

## MODULE 3

### **CASE STUDY - HOSTEL INFORMATION SYSTEM – Fact Gathering and Requirements Determination**

System analyst's diary: "I was called at 9 a.m. today (18 March 04) by the chief Warden of Raman Hostel, Prof.V.Ramakrishna. He wants to examine if computers can help in hostel administration. I made an appointment to meet him tomorrow at 10 a.m. in the hostel office. I told him I will need 40 minutes to get an overview of his requirements". I made the following checklist before meeting him.

#### *Checklist*

- Find out what aspects of hostel operation he wants to analyze and improve.
- Find out why he wants this and what benefits he foresees.
- Find out his priorities
- Find out how early he wants the system.
- Find out about the organization of the hostel administration.
- Find out who else he wants me to talk to.
- Find out if any documentation on existing procedures exists.

I met Prof.V.Ramakrishna at 10 a.m. on 19 March 04 in his office in the hostel and asked his permission to take notes. The summary of my notes which I made and sent to him on 20 March 04 for his comments are:

- The total mess expenses are divided among members. Policy is set by the Chief Warden in consultation with a student mess committee.

- He wants correct mess bills to be prepared and despatched within 5 days of the end of the month to the accounts office for collection.
- He wishes to know which students have large unpaid bills.
- He is eager to control inventories to minimize stock.
- He intends to control issue of stores to cooks to minimize wastage.
- He wants to do some planning about purchase of vegetables and fruits to minimize cost and wastage.
- He desires to have an up-to-date data base of students in hostel.
- The primary objective is to minimize students' mess bills, reduce outstanding payments, and have ready information about residents.
- The priority order of the Chief Warden is: control inventory, control stores issues, ensure speedy bill collection, student data base.
- He would like a new system to be implemented within 4 months.
- The organization chart of the hostel is given in Fig.3.1
- The Chief Warden wants me to talk to assistant wardens, mess supervisors and students' mess committee members.
- There is no procedure manual. Most operation are done routinely using a commonsense approach.

Professor Ramakrishna agreed that my notes, on the whole, reflected our conversation. He added that the number of residents in the hostel was 400, all staying in single rooms. He further indicated that he could afford to install a Personal Computer if benefits can justify cost. I then made an appointment to meet Dr.M.N.Swamy, the assistant warden

on 23 March 04 at 4 p.m. in his office. I requested half an hour of his time for discussions. I made the following checklist before meeting him:

- Find out details of accounting and billing procedure currently used.
- Ascertain his ideas about the current system and improvements
- Try to know his ideas on deployment of personnel if a computer is used.

The following notes were prepared by me on 23 March 04 evening. I used the jottings in my notebook made with Dr.Swamy's permission on 23 March 04 during the interview.

Dr.Swamy is in-charge of all hostel accounts and is assisted by Mr.R.Sampath whose responsibilities are to collect mess dues from residents and issue receipts, prepare cheques for vendors' payments and keep petty cash account. Besides Mr.Sampath, there is Mr.K.S.Iyengar, an accountant, who keeps accounts of (a) daily purchases for the mess, (b) periodical purchases for mess, and (c) employees salaries (total around 30 employees).

Presently there are three purchase payment procedures. These are:

*Monthly payment.* Milk, green vegetables, meat, bread, butter, and confectionery are delivered daily. A delivery chalan with a bill is given. Delivery is checked by mess supervisor (Mr.Viswam) and the bill is sent to Mr.Iyengar. The rates are checked by the mess secretary (elected by residents) against market rates and negotiated with the vendor. The bill with the negotiated rate are filed by Mr.Iyengar and a copy given to the vendor.

At the end of the month they are verified by the secretary and Dr.Swamy, and payment by cheque made to vendors.

*Cash payment.* Items such as gas, coal, kerosene, dry fruits are received at random and immediate cash payment is made. Similarly, cash payment is made for cartage of goods and for cleaning of grains. Cash payment bill copy is kept by Mr.Iyengar as authorised by Dr.Swamy. Cash is paid by Mr.Sampath who keeps the cash accounts.

*Biweekly payment.* Once in two weeks items such as sugar, grain, pulses, condiments, etc. are purchased from the wholesale market by a group consisting of mess secretary, Mr.Iyengar and Mr.Viswam. Rates are fixed by negotiations and bulk delivery is made to the hostel. Delivered quantities are checked by Mr.Viswam and bills filed by Mr.Iyengar. Bills are approved by Dr.Swamy, and the payments are made within two weeks by cheque.

The mess bill is calculated by Mr.Iyengar and his assistant Mr.Singh. To find the daily rate, the total expenses are divided by the sum of the number of students who have their food in the mess every day. If the total expenses are say Rs.5,60,000, and 400 students eat on the first day, 395 on the second, and 406 on the third day, etc., then

$$\begin{aligned} \text{Daily rate} &= \text{Rs.5,60,000} (400 + 395 + 406 + \dots \text{ for 30 days}) \\ &= \text{Rs.5,60,000}/12043 \\ &= \text{Rs.46.50} \end{aligned}$$

Currently, the manual calculation of bills takes over 6 days and many errors are found. Bills do not go on time to students. This needs a better system.

Students are allowed to claim rebate if they do not eat for 2 days consecutively in the mess, provided they give minimum 3 days notice in writing in the register kept with the mess supervisor. Students can bring guests for meals and they have to enter the number of guests for meals (not more than 4 at a time) in a register. They can also order "extras" such as milk and eggs, which are entered in a register. Such entries from a daily register are transferred to another students extras/guests/rebate register which has one page for each student, and all entries for a student are written date-wise in this by Mr.Singh. This register is used in calculating individual bills.

Dr.Swamy feels that this procedure complicates bill preparation. The student body wants this facility to be continued. Dr..Swamy feels that if a proper system is designed, Mr.Iyengar and Mr.Singh can be easily trained to use it, as both are intelligent and also know typing.

The above notes were sent to Dr.Swamy who approved them. He added that a speedier and accurate billing method with full details will be welcomed by students. Currently full details of extras/guests are not provided in the bill as manual entry is too slow. Further follow-up with students who have not paid their mess bill is currently not methodical.

I then decided to meet Dr.Prasad who is the assistant warden in charge of mess affairs. I fixed a meeting with him on 24 March 04 at 3 p.m. Before the interview the following points were noted in the checklist:

- Find out how items are issued to cooks each day
- Find out if any inventory control is exercised
- Find out how wastage is reduced
- Find out his ideas for an improved system and its operation.

The following notes were prepared by me after the interview and sent to Dr.Prasad on 25 March 04. (Dr.Prasad oversees the work of Mr.Viswam, the mess manager, Mr.Garg, the store keeper, and coordinates with the student mess committee).

Dr.Prasad is very unhappy with the way the inventory is controlled. The store keeper waits till an item is exhausted and only then he tells the mess manager about this. It leads to many trips to the city to order items and piecemeal arrival of items, leading to high travel/transport cost. Rs.8000 is spent in this which can be considerably reduced. Items are issued by the mess manager to the cooks based on nominal number of students in the hostel. Proper care is not taken to reduce issues to cooks when many students are absent. This leads to wastage. Over 100 different items are stocked in the store and a systematic technique of replenishing stock should be used. Mess bill could be reduced by bulk purchase of non-perishable items when their cost is low. This is not done. Dr.Prasad feels that use of a computer in inventory control and issue control can be very effective.

The above notes were approved by Dr.Prasad who suggested that I should meet the secretary of the student mess committee Mr.A.Pramod. I found Mr.Pramod in his room in the hostel on 26<sup>th</sup> morning and he invited me to have a breakfast meeting. (Mr.Pramod was elected secretary 8 months ago and has 4 more months in his current term. He wants improvements within that period). He reiterated the points made by Dr.Prasad and Dr.Swamy on the need to systematize issues, inventory and billing. He pointed out one of the main difficulties he faced. Currently the bill is calculated at the end of the month. Till then he has no idea of what the daily rate will be. Very often the daily rate goes up sharply from say Rs.46 to Rs.54 which the students do not like. This leads to hasty economy measures in the mess without proper knowledge of the areas in which these measures will be effective. The student body would like to have uniform rates. This can be ensured if estimates of daily rates are available at the end of each week. If the rate tends to become high, some planned economy can be effected. Weekly adjustment can lead to uniform rates. The daily menu is decided by the mess manager in consultation with the mess secretary. Currently it is somewhat repetitive. Students joke" It is beans curry and therefore it is Wednesday". There must be some way of randomizing menus, keeping nutritional balance, variety of items and of effectively using seasonal low cost vegetables, thereby reducing the mess bill. He thinks aloud whether some operations research techniques can be used in this problem. I am somewhat intrigued by this suggestion.

I summarized the above discussion and sent it to the mess secretary and Dr.Prasad for their comments. I next met employees of the mess to get their views. I met Mr.Viswam, the mess manager on 27 March morning. He explained his responsibilities as :

- Preparing daily menu based on advise from the mess committee.
- Preparing an "issue list" of items and quantities for each meal and sending it to the hostel store for issue to the kitchen.
- Preparing a "return list" of items and quantities not used during the day by the cooks to the store.
- Stock register updating based on issue and return list.
- Keeping track of rebates to students absent from mess and extras taken by students which are to be separately charged. Relate rebates to stores issue.
- Ordering items when stock level is low. In practice, however, ordering is done only when an item is exhausted. As delivery at door may be delayed, unnecessary special trips are made to do cash purchases.

Mr.Viswam felt that some help in automatically preparing issue list based on number of persons who will eat in the mess will be very helpful. He would also appreciate assistance in error free recording of rebates and extras. An automatic warning mechanism when stocks become low would be useful. Consolidation of purchases to reduce trips would be desirable.

A summary of the above discussion was sent to Mr.Viswam for his comments.



Next I met Mr.Mathews, the assistant mess manager. His responsibilities include supervising mess staff and day-to-day maintenance of the hostel. He also assists the warden in room allotment by keeping a list of available rooms, preferences, applications for change of rooms etc. He feels that mess bill preparation is time consuming as it takes a week. Room allotment, on the other hand, is not difficult and the current system is satisfactory.

I then met Mr.Garg, the store-keeper. He keeps the stores stock register and helps the mess manager in preparing the issue and return lists. He prepares lists of items to be bought and monitors quality of supplies.

I finally held a group meeting with the chief Warden, assistant wardens, mess manager, assistant manager, mess secretary, accountant and store-keeper. I showed the data and document flow diagrams (Figs. 3.2-3.4) prepared by me and got their approval. I then listed the critical needs which various persons identified. These are given in Table 3.1. Based on this a consensus was reached on what aspects needed.

**Table 3.1** Critical Needs Identified by Various Persons

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- Mess bills to be despatched within 5 days to students.
  - Identify large outstanding bills from students.
  - Correct billing of extras and rebates to students.
  - Weekly calculation of daily rate.
  - Prompt payment to vendors.

- Issue of exact quantities of items to cooks based on menu and number of students.
  - Reducing menu repetitions.
  - Keeping a nutritionally balanced menu and minimizing cost.
  - Forecasting requirement of stores based on menu and students.
  - Consolidating purchases to reduce frequent trips for purchase and reducing cartage charges.
  - Student data base.
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Computerization, and priority among them was also determined. The following priority list was prepared as system to be computerised.

Preparation of mess bill

Stores issue and ordering system

Menu planning

Data base of hostel residents.

They requested me to begin a feasibility study and provide a cost-benefit analysis of the above systems.

**End of Fact Gathering and Requirements Specification Phase.**