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Establishing a Reference Model for Requirements Elicitation Behaviour

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Discussion Topics

1. Requirements engineering
2. Requirements
3. The requirements engineering environment
4. Establishing a reference model for requirements engineering
5. The elicitation-diffusion model
6. Examples of ideal-world behaviour
7. Examples of real-world behaviour
8. Conclusion and further research

Requirements Engineering

is concerned with eliciting or discovering, documenting, and managing the requirements that embody the desired utility.

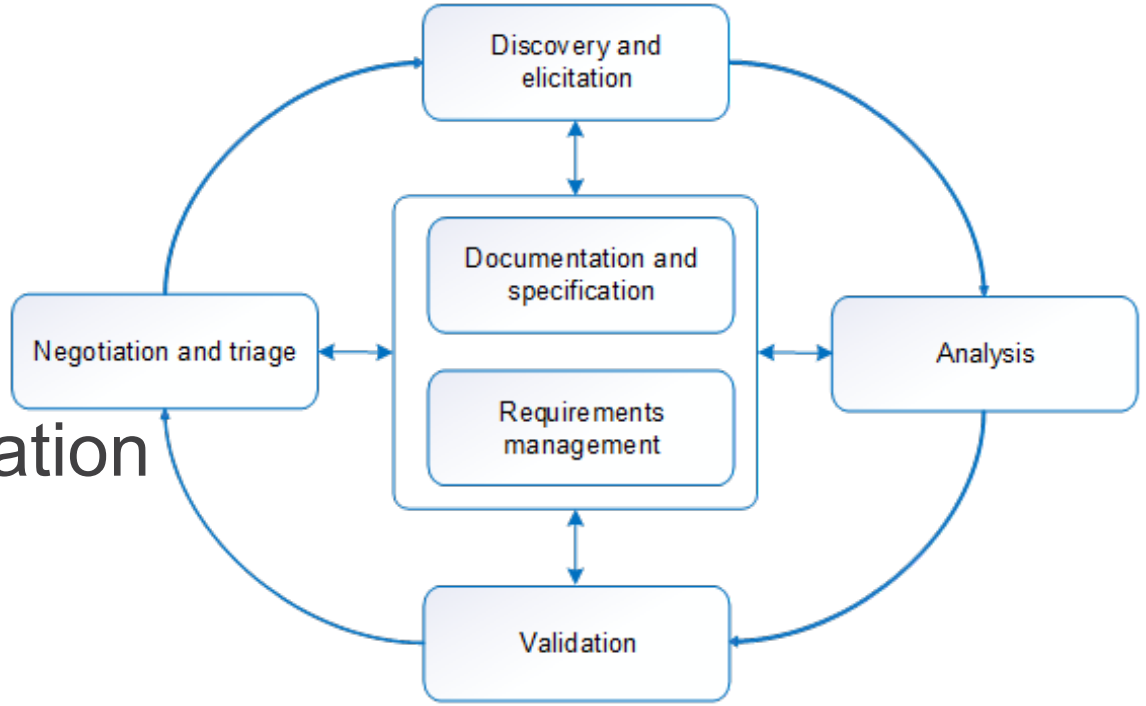
"… an interdisciplinary function that mediates between the domains of the acquirer and supplier to establish and maintain the requirements to be met by the system, software or service of interest" (ISO/IEC/IEEE Standard 29148)

Requirements engineering is concerned with the "discovering, eliciting, developing, analyzing, determining verification methods, validating, communicating, documenting, and managing requirements" (ISO/IEC/IEEE Standard 29148)

Requirements Engineering

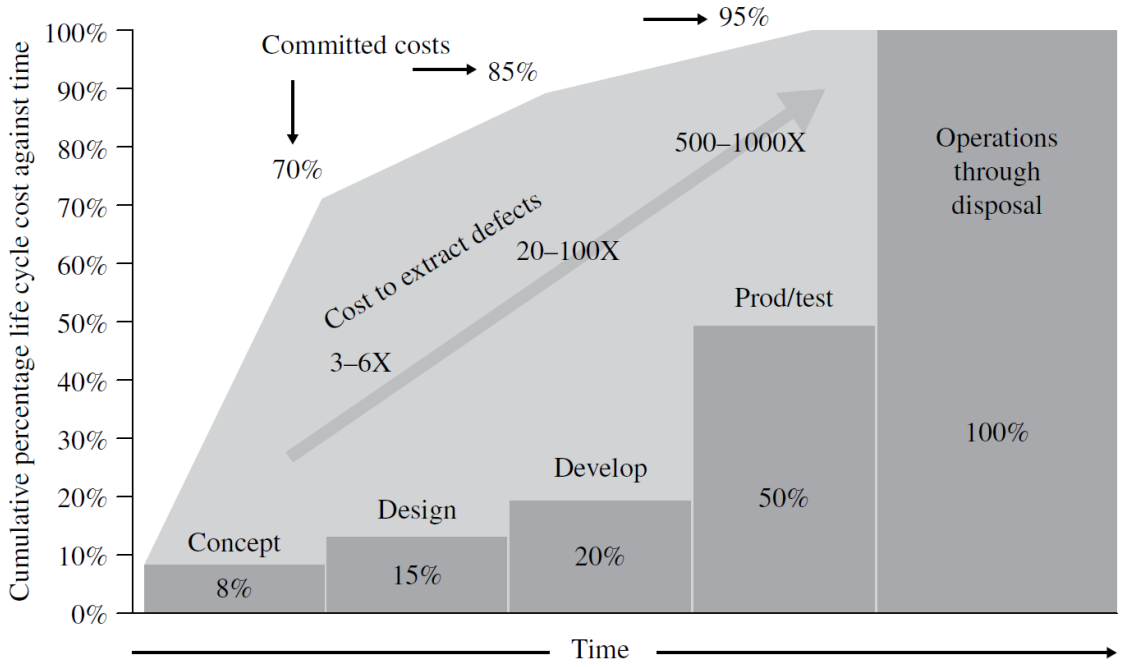
Requirements engineering consists of the following activities:

- Discovery and elicitation
- Analysis
- Validation
- Negotiation and triage
- Documentation and specification
- Requirements management
  - Traceability
  - Requirements allocation
  - Categorizing requirements
  - Compliance verification
  - Common repository



Requirements

- What is a requirement?
- Where do requirements fit in the project cycle?
- Requirements are difficult and can have catastrophic effects



Requirements

- What are the main sources of requirements?
  - Stakeholders
  - Documentation
  - Existing or legacy systems
- How does one go about eliciting requirements?
- Requirements may change during the project lifecycle

The requirements engineering environment

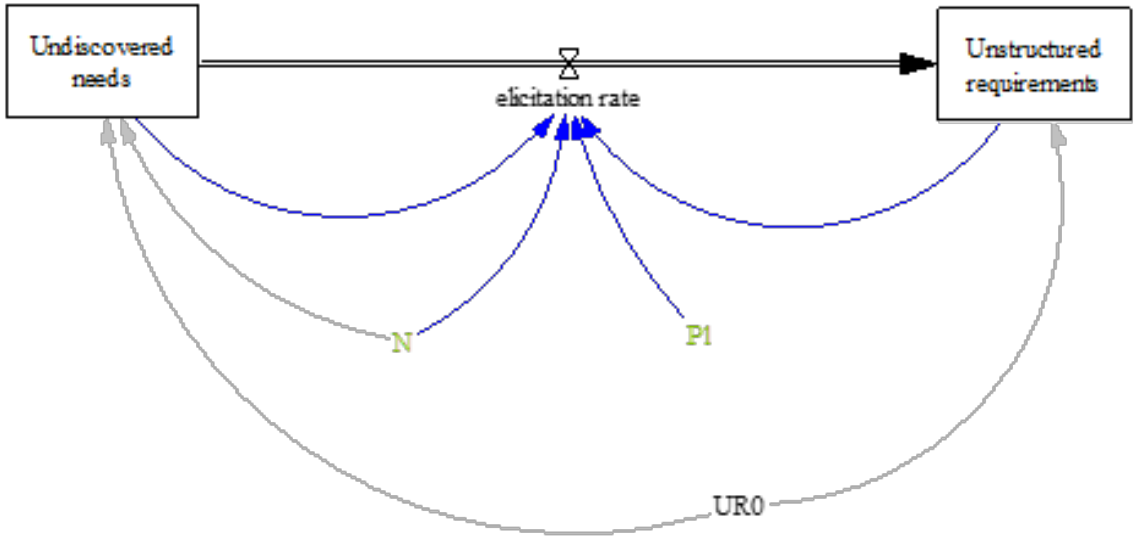
- The requirements engineering environment is complex
  - The maturity of the organization,
  - The number of stakeholders, and
  - The type of stakeholder involvement in the process.
- The requirements engineering environment is a socio-technical system

Establishing a reference model for requirements elicitation

- Requirements elicitation is more of learning process than a gathering process
- The need for a benchmark against which to compare the elicitation process

Elicitation-Diffusion Model

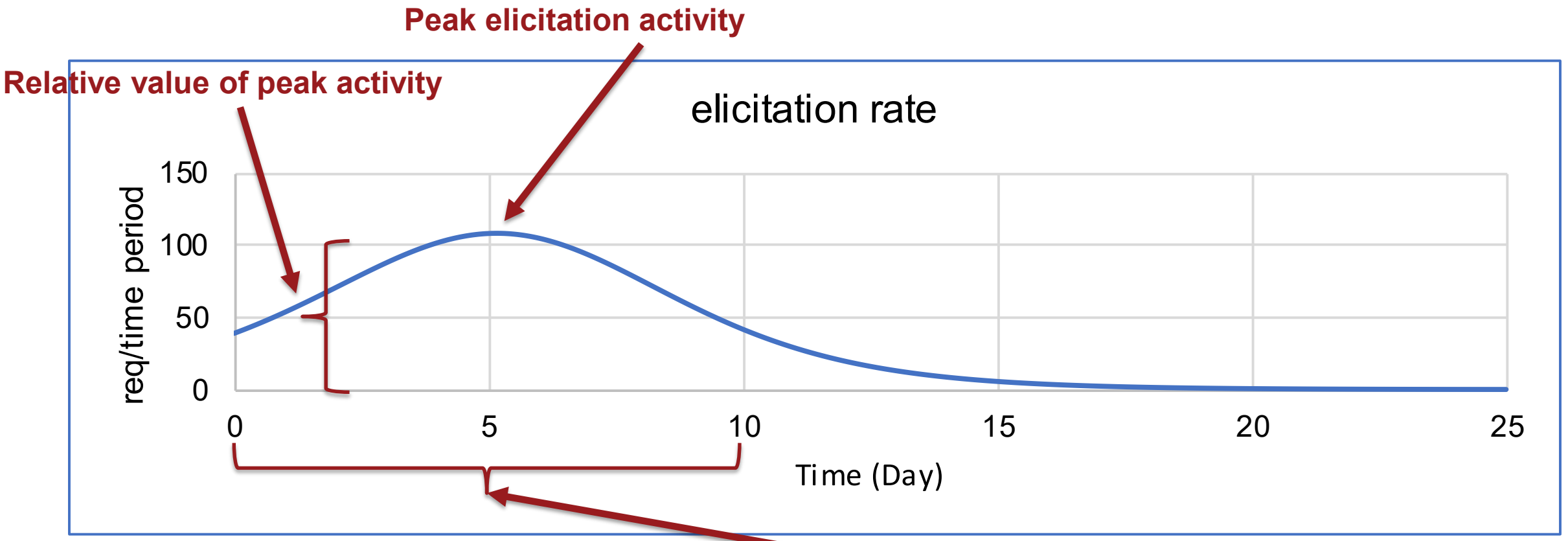
Model



Description of the parameters

Simulation model element	Element type	Equation/description
Undiscovered needs	Stock element	$\int(-elicitation\ rate)$ initial value = N − UR_0
Unstructured requirements	Stock element	= $\int(elicitation\ rate)$; initial value = UR_0
Elicitation rate	Flow element	PI × Undiscovered needs × (Unstructured requirements/N)
UR_0	constant	number of unstructured requirements at T_0
N	Constant	The total population of undiscovered needs to be elicited
PI	Constant	probability of learning

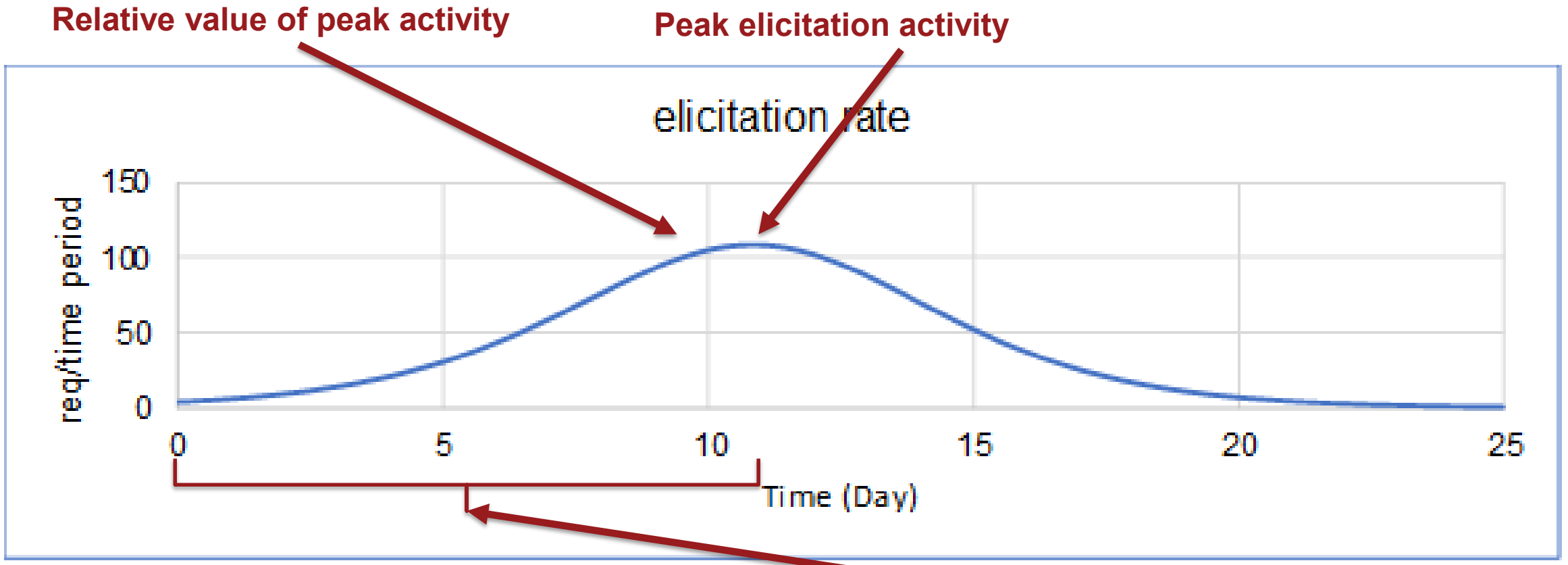
Ideal world behavior – Example 1



Elicitation behavior for N = 1000, UR_0 = 100 and P_I = 0.431

Relative time from the start of the elicitation activity

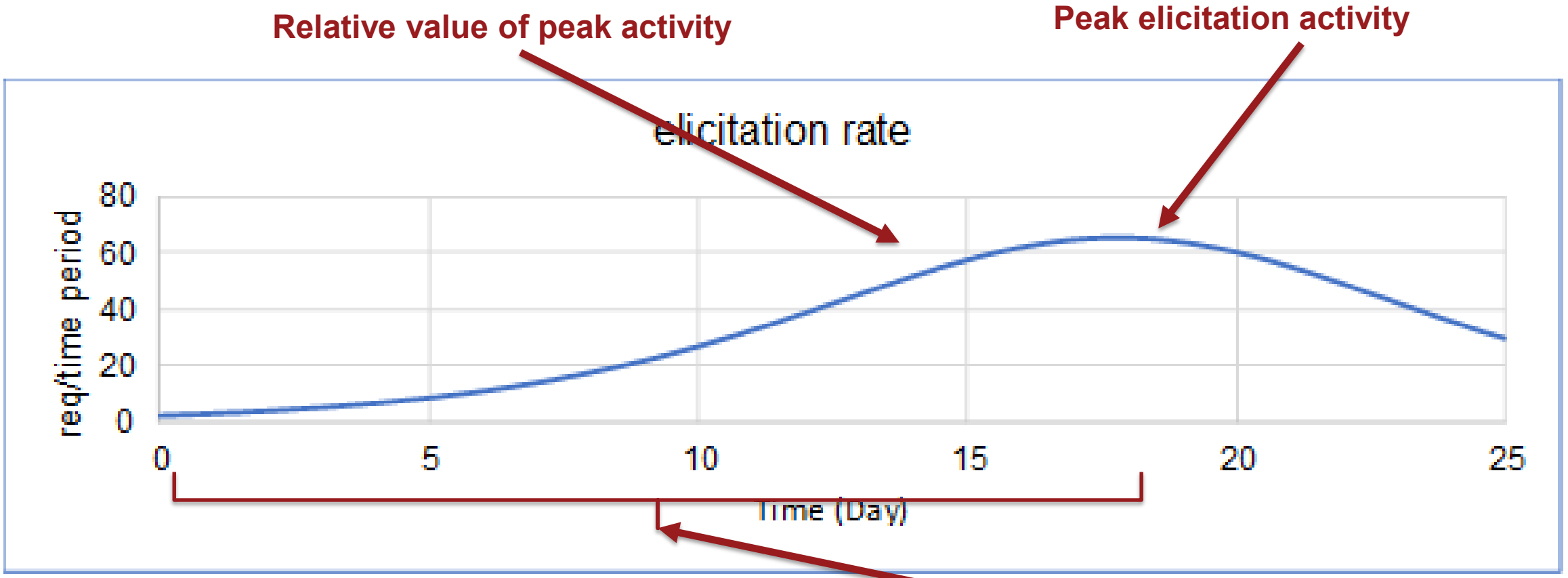
Ideal world behavior – Example 2



Elicitation behavior for N = 1000, UR0 = 10 and PI = 0.431

Relative time from the start of the elicitation activity

Ideal world behavior – Example 3

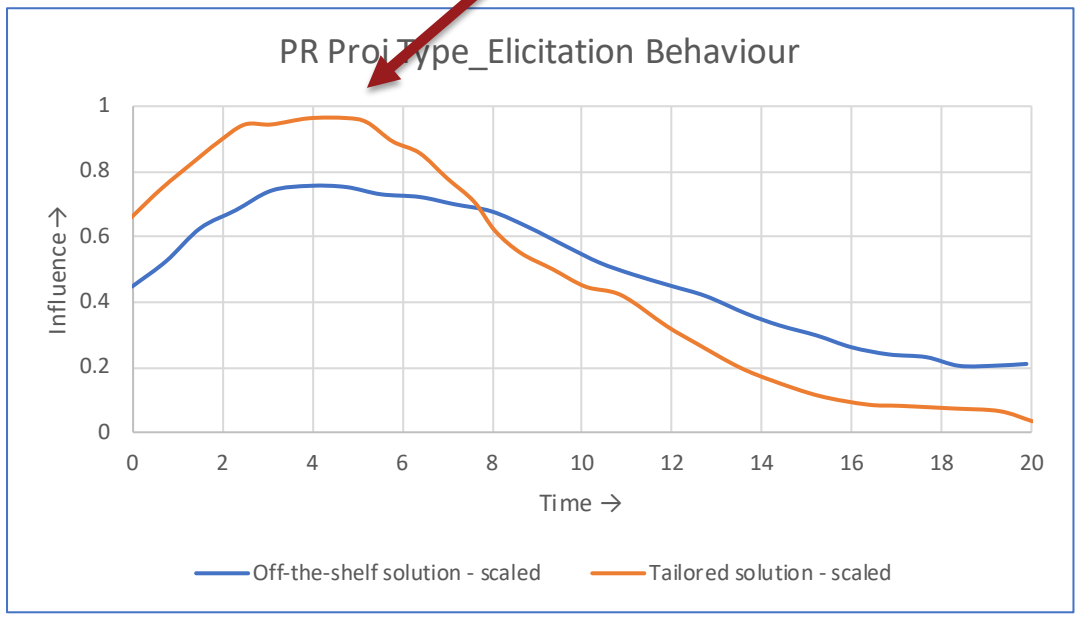


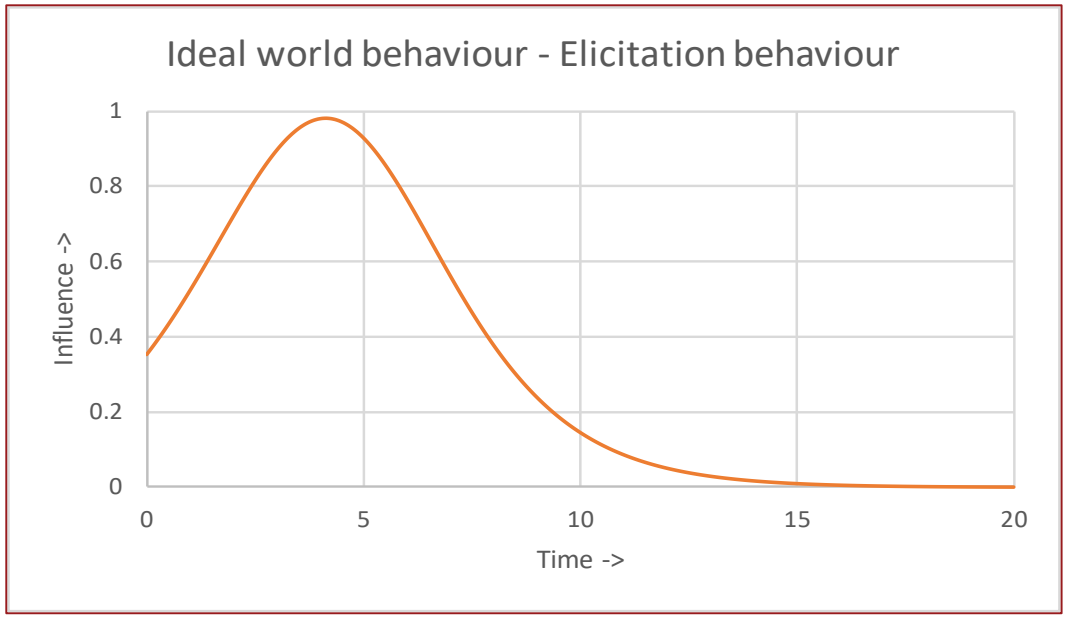
Elicitation behavior for N = 1000, UR0 = 10 and PI = 0.261

Relative time from the start of the elicitation activity

Real world behavior – Example 1

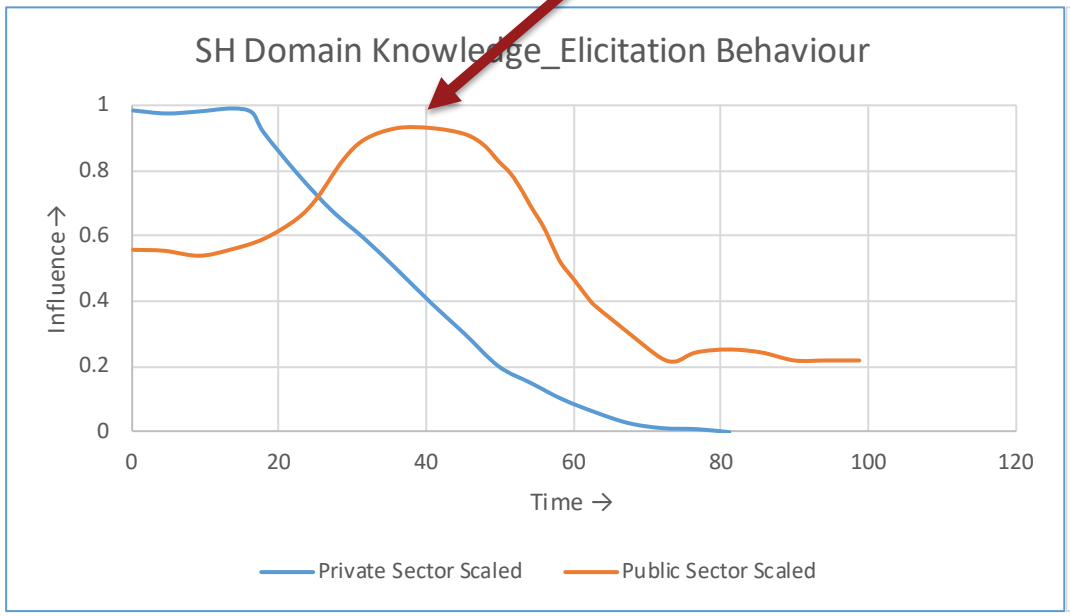
Peak elicitation activity

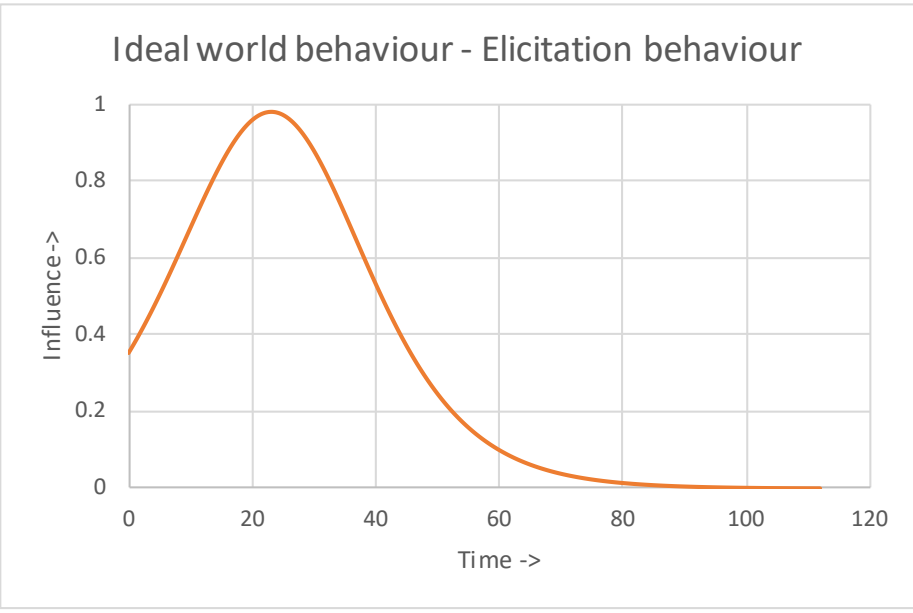




Real world behavior – Example 2

Peak elicitation activity

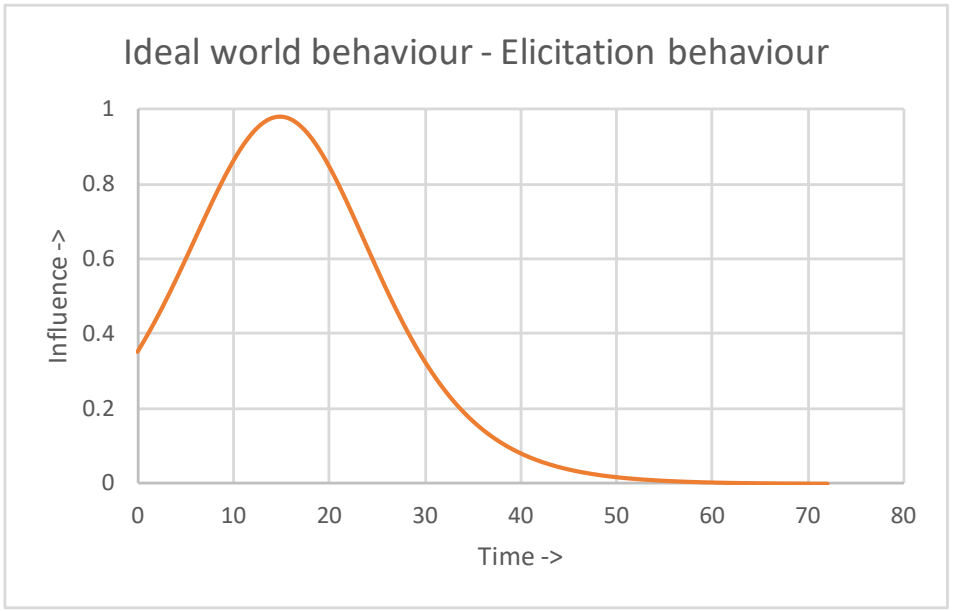




Relative time from the start of the elicitation activity

Real world behavior – Example 3

Peak elicitation activity



Relative time from the start of the elicitation activity

Summary and conclusion

- Requirements engineering process plays a crucial role throughout the project lifecyle
- The requirements engineering environment is a complex socio-technical system
- Errors will be made during the requirements elicitation phase
- The aim of the elicitation-diffusion model presented is to act as health check for the requirements elicitation process

Further research

- The model presented is an initial model. Further research is being conducted where empirical field data is being compared to the results generated by the model.
- Further research is also required in benchmarking the parameter PL in relation to the size, type and complexity of the project.

Questions

I wish to thank you for your attention and look forward to any question that you may have regarding my research and presentation

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