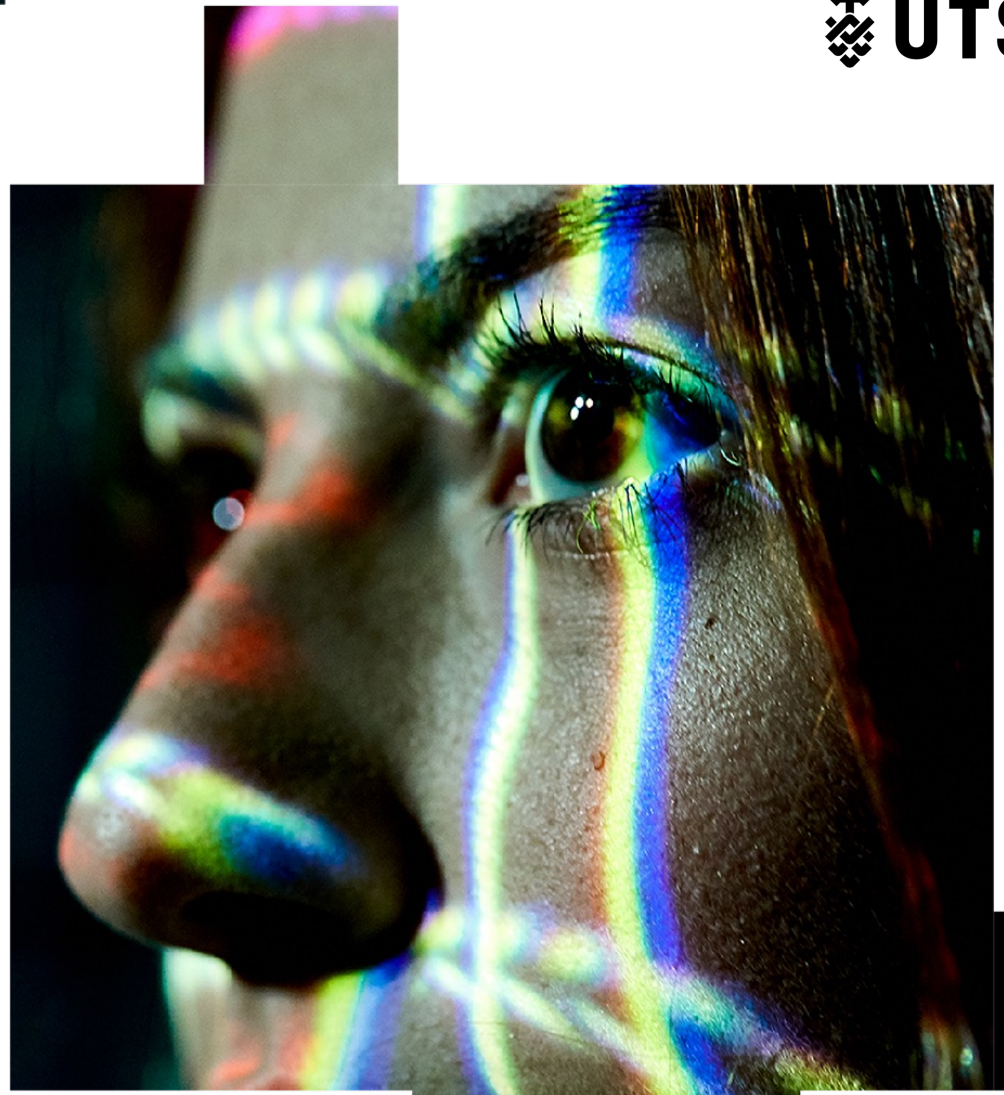
Requirements Elicitation



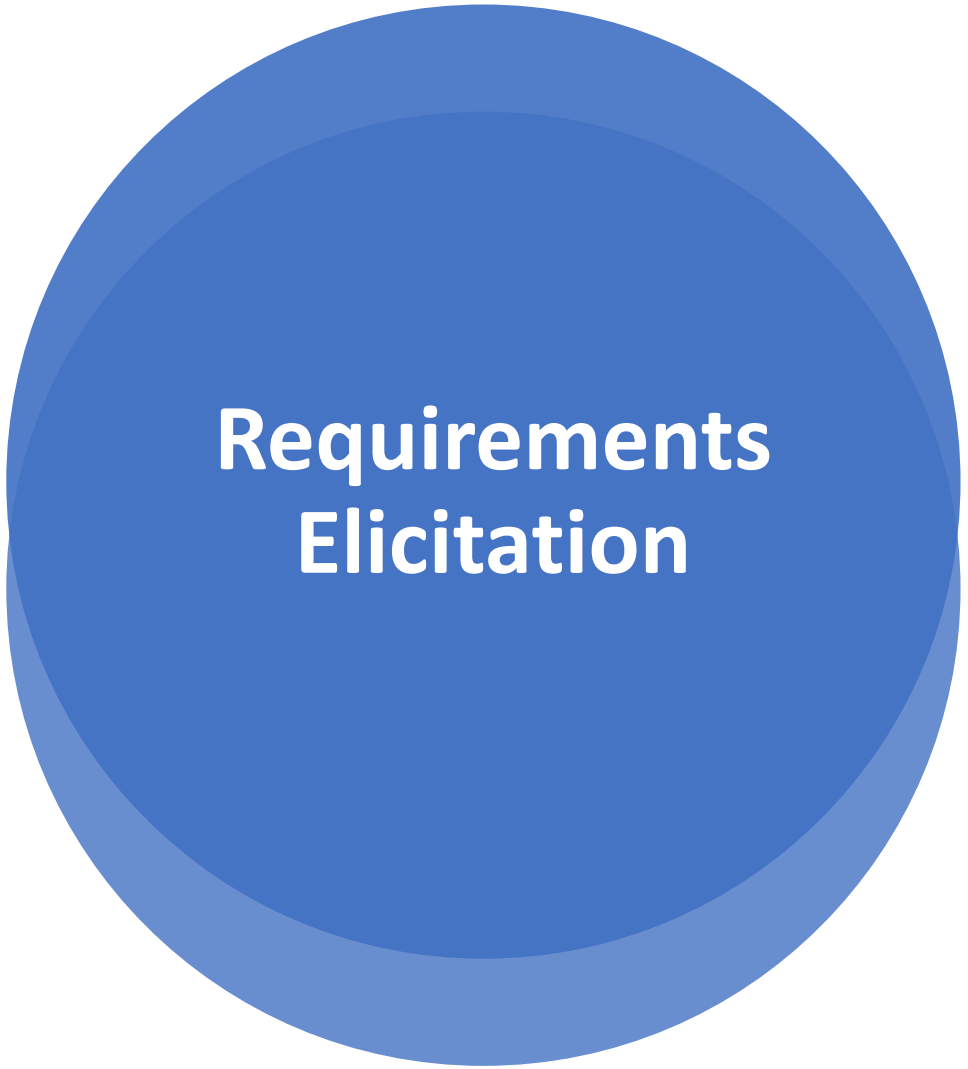
SSTC 2022
Module 2 – Lecture 1

Dr. Salvatore Flavio Pileggi

SalvatoreFlavio.Pileggi@uts.edu.au
https://www.uts.edu.au/staff/salvatoreflavio.pileggi

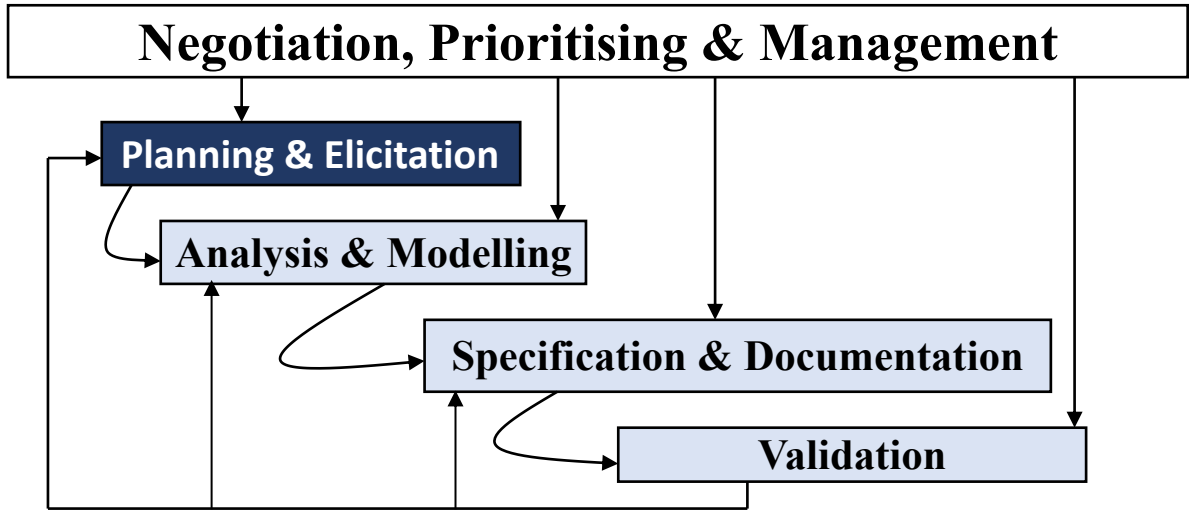
School of Computer Science, Faculty of Engineering and IT
University of Technology Sydney (Australia)

- Elicitation Process
- Present vs Future System
- Elicitation Techniques



Objectives

- Plan for and carry out **elicitation of requirements from stakeholders** and other sources
- Understand the **benefits and drawbacks of** different **elicitation techniques**
- Identify **appropriate technique** for eliciting requirements for a given system and situation
- Understand the differences between requirements elicitation for **existing systems** vs the **new system**



The Elicitation Process

Requirements Engineering

Elicitation

- Process of **seeking, uncovering, acquiring, and elaborating** requirements
- Requirements are elicited **rather than just captured or collected**. This implies a continuous discovery, as well as emerging elements or new aspects in the process.
- It involves humans so it is understood as a **complex process** composed of different activities.
- A variety of available **techniques, approaches, and tools** can be adopted.
- We need to identify the various **sources of requirements**. Hence we need to identify and analyze all the relevant stakeholders.

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Elicitation

The following **activities** should be included in any requirements elicitation process:

- **Understanding** the application domain & the properties of the existing system
- **Identifying** the sources of requirements
- **Analyzing** all the relevant stakeholders
- **Selecting** the most appropriate techniques, approaches and tools

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Key Message

You need to have sufficient **understanding of "what"** to build **before** figuring out exactly **"how" to build it**…

You need to identify all relevant stakeholders and communicate with them to **learn what to build**…

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Conflicting Requirements

- Stakeholders may have **differing or conflicting requirements**
- Not understanding stakeholder differences can lead to a **wrong understanding of actual requirements**
- Unless there is an understanding of what causes the conflicts, it is very difficult to determine appropriate **trade-offs**
- **Facilitate communication** between the stakeholders who are in conflict over the requirement in order to resolve the issue.
- Conflicts may be resolved through **formal meetings** among affected stakeholders, through research, resolution by a third party, or other methods as appropriate.

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Challenges

The process extensively relies on information from people….

Present vs Future System

Requirements Engineering

Present vs Future System

I. Get a **clear understanding** of:

[Context]

- The overall **objectives** of the enterprise
- What do stakeholders **want to achieve**

[Present vs Future]

- How the business is operating at **present**
- How people are working right now and **what they cannot do with the existing system**
- The **problems** with and **inadequacies** of the current system

II. Hence, **discover** the “new requirements”

Approaches, Techniques & Tools

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Techniques

Typical techniques for eliciting requirements:

- **Interviews**
- **Questionnaires/Survey**
- **Observation**
- **Prototyping**
- **Workshops**

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Techniques

- An interview is a **systematic approach** designed to formally or informally **direct questions to a stakeholder**
- **One-on-one interviews** are typically most common. Managing **group interview** may require some more sophisticated model.
- Requires **experience and sensitivity**, good planning/design, good interpersonal skills and an alert and responsive frame of mind.
- **Biases and predispositions** of the interviewer may interfere with a free exchange of information.
- Used to **explore issues** and can collect some quantitative, but mostly qualitative, data.
- **Structured Interviews** assume a pre-defined set of questions, while in **unstructured interviews** the interviewer and the interviewee discuss topics of interest in an open-ended way without any pre-defined questions.

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Interviews

+ Interviews allow the interviewer and participant to have full **discussions and explanations** of the questions and answers.
+ **Personal contact** allows responsiveness and adapting to what the user says.
+ They provide **great insight and probe** (if well conducted)
+ A reasonable level of **confidentiality and privacy** can be negotiated and maintained.

- Can be time **consuming and costly**
- Requires considerable **commitment and involvement of the participants**.
- Can be subject to **bias**
- If **conflicting information** is given, it can be difficult to resolve
- There is a risk of unintentionally leading the interviewee

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Surveys/Questionnaires

- A **questionnaire or "survey"** is composed of a number of standard questions that can be sent to obtain information from a large number of people
- Normally they aim at quantitative data (but it is possible to collect also qualitative data).
- They are also appropriate for systems that will be used by the general public and where the analyst has to investigate all the types of users of the system.

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Surveys/Questionnaires

+ An **economical** and quick method of gathering data from a large sample
+ **Can reach many people** with low resource – i.e. online
+ Can be **administered remotely**
+ **Easy to analyse**
+ **High level of privacy** can be automatically assured

- Effective questionnaires are **hard to design** (e.g. leading questions, misinterpretation of questions).
- The response rates for surveys are often too low for statistical significance.
- There is **no automatic way of follow up**

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Observation

- The analyst directly **observes** the actual **system behaviour** and the execution of **existing processes** by the users, usually without interference.
- Seeing the environment and domain where the system will be situated in action gives **additional perspectives and a better understanding**.
- Observation also allows us to **verify** (**or disprove) statements** made in interviews and surveys to determine whether the procedures within the domain really operate as they were described.
- It may be **useful in situations of conflicting information** emerged during the process.

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Observation

+ Provides **first hand experience** of the way the current system works
+ Data is collected in real time and can have a high level of validity
+ Can be used to **verify information** from other sources or to look for exceptions
+ Baseline data about the performance of the existing system and of users can be collected

- Sometimes **time consuming**
- **Most people do not like to be observed** and may be disruptive to the person being observed
- Requires **trained and skilled observer** to be most effective
- **Ethical problems and privacy issues**
- **Unusual exceptions and critical situations may not occur during the observation**

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Prototyping

- A prototype is an **initial working model** of a larger, more complex entity, usually a program with limited functionality that is built to test out some aspect of **how the final system will work (and look like)** and then present it to the stakeholders**.**

- Prototypes may be constructed with **various objectives** in mind:
  - To investigate user requirements
  - To test specific concept or verify an approach
  - To focus on human-computer interface

Requirements Engineering

Prototyping

+ A prototype allows for **early user interaction and feedback**.
+ Can be **relatively inexpensive**
+ Vehicle for designers and developers to **further learn about the users' interface needs** and to evolve system requirements accordingly

– Depending on the complexity of the target system, using prototyping to elicit requirements can take **considerable time**

– A prototype may lead users to develop **unrealistic expectations** regarding the delivered system's performance, completion date, reliability and usability characteristics. This is because an elaborated, detailed prototype can look a lot like a functional system.

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Workshops

- The objective is to compress all of the activities involved in other fact finding techniques into a shorter series of **workshop sessions** with users and project team members.

- A workshop may be used to **scope, discover, define, refine, update, prioritize and reach closure** on requirements for the target system.

- A workshop may be used **to generate ideas for new features or products, to reach consensus on a topic or conflicting views, or to review requirements**.

- **Organised process:** uses techniques such as brain storming, empathy mapping, etc.

Requirements Engineering

Workshops

+ **Very successful** in reducing project development efforts and shortening the schedule.
+ **Foster creativity**
+ To reach consensus on a topic or **conflicting views**
+ Is able to gauge reaction to **stimulus material** (e.g. storyboards, screenshots).
+ Provide a means for stakeholders to **collaborate, make decisions and gain a mutual understanding** of requirements.

- **Risk involved in speeding up the decisions**.
- Sometimes the **decisions** made about the requirements are **not optimal**
- **Critical roles** (e.g. moderator) as well as **hierarchies** (or other existing dynamics among participants) and **personalities** may affect results
- Require accurate design to **focus on the goal(s)**


Thank You!