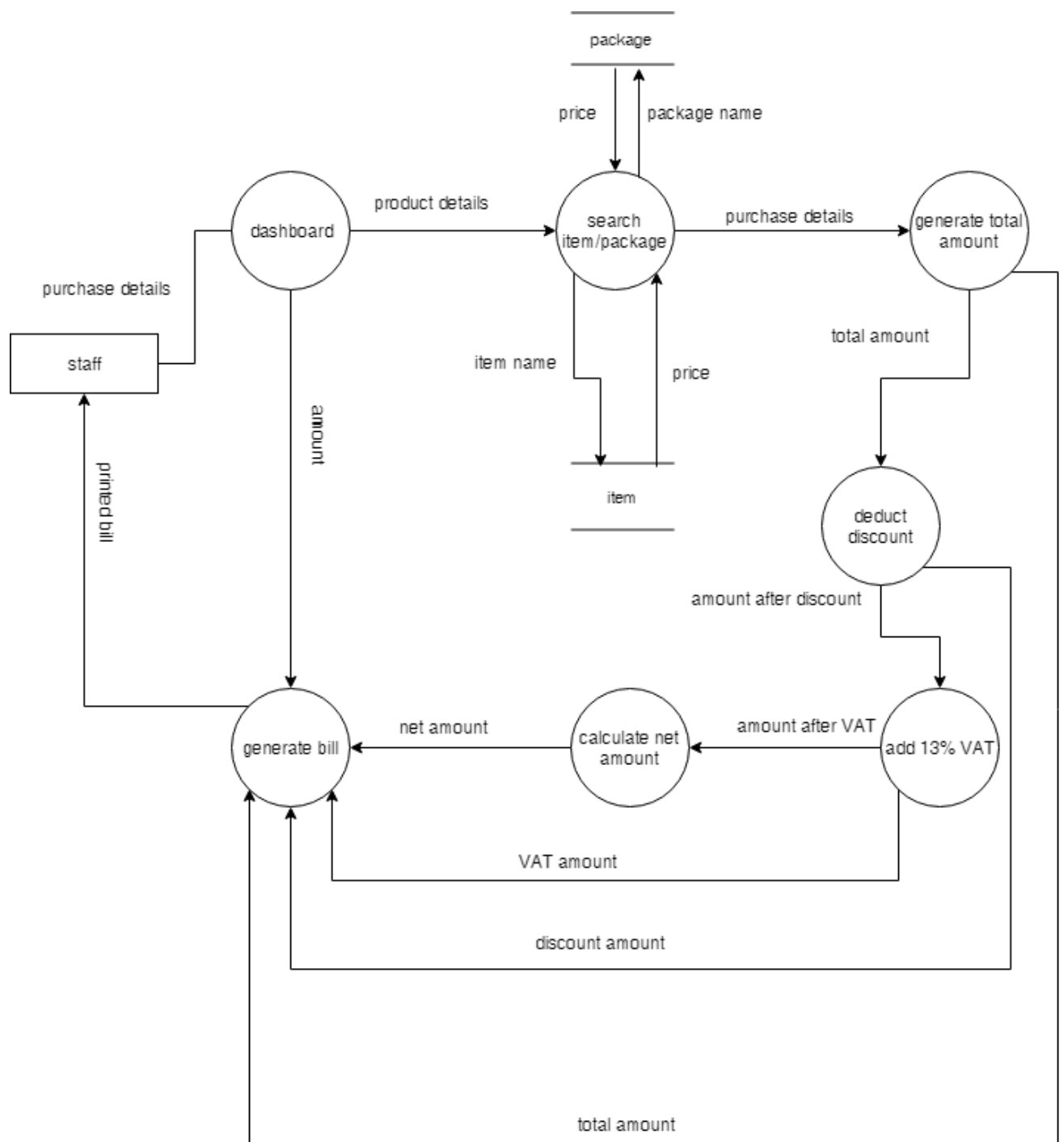


### 3.3. The upper level DFD





### 3.4. Lower level DFD



### 3.5. Data Dictionary:

Field name	Datatype	Field size	Data format	Description	Example
Item name	Text	20	-	Name of item	Dairy milk
Item category	Text	20	-	Category of item	Chocolate bar
Item quantity	Int		-	Quantity of item	200 pieces
Expiry date	Date	10	DD/MM/YYYY	Expire time of item	22/12/2021
MRP	Double	5.2	NNNNN.NN	Marked price of the item	50
Minimum order level	Int		-	Minimum number of items after restocking	Minimum order level for dairy milk is 40
Status	Text	10	LLLLLLLLLL	Item status	Normal
Buying price	Double	5	NNNNN	The cost price of item	45
Manager name	Text	20	-	Name of manager	Dhan Prasad
Phone no	Int	15	-	Phone number	9841546589
Customer name	Text	20	-	Name of customer	Gopal Prasad
Staff id	Varchar	10	LLLLLNNNNN	Unique ID given to staff	LJIHH78758
VAT	Double	1.2	N.NN	Tax value	0.13
Discount	Double	1.2	N.NN	Amount to be discount	0.10
Total amount	Double	5.2	N.NN	Final amount to be paid	45.76
Staff name	Text	20	-	Name of staff	Kali Prasad
Address	Text	20	-	Details of location	Bhimsensthan
Package name	Text	20	-	Package name	Valentine bundle
Package price	Double	5.2	NNNNN.NN	Price of package	500
Billing date	Date	10	DD/MM/YYYY	Issue date of bill	21/05/2019

Billing no	Varchar	8	LLLLNNNN	Unique number given to the bill	HI4592
Package id	varchar	5	LLNNN	Unique id of package	DM789

### 3.6. Process specifications (Pspecs)

#### PSPECS OF STAFF

##### Staff login

- GET manager username and password.
- VERIFY login details.
- DISPLAY error if login details are incorrect
- REDIRECTS to the dashboard IF login successful
- ENTER product details.

##### Generate Bills

- SELECT item/packages
- GET item price and status
- CALCULATE total amount
- DEDUCT discount
- ADD VAT amount
- CALCULATE net amount
- PRINT bill

#### PSPECS OF MANAGER

##### Manager login

- GET manager username and password.
- VERIFY login details.
- DISPLAY error if login details are incorrect
- REDIRECTS to the dashboard IF login successful
- GET report

### Create Package

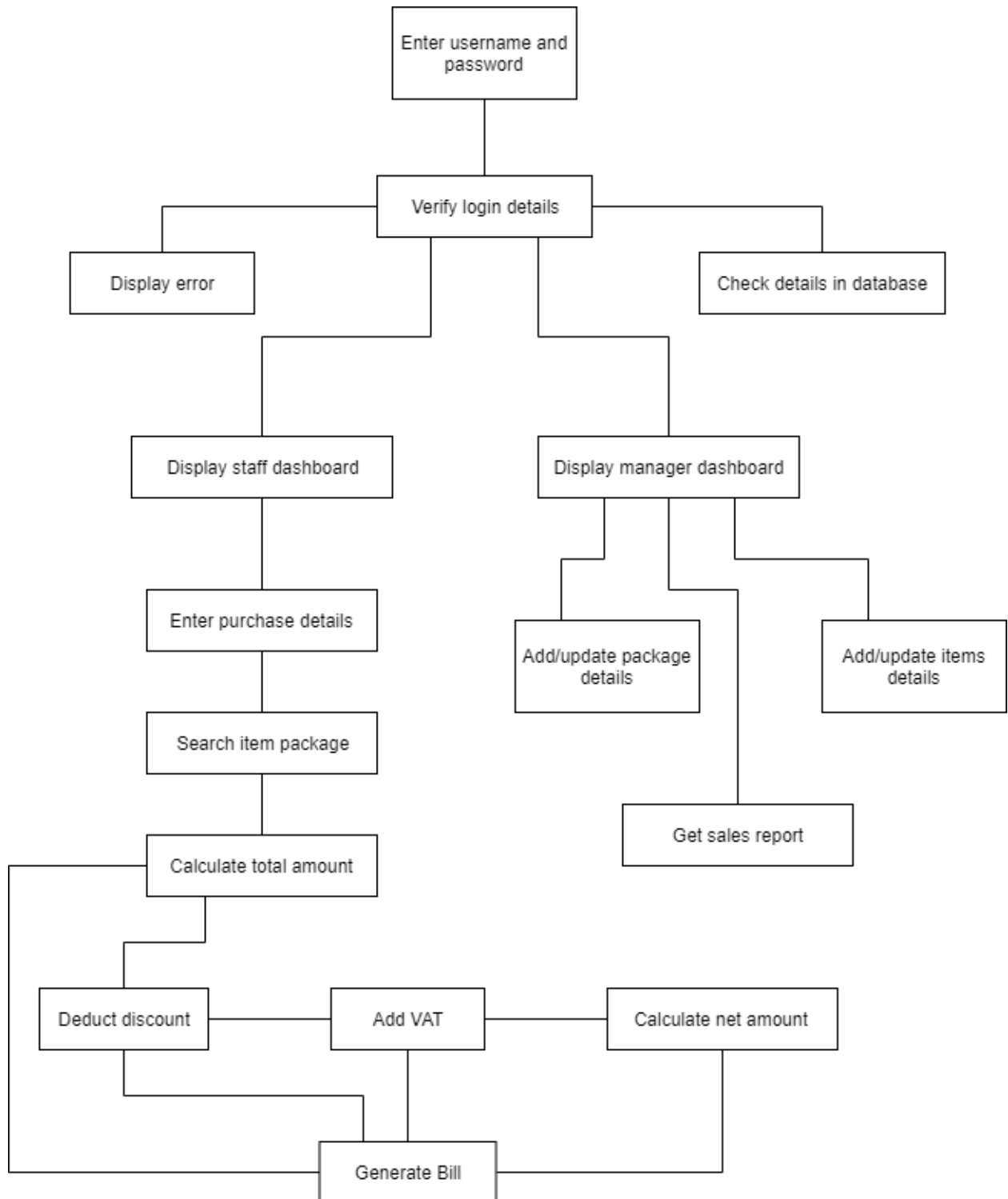
- ADD new items to the packages.
- ADD new package in the system.
- CHECK status of the item.
- SET price for the package.
- SET the items with expiry dates.

### Generate Report

- GET Item Details
- GET Sales Details
- CALCULATE sales per day
- CALCULATE sales per month
- GET items with expiry date
- GET items with maximum sales and minimum sales
- GET items to be reordered.
- DISPLAY report

## 4. Design Specification

### 4.1. Structure chart (upper level) for the software



#### **4.2. Module Specification (Mspeces):**

**MODULE NAME:** Valley Mart Department Store

**PURPOSE:** We are building up a fully computerized system for the department store where we have deliberated to range the stock management and the billing process to an obsolete desktop-based system. The system is similar with the department store if it is analyzed and evaluated. The execution should be done for every function like adding and updating the products, every details and pricing and generating bills for every product sale and making the sales report of the Valley Mart Department Store.

#### **PSEUDOCODES:**

##### **Billing Module:**

- Get staff ID
- Get item details (Name, Quantity)
- Get item price and status
- Calculate total amount
- Deduct Discount (if any)
- Add VAT (13%) amount
- Calculate net amount
- Generate bill
- Deduct amount from the items stock

##### **Report Module:**

- Check item sales per day and month
- Check minimum and maximum item sales
- Check total profits from the item sales

**Items Module:**

Enter Item ID, name, category, MRP, Expiry Date and Quantity

Check the status of the product

Check minimum order level

Record the details

Add in Stock

Generate report

**INPUT PARAMETERS (if any)**

- Item name
- Item category
- Item Quantity
- Buying price
- MRP
- Expiry Date
- Status
- Minimum order level

**OUTPUT PARAMETERS (if any)**

- Net amount (Total amount – Discount amount + VAT amount)
- Print Bill
- Generate Report

**GLOBAL VARIABLES (if any)**

- Item ID
- Item name
- MRP
- Status
- Expiry Date

**LOCAL VARIABLES (if any)**

- Discount
- VAT

## **5. Meeting minutes**

### **Meeting: 1**

**Date:** 19 Dec, 2018

**Venue:** Lecture hall, Herald College Kathmandu

**Start time:** 1:10 PM

**End time:** 1:25 PM

#### **Attendance:**

- Saman Khadgi
- Utsav Bajracharya
- Ritesh Khambu Shrestha
- Pratik Dhungana

#### **Agenda:**

- To go through coursework and know about our tasks

#### **To Do:**

- Try to create event list and DFD of the software

#### **Next Meeting:**

21st Dec, 2018



## **Meeting: 2**

**Date:** 21 Dec, 2018

**Venue:** Seminar Room, Herald College Kathmandu

**Start time:** 9:30 PM

**End time:** 9:45 PM

### **Attendance:**

- Saman Khadgi
- Utsav Bajracharya
- Ritesh Khambu Shrestha
- Pratik Dhungana

### **Agenda:**

- To divide tasks among the group members

### **To Do:**

- Research on the module specs and make event list

### **Next Meeting:**

24 Dec, 2018

### **Meeting: 3**

**Date:** 3 Jan, 2019

**Venue:** Lab level 04, Herald College Kathmandu

**Start time:** 10:30 PM

**End time:** 10:45 PM

#### **Attendance:**

- Saman Khadgi
- Utsav Bajracharya
- Ritesh Khambu Shrestha

#### **Agenda:**

- Try to make ERD for the software and know about upper and lower DFD fragments.

#### **To Do:**

- To do research on middle level DFD and upper level DFD fragments.

#### **Next Meeting:**

7 Jan, 2019

## **Meeting: 4**

**Date:** 7 Jan, 2019

**Venue:** Lab level 03, Herald College Kathmandu

**Start time:** 10:00 PM

**End time:** 10:15 PM

### **Attendance:**

- Saman Khadgi
- Utsav Bajracharya
- Ritesh Khambu Shrestha

### **Agenda:**

- Discuss on data definition and data entries required for the software.

### **To Do:**

- To do research on data dictionary and process specification.

### **Next Meeting:**

21 Jan, 2019

## **Meeting: 5**

**Date:** 21 Jan, 2019

**Venue:** Lab level 03, Herald College Kathmandu

**Start time:** 10:30 PM

**End time:** 10:45 PM

### **Attendance:**

- Saman Khadgi
- Utsav Bajracharya
- Ritesh Khambu Shrestha

### **Agenda:**

- Finish 4.1.2 (Internal Model Specification)

### **To Do:**

- To do research on Structure chart.

### **Next Meeting:**

31 Jan, 2019

## Testing Specification

Test case ID	Title	Test Steps	Test Data	Expected	Actual	Result	Comment
TC01	Staff login page	1. Open the store system. 2. Enter the login page. 3. Click on the staff login. 4. Enter Username Enter Password 5. Click on Log In	Val1: Username= Password=	Username and password are not entered.	Enter username and password	Fail	Please enter your username and password.
			Val2: Username=adssss Password=*****	Username is not correct.	Incorrect username	Fail	Please check your username and try again.
			Val3: Username=Ram Password= **	Password is not correct.	Incorrect password	Fail	Sorry, your password was incorrect.
			Val4: Username=abc Password=**	Username and password are incorrect.	Incorrect Username or password	Fail	Sorry, your username and password were incorrect.
			Val5: Username=Ram Password=*****	Opens Dashboard	Opens Dashboard	Pass	
TC02	Manager login page	1. Open the store system. 2. Enter the login page. 3. Click on the manager login. 4. Enter Username Enter Password 5. Click on Log In	Val1: Username= Password=	Username and password are not entered.	Enter username and password	Fail	Please enter your username and password.
			Val2: Username=adssss Password=*****	Username is not correct.	Incorrect username	Fail	Please check your username and try again.
			Val3: Username= Harry Password= **	Password is not correct.	Incorrect password	Fail	Sorry, your password was incorrect.
			Val4: Username=abc Password=**	Username and password are incorrect.	Incorrect Username or password	Fail	Sorry, your username and password were incorrect.

			Val5: Username= Ram Password=*****	Opens Dashboard	Opens Dashboard	Pass	
TC03	Add Items	1.Enter item detail in system. 2.Enter price of package.	Val1: Item name Val2: Item category Val3: Item price	Stores and displays item details.	Stores and displays item details.	Pass	
			Val1: Package name Val2: Item Category Val3: Blank	Please enter Item price	Invalid item price	Fail	Error message incorrect
TC04	Package Creation	1.Enter package detail in system. 2.Enter price of package.	Val1: Package name Val2: List of items Val3: Package price	Stores and displays package details.	Stores and displays package details.	Pass	
			Val1: Package name Val2: List of items Val3: Blank	Please enter package price	Invalid package price	Fail	Error message incorrect
TC05	Bill Generation	1. Enter details of item purchased by a customer. 2. Calculate total amount. 3. Add VAT. 4.Deduct discount (if any). 5. Tender amount 6.Change amount (if any).	Val1: Item detail: Chocolate = 500 T-shirt: 1200 Shampoo= Total= 1700 VAT= 13% Discount= 0% Tender amount= 2000 Change amount=300	Prints Bill	Shampoo amount is empty.	Fail	Please enter the item price.
			Val2: Item detail: Chocolate = 500 T- shirt = 1200 Shampoo = 600 Total =2300 VAT= Discount= 5% Tender amount= 2185	Prints Bill	Vat amount is empty	Fail	Please enter the VAT amount.

			Val3: Item detail: Chocolate = 500 T - shirt = 1200 Shampoo = 600 Total = 2300 VAT= 13% Discount= 5% Tender amount= 2800 Change amount = 70	Prints bill	Prints bill	Pass	
TC106	Status	1.Enters item no 2.Check Expiry date	Val1: Item no	Expired/ not added in bill	Added in bill	Fail	Expired item added to the bill
			Val2: Item no	Expired/ not added in bill	Not added in bill	Pass	
TC107	Check Order quantity	1.Goes to order list 2.checks order items 3.Item quantity	Val1: Order items: Fanta Noodles Item quantity: Fanta: 15 Noodles: 50	Order of items and its quantity	15 Fanta No noodles order	Fail	Noodles order quantity not shown
			Val2: Order items: Fanta Noodles Item quantity: Fanta: 15 Noodles: 50	Order of items and its quantity	15 Fanta 50 noodles	pass	

## 6. Individual Task Division:

- **Environmental Model Specification**

Work	Draft	Done/Drawn by
Event list for the software	Saman Khadgi	Ritesh Khambu Shrestha
Context DFD (the top level 0)	Utsav Bajracharya	Saman Khadgi

- **Internal Model Specification**

Work	Draft	Done/Drawn by
ERD for the software.	Saman Khadgi	Ritesh Khambu Shrestha
The 'middle level' DFD fragments	Saman Khadgi	Ritesh Khambu Shrestha
The 'upper level' DFD	Saman Khadgi	Ritesh Khambu Shrestha
Lower level DFDs for Functions 3	Saman Khadgi	Ritesh Khambu Shrestha
Data Dictionary	Ritesh Khambu Shrestha	Ritesh Khambu Shrestha
Process specifications (Pspecs).	Utsav Bajracharya	Utsav Bajracharya

- **Design Specification**

Work	Draft	Done/Drawn by
Structure chart (upper level) for the software	Saman Khadgi	Utsav Bajracharya
Module specifications (Mspece).	Utsav Bajracharya	Utsav Bajracharya



- **Testing Specification**

<b>Work</b>	<b>Draft</b>	<b>Done/Drawn by</b>
Black box testing	Utsav Bajracharya	Utsav Bajracharya

- **Assignment Diary**

<b>Work</b>	<b>Done/Drawn by</b>
Meeting Minutes	Utsav Bajracharya
Group report	Utsav Bajracharya

## **7. Conclusion**

In this report we are given with the valley mart department store to develop structured based software for stock management and billing process.

So, this report helps us to develop an obsolete desktop – based system in to the computerized billing system used by the staff and manager. This system makes their task easier and more effective. Using this system, staffs can add items and generate bills. Manager can also generate report and record details. They can also update and add items and its price. It helps to reduce time for updating item details, generating bill and many more.