RE Concepts, System & Context Boundaries, Elicitation, Stakeholders

Lecture 2, DAT230, Requirements Engineering
Robert Feldt, 2012-09-05

Recap

- Software Engineering is more than technology
- RE in particular: human-centered => multi-disciplinary
- RE mistakes very costly
- No matter which process: Requirements still key
- Engineers focus on solutions - RE on problem domain
  - Constant “battle” - never enough time/resources
- RE is more than writing requirements
- Req = need/characteristic/property of system
- Types: Functional, Quality/NFR, Dev Constraints

Basic concepts and activities

www.certified-re.de/fileadmin/IREB/Download/Homepage%20Downloads/IREB_CPRE_Glossary_13.pdf

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IREB International Requirements Engineering Board

Martin Glinz

A Glossary of Requirements Engineering Terminology

Version 1.3 August 2012

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James W. Moore, The MITRE Corp.

Editors
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Purpose: Consensus definition of what SE is and is not

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SWEBOK News

3 Additional KAs in SWEBOK V3 Open for Public Review

SWEBOK Guide V3 Refresh in Progress

Volunteers are in the process of refreshing the *Guide to the Software Engineering Body of Knowledge*—SWEBOK—adding new knowledge areas (KAs) and revising others. For the latest materials available for public review, please check our **SWEBOK V3 Public Review site**.

Three knowledge areas are currently available for public review (through September 28, 2012):

Table 1 The SWEBOK Knowledge Areas (KAs)

Software requirements
Software design
Software construction
Software testing
Software maintenance
Software configuration management
Software engineering management
Software engineering process
Software engineering tools and methods
Software quality

Guide to the Software Engineering Body of Knowledge
2004 Version

- Software Requirements
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  - Requirements Validation
  - Practical Considerations
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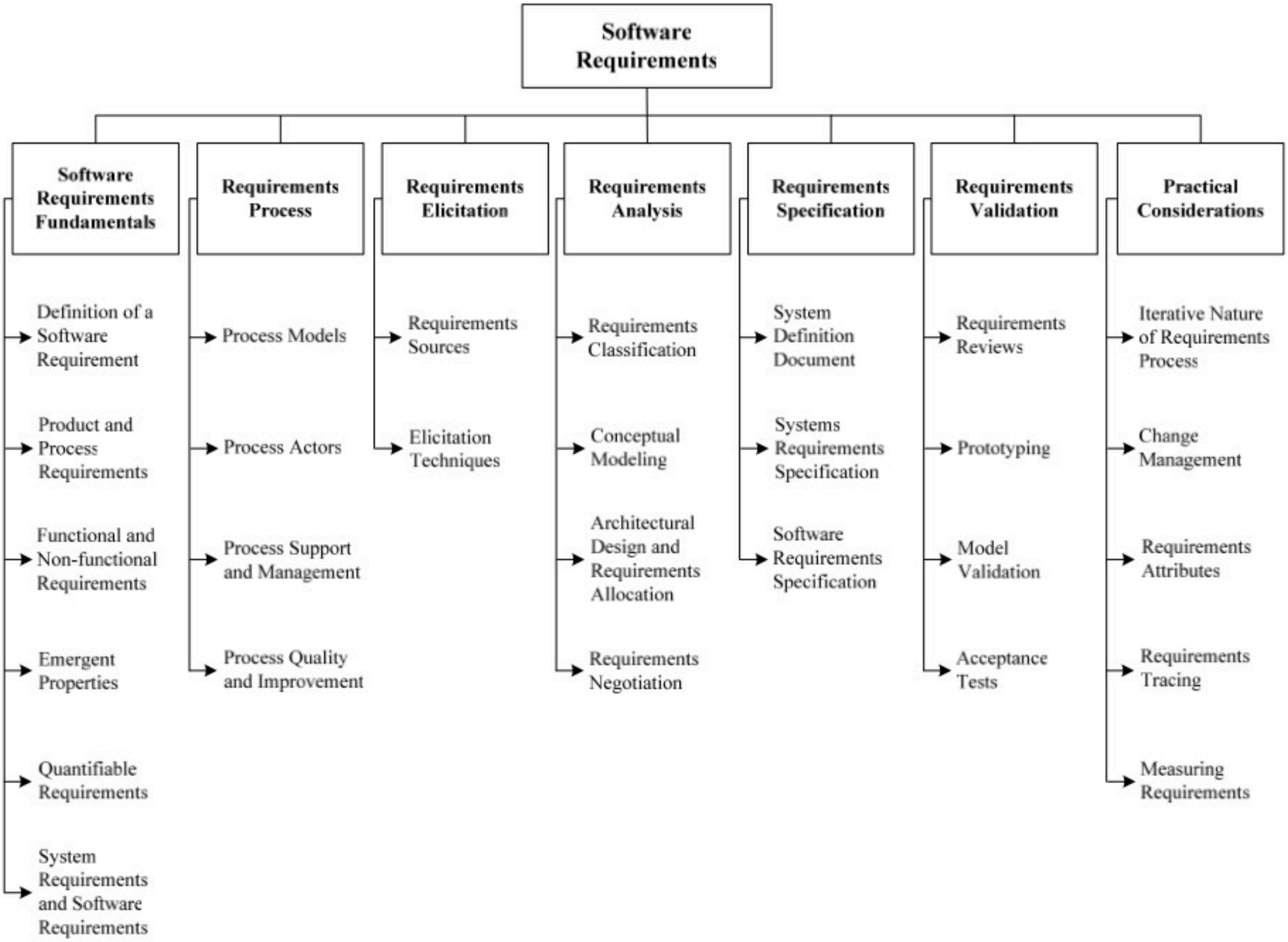
  - Software Structure and Architecture
  - Software Design Quality Analysis and Evaluation
  - Software Design Notations
  - Software Design Strategies and Methods
- Software Construction
  - Software Construction Fundamentals
  - Managing Construction
  - Practical Considerations
- Software Testing
  - Sofware Testing Fundamentals
  - Test Levels
  - Test Techniques
  - Test Related Measures
  - Test Process
- Software Maintenance
  - Software Maintenance Fundamentals
  - Key Issues in Software Maintenance
  - Maintenance Process
  - Techniques for Maintenance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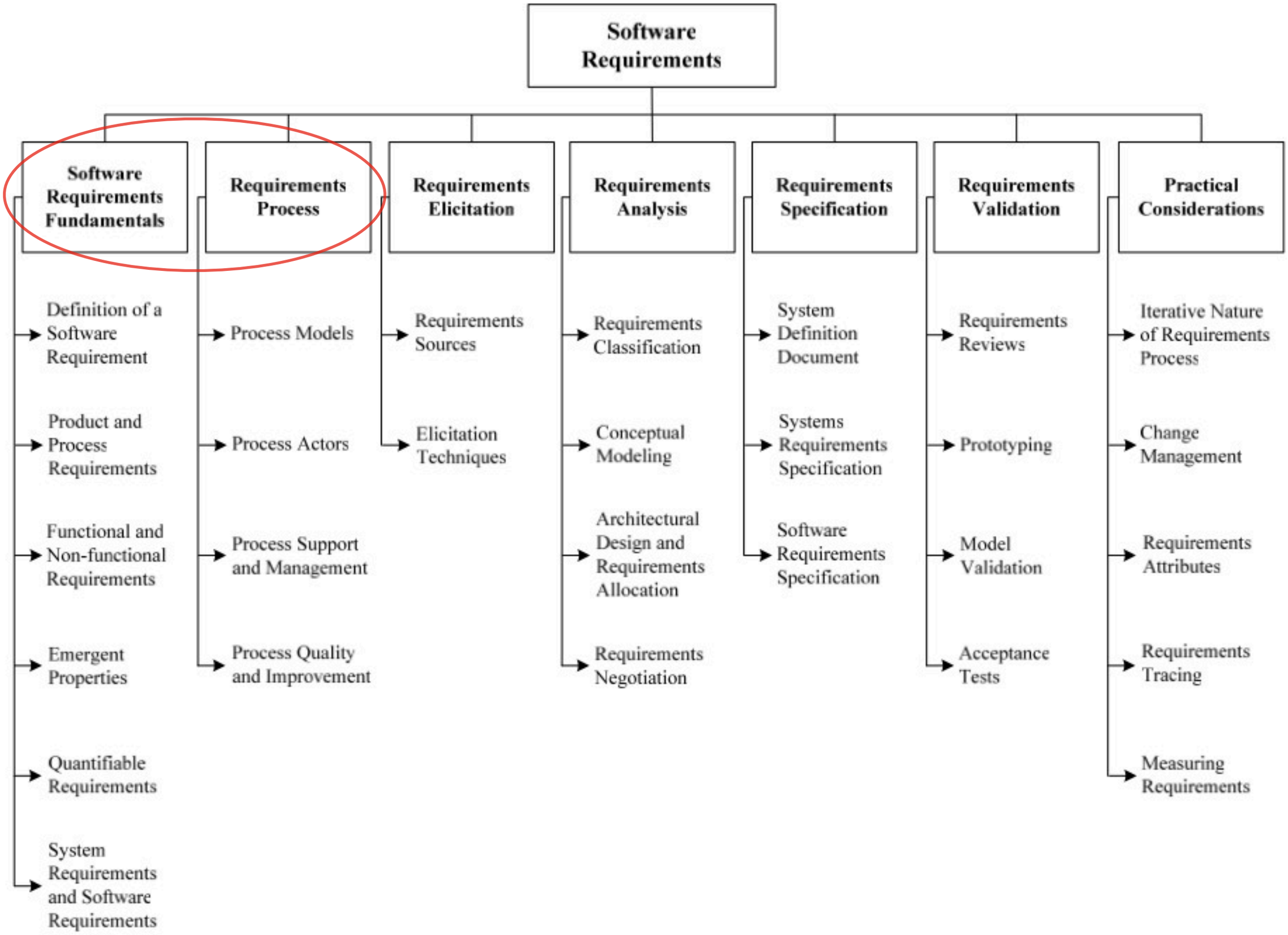
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Reqs have unique identifier for configuration control and management throughout lifecycle

SWEBOK KA1.1.2 Product & Process Reqs

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Product Req = req on software to be developed

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SWEBOK KA1.1.3 FR & NFR

Functional Req describes functions of SW

Non-Functional Reqs constrain the solution (also called Constraints or Quality Reqs)

SWEBOK KA1.1.4 Emergent Properties

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Some reqs represent Emergent Properties

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"The call center software must increase the center's throughput by 20%"

SWEBOK KA1.1.5 Quantifiable

Reqs stated clearly, unambiguously & quantitatively

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"The software shall be reliable"

"The probability of a fatal error during one hour of operation should be less than 10^-8"

"The software should be user-friendly"

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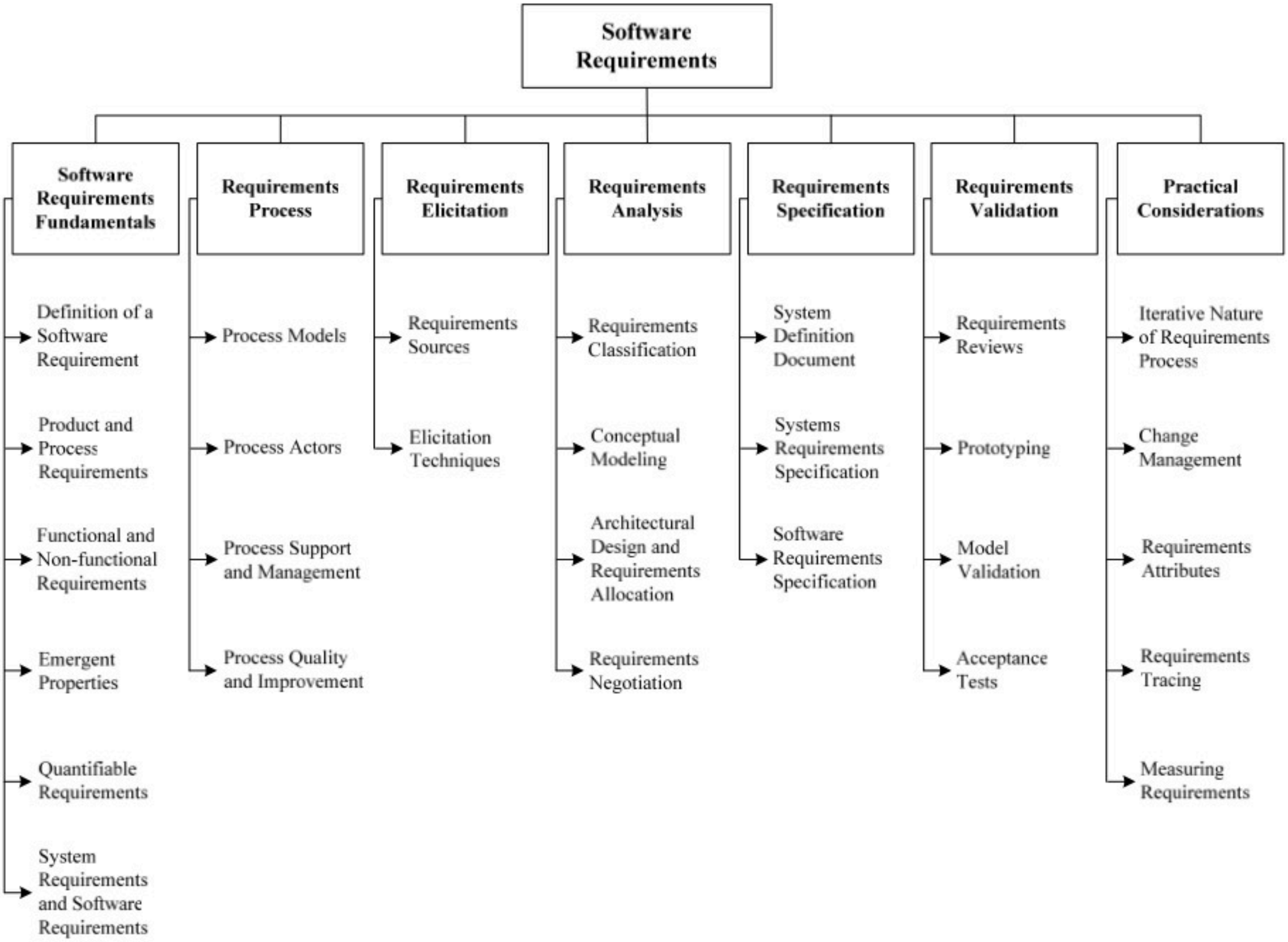
A system with software components has software requirements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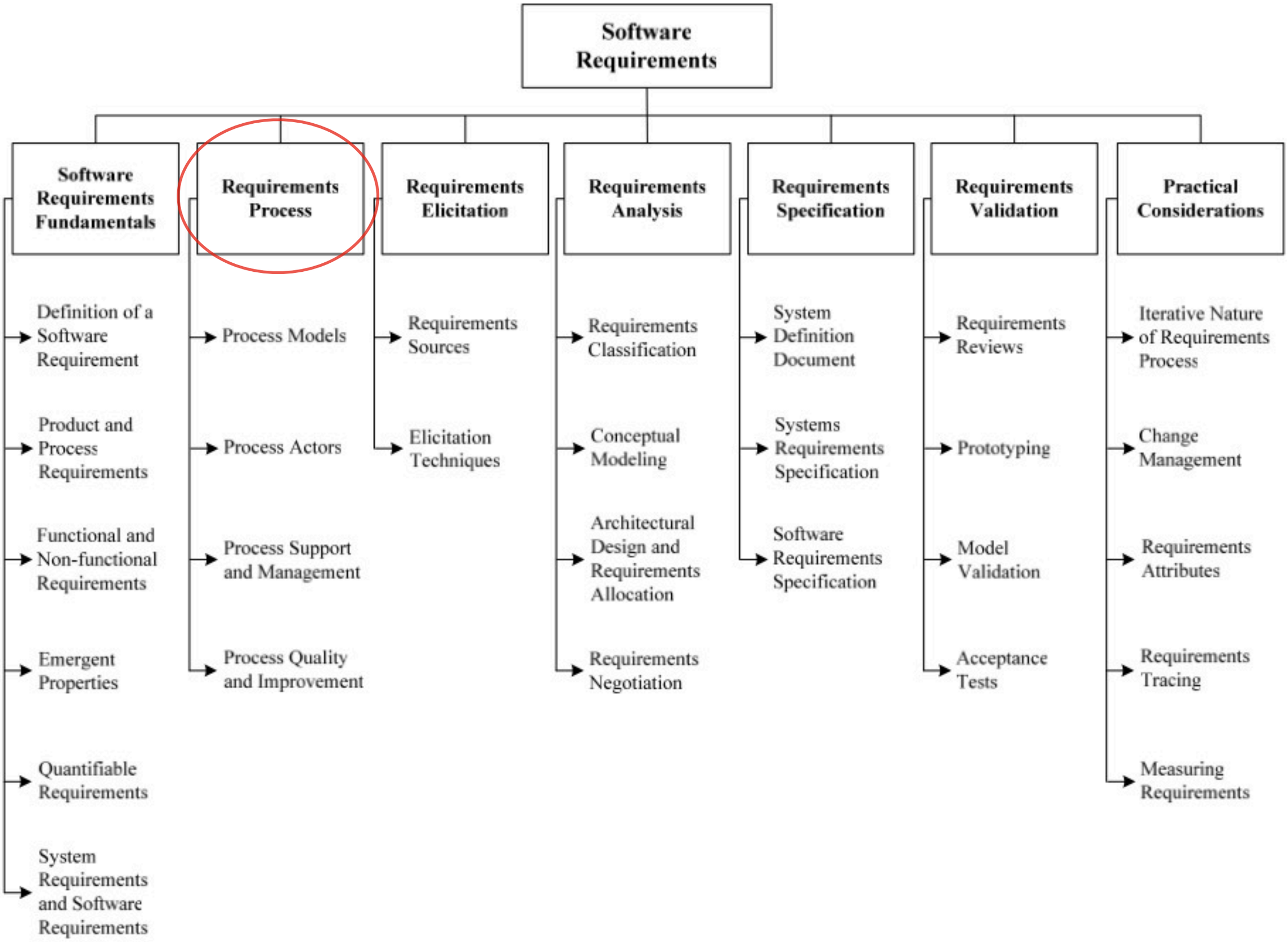
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Req Process configuration manages all reqs

Req Process needs adaptation to organization and project context

Req Process includes input activities like marketing and feasability studies

SWEBOK KA1.2.2 Process Actors

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Req specialist must mediate between domain of stakeholder and that of SE

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SW Engs job to negotiate trade-offs; not all stakeholders can be perfectly satisfied

What is Req Elicitation?

Requirements elicitation

The process of seeking, capturing and consolidating ↑requirements from available ↑requirements sources. May include the re-construction or creation of requirements.

Synonym: Requirements discovery

What is Req Elicitation?

"The art of determining the needs of stakeholders"

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What is Req Elicitation?

"The art of determining the needs of stakeholders"

"The process of discovering the requirements for a system by communication with stakeholders and through the observation of them in their domain"

Requirements elicitation

The process of seeking, capturing and consolidating ↑requirements from available ↑requirements sources. May include the re-construction or creation of requirements.

Synonym: Requirements discovery

What are the "Other sources"?

- Stakeholders are key but also DOMAIN knowledge
- Problem/application domain
  - What is the problem? Who can explain it?
  - Process descriptions? Mission statements?
- History
  - Previous & current systems/solutions
  - Documentation, Old reqs & designs

What are the “Other sources”?

- Competitors
  - Is/are there a (partial) solution(s) out there?
- Environment
  - Other systems?
  - Processes to be supported? Processes that influence?
  - Organizational descriptions?

Limits for Elicitation work?

System boundary

The boundary between a ↑system and its surrounding ↑context.

The system boundary separates the ↑system to be developed from its environment; i.e., it separates the part of the reality that can be modified or altered by the development process from aspects of the environment that cannot be changed or modified by the development process.

System context

The part of a ↑system's environment that is relevant for the definition as well as the understanding of the ↑requirements of a ↑system to be developed.

Context boundary

Boundary between the ↑context of a ↑system and those parts of the ↑application domain that are irrelevant for the ↑system and its ↑requirements.

The context boundary separates the relevant part of the environment of a system to be developed from the irrelevant part, i.e., the part that does not influence the system to be developed and, thus, does not have to be considered during requirements engineering.

What is a stakeholder?

Stakeholder A person or organization that has a (direct or indirect) influence on a ↑system's ↑requirements.

Indirect influence also includes situations where a person or organization is impacted by the system.

Stakeholder Identification

[Sharp1999]

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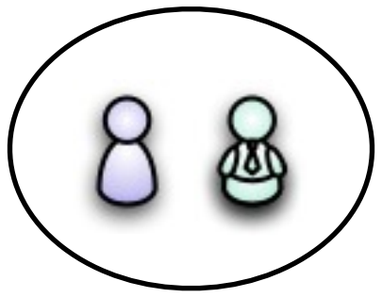

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Stakeholder Identification

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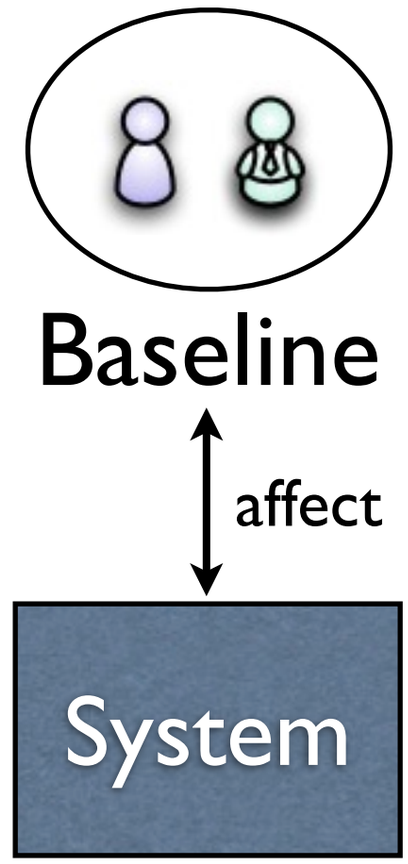

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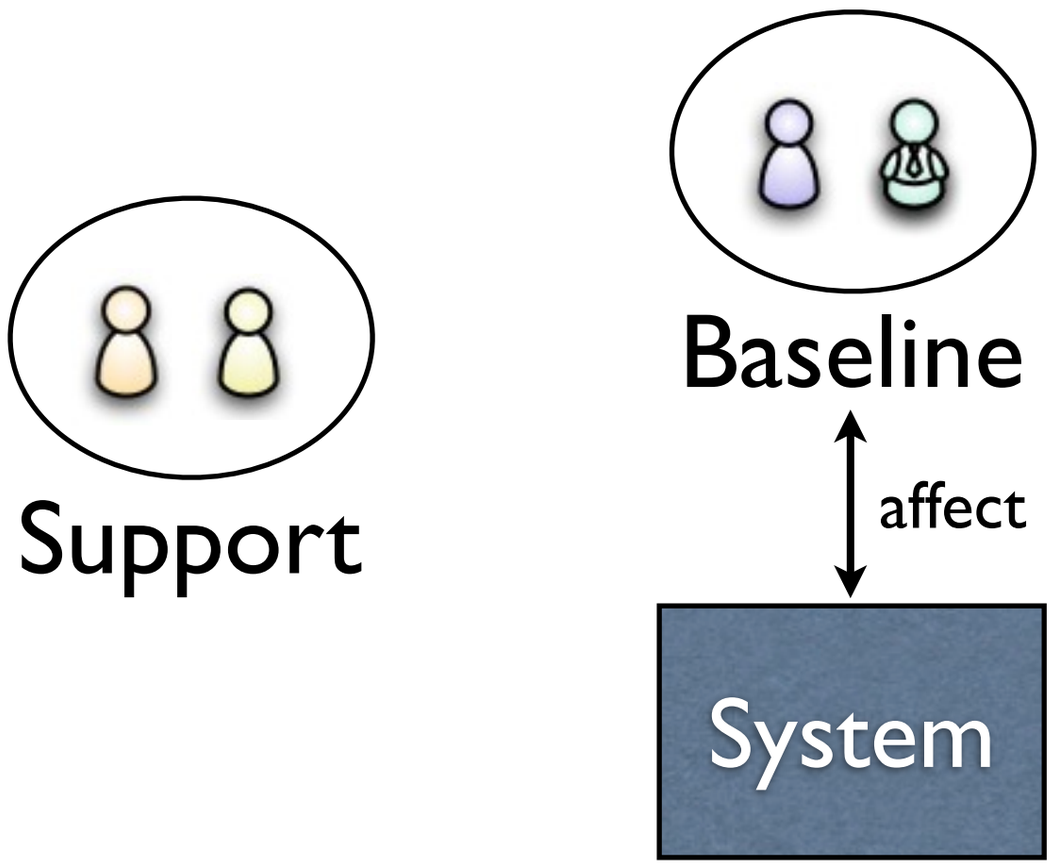

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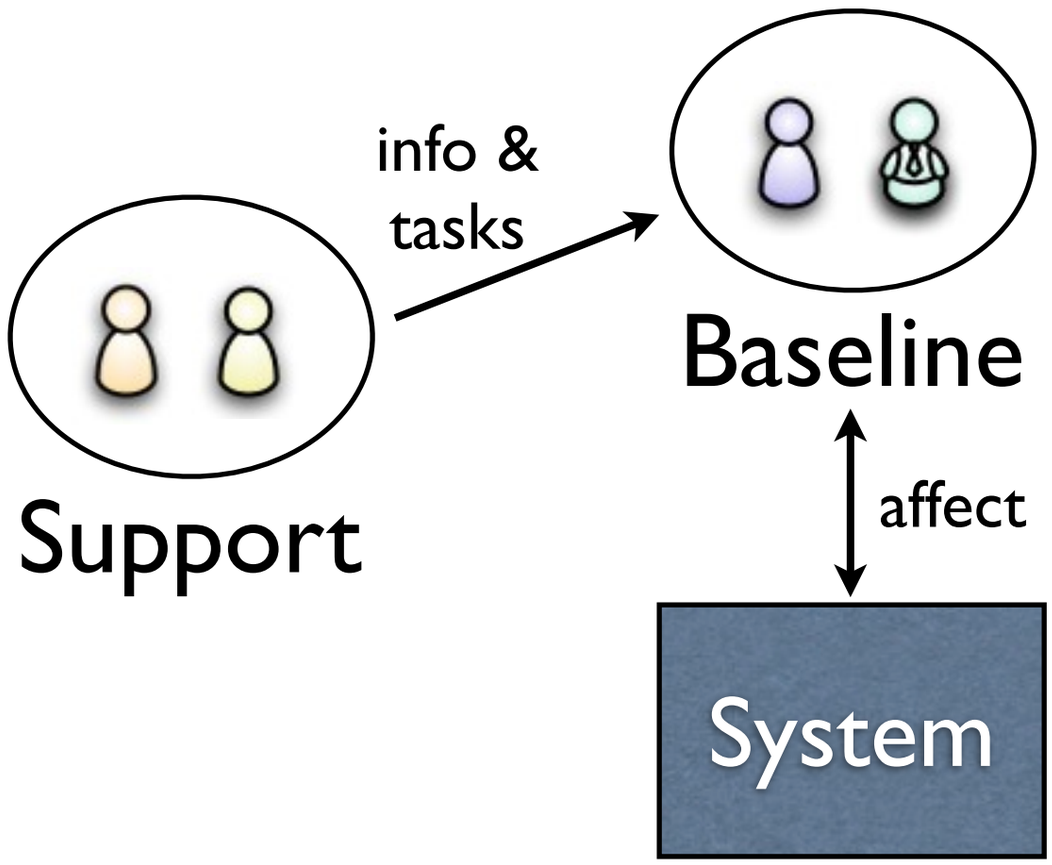

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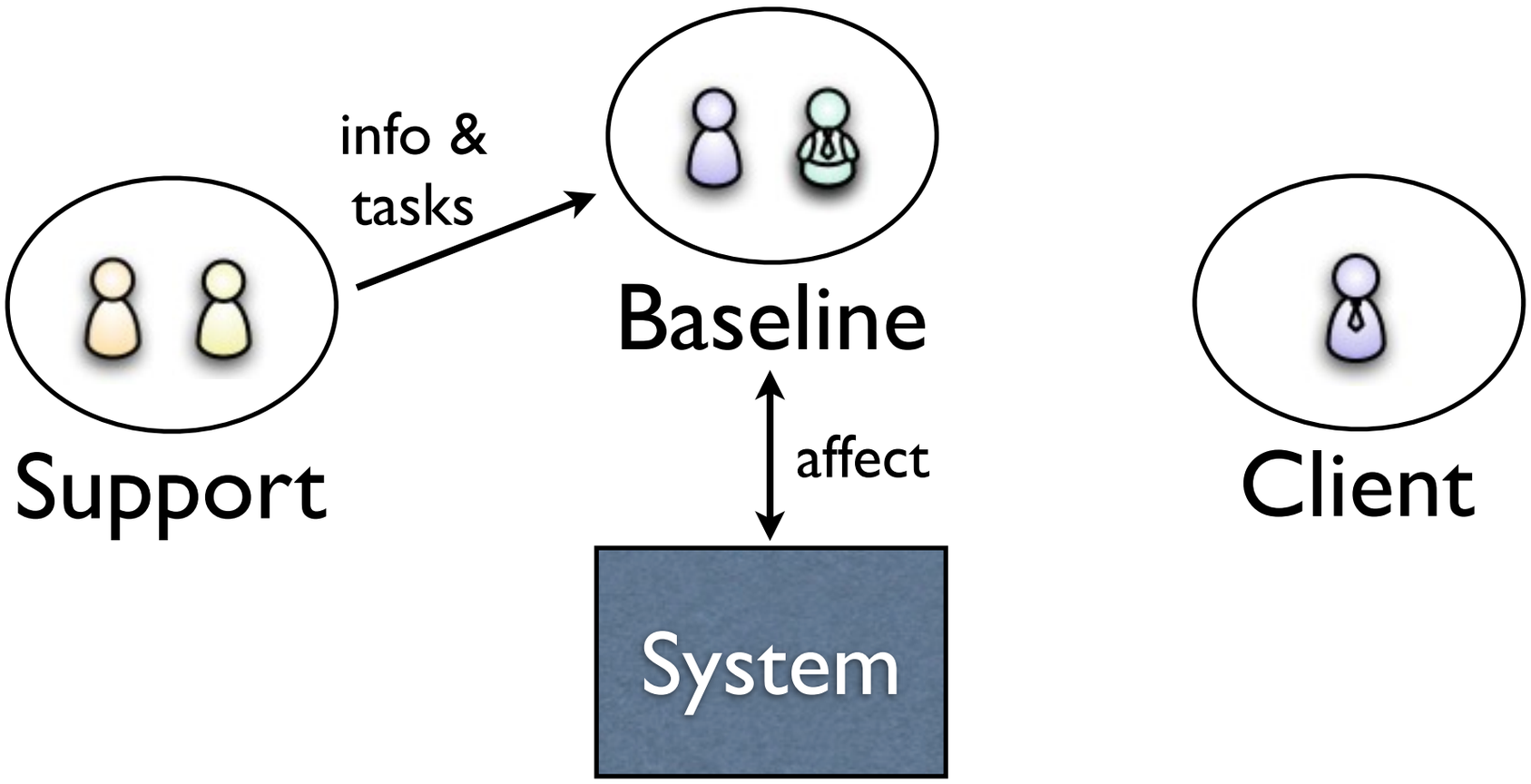

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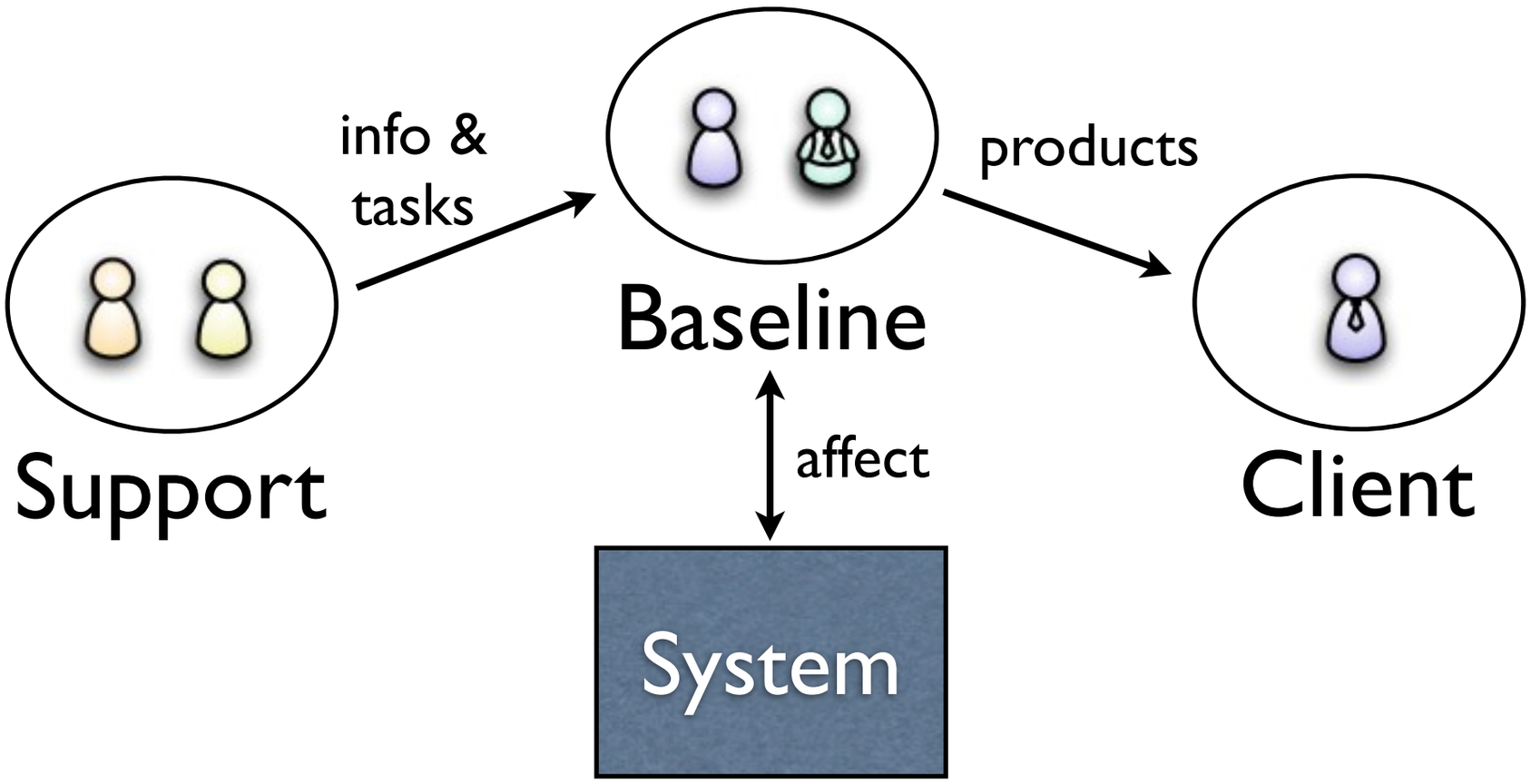

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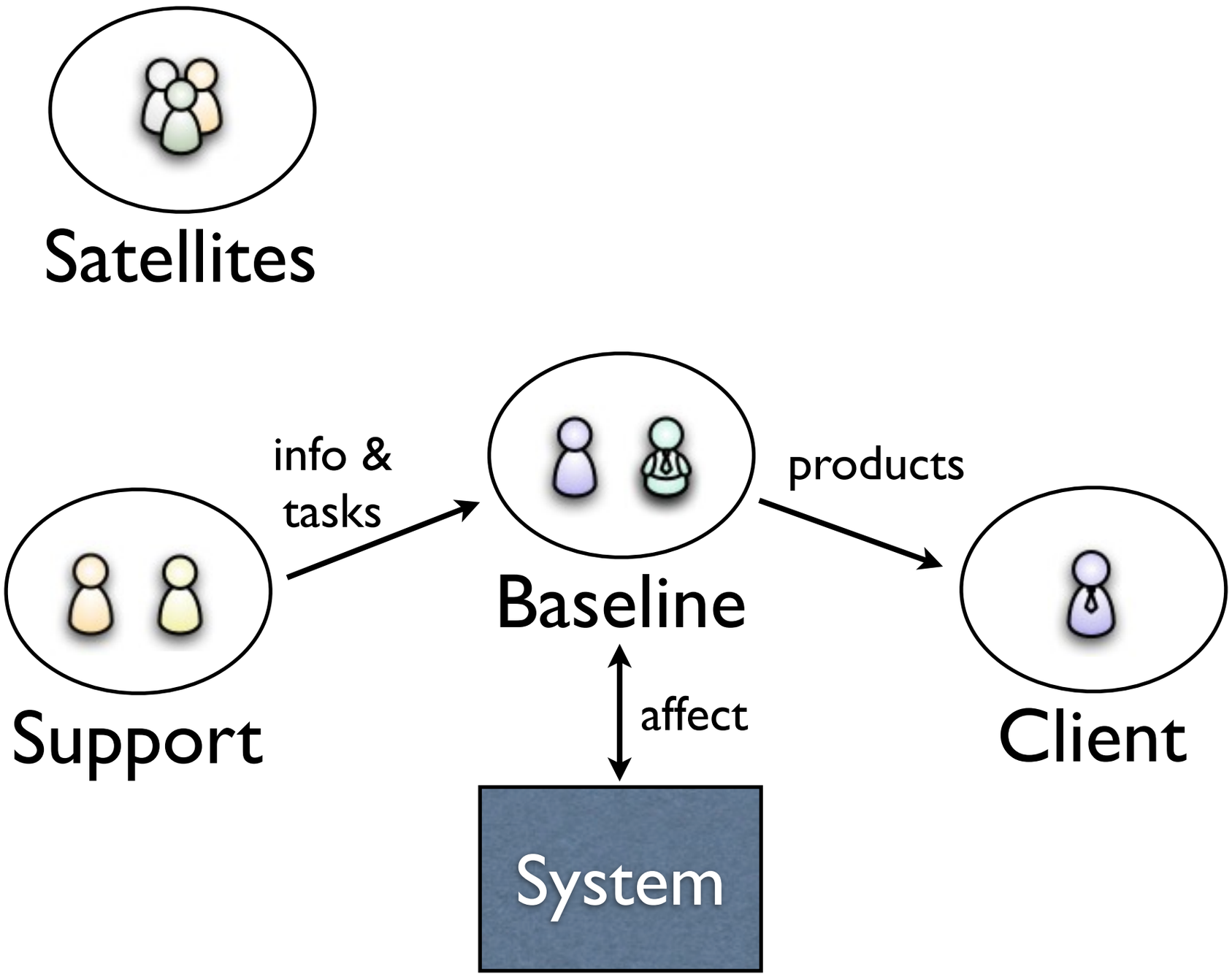

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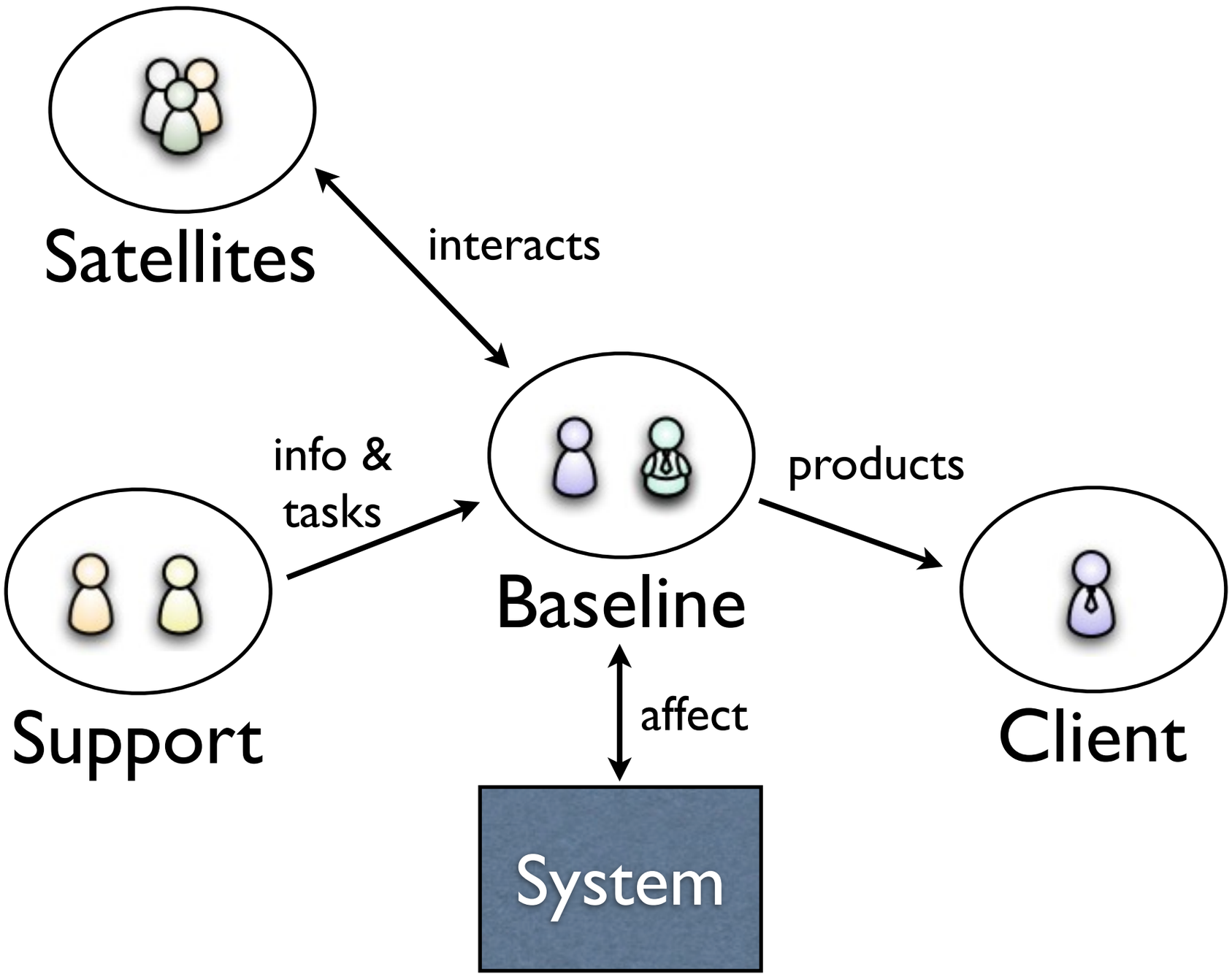

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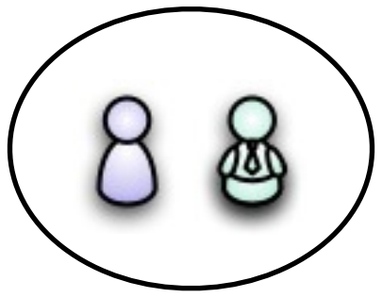

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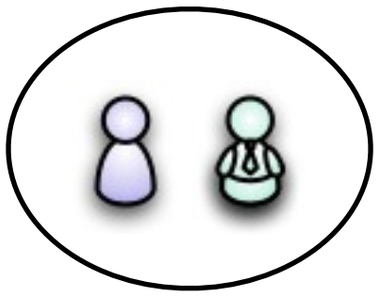

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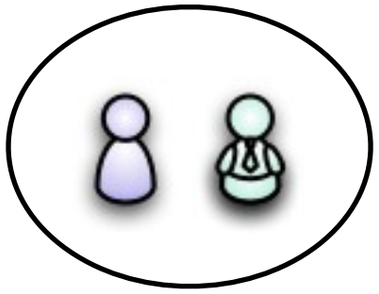

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Legislators - constrains the SW

Decision-makers - takes decisions

Stakeholder Identification

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Users - operate the SW

Frequent users, occasional users,
future & past users, users of products from sw

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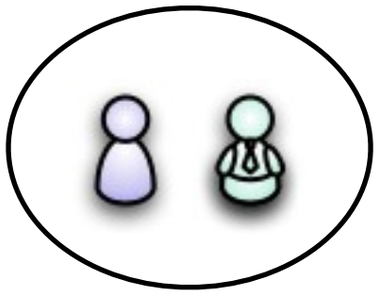

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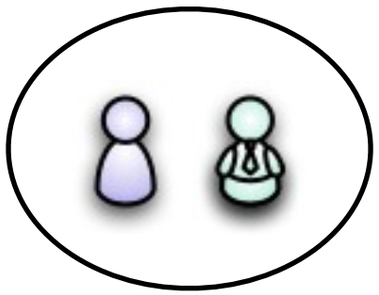

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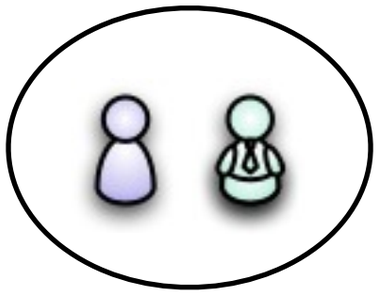

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Legislators - constrains the SW

Government, Community, Trade unions,
Legal representatives, Standard bodies (ISO, IEEE),
Auditors (TUV)

Decision-makers - takes decisions

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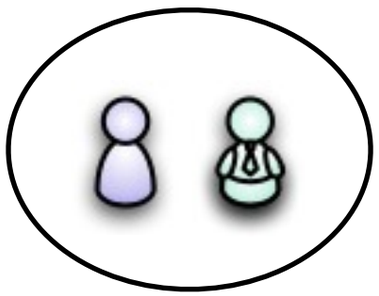

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Auditors (TUV)

Decision-makers - takes decisions

Dev & user managers,
Financial managers/controllers

Stakeholder Identification

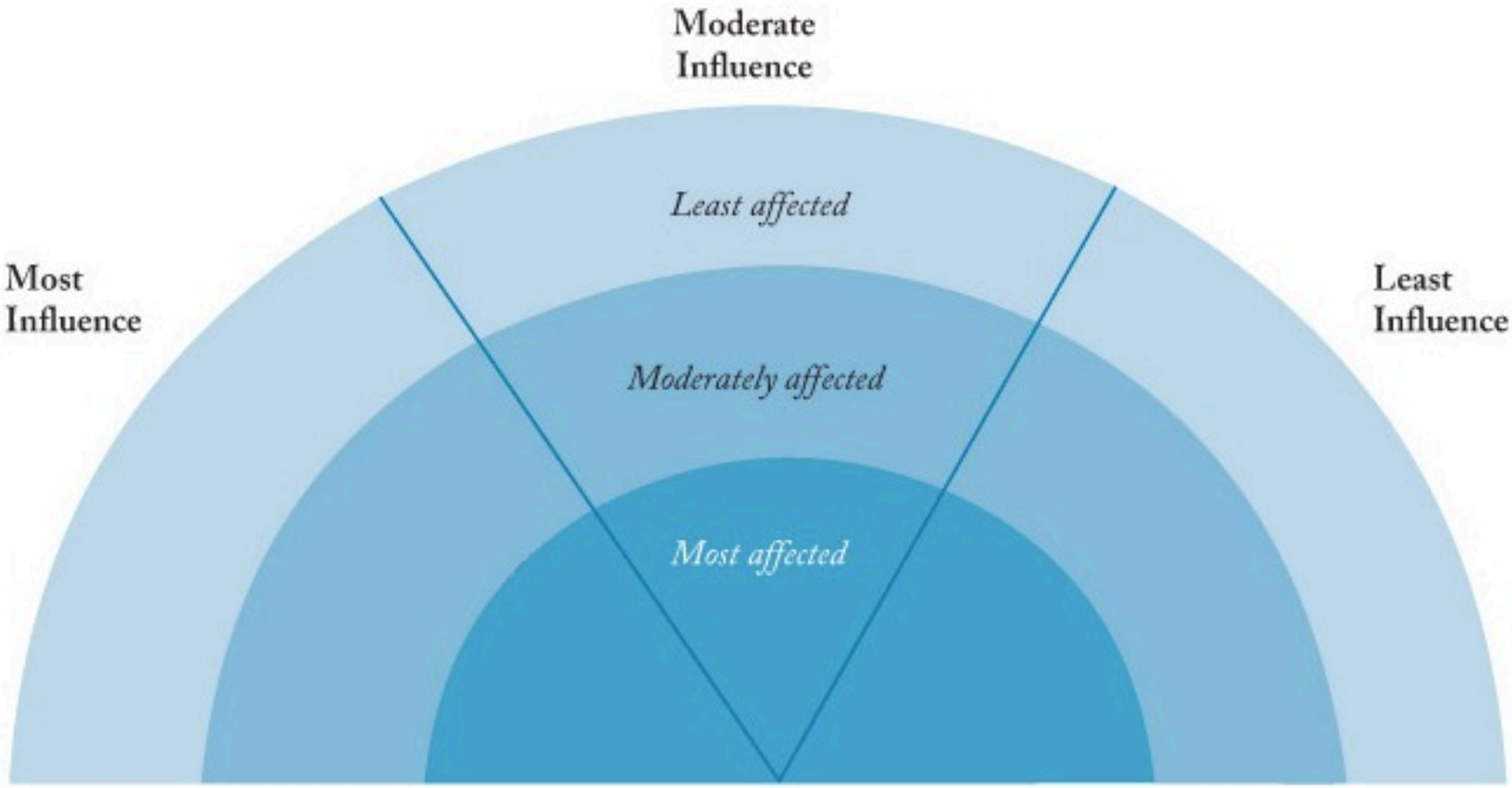
[Sharp1999]

1. Identify all relevant groups of baseline stakeholders
2. Identify all relevant roles within each baseline group
3. For each baseline role:
    1. Who supplies information to this role? Who performs supporting tasks? => Support stakeholders
    2. Who processes or inspects products from this role? => Client
    3. Who interacts with this role in other ways? => Satellite
4. Repeat 3 above for newly found stakeholders
5. Consider relations between identified stakeholders: "in charge of", "supports", "is crucial to", "provides info for", ...

Stakeholder Analysis

- Who are the stakeholders?
- Do we have access to them?
- What are their expectations and interests?
- What are their influence and role in project?

Stakeholder Analysis



Rainbow diagram

Stakeholder Analysis

- Expectations and interests
  - Personal: Work or Family focus, Job satisfaction, Org satisfaction, Improving knowledge, Sufficient appreciation, Workload/Responsibility
  - Social: Peer recognition, Cover incompetence, Sponsorships, Undermining, On the move, Power hierarchies
  - Material: Money, Tools, Office, Travels