IST Design, Produce and Evaluate Notes

9.1 Projects and the development process
The Development Process
- Design, produce and evaluate is a structured process used to develop information and software solutions
    o Identify problem
    o Defining/analysing the problem
    o Designing, producing and evaluating solutions

Selecting the project tools and techniques
- Tools and techniques vary between projects, but depend on
    o The project being solved
    o Existing knowledge and skills of project team
    o Hardware and software resources available

9.2 Defining the problem
Identifying/Defining the Problem
- Uses information collected from:
    o Documentation about an existing system
    o The client or end user through interviews
    o A design brief or problem statement
        ▪ Design brief is a short statement about the requirements of the project, comes from an identified need to want
        ▪ Problem statement is a definition of the problem, solved by completing the project

9.3 Analysing the problem
Analysing the Problem
- Analyse the problem through a detailed investigation:
    o Collecting data about the problem (reviewing documentation, interviews, finding needs, identifying factors affecting solution)
    o Analysing problem and requirements (getting a good understanding of problem, collating data, finding limitations, alternative solutions)

Factors Affecting the Project Solution
- By knowing the factors it will help identify what a project can do and cannot do
    o Major constraints come from the client's requirements, or existing systems
- Factors can be grouped into 4 groups
    o Technical Factors
        ▪ Constraints imposed by available hardware, software and resources/data
    o Operational Factors
        ▪ Time, people and organisational procedures and policies
    o Financial Factors
        ▪ Money available for a project effects type and quality of solution, restrict time spent
    o Social and ethical factors
        ▪ Developers have moral, ethical and legal considerations, i.e. plagiarising, privacy

Analysing a range of possible solutions
- Different solutions should be considered
- To determine the stability of solutions, two techniques can be used:
    - o Feasibility study
        - ▪ Determines whether a solution is worth developing – technical, operational, financial and ethical constraints can be examined
        - ▪ If one or more of these factors are limited, the solution is not feasible
    - o Cost-benefit analysis
        - ▪ Assesses the benefits against the costs of the solution – allows comparisons

Documenting the problem
- Documentation is an in-depth description of the problem and what needs to be solved
    - o Includes objectives, goals, scope and needs of the problem
    - o Can be a design brief, problem statement, feasibility report or needs analysis
- Documentation helps clarify the problem and helps communication between developer and client
- Enables feedback from client which can stimulate more refinements

9.4 Designing a solution
Design Techniques and Tools
- Techniques when designing solutions include:
    - o Concept mapping
        - ▪ Developing a graphic representation of ideas, with links between them
        - ▪ Used to group/categorise information about the problem
    - o Brainstorming
        - ▪ Ideas recorded without any judgement on their worth or feasibility
    - o Observation
        - ▪ Observing how people interact with software and technology, i.e. a website
    - o Research
        - ▪ Collecting ideas and information to support development of solution, increase awareness of new products and provides understanding
- Collected data can be summarised by collating, organising and displaying data by using tables, etc.
    - o Prototyping
        - ▪ Limited version of a potential solution
        - ▪ Used to gain feedback from client and end users, and highlight areas not meeting needs of users
    - o Input, Process, Output
        - ▪ IPO tables used to show data coming from the system, the processes data undergoes and the outputs from the system
    - o Storyboarding
        - ▪ Used to document design of IPO screens, and relationships between screens

Modelling, Evaluating, Producing and Testing Solutions
- Once design ideas are generated, proposed designs can be created and documented
- Design is examined to determine suitability by experimenting and testing, and apply criteria
- Solution can be constructed/produced after design selected
- Solution is thoroughly tested

9.5 Evaluating Projects
- Evaluation is important as it measures how successful a solution is

Evaluation Criteria
- Criteria should be based on original specifications of project
    - o Functionality of solution
    - o Quality of information in the solution
    - o Ethics of the solution
    - o Environmental impact of the solution

Methods of Evaluation
- Individual evaluation
    - o Collect data from a single person, involving interviews or observation,
    - o Thoughts, ideas and issues, improvements for the solution
- Group evaluation
    - o Collect data from groups of people, surveys or questionnaire
    - o People include developer's peers, end users, target groups (age)

9.6 Project Management
Project Management
- Project management is the integration of activities throughout the project to achieve the defined output within given constraints
- Also includes management of time, finance and people
- Project Management Body of Knowledge (PMBOK) – international standard of managing projects
    - o Initiating, Planning, Executing, Controlling and Closing

Initiating
- Initiation involves a proposal for the project
    - o Outlines problem, how it will be solved, benefits and costs – indicates whether it will proceed

Planning
- Planning involves setting up the project by creating a management plan of how it will be completed
- Plan involves decisions on
    - o What, how who and when it should be completed
- Plan includes
    - o Action list of tasks, activities and deliverables
    - o Allocation of responsibilities (groups)
    - o Schedule for completion and milestones
    - o Resources available, including time, people and money
    - o Risk Analysis – identifying problems that may arise, how they can be handled
- Scheduling
    - o Creation of a timeline for project's completion
    - o Sets out the order of activities, shows graphically how it will be completed in the time
        - ▪ Gantt Chart – shows estimated time for completion, dependence of tasks on others
        - ▪ Milestones when particular aspects should be completed – breaks project down

ACTIVITY	WEEK 1 LESSONS				
	1	2	3	4	5
Read scripts					
Discuss characters					

Executing
- Involves co-ordinating and managing people and resources to carry out plan
- Where the work is performed – setting up the team, implementing the plan

Controlling
- Controlling the operation to ensure it stays on track
    - o Regular meetings and reports, budget blowouts or failing milestones should be identified
- Documents should be checked regularly to monitor progress, updated regularly
- Making decisions – choice between options – quality of final product versus time/budget constraints

Closing
- Once all tasks complete, documentation finalised project is complete
- Project's processes and management are then evaluated to reflect on learning experiences

9.7 Collaboration and group work
Collaboration and Group Work
- Projects are often developed in groups because
    - o Project is large, complex, needs to be completed quickly, requires wide range of skills or would benefit from collaborative work
    - o Groups benefit projects – sharing and building of ideas, instant feedback and support
    - o Group problems – communication, management, group dynamics (personality clashes)

Forming Groups
- Groups are formed by who is available or by managers
- Team members are based on skill and knowledge, and based on personalities (group dynamics)

Collaborative Strategies
- Group protocols/rules – behaviour, responsibilities, group roles, decision making, methods
- Group meetings – initial meeting: decide protocols, understand problem, establish management
- Group meetings – regularly: report progress, make decisions, share information, feedback
    - o Supports communication and dynamics between members

Group Roles and Responsibilities
- Group facilitator – moderates discussions, negotiating decisions/conflicts
- Timekeeper/recorder – monitors progress and documents meetings, actions, decisions
- Roles should be set clearly, allocated fairly

9.8 Communication Techniques
Communication Techniques
- Important for development of projects – exchanging ideas with client and end user
- Verbal Communication
    - o Important when discussing/presenting information and ideas during group work
        - ▪ Discussion, debate, interview, presentation
- Written Communication
    - o Documents have different intended purposes – intended for developer, end user, client
        - ▪ Log book, surveys and questionnaires, documentation of solutions/experiments
- Graphic/Visual communication
    - o Supports and enhances written communication, includes Gantt charts, concept maps, IPO tables

Simple Design, Produce and Evaluate Notes

- Development process involves **identifying/defining** and **analysing** problem and **designing**, **producing** and **evaluating** solutions
- Selecting project tools depend on what is being solved, skills of project team and available resources
- Problem **identified/defined** by documentation of existing system, interviews of client, design brief
    - o Design brief – statement about requirements of project, a definition of problem
- Problem **analysed** by collecting data and analysing problem and requirements
- **Factors** affecting solution include
    - o Technical – constraints in available hardware, software, resources, data
    - o Operational – time, people, organisational procedures and policies
    - o Financial – money available for quality of solutions
    - o Social and Ethical – moral, ethical and legal considerations – plagiarising, privacy
- **Different solutions** should be considered – through a feasibility study or a cost vs benefit analysis
- **Documenting** problem – in-depth description of problem and what needs to be solved
    - o Objectives, goals, scope, needs of problem, can be design brief, problem statement
- **Design Techniques** include:
    - o Concept mapping – graphical representation with links – categorises information
    - o Brainstorming, observation (of people interacting), research – info about new products, ideas
    - o Prototyping – limited version of solution, IPO table and storyboarding – links between screens
- Once ideas are created designs can be made – **modelled, evaluated, produced and tested**
- **Evaluation** can be individual (interviews) or group (surveys, questionnaires)
- **Project Management** – integration of activities to achieve good results in given constraints
    - o PMBOK – Project Management Body Of Knowledge
        - ▪ **Initiating, Planning, Executing, Controlling and Closing**
- **Initiating** – proposal for project – outlines problem and how it will be solved, benefits, costs
- **Planning** – setting up project – decisions on what, how, who and when completed
    - o Action list, roles allocated, schedule, resources and risk analysis
    - o Schedule can be a timeline, Gantt Chart, milestones
- **Executing** – co-ordinating, managing people and resources – implementing plan
- **Controlling** – making sure project stays on track – meetings and reports, documentation, decisions
- **Closing** – document finalised project, processes and management are evaluated for future projects
- Projects are developed **in groups** – large, complex, completed quickly, range of skills
- Groups benefit – sharing/building ideas, instant feedback/support
- Group **problems** – communication, management, personality clashes
- **Group Roles** include facilitators (moderates discussion), timekeeper, recorder
- **Communication** can be:
    - o Verbal – discussion, debate, interview, presentation
    - o Written – log book, surveys, documentation of solutions/experiments
    - o Graphical/Visual – Gantt charts, concept maps, IPO charts