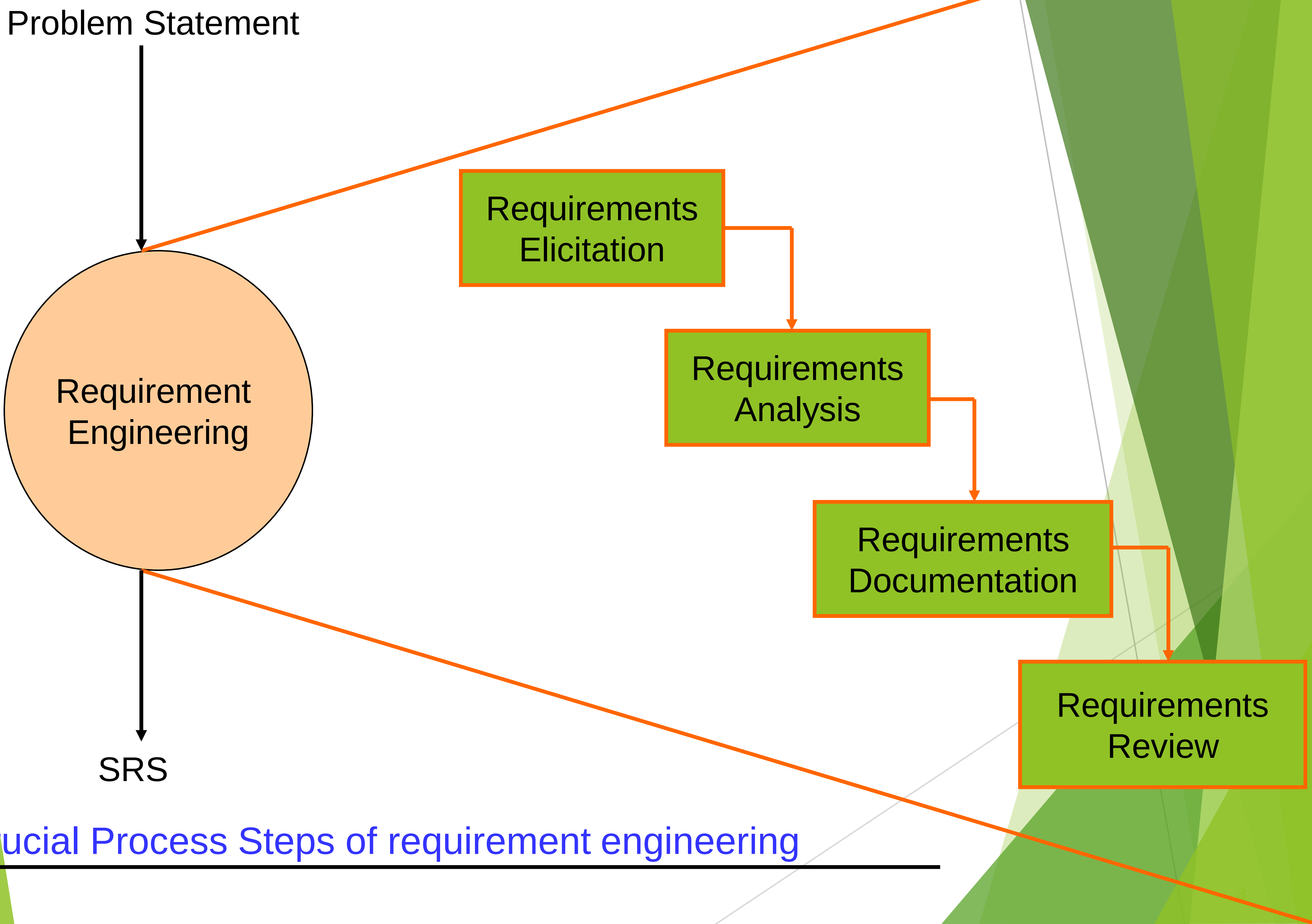
Software Requirements Analysis and specification

Requirements describe

What not **How**

Produces one large document written in natural language contains a description of what the system will do without describing how it will do it.



Crucial Process Steps of requirement engineering

Requirements Documentation

This is the way of representing requirements in a consistent format

SRS serves many purpose depending upon who is writing it.

-- written by customer

-- written by developer

Serves as contract between customer & developer.

Requirements Documentation

Nature of SRS

Basic Issues

- Functionality
- External Interfaces
- Performance
- Attributes
- Design constraints imposed on an Implementation

Need for SRS

- The users and the client get a brief idea about the software while in the initial stages.
- The purposes and the intentions as well as the expected results are properly defined. It hence lays the outline for software design.
- The desired goals are defined thereby easing off the efforts of the developers in terms of time and cost.
- It forms a basis for the agreement between the client and the developer.
- It becomes easier while transferring and using the solution elsewhere or with new customers as the basis of functioning of the software is mentioned.
- It acts as a material for reference at a later stage.
- It acts as the basis for reviews.

Requirements Documentation

SRS Should

-- Correctly define all requirements

-- not describe any design details

-- not impose any additional constraints

Requirements Documentation

Characteristics of a good SRS

An SRS Should be

✓ Correct

✓ Unambiguous

✓ Complete

✓ Consistent Ranked for important and/or stability

✓ Verifiable

✓ Modifiable

✓ Traceable

Requirements Documentation

Correct

An SRS is correct if and only if every requirement stated therein is one that the software shall meet.

Unambiguous

An SRS is unambiguous if and only if, every requirement stated therein has only one interpretation.

Complete

An SRS is complete if and only if, it includes the following elements

(i) All significant requirements, whether related to functionality, performance, design constraints, attributes or external interfaces.

Requirements Documentation

(ii) Responses to both valid & invalid inputs.

(iii) Full Label and references to all figures, tables and diagrams in the SRS and definition of all terms and units of measure.

Consistent

An SRS is consistent if and only if, no subset of individual requirements described in it conflict.

Ranked for importance and/or Stability

If an identifier is attached to every requirement to indicate either the importance or stability of that particular requirement.

Requirements Documentation

Verifiable

An SRS is verifiable, if and only if, every requirement stated therein is verifiable.

Modifiable

An SRS is modifiable, if and only if, its structure and style are such that any changes to the requirements can be made easily, completely, and consistently while retaining structure and style.

Traceable

An SRS is traceable, if the origin of each of the requirements is clear and if it facilitates the referencing of each requirement in future development or enhancement documentation.

Requirements Documentation

Organization of the SRS

IEEE has published guidelines and standards to organize an SRS.

First two sections are same. The specific tailoring occurs in section-3.

1. Introduction

1.1 Purpose

1.2 Scope

1.3 Definition, Acronyms and abbreviations

1.4 References

1.5 Overview

Requirements Documentation

2. The Overall Description

2.1 Product Perspective

- 2.1.1 System Interfaces
- 2.1.2 Interfaces
- 2.1.3 Hardware Interfaces
- 2.1.4 Software Interfaces
- 2.1.5 Communication Interfaces
- 2.1.6 Memory Constraints
- 2.1.7 Operations
- 2.1.8 Site Adaptation Requirements

Requirements Documentation

2.2 Product Functions
2.3 User Characteristics
2.4 Constraints
2.5 Assumptions for dependencies
2.6 Apportioning of requirements

3. Specific Requirements

3.1 External Interfaces
3.2 Functions
3.3 Performance requirements
3.4 Logical database requirements
3.5 Design Constraints
3.6 Software System attributes
3.7 Organization of specific requirements
3.8 Additional Comments.