Ch1

Components of Information Systems

Hardware

➢Is the physical layer of the information system

➢Can include : o Servers o Workstations o Networks o Scanners o Digital capture devices o Telecommunications equipment o Fiber-optic cables o Mobile devices

Software

➢ Programs that control the hardware and produce the desired information or results

• Data

➢Data is raw facts that an IS transforms into useful information

➢Data has no inherent meaning ➢Data cannot be used for making decision

Processes

➢Describe the tasks and business functions that users, managers, and IT staff members perform to achieve specific results

➢Represent actual day-today business operations

➢Example: Generate report

• People

➢Have an interest in an IS

➢A user is a person who communicates with an IS or uses the information that it generates ➢Example : Stakeholders

Describe 5 components of information system with 2 examples.

Hardware - example servers, networks & fiber-optic cables

Software - example Microsoft word, spreadsheet & food ordering system

Data - example customer details, student details & bank account

Processes - example user manual, flowchart & checklist document

People - example stakeholders & users

Ch2

Roles of a Systems Analyst

➢Consultant  
 o A systems consultant to a business

O Hired specifically to address information systems issues within a business

➢Supporting Expert

O Draws on professional expertise concerning computer hardware and software and their uses in the business

O Not managing the project but merely serving as a resource

Agent of change

➢A change agent is a person from inside or outside the organization who helps an organization transform itself by focusing on such matters as organizational effectiveness, improvement, and development.

➢A comprehensive and responsible role whether internal or external to the business

➢A person who serves as a catalyst for change, develops a plan for change, and works with others in facilitating change

Skills of a Systems Analyst

➢Analytical Skills

o Systems thinking

o Organization knowledge

o Problem identification

o Problem analysis & solution

• Management Skills

➢ Resource Management ➢ Change Management ➢ Risk Management ➢ Project Management

• Technical Skills

➢ Constant re-education ➢ Keep skills up-to-date ➢ Understanding a wide variety of technologies

• Interpersonal Skills

➢Communication Skills ➢Working alone / working with a team ➢Managing expectations of users / managers ➢Facilitating Groups

Roles and Skills of a Project Manager

• Project Planning ➢Identify all project tasks and estimate the completion time and cost of each

Project scheduling ➢Create a specific timetable that shows tasks, task dependencies, and critical tasks that might delay the project.

• Project monitoring and controlling

➢Guiding, supervising, and coordinating the project team’s workload ➢To help ensure that quality standards are met

➢Structured walkthrough: a review of a project team members’ work by other members of the team

• Project reporting

➢Create regular progress reports to management, users, and the project team itself

➢Conduct Project Status Meetings: Schedule regular meetings to update the team and discuss project status, issues, problems, and opportunities

➢Project Status Reports: A progress report to management and user usually are written

➢Gantt charts are often included to show project status graphically

Resistance to Change

• Reasons

➢The threat to job security

➢The reduction in social satisfaction

➢The reduction of self-esteem and reputation

• Effects

➢ withholding facts - Refuse information, suggestions, help or support. ➢ providing inaccurate data

➢ displaying an attitude of indifference

• Methods to overcome

➢Keep people informed about

o effects of the change on their job

o reason for (and the benefits of) the changes

➢Transfer employee to another department so that the employee is employed

➢Extend necessary training

➢Seek Employee Participation

Ch5

Feasibility study

• Why is feasibility study important?

– to determine whether a project has a reasonable chance of success

Technical Feasibility

• Process of determining whether the organization has the technology resources to develop or purchase, install, and operate the system.

Operational Feasibility

• The process of assessing the degree to which a proposed system solves business problems or takes advantage of business opportunities.

• Refers to a system that users will accept and use effectively to support business objectives

Schedule Feasibility

The process of assessing the degree to which the potential time frame and completion dates for all major activities within a project meet organizational deadlines and constraints for affecting change.

• Time Estimation can be done in many ways

• One popular method is by using GANTT Chart

• You may include a summarized schedules,

Economic feasibility

• To concludes if the project can be done within the given budget and to determine the cost and benefit (including profit) from the project.

• Cost-Benefit Analysis – Process of identifying the financial benefits and costs associated with a development project –

Is performed when:

• Conducting a preliminary investigation.

• Evaluating a project. • Making recommendations to management.

Ch6

Fact-finding techniques

Interview

• Step 1: Determine the people to interview

– Select the right people and ask the right questions

• Step 2. Establish objectives for the interview

– Determine the areas to be discussed

– List the facts you need to gather

• Step 3. Develop interview questions

- Decide what to ask and how to phrase the question }

The same question to different people - for comparison-

• Step 4. Prepare for the interview

– Careful preparation is essential because an interview is an important meeting and not just a casual chat

– Limit the interview to no more than one hour

• Step 5. Conduct the interview

– Develop a specific plan for the meeting

– Begin by introducing yourself, describing the project, and explaining your interview objectives

– Engaged listening

– Allow the person enough time to think about the question

• Step 6. Document the interview

– Note taking should be kept to a minimum

– After conducting the interview, you must record the information quickly

• Step 7. Evaluate the interview

– In addition to recording the facts obtained in an interview, try to identify any possible biases

Document Revie

• Aims to find out the information requirements that people have in the current system

• Includes:

– Review existing system documentation

– Obtain copies of actual forms and documents

– Review blank copies of forms

– Review samples of completed forms

– Review software documentation

Observation

• Aim is to see what really happens, not what people say happens.

• Can be open-ended or based on a schedule

• Includes:

❑seeing how people carry out processes

❑Examine each form, record and report

❑Consider each person working with the system

❑Talk to people who receive current reports

❑Consider the Hawthorne Effect

Questionnaires and Surveys

• Aims to obtain the views of a large number of people in a way that can be analyzed statistically.   
Includes:

- postal, web-based and email questionnaires

- open-ended and closed questions

- gathering opinion as well as facts

Sampling

• Also known as purposive and selective sampling, purposeful sampling is a sampling technique that qualitative researchers use to recruit participants who can provide indepth and detailed information about the phenomenon under investigation.

• There are several techniques of sampling:

– Systematic sample : Select every tenth customer for review

– Stratified sample : Select five customers from each of four postal codes

– Random sample : Any 20 customers

• Main objective : to ensure representation of the overall population accurately

• May considered either interviewing or questionnaires

Research

• Journals, periodicals, books

• Internet sites

– Hardware and software vendors

– Independent firms that provide information

– Newsgroups

• Professional meetings, seminars, discussions

• Site visits to observe a system in use

Ch7&8

Data Flow

• represents the transfer of data among data stores, sources or sinks, and processes

• can represent a specific piece of data – employee names or a set of data – class list – student numbers & student names

• line can be curved or straight

WHAT IS A DATA DICTIONARY?

• Also known as data repository

• A reference work of data about data (metadata) which is compiled by systems analysts to guide them through analysis and design

• A central storehouse of information about the system’s data

• A document which is used to collect and coordinate specific data terms, as well as confirms what each term mean to different people in the organization

A DATA DICTIONARY IS USED TO :

• provide documentation

• eliminate redundancy

• validate the data flow diagram for completeness & accuracy

• provide a starting point for developing screens and reports

• determine the contents of data stored in files

• develop the logic for data flow diagram processes

Ch9

Physical Design

• a plan for the actual implementations of the logical design of the system

• describes the implementation of all components of the Information Systems

• e.g. – describes actual processes of entering, verifying, and storing data; the physical layout of data files; the sorting procedures; the exact format of the reports

PHYSICAL DESIGN

• is concerned with how the requirements are satisfied

• how the data is input

• how is the data stored and processed

• how the output is processed

• how the constraints are met

• is completed during the systems design phase

Types of Report

– DETAIL REPORTS

• Produces one or more lines of output for each record processed

• Can be quite lengthy

• A better alternative might be an exception report

– EXCEPTION REPORTS

• Displays only those records that meet a specific condition or conditions

• Useful when the user wants information only on records that might require action, but does not need to know the details

– SUMMARY REPORTS

• Upper-level managers often want to see total figures and do not need supporting details

Ch10

Types of testing

Unit Testing

• The testing of an individual program or module

• Objective is to identify and eliminate execution errors that could cause the program to terminate abnormally, and logic errors that could have been missed during desk checking

Integration Testing

• Testing two or more programs that depend on each other to make sure that the programs work together properly

System Testing

• Verify that all system components are integrated properly and that actual processing situations will be handled correctly

• Confirm that the information system can handle predicted volumes of data in a timely and efficient manner

Ch11

System Change-over Strategies

(How the old system will be replaced with new?)

• Direct cutover: New system replaces old system immediately

• Parallel operation (or parallel running): Both old and new system are run simultaneously for a period

• Pilot operation: New system, is introduced in just one branch of a organisation.

• Phased operation: New system is added a bit at a time

Maintenance Tasks

• Maintenance expenses

– Vary significantly during the system’s operational life and include spending to support maintenance activities

• Maintenance activities

– Programs, procedures or documentation to ensure correct system performance

– Adapt the system to changing requirements – Make the system operate more efficiently

• Corrective Maintenance

- Diagnoses and corrects errors in an operational system

- Respond to errors in various ways, depending on nature

-Adaptive Maintenance

- Adds enhancements to an operational system and makes the system easier to use

-The procedure for minor adaptive maintenance is similar to routine corrective maintenance

- Can be more difficult than new systems development

• Perfective Maintenance

- Involves changing an operational system to make it more efficient, reliable and maintainable

-Cost-effective during the middle of the system’s operational life

-Programs that need a large number of maintenance changes usually are good candidates for reengineering

• Preventive Maintenance

- Requires analysis of areas where trouble is likely to occur

- IT department normally initiates preventive maintenance

Maintenance Management

• The Maintenance Team

❑ System administrator

- Manages computer and network systems

❑ Systems analysts

- Investigate and rapidly locate the source of a problem by using analysis and synthesis skills

❑ Programmers

- Applications programmers work on new systems development and maintenance

- Systems programmers concentrate on operating system software and utilities

- Database programmers focus on creating and supporting large-scale database systems

❑ Organisational issues

- Maintenance team vs. new systems development team

• Maintenance Requests

- Involve a series of steps

- All work must be covered by a specific request

- Initial determination

- The systems review committee

- Task completion

- User notification

• Initial Determination

- System administrator makes the initial determination if are justifiable

• The System Review Committee

- Either approves the request and assigns a priority to it, or rejects it

• Task Completion

- System administrator usually assigns tasks to individuals or to a maintenance team

• User Notification

- Users who initiate maintenance requests expect a prompt response, especially if the situation directly affects their work

• Establishing Priorities

- In many companies, systems review committee separates maintenance requests from new systems development requests

- Some IT managers believe that evaluating all projects together leads to the best possible decisions

- Object is to have a procedure that balances new development and necessary maintenance work