Software Requirements Engineering (SE2001)

Dr. Syed Muazzam Ali Shah

HEC Approved Ph.D. Supervisor

(Assistant Professor)

Department of Software Engineering

NUCES-FAST Karachi

Contact#: (021) 111-128-128 Ext. 130

Website: sites.google.com/view/muazzam-kazmi/home

Official page: https://khi.nu.edu.pk/personnel/dr-syed-muazzam-ali-shah-2/

Google Scholar: https://scholar.google.com.tw/citations?hl=en&user=0vcfR-IAAAAJ

Requirements Engineering Processes

What is a Process?

- A process is an organized set of activities, which transforms inputs to outputs.
- We can use synonyms of process such as: procedure, method, course of action, etc.
- Processes are essential for dealing with complexity in real world.

What is a Process?

- Processes document the steps in solving a certain problem.
- Descriptions of processes are very important
  - *They allow knowledge to be reused.*
- They Allow people to apply the process in their peculiar but similar problems.

Examples o f Processes

- An instruction manual for a kitchen dishwasher describes the process of using that machine to clean dishes.
  - ***Inputs:*** *Pile of dirty dishes*
  - ***Outputs:*** *Stack of clean dishes*
- A cookery book describes a set of processes to prepare and cook various types of meal.
  - ***Inputs:*** *Raw ingredients*
  - ***Outputs:*** *Cooked meals*

Examples o f Processes

- A quality manual for the software development describes the processes which should be used to assure the quality of the software.
- It may include descriptions of standards which are the basis for the quality checking.
  - ***Inputs:*** *Documents & programs to be checked and quality standards which must be followed*
  - ***Outputs:*** *Report of quality assurance activities.*

Software Processes

- Software engineering, as a discipline, has many processes.
- These processes help in performing different software engineering activities in an organized manner.

Design Processes

- Requires creativity
- Provides interactions between a wide range of different people
- Helps in engineering judgment
- Requires background knowledge
- Experience

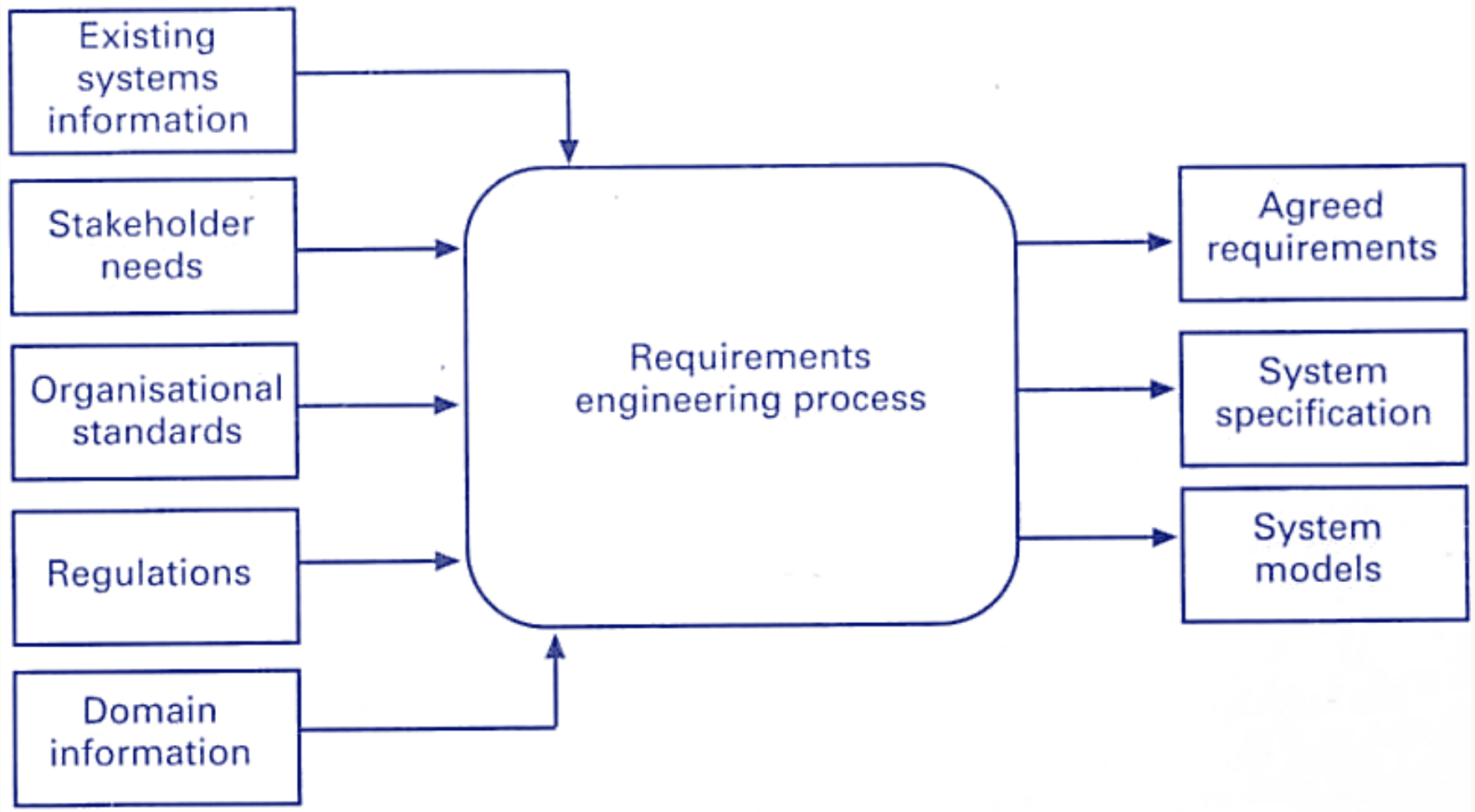
Design Processes : Examples

- Writing a book
- Organizing a conference
- Designing a processor chip
- Requirements engineering

Design Processes : Examples

- Software engineering development process (SDLC)
- Requirements engineering (RE) process
- Design process
- Quality assurance process
- Change management process

Inputs and outputs of RE process



Inputs and outputs of RE process

Input or output	Type	Description
Existing system information	Input	Information about the functionality of systems to be replaced or other systems which interact with the system being specified
Stakeholder needs	Input	Descriptions of what system stakeholders need from the system to support their work
Organisational standards	Input	Standards used in an organisation regarding system development practice, quality management, etc.
Regulations	Input	External regulations such as health and safety regulations which apply to the system.
Domain information	Input	General information about the application domain of the system
Agreed requirements	Output	A description of the system requirements which is understandable by stakeholders and which has been agreed by them
System specification	Output	This is a more detailed specification of the system functionality which may be produced in some cases
System models	Output	A set of models such as a data-flow model. an object model, a process model, etc. which describes the system from different perspectives

RE Process Variability

- RE processes vary radically from one organization to another, and even within an organization in different projects
- Unstructured process rely heavily on the experience of the people, while systematic processes are based on application of some analysis methodology , but they still require human judgment.

Variability Factors

There are four factors which count towards the variability of the Requirements Engineering Process

- Technical maturity
- Disciplinary involvement
- Organizational culture
- Application domain

Variability Factors

- **Technical maturity:**
  - The technologies and methods used for requirements engineering vary from one organization to other
- **Disciplinary involvement:**
  - The types of engineering and managerial disciplines involved in requirements vary from one organization to another

Variability Factors

- **Organizational culture:**
  - The culture of an organization has important effect on all business and technical processes
- **Application domain:**
  - Different types of application system need different types of requirements engineering process

Process Model

- A process model is a simplified description of a process presented from a particular perspective.
- There may be several different models of the same process.
- No single model gives a complete understanding of the process being modeled.

Variations in Process Model

A process model is produced on the anticipated need for that model. We may need

- A model to help explain how process information has been organized.
- A model to help understand and improve a process.
- A model to satisfy some quality management standard.

THANK YOU

Dr. Syed Muazzam Ali Shah
muazzam.ali@nu.edu.pk