BRAC UNIVERSITY
Inspiring Excellence

Course ID: **CSE471**
Course Title: **System Analysis and Design**

Lecture 3: Requirements Determination

Prepared by:
Dr. Muhammad Iqbal Hossain
Assistant professor
Department of Computer Science & Engineering
BRAC University.

Objectives

BRAC UNIVERSITY
Inspiring Excellence

- Understand how to create a requirements definition.
- Become familiar with requirements analysis techniques.
- Understand when to use each requirements analysis technique.
- Understand what and where to use REQUIREMENTS ANALYSIS STRATEGIES

BRAC UNIVERSITY
Inspiring Excellence

Segment 1: Requirements Specification

Segment 2: Requirement Gathering Techniques and Interview

Segment 3: JOINT APPLICATION DESIGN (JAD)

Segment 4: Other Requirement Gathering Techniques

Key Ideas

- The goal of the analysis phase is to truly understand the requirements of the new system and develop a system that addresses them.
- The first challenge is collecting and integrating the information
- The second challenge is finding the right people to participate.

Analysis Phase

- This phase takes the general ideas in the system request and
  - refines them into a detailed requirements definition (this chapter),
  - functional models
  - structural models and
  - behavioral models
- This becomes the system proposal
  - Includes revised project management deliverables,
    - feasibility analysis and
    - workplan

Requirement Specification

- A statement of what
  - the system must do or
  - characteristics it must have
  - Written from business person perspective – **business requirement**
  - Later requirements become more technical – **system requirement**

Functional vs. Nonfunctional

BRAC UNIVERSITY
Inspiring Excellence

- A ***functional requirement*** relates directly to a process the system has to perform or information it needs to contain.

- ***Nonfunctional requirements*** refer to behavioral properties that the system must have, such as performance and usability.

Functional Requirements example

BRAC UNIVERSITY
Inspiring Excellence

Functional Requirements

1. New Vehicle Management

1.1 The system will allow managers to view the current new vehicle inventory.
1.2 The system will allow the new vehicle manager to place orders for new vehicles.
1.3 The system will record the addition of new vehicles to inventory when they are received from the manufacturers.

2. Vehicle Sales Management

2.1 The system will enable salespersons to create a customer offer.
2.2 The system will allow salespeople to know whether an offer is pending on a specific vehicle.
2.3 The system will enable managers to record approval of a customer offer.
2.4 The system will prepare a sales contract.
2.5 The system will prepare a shop work order based on customer requested dealer options.
2.6 The system will record a customer deposit.
2.7 The system will record a customer payment.
2.8 The system will create a record of the customer's vehicle purchase.

3. Used Vehicle Management

3.1 The system will record information on a customer trade-in vehicle ... etc.

Nonfunctional Requirements example

BRAC UNIVERSITY
Inspiring Excellence

Nonfunctional Requirements

1. Operational
- 1.1 The system should run on tablet PCs to be used by salespeople.
- 1.2 The system should interface with the shop management system.
- 1.3 The system should connect to printers wirelessly.

2. Performance
- 2.1 The system should support a sales staff of 15 salespeople.
- 2.2 The system should be updated with pending offers on vehicles every 15 minutes.

3. Security
- 3.1 No salesperson can access any other salesperson's customer contacts.
- 3.2 Only the owner and sales manager may approve customer offers.
- 3.3 Use of each tablet PC should be restricted to the salesperson to whom it is assigned.

4. Cultural and Political
- 4.1 Company policy says that all computer equipment is purchased from Dell.
- 4.2 Customer personal information is protected in compliance with the Data Protection Act.
- 4.3 The system will conform to the state's "lemon law."

Types of Nonfunctional Requirements

BRAC UNIVERSITY
Inspiring Excellence

Nonfunctional Requirement	Description	Examples
Operational	The physical and technical environments in which the system will operate	■ The system can run on handheld devices. ■ The system should be able to integrate with the existing inventory system. ■ The system should be able to work on any Web browser.
Performance	The speed, capacity, and reliability of the system	■ Any interaction between the user and the system should not exceed 2 seconds. ■ The system downloads new status parameters within 5 minutes of a change. ■ The system should be available for use 24 hours per day, 365 days per year. ■ The system supports 300 simultaneous users from 9–11 A.M.; 150 simultaneous users at all other times.
Security	Who has authorized access to the system under what circumstances	■ Only direct managers can see personnel records of staff. ■ Customers can see their order history only during business hours. ■ The system includes all available safeguards from viruses, worms, Trojan horses, etc.
Cultural and Political	Cultural and political factors and legal requirements that affect the system	■ The system should be able to distinguish between U.S. currency and currency from other nations. ■ Company policy is to buy computers only from Dell. ■ Country managers are permitted to authorize custom user interfaces within their units. ■ Personal information is protected in compliance with the Data Protection Act.

Sl.No	Functional Requirement	Non-functional Requirement
.1	Defines all the services or functions required by the customer that must be provided by the system	.Defines system properties and constraints e.g .reliability, response time and storage requirements Constraints are I/O device capability, system .representations, etc
.2	.It describes what the software should do	It does not describe what the software will do, but .how the software will do it
.3	Related to business. For example: Calculation of order value by Sales Department or gross pay by the Payroll Department	.Related to improving the performance of the business For example: checking the level of security. An operator should be allowed to view only my name and .personal identification code
.4	.Functional requirement are easy to test	Nonfunctional requirements are difficult to test
.5	Related to the individual system features	Related to the system as a whole
.6	Failure to meet the individual functional requirement may degrade the system	Failure to meet a non-functional requirement may .make the whole system unusable

End of segment 1

BRAC UNIVERSITY
Inspiring Excellence

Segment 2

REQUIREMENTS ANALYSIS STRATEGIES

Requirement Gathering Techniques

BRAC UNIVERSITY
Inspiring Excellence

- An analyst search for requirements using a variety of techniques
- Make sure that the current business processes and the needs for the new system are well understood before moving into design.
- Five most commonly used requirements elicitation techniques:
    1. Interviews
    2. JAD sessions
    3. Questionnaires
    4. Document analysis
    5. Observation.

Problem Analysis

- Ask users to identify problems and solutions
- Improvements tend to be small and incremental
- Rarely finds improvements with significant business value

Root Cause Analysis

- Users are not asked for solutions, but for:
  - A list of (prioritized) problems.
  - All possible root causes for those problems.
- Analysts investigate each root cause to find:
  - Solutions for the highest priority problems.
  - Root causes that are common to multiple problems.

Duration Analysis

BRAC UNIVERSITY
Inspiring Excellence

- Calculate time needed for each process step
- Calculate time needed for overall process
- Compare the two – a large difference indicates a badly fragmented process
- Potential solutions:
  - Process integration – change the process to use fewer people, each with broader responsibilities
  - Parallelization – change the process so that individual step are performed simultaneously

Activity-Based Costing

- Calculate cost of each process step
- Consider both direct and indirect costs
- Identify most costly steps and focus improvement efforts on them

Benchmarking

- Studying how other organizations perform the same business process
- Informal benchmarking
- Common for customer-facing processes
- Interact with other business' processes as if you are a customer

Technology Analysis

BRAC UNIVERSITY
Inspiring Excellence

- Analysts list important and interesting technologies
- Managers list important and interesting technologies
- The group identifies how each might be applied to the business and how the business might benefit

Activity Elimination

- Identify what would happen if each organizational activity were eliminated
- Use "force-fit" to test all possibilities

Comparing Analysis Techniques

- Potential business value
- Project cost
- Breadth of analysis
- Risk

BRAC UNIVERSITY

Inspiring Excellence

Thank you