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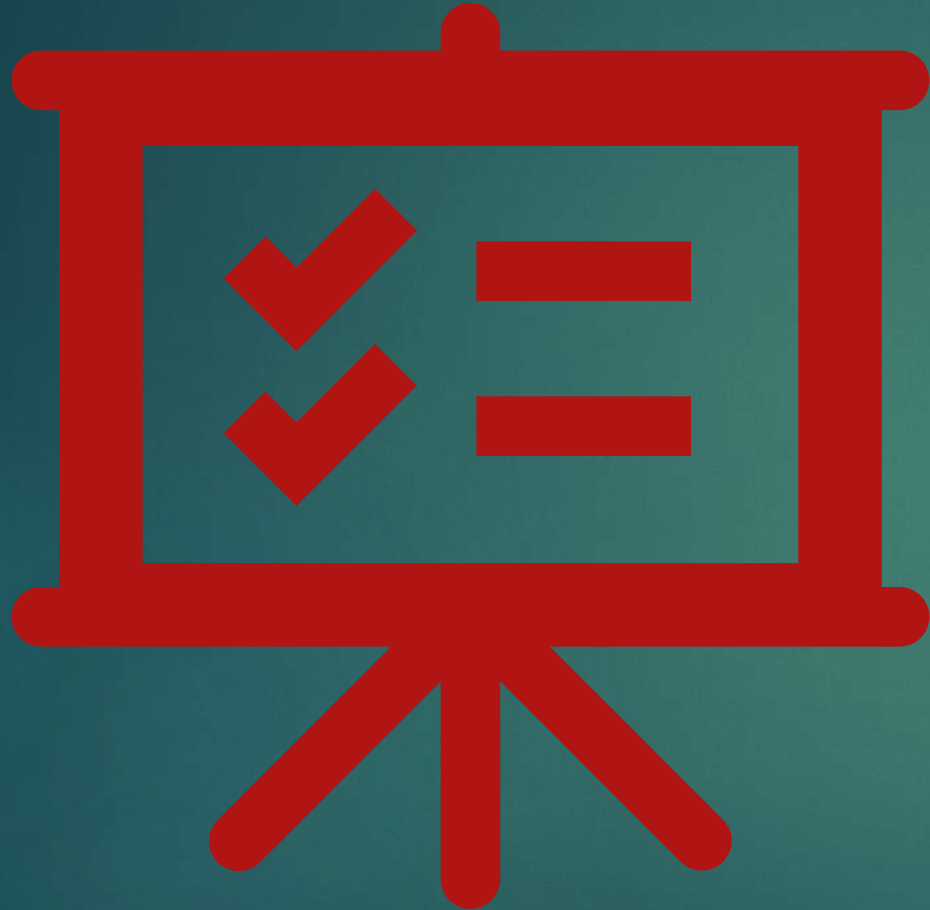
Business and Management

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BIS Design, Build &
Implementation

BIS Design

What is BIS Design (systems design)?

- ▶ The design phase of the lifecycle **defines how the information system will operate.**
- ▶ This is **defined in a design specification.**
- ▶ The design specification is **based on the requirements collected at the analysis stage.**

Aim of Systems Design

In systems design, we are concerned with **producing an appropriate design** that results in a good quality information system, that is

1. **Easy to use**
2. Provides the **correct functions for end-users**
3. Is **rapid** in retrieving data and moving between different screen views of data
4. Is **reliable**
5. Is **secure**
6. Is **well integrated** with other systems

Constraints on Systems design

System design is constrained by:

- **User requirements specification** (the result of the systems analysis)
- **Environmental constraints**, including
 1. **Hardware platform** (PC, Apple or Unix workstation)
 2. **Operating system** (Windows, MAC OS, Unix, etc)
 3. **Data links** required between the application and other programs or a particular RDB such as Oracle or MS SQL Server, etc.

Constraints on Systems design

System design is constrained by:

1. **Design tools** such as CASE tools
2. **Methodologies or standards** adopted by the organisation, such as SSADM
3. **Systems development tools** or development environment for programming, such as MS Visual Studio
4. **Number of users** to be supported and performance required.

CASE: Computer-aided software engineering

SSADM: Structured Systems Analysis & Design Method

Relationship between Systems Analysis & Systems design

- **Analysis** is focused on the **logical representation of data or processes**
- **Design** is focused on **physical representation**

For example, Data analysis

- The analysis phase will be, to gather information to develop an entity relationship diagram
- The design phase will be transforming the diagram into a physical database table definition

Elements of Design

1. **Top-down:** starts with specifying the **overall control architecture** of the application before designing the individual modules.
2. **Bottom-up:** starts with the design of **individual modules**, establishing their input and outputs, and then building an overall design from these modules.
3. **Validation:** It's a **test of the design** to check that the design fulfils the requirements of the business users, defined in the requirements specification.
4. **Verification:** It's a test of the design to ensure that the design chosen is the best available and that it is error-free

Elements of Design

1. **Scalability**: the potential of an IS, piece of software, etc., to **move from supporting a smaller number of users to a larger number** without a marked decrease in reliability or performance.
2. **Data modelling and process modelling**:
 - **Process modelling**: involves the design of different modules of the system, each of which is a process with clearly defined inputs and outputs and a transformation process. **Data flow diagrams are often used to define processes in the system.**
 - **Data modelling**: involves considering how to represent data objects within a system, both logically and physically. **The entity relationship diagram is used to model data.**

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BIS Build & Implementation

What is **BIS Build**?

- ▶ The **creation of software** by programmers involving:
 - ❖ **programming**,
 - ❖ **building release versions** of the software and
 - ❖ **testing** by programmers and end-user.
 - ❖ **Writing documentation** and **training** may occur at this stage.

What is a **BIS** implementation

- ▶ Involves the **transition or change-over from the old to the new** and the preparation for this such as:
 - ❖ Making sure the **hardware and network infrastructure** for a new system are in place;
 - ❖ **Testing the system** and also **human issues** of how best to educate and train staff who will be using or affected by the new system.

What Occurs at the Systems Build Phase (Key systems build activities)

System Development: this involves programming and testing mainly.

Tools for developing systems:

- **3rd-gen languages (3GLs):** Basic, Pascal, C, C#, C++, COBOL, FORTRAN (*involves writing programming codes*)
- **4th -gen languages (4GLs):** They avoid the need for programming.
- **Visual development tools:** Microsoft Visual Studio, Visual Basic, and Visual C++ (interactive environments). [Examples](#)

Assessing Software Quality

Some Questions about Quality

- ▶ Does the **product work**?
- ▶ Does it **crash**?
- ▶ Does the **product function** according to **specifications**
- ▶ Does the **user interface** meet product specifications and is it easy to use?
- ▶ Are there any **unexplained or undesirable side-effects** to using the product which may stop other software working?

Assessing Software Quality

- ▶ **Software quality** is measured according to its suitability for the job.
- ▶ Key questions include: **does it meet the business requirements? Does it work reliably?**
- ▶ The quality of software is dependent on two things:
 - ❖ **The number of errors or bugs in the software**
 - ❖ **The suitability of the software to its intended purpose.**

Assessing Software Quality

Software Metrics

▶ **Software metrics:** measure quality of software such as:

- ❖ **Analysis**
- ❖ **Design**
- ❖ **Coding**
- ❖ **Testing**

Assessing Software Quality

Software Metrics (as project)

- ▶ If approached as a project:
 - ❖ Definition, design and planning;
 - ❖ Coding;
 - ❖ Component test and early system test;
 - ❖ Full system test, user testing and operational trials;
 - ❖ Documentation, training and implementation support;
 - ❖ Overall project management;

Managing Change in Implementation

Change-over methods:

- ▶ **Immediate cutover (big bang):** when a new system becomes operational and operations transfer immediately from the previous system
- ▶ **Parallel running:** involves the old and new system operating together at the same time
- ▶ **Phased implementation:** introducing different modules of the new system sequentially
- ▶ **Pilot system:** trialling in a more limited area before extensively across the business

Software Development Process

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Methodologies

DB Design example

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MySQL, SQL & Building DBs



Questions



Best of luck!

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