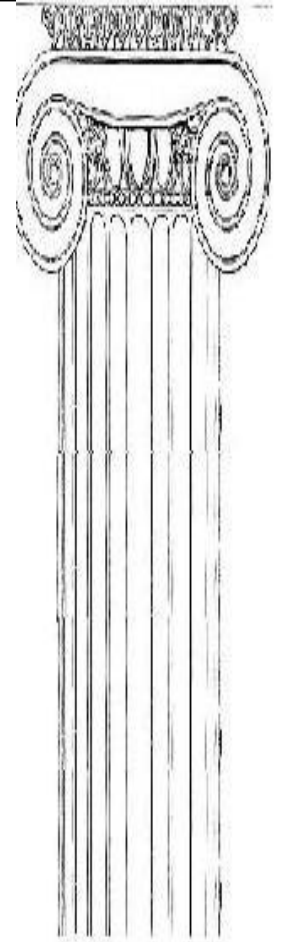
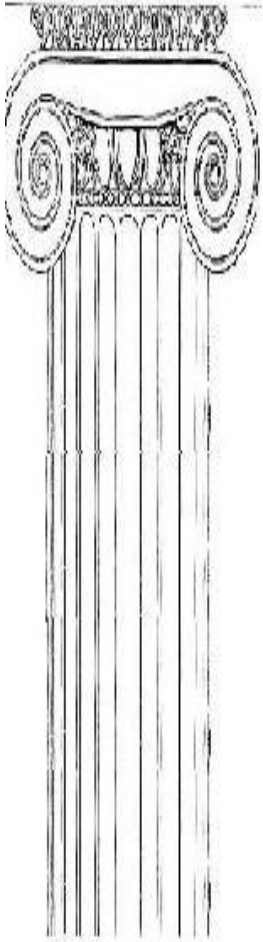


Software Requirements: Application of fundamental principles

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Agenda

- Introduction
- List of fundamental principles of software engineering
- SWEBOK - Software Requirements : The presence of fundamental principles
- Process of application of the fundamental principles:
Example
- Discussion

Introduction

- SWEBOK - Software Requirements
The Software Requirements KA (KA) is composed of four phases of software requirements: elicitation, analysis, specification and validation.
- 9 fundamental principles
- How to apply these 9 fundamental principles?

Fundamental principles of software engineering

#	Vincenti, IEEE and ACM mapping
1	Apply and use quantitative measurements in decision making
2	Build with and for reuse
3	Grow systems incrementally
4	Implement a disciplined approach and improve it continuously
5	Invest in the understanding of the problem
6	Quality is the top priority; long term productivity is a natural consequence of high quality
7	Since change is inherent to software, plan for it and manage it
8	Since tradeoffs are inherent to software engineering, make them explicit and document it
9	To improve design, study previous solutions to similar problems

SWEBOK - Requirements: Presence of fundamental principles

Software requirements Subareas	Software requirements Topic	Engineering fundamental principles
Software requirement fundamentals	Definition of a software requirement	
	Product and process requirements	
	Functional & nonfunctional requirement	
	Emergent properties	
	Quantifiable requirements	#1,
	System requirements and software requirements	
Requirement Process	Process models	#4,
	Process actors	#4,
	Process support and management	#4,
	Process quality and improvement	#4, #6

SWEBOK Requirements: Presence of fundamental principles Cont.

Software requirements Subareas	Software requirements Topic	Engineering fundamental principles
Requirements elicitation	Requirements sources	#3, #4,#5
	Elicitations techniques	#3, #4,#5
Requirements Analysis	Requirements classification	#3, #4,#5
	Conceptual modeling	#2,#3, #4,#5
	Architectural design and requirements allocation	#2,#3, #4
	Requirement negotiation	#3, #4,#5,#8
Requirements specification	System definition document	#3, #4
	Systems requirement specification	#3, #4
	Software requirement specification	#3, #4
Requirements validation	Requirement reviews	#3, #4, #6
	Prototyping	#3, #4, #6
	Model validation	#3, #4, #6
	Acceptance test	#2,#3,#4, #6

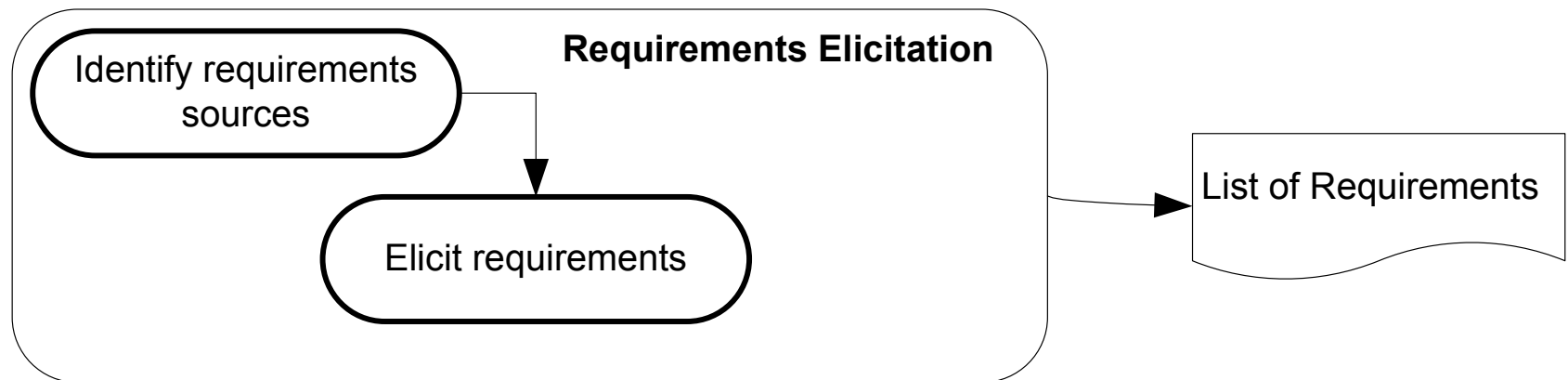
SWEBOK Requirements: Presence of fundamental principles (Cont.)

Software requirements Subareas	Software requirements Topic	Engineering fundamental principles
Practical Considerations	Iterative nature of the requirement process	#7,
	Change management	#7,
	Requirement attributes	#7,
	Requirements tracing	#7,
	Measuring requirements	#1,

Process of application of the fundamental principles: Example

Principle 4: Implement a disciplined approach & improve it continuously

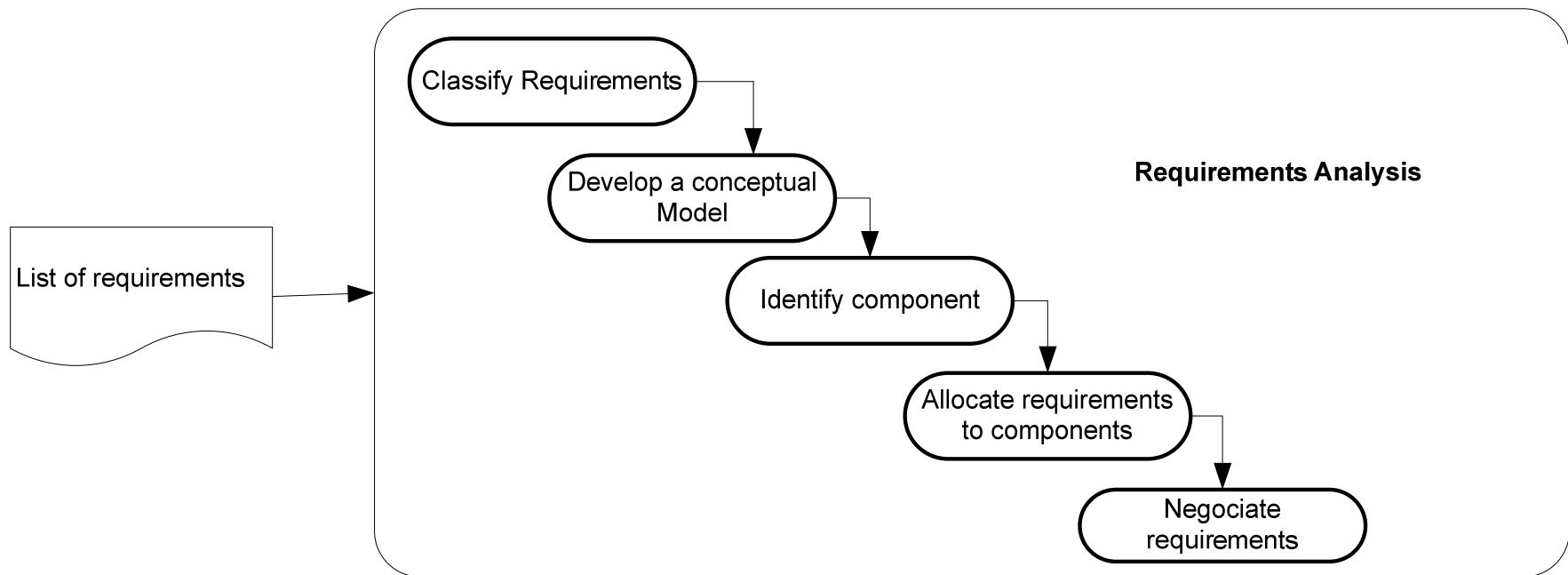
Phase 1 Requirements elicitation



Process of application of the fundamental principles: Example

Principle 4: Implement a disciplined approach & improve it continuously

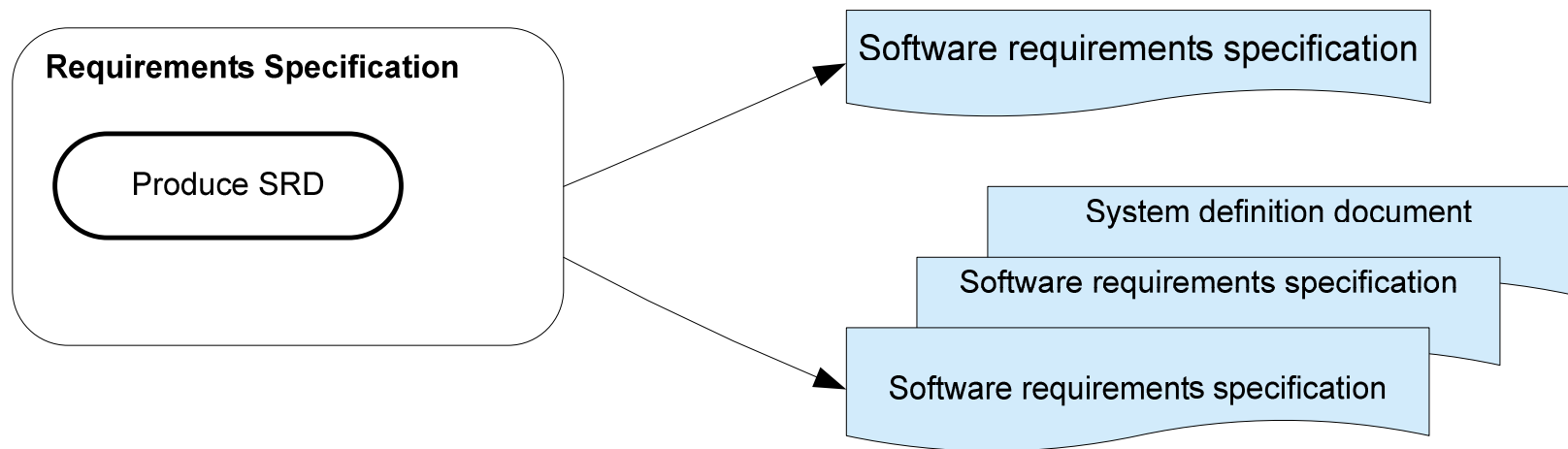
Phase 2: Requirements Analysis



Example (Cont.)

Principle 4: Implement a disciplined approach & improve it continuously

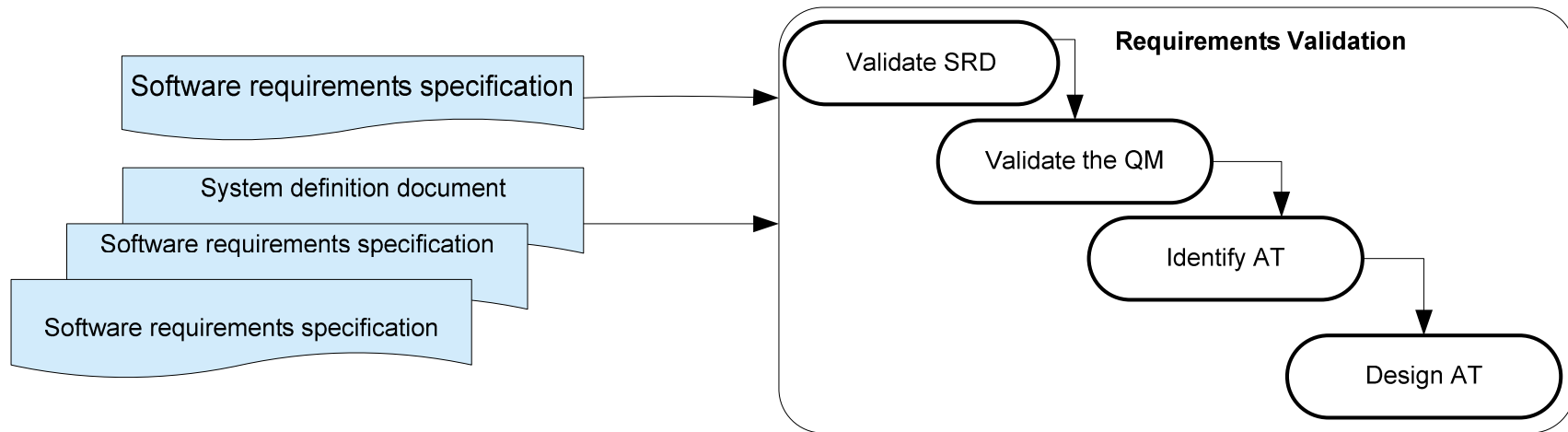
Phase 3: Requirements Specification



Example (Cont.)

Principle 4: Implement a disciplined approach & improve it continuously

Phase 4: Requirements Validation



References

Questions



Discussion

- **Analysis of the presence of the fundamental principles in the SWEBOK**
- **Do you think that the nine fundamental principles listed in the table below are all present in the requirement KA?**
 - **Which one is explicitly present?**
 - **Which one is implicitly present?**

Discussion Cont.

- **At which level of presence?**
- **At which level of absence?**
- **Do you think that the process of application of fundamental principle should be a systematic process and why?**