

System Development Methods

CT00046-3-2



System Analysis – Part 1

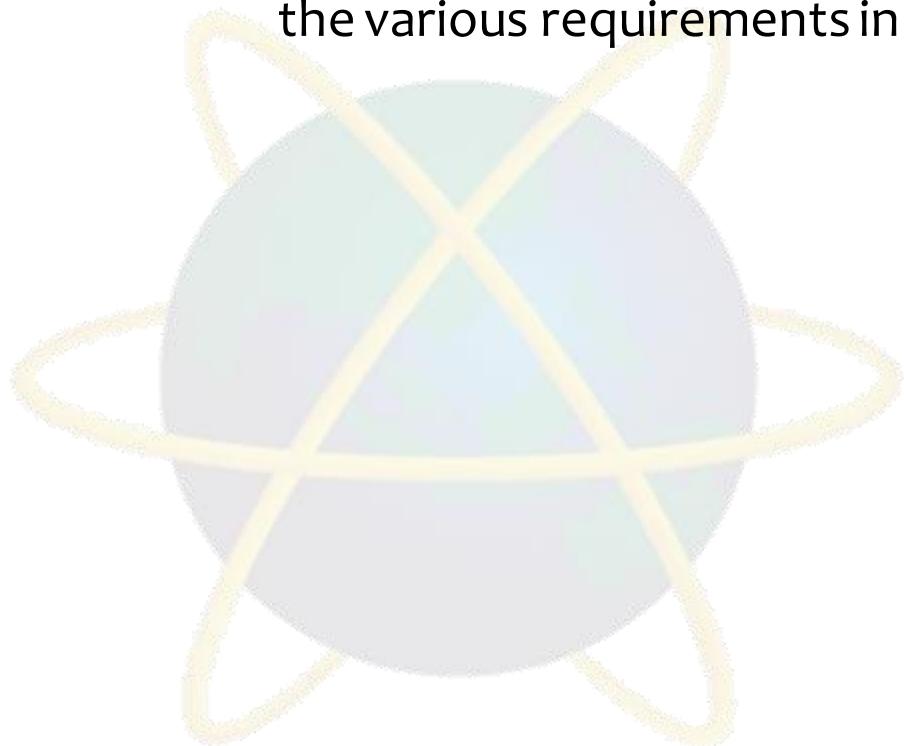
Topic & Structure of the Lesson

- System Analysis
- Data Analysis
- System Specification



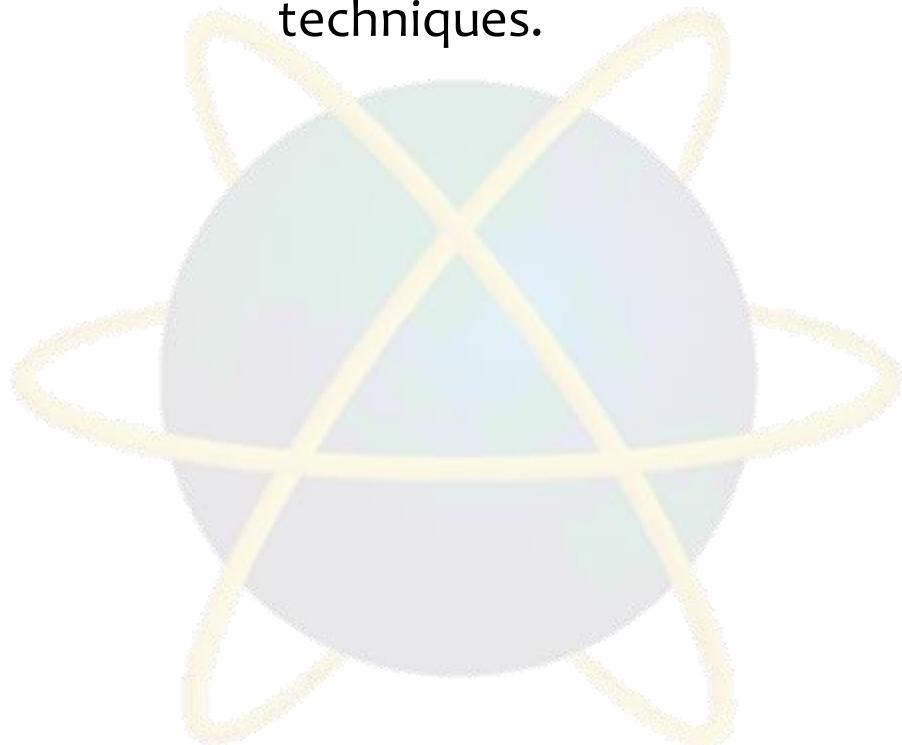
Learning Outcome

- At the end of the module, you should able to:
 - Explain the tools and techniques used for data analysis and discuss the various requirements in system specification.



Learning Outcome

- At the end of the module, you should able to:
 - Analyze and design different views of a system using tools and techniques.



Key Terms you must be able to use

- If you have mastered this topic, you should be able to use the following terms correctly in your assignments and exams:

- Systems Analysis Techniques
- Analysis Tools
- Analysis Outcomes
- System Specifications and Requirement.



System Analysis

- **System Analysis**

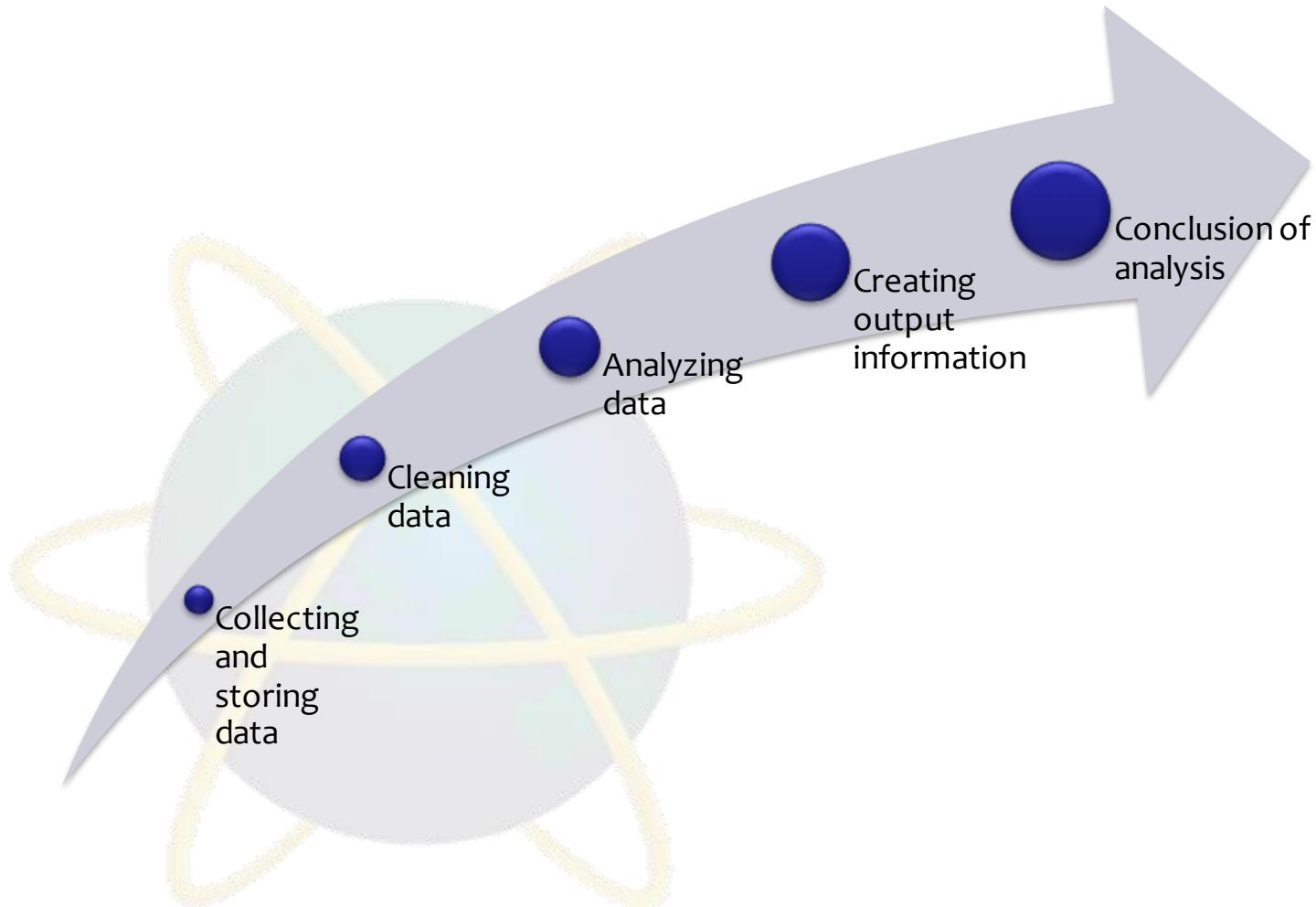
- Systems analysis is a problem solving technique
- Decomposes a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose
- Involves Data Gathering, Data Analysis, Creating Specification

- **Data Analysis**

- A process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making.



Process of Data Analysis



System Specification



Data Collections and Compilation for Analysis



- Traditional methods
 - Interviews, questionnaires, literature reviews, etc.
 - Big Data
 - Stream, Batch, Iterative
 - Using Sensors - IOT devices
 - Traffic cameras, satellites, recording devices, etc.
 - Online collections
 - Auto capturing of online transitions
 - Statistics from internet traffic (real time) and cookies
 - Data storage
 - Databases
 - Data Warehouse and Datasets

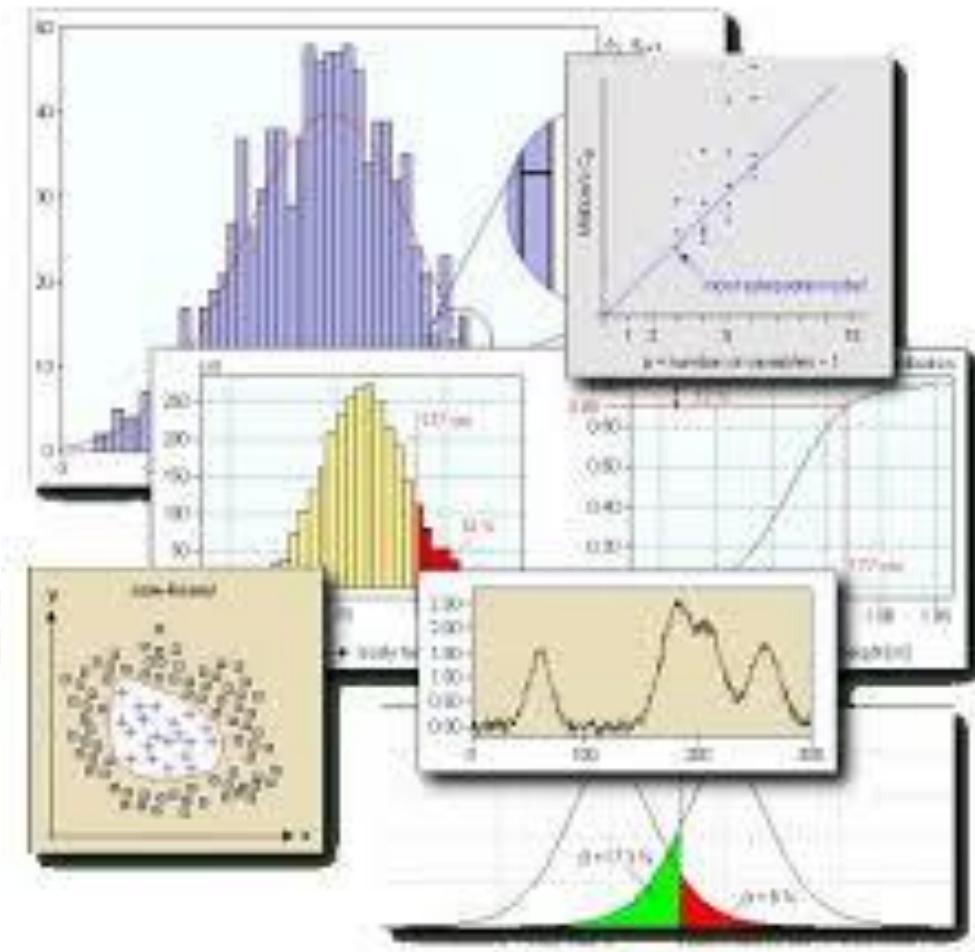


Data Analysis process

- Data Compilations
 - Merging data from different sources
- Data Cleaning
 - Removing errors invalid data , redundancy, empty / incomplete data
- Data Associations
 - Looking for relations and patterns within/between data
- Data Visualization
 - Presenting data in tabular, graphical, chart, etc.
- Conclusions
 - Result of analysis.
 - Helps in creating System Requirements Specifications (SRS)

Output of Data Analysis

- New knowledge
- Summary Table / Charts
- Final Facts and Figures
 - Conclusion
- System Specifications / SRS



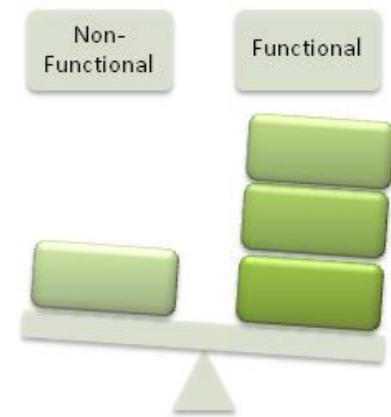
System Specification

- Finalized output of System Analysis
- Contains detailed information of the system to be built
- Mainly contains various **Requirements** such as;
 - Functional Requirements
 - Non-Functional Requirements
 - Technical Requirements
 - User Requirements
 - Interface Requirements
 - Business Requirements, etc



Functional Requirements

- The vital function of a system and its components.
- Described as a set of inputs, the behavior that the system is supposed to accomplish.
- Defines '**WHAT**' the system is supposed to do.
- Ex;
 - Main calculations that need to be performed
 - Technical details need to be included
 - Data manipulation and processing



Non-Functional Requirements

- Criteria that can be used to judge the operation of a system
- define '**HOW**' a system is supposed to be.
- NFR - often concerns the **qualities** of a system which defines in **measurable units**.
 - usability, reliability, and availability, etc
- Ex;
 - The web portal should have a uptime of **99.98%**
 - Bandwidth within the conference should be maintain at minimum of **2MBps** at peak hours.



Technical Requirements

- Hardware / Software / Environment requirement for the new system to run on.
- Often included / merged with Non-Functional Requirement (but better to separate)
- Ex;
 - System should run a Windows Server 2010 and above
 - The core system should have minimum 4GB of RAM.
 - The database server should be minim capacity of 2Tb available storage space for the next 3 year



User Requirements

- Special requirements from users, for the personal benefits
- Often not high priority but developed when developer has enough time/budget.
- Ex;
 - User should be able to **print** his/her profile from the system.
 - User should be able to customize the background of the desktop.



Interface Requirements

- Special settings for the Graphical User Interface (GUI)
- Should be revealed to user in prototype
- Ex;
 - The GUI should be built mostly with the company's corporate color which is Blue and red.
 - All main pages in the website should carry the company logo at the bottom right.



Business Requirements

- Requirements that needed to be included in the system for the benefit of the company's business
- Comes from the system owners or stakeholders.
- Aligns with the company vision & mission, business goals and objectives
- Ex;
 - The web based system should support the business growth for the next five years.
 - The system should be flexible to support corporate merger in a another 3 years time.



Benefits of System Analysis

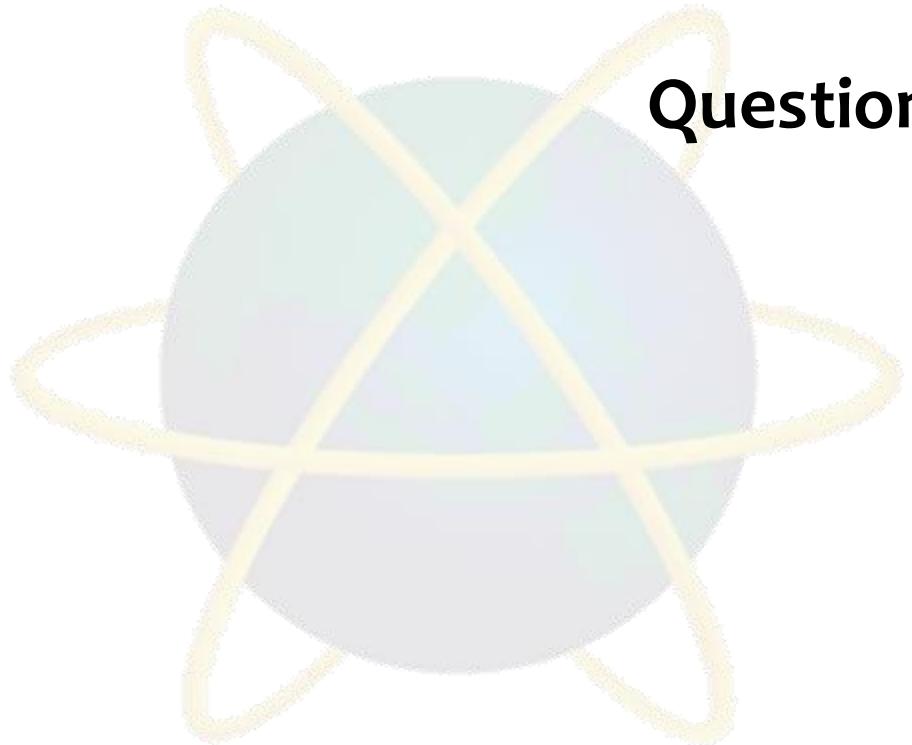
- Knowledge discovery
- Problems source / cause discovery
- Obtain proof to support a theory
- Verify assumptions with real facts
- Filter and keep only important/relevant data
- See relationship between facts and figures
- View data in a different way to obtain ideas



Setbacks of System Analysis

- Insufficient data collected
- Unreliable and invalid data
- Incorrect analysis methods used
- Difficult to use analysis tools
- Lack of scope / objective of output
- Biased inference
- Analyst (architect) - lack analysis skills
- External issues / hindrance





Question & Answer

Next Session

- System Analysis – Part 2 – Data Analysis Techniques and Tools



Tutorial

- 1) You are given a task to upgrade Webspace2, to improved Webspace3
 - a) Discuss what are the methods of data collection would you apply for the above project (and why).
 - b) The problems that would face when analyzing the data collected for your project.
- 2) Write 2 functional and non-functional requirement for Webspace3 (upgrade of Webspace2).