

Software Engineering and Information System

Lecture 04: INFORMATION GATHERING



Md. Al-Hasan

**Department of Computer Science & Engineering (CSE)
Bangladesh Army University of Science & Technology
(BAUST)**

INFORMATION GATHERING

Contents

- 3.1 Strategy to gather information
- 3.2 Methods of gathering information
- 3.3 Case study –hostel information system
- 3.4 Systems requirements specifications
- 3.5 Classifications of requirements to operational,tactical,strategic

MOTIVATION

- The Information system designed for an organization must meet the requirements of the end users of the organization.
- To obtain what an end user expects from the Information System the designer must gain complete knowledge of the organization's working.
- It is important for the student to know the information gathering techniques so that no information is overlooked and the nature and functions of an organization are clearly understood

MOTIVATION

- The main purpose of gathering information is to determine the information requirements of an organization
- Information requirements are often not stated precisely by management
- Analyst's responsibility to prepare a precise Systems Requirements Specifications understood(SRS) by users
- SRS document is a vital document before starting a project

LEARNING GOALS

- Strategy to gather information for computerization.
- Various sources of information.
- Methods of searching for information.
- Interviewing techniques to gather information from line managers to top management.
- Methods of consensus for formulating requirements.

LEARNING GOALS

- Use of document flow diagrams to depict flow of documents in an organization
- Specification of Operational, Tactical and strategic information which will be provided by the system
- Use of dataflow diagrams to specify flow of records and how they will be processed to create reports

INFORMATION GATHERING STRATEGIES

- Identify Information sources
- Evolve a method of obtaining information from the identified sources.
- Use Information flow model of organization.

INFORMATION SOURCES

- Users of System
- Forms and Documents used in the organization
- Procedure manuals, rule books etc.
- Reports used by the organization
- Existing computer programs(If Any).

INFORMATION SOURCES

- Interviews are very important
- Use organization chart
- Understand the importance of the people who operate the system-Clerks,Line managers.
- Gather information from Middle level persons who have lot of experience
- Gather both qualitative and quantitative information & Observe how the organization works.

INFORMATION GATHERING METHODS

Searching for information

- Individual Interviews
- Group discussions
- Several Interviews needed.

PLANNING AN INTERVIEW

- Make a list of people to be interviewed and in what order
- Plan and note down a list of questions to be asked
- Plan several interviews with same person-mainly to clarify doubts
- Interview groups as appropriate

INTERVIEWING TECHNIQUE

- Make appointment
- Allot time
- Read background material
- State purpose of interview
- Be punctual and pay attention to what user says
- Do not use computer jargon

INTERVIEWING TECHNIQUE

- Obtain both quantitative and qualitative Information
- Discriminate between essential and desirable requirements
- State what you understand and get it confirmed
- Do not prolong interview
- Summarize information gathered and get it checked by the interviewee

USE OF QUESTIONNAIRES

- Questionnaires useful for statistical data collection
- Useful when large number of persons have to respond
- Make questionnaires short
- Design questionnaires by enumerating objectives and data needed to meet the objectives
- Several follow-ups/personal interviews may be required to get questionnaires back from respondents

INFORMATION GATHERING OTHER METHODS

- Existing system(If any)
- Systems in similar organization
- Observe workflow in workplace
- Case repository in own organization

SYSTEM REQUIREMENTS SPECIFICATION

- System requirements specification specifies what Information requirements will be provided.
- It does not specify how the system will be designed
- SRS is obtained after excessive discussions with the user.
- Developing SRS is most important and difficult task of a Systems analyst

SYSTEM REQUIREMENTS SPECIFICATION

How SRS is Developed

- Analyst examines the current system if any.
- Analyst finds out the shortcomings of the system as seen by the user.
- Analyst's aim is to develop SRS which is understandable by the user and which can be used for detailed design of the system.

SYSTEM REQUIREMENTS SPECIFICATION

Ideal characteristics of SRS

- Complete and Unambiguous.
- Specifies operational, tactical, and strategic information requirements
- Eliminates possible later disputes between users and Analyst
- Uses Graphical aids understood by users who are not computer literate and will also be useful in design.
- Jargon Free.

FROM WORD STATEMENT TO SRS

- Narratives of requirements by users too long and imprecise
- Needs conversion to precise specifications
- Step1: Analyse statement
Step2: Identify physical entities such as vendors, receiving office, Inspection office etc.
Step3: Identify documents which are received/sent by each office
Step4: Draw a physical document

DEVELOPING A DOCUMENT FLOW DIAGRAM

EXAMPLE WORD STATEMENT

“Our company receives many items from several vendors each accompanied by a delivery note. A receiving office receives the item and checks the delivery note with corresponding order. Any discrepancy is reported to purchase office. The items received along with items received note (with details of items) is sent to the inspection office.”

ENTITIES IDENTIFIED-Vendors, Receiving office, Inspection office
DOCUMENTS IDENTIFIED-Delivery note, discrepancy note, Items Received note.

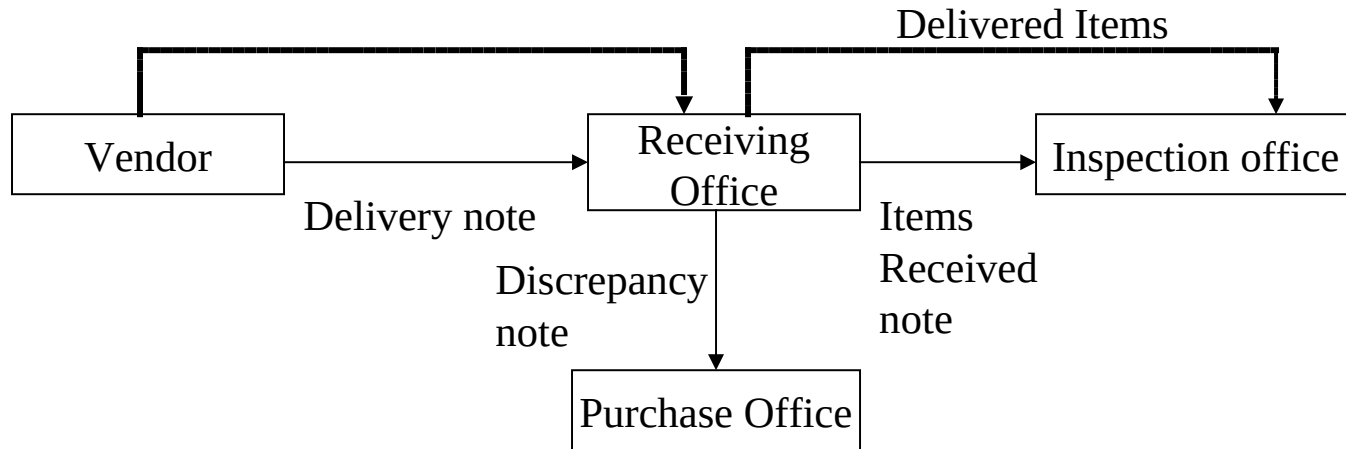
Using these a document flow diagram is drawn

SYSTEM REQUIREMENTS SPECIFICATION

Graphical Specification Tools

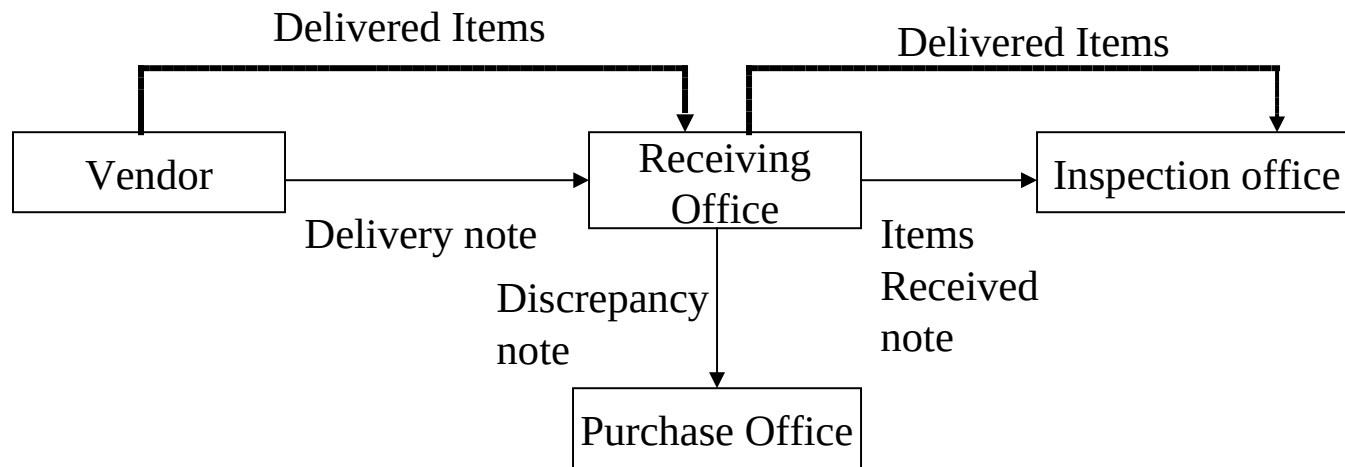
- Physical document flow diagram.
- Logical Data flow Diagram (abbreviated as DFD)
- Document flow diagram depicts various entities or offices & documents generated/transmitted by these entities
- Entities represented by Rectangles, Document flow by lines, direction is shown by arrows.
- Document flow lines are labeled by name of the document
- Dashed lines used to depict flow of physical items.
- Document flow diagram depicts various entities and documents generated and/or transmitted by these entities

DOCUMENT FLOW DIAGRAM



- Entities in the Document flow diagram given above are Vendor, Receiving office, Inspection office and purchase office
- Documents are: Delivery note, items received note and discrepancy note
- Physical flows are delivered items

DOCUMENT FLOW DIAGRAM (CONTD)



The diagram is interpreted as follows:

- 1) Vendors deliver items to receiving office accompanied by a delivery note
- 2) Receiving Office sends items to inspection office along with an items received note
- 3) Receiving office sends discrepancy note to Purchase office

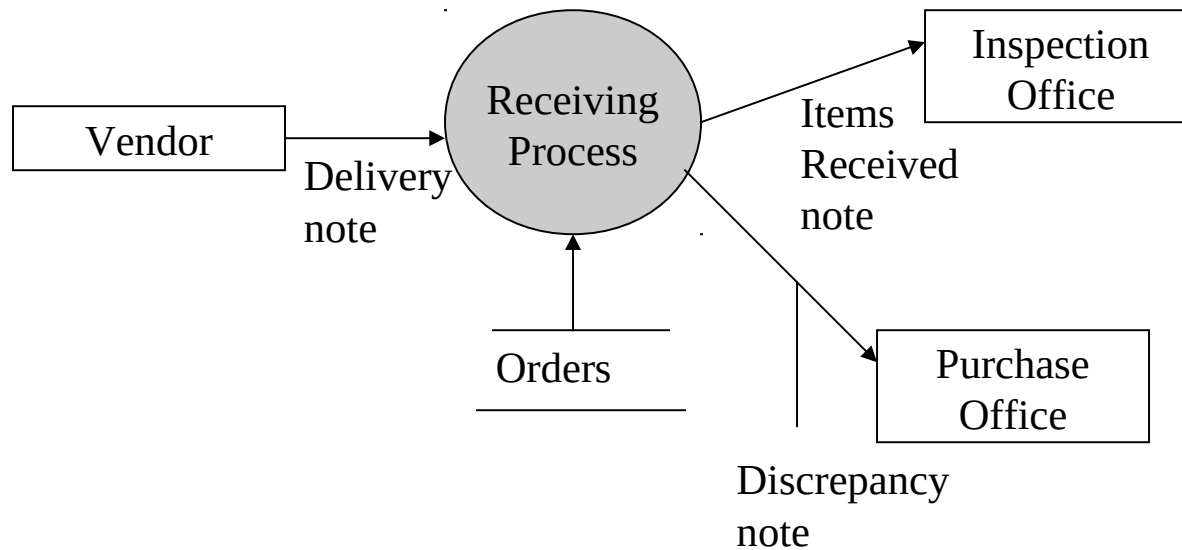
ENTITIES: Vendor, Receiving office, Inspection office and purchase office

DOCUMENTS : Delivery note, Items received note and discrepancy note

DATA FLOW DIAGRAM (DFD)

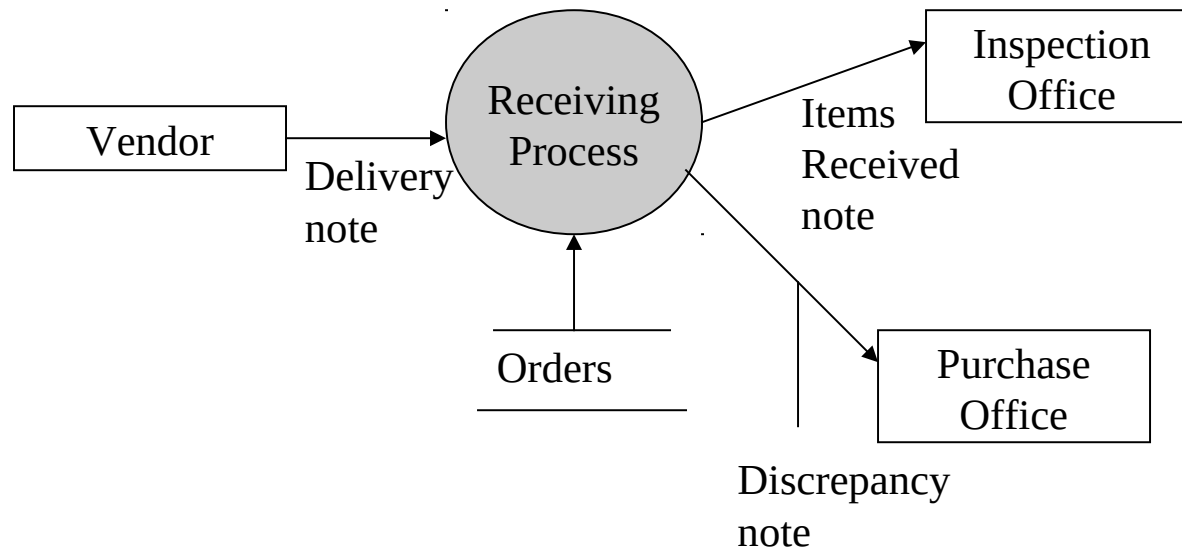
- DFD also has entities and data flows
- Besides this DFD specifies processing performed by some of the entities
- Data flow diagrams specify which entities generate documents
- Details of documents and their flow
- Processing performed by some entities
- Data stores which are referred while processing data and in which processed data may be written or stored

DATA FLOW DIAGRAM (DFD)



- Entities are, originators of data and “consumers” of data
- Vendor, Inspection office and purchase office are entities in the above diagram
- Data flows are delivery note, items received note and discrepancy note
- A circle is used to depict a process
- A pair of parallel lines depict a store

DATA FLOW DIAGRAM (CONTD)



- 1) Data in a store may be read by a process
- 2) Processed data may also be written in a store
- 3) Circles depicting process are detailed separately using “ Structured English Algorithms” Or decision tables
- 4) Data flows are expanded to detail the data elements
- 5) Contents of the data stores are also detailed

DATA ELEMENTS IN DATA FLOW & STORE

Delivery note:

Order no, Vendor code, Vendor name and address, Item name, Item code, Delivery date, Quantity supplied, units.

Items Received note:

Order no, Item name, Item code, Delivery date, quantity supplied, units.

Discrepancy note:

Order no, Vendor code, Vendor name and address, Item name, Item code, Order date, Delivery date, quantity supplied, units, excess/deficiency, No of days late/early.

Receiving office order file

Order no, Order date, Item name, Item code, Vendor code, Vendor Name and address, Quantity ordered, delivery period.

PROCESSING RULE

English statement

1. Compare order no in delivery note with that in order file. If no match return item to vendor.
2. If order no matches then compare item codes, if no match return item to the vendor.
3. If order number matches compare qty delivered with quantity ordered. If excess or deficient send discrepancy note to purchase office.
4. If order number matches compare date of delivery with expected date. If late or early send discrepancy note to purchase office.
5. In case 3 and case 4 send items received note to inspection office

The above statements are shown to the user for his approval.

OPERATIONAL,TACTICAL AND STRATEGIC INFORMATION

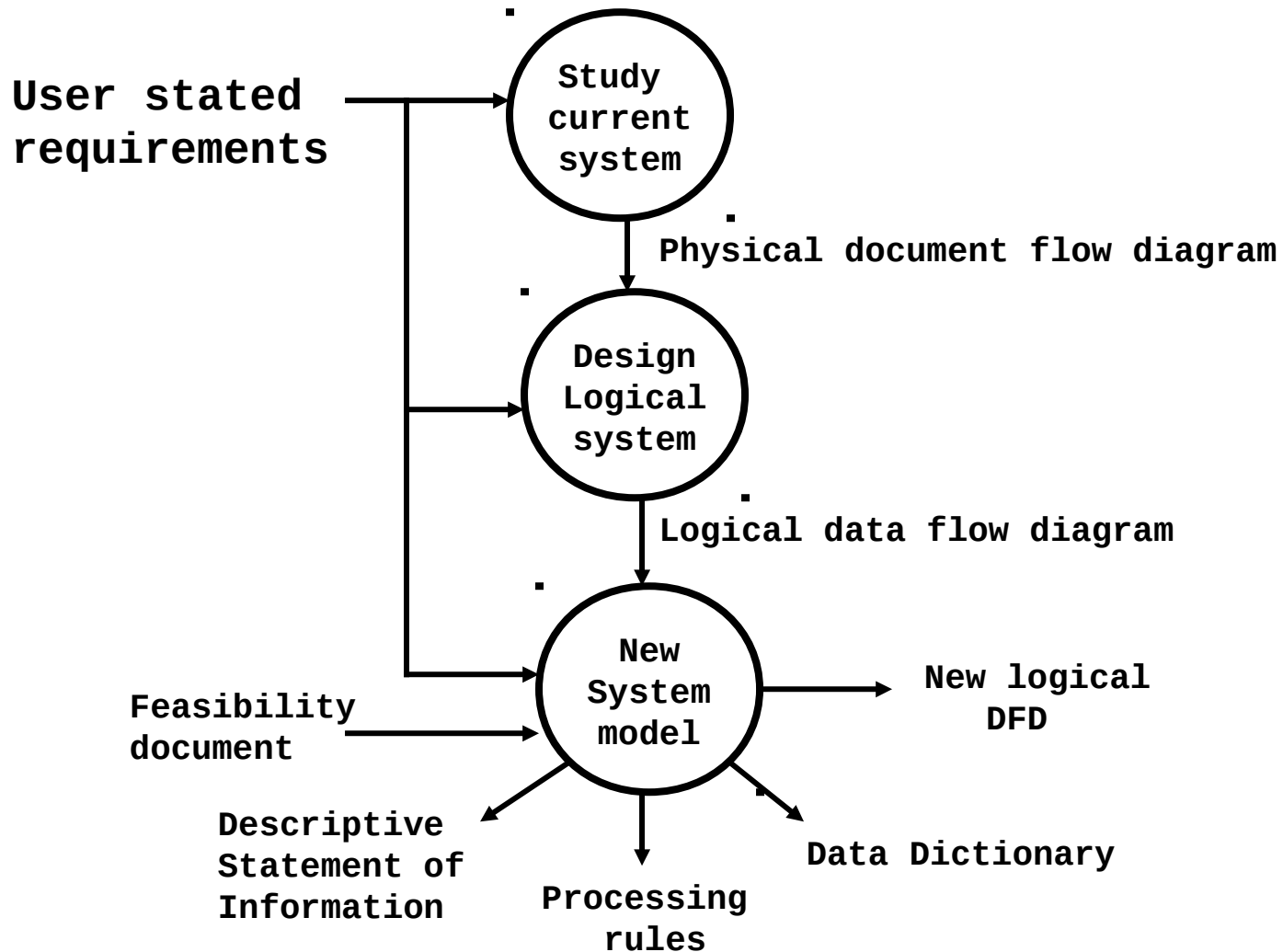
For this simple examples are:

OPERATIONAL: Automatic checking of delivery against order and create discrepancy note.Note discrepancy (if any) of each order.

TACTICAL:Evolve vendor performance index based on discrepancy in supplies and quality inspection.

STRATEGIC:Use performance index to decide proportion of order for an item to be placed with each vendor.Develop new vendors if all existing vendors performance are poor.

STEPS IN SYSTEM ANALYSIS AND DESIGN



MODULARIZING REQUIREMENTS SPECIFICATIONS

SRS Document

SRS Document now consists of:

- Document flow diagrams(as many as needed).
- Data Flow Diagrams.
- Data elements of each data flow and Data Store

MODULARIZING REQUIREMENTS SPECIFICATIONS

SRS Document (Continued)

- Processing rules carried out in each circle of DFD.
- A descriptive statement of operational,tactical,strategic information will be provided
- A data dictionary which consolidates all data elements in the document and data store.