

I. Introduction

Types of Software

Information Systems in Organizations

Requirements Analysis and Design

Roles of a Systems Analyst

Notations, Methods and Tools

Information System Lifecycle Phases

Business Rules

Business Process Modelling



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Software Everywhere!

- Software started off as an artifact used only by IT professionals in the '60s and '70s.
- With PCs and breakthroughs in usability, it became a fundamental component of our work day in the '80s and '90s.
- In the new millennium, it literally threatens to run our lives!
- There are different types of software:
 - ✓ **System software**: Operating systems, network drivers,...
 - ✓ **Middleware**: Compilers, database management systems, office software,...
 - ✓ **Applications**: Accounting, inventory control, personnel management,...
- **Information systems** are software applications which manage large amounts of data.
- Most of the software out there is information systems software, written in languages such as COBOL, RPG, 4GLs and the like.

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Information Systems

- Used heavily in large organizations
- Give feedback on on-going projects (e.g., production)
- Used for decision support (DSS)
- Used for on-line analytical processing (OLAP)
- Used for data mining
- Used for customer service (web-based systems).

Information System Technologies

- *Database Management Systems (DBMS)*
- *Data Warehouses*
- *Data Mining*
- *Web technologies (Java, HTML/XML, RDF/S, Web services,...)*

Information System Methodologies

- *Where do we start? --> Feasibility study (or, early requirements analysis)*
- *Define the problem --> Requirements analysis*
- *Design a solution --> Design*

This course is about methodologies for building information systems!

Why is this Course Important?

- *Most errors (54%) are detected after coding and testing.*
- *Almost half of all errors (45%) are introduced during requirements and design.*
- *Most errors made during requirements analysis are non-clerical (77%).*
- *Requirements errors can cost up to 100 times more to fix than implementation errors -- if they are not caught early on.*

Need to do requirements and design right!

What is Systems Analysis?

- The collection of notations, methodologies and tools used to gather details and analyze a problem situation prior to information system design and implementation
- ***Systems analysis*** (or, ***requirements analysis***) must ensure that the proposed information system meets user needs, can be delivered on time, and can be updated inexpensively.
- Problems in "getting the systems analysis right", such as ill-defined situations, ambiguities, inconsistencies, mixing requirements with design

Remember, finding and fixing a fault after software delivery is 100 more expensive than finding and fixing it during systems analysis or early design phases

*What is the **Result** of Systems Analysis?*

- The result of an information system analysis is a **requirements definition** (or, "requirements")

How is a requirements definition used?

As a statement of the problem to be solved

For communication between designer and end-users

To support information system evolution

To support design validation

- What goes in a requirements definition?

Functional requirements: What does the system do? What information is maintained? What activities are carried out? What interfaces are supported?

Non-functional requirements: Global constraints on the system, such as performance constraints, (resource constraints, security, reliability,..), operational constraints (hardware requirements, personnel,...), life cycle constraints, etc.

What is System Design?

The specification of the information system to be built. This specification includes:

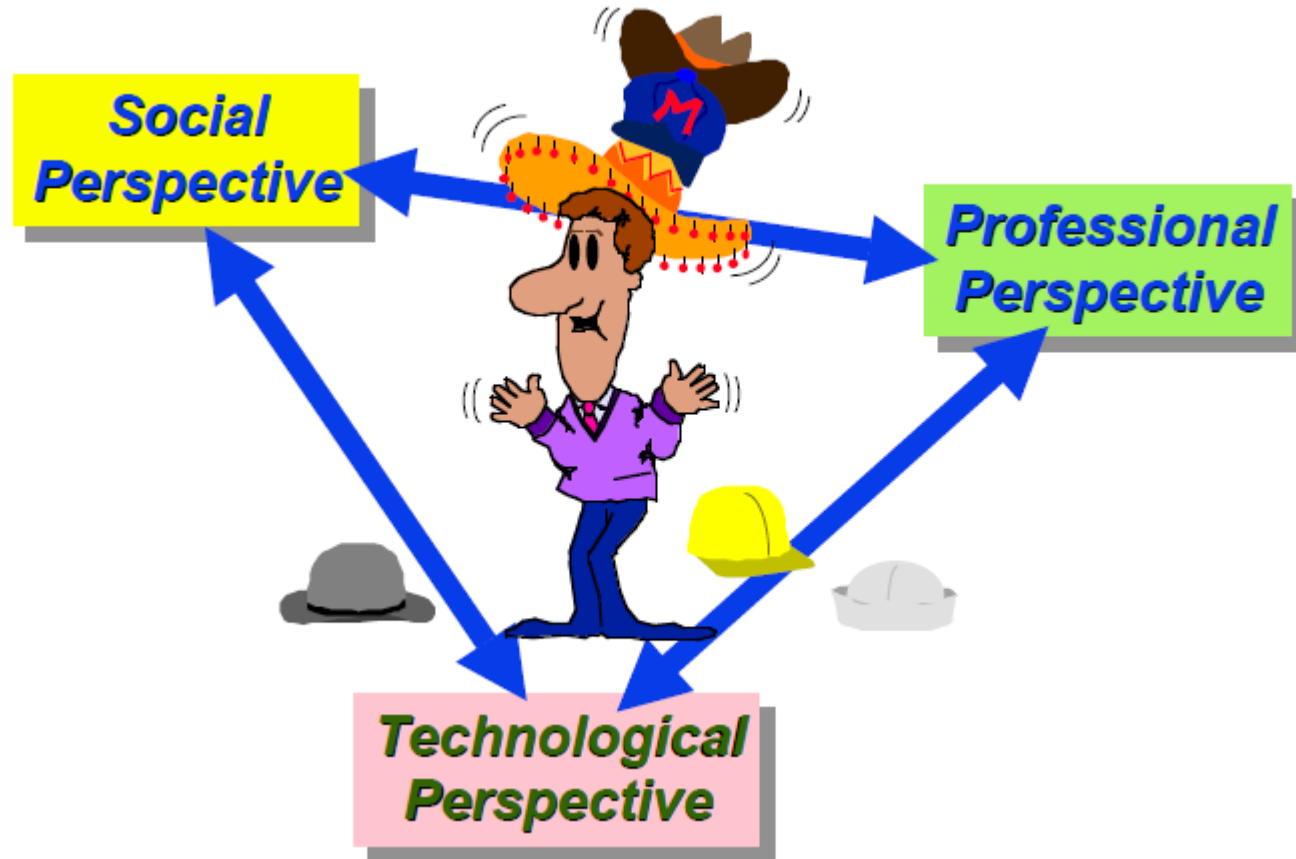
- The ***hardware configuration*** on which the system will run, including network interfaces.
- The ***software platform*** on which the system will run, i.e., operating system, DBMS, programming language, etc...
- The ***software architecture*** of the proposed system, including interfaces between the system modules.
- The ***function*** of each module, i.e., what does each module do, i.e., transformations it performs on its inputs.
- The ***database(s)*** that will be part of the information system, stored in database management systems (DBMSs) or in files
- ***User interfaces*** that need to be in place to facilitate use of the system by different user groups

Roles of the Systems Analyst

- **Consultant** -- often hired from outside, specifically for a project; this means that she brings a new perspective but will not be familiar with company culture/politics.
- **Supporting Expert** -- knows well relevant hardware and software technologies, advises on alternative hardware/software configurations.
- **Change Agent** -- will be expected to suggest alternative business processes which improve on current practices (business reengineer).

Systems analysis is, above all, a problem solving activity

Background of a Systems Analyst



Technologies for System Analysis

