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BUSINESS AND TECHNOLOGY UNCERTAINTIES IN ERP-SYSTEMS IMPLEMENTATION PROJECTS BASED ON WATERFALL AND MULTI-PASS MODELS

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1. Introduction

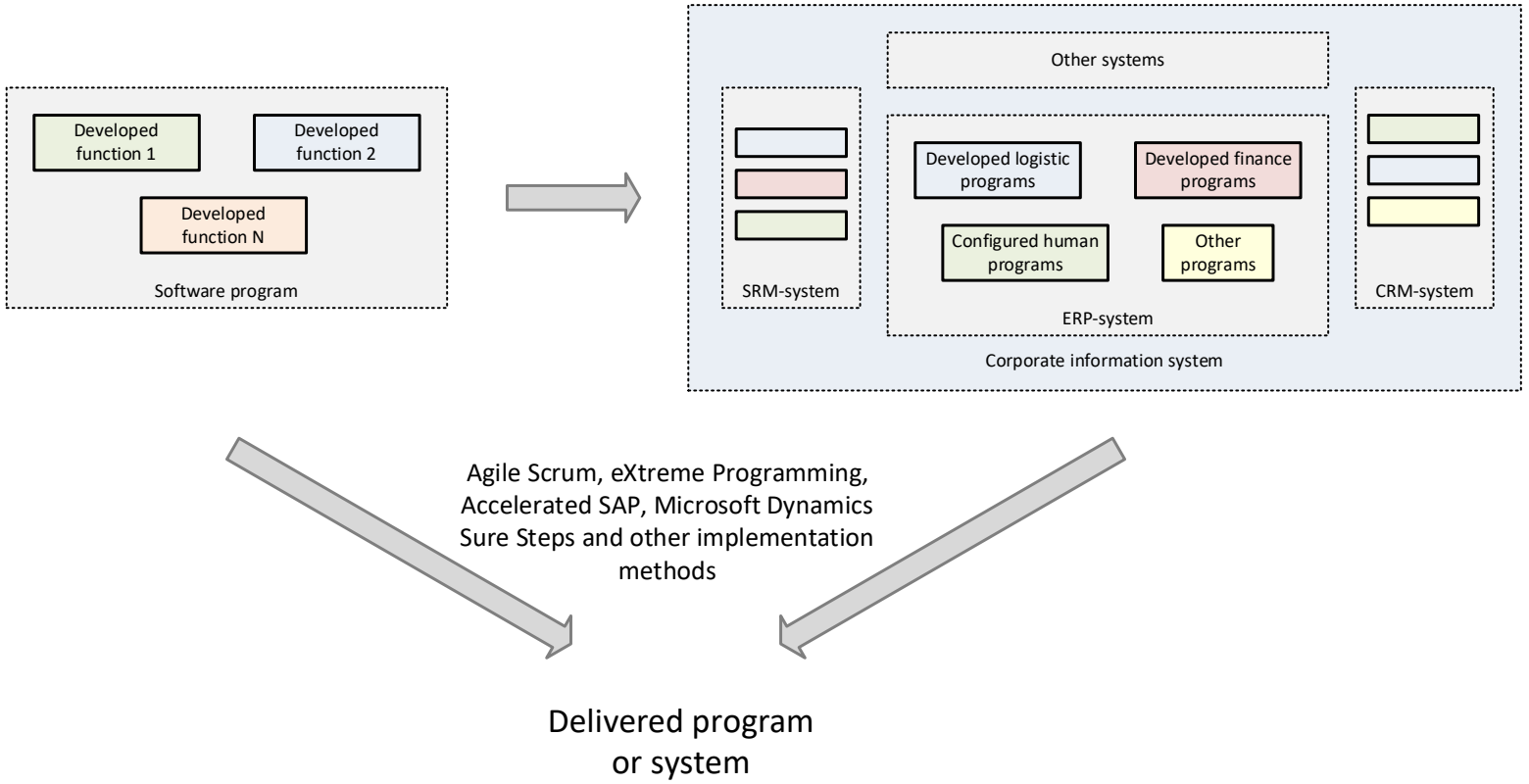


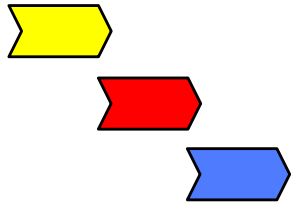
Fig. 1. Program, systems and it's delivery

2. Problem statement

The goal of the paper is to demonstrate using cascade, iterative and spiral implementation models in ERP-projects in case of business and technology uncertainties. Following tasks will be performed to achieve the goal:

– review one-pass and multi-pass implementation models;
– define business and technology uncertainties;
– analyze basic principals relevant for ERP-systems development;
– consider business uncertainty in implementation models.
– refine usage of implementation models in ERP-projects.

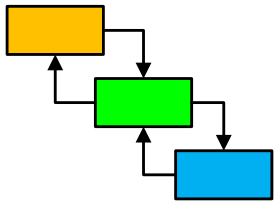
3. Overview of implementation models



1. Cascade

Implementation models

2. Iterative



3. Spiral

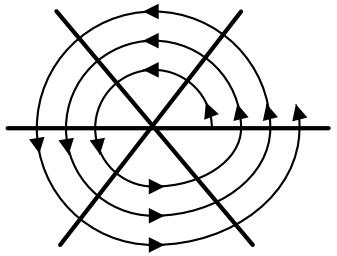


Fig. 2. Classical implementation models

3.1. Business uncertainty

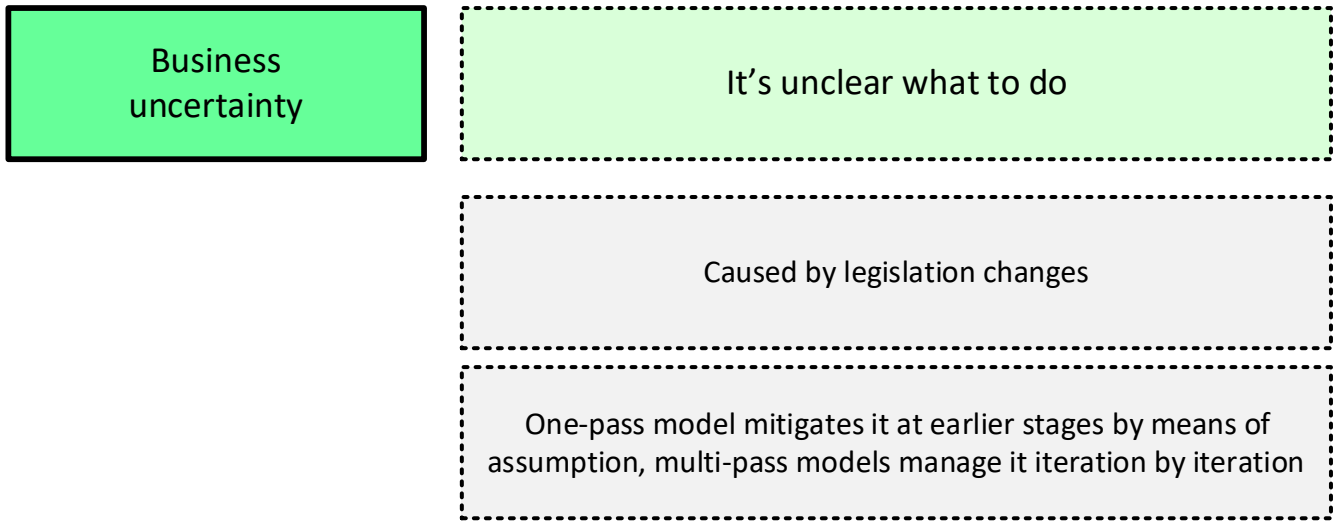


Fig. 3. Root cause of business uncertainty

3.2. Technology uncertainty

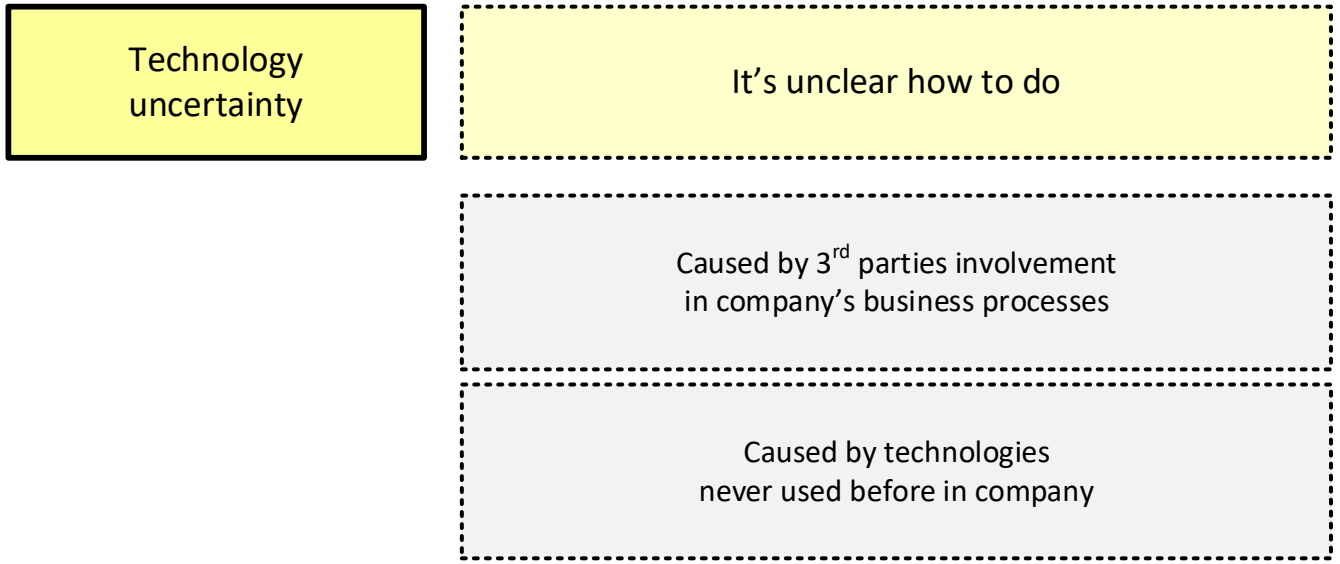


Fig. 4. Root cause of technology uncertainty

3.3. Using implementation models in case of uncertainty

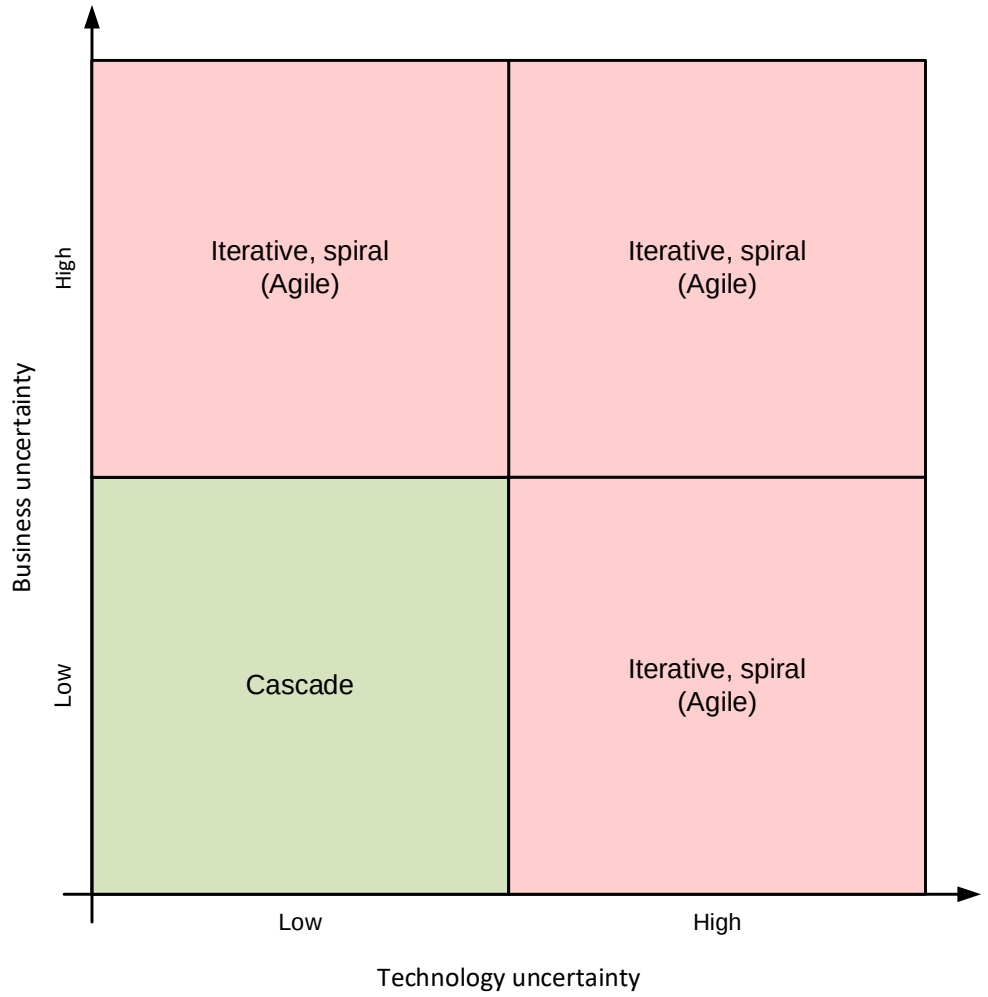
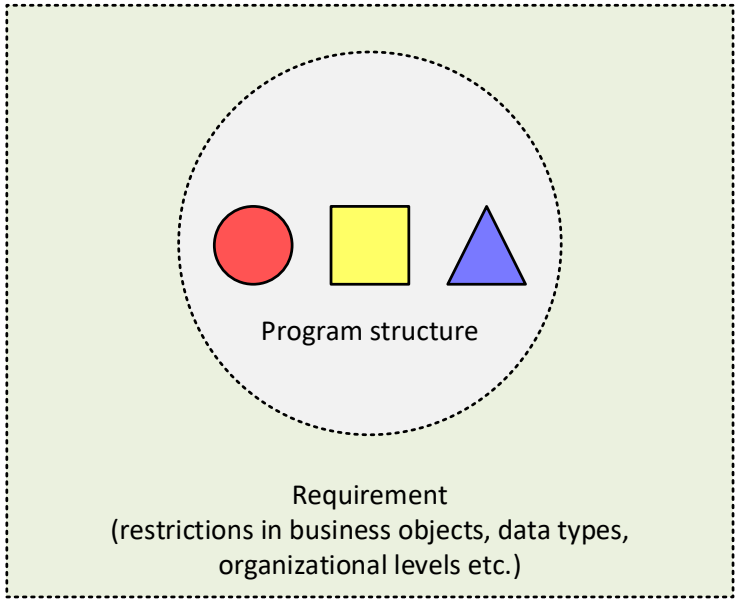


Fig. 5. Using cascade, iterative and spiral models in case of uncertainty

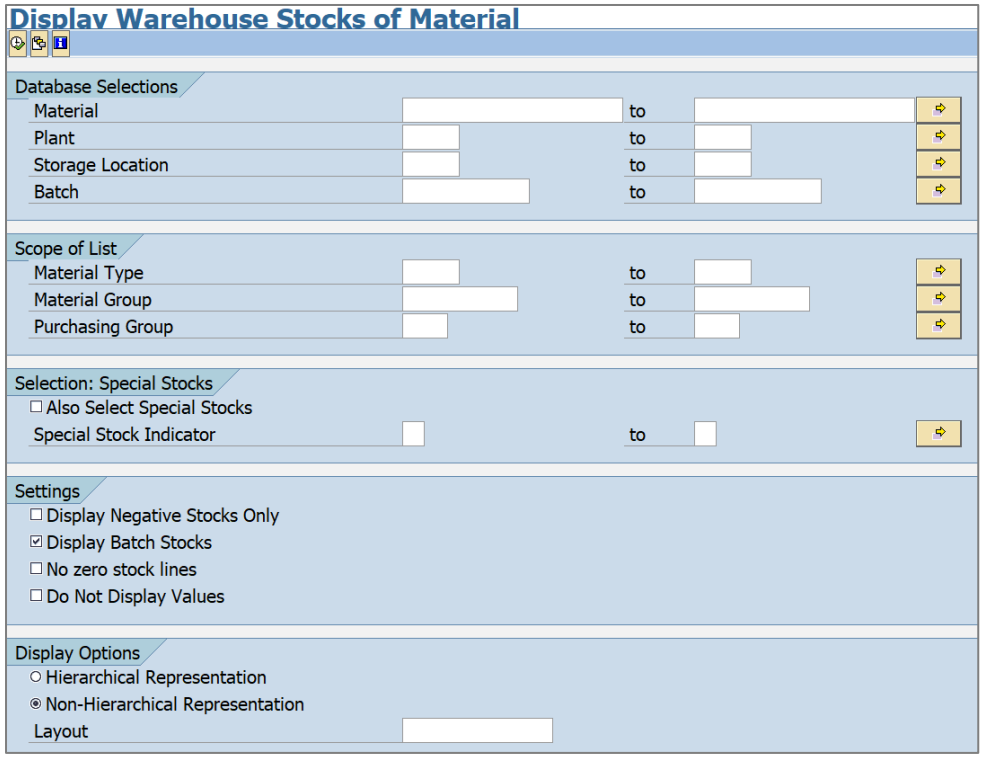
4. Implementing principals in ERP-system development

- Control theory:
  - – programmable control;
  - – compensation;
  - – feedback loop.
- System analysis:
  - – **functionality;**
  - – evolution;
  - – uncertainty.
- Programming discipline:
  - – modularity;
  - – functional selectivity;
  - – reliability.

4.1. Functionality principal



A)



B)

Fig. 6. Graphical illustration of functionality principal (A) and example of its realization in SAP ERP (B)

4.2. Change management in ERP-projects

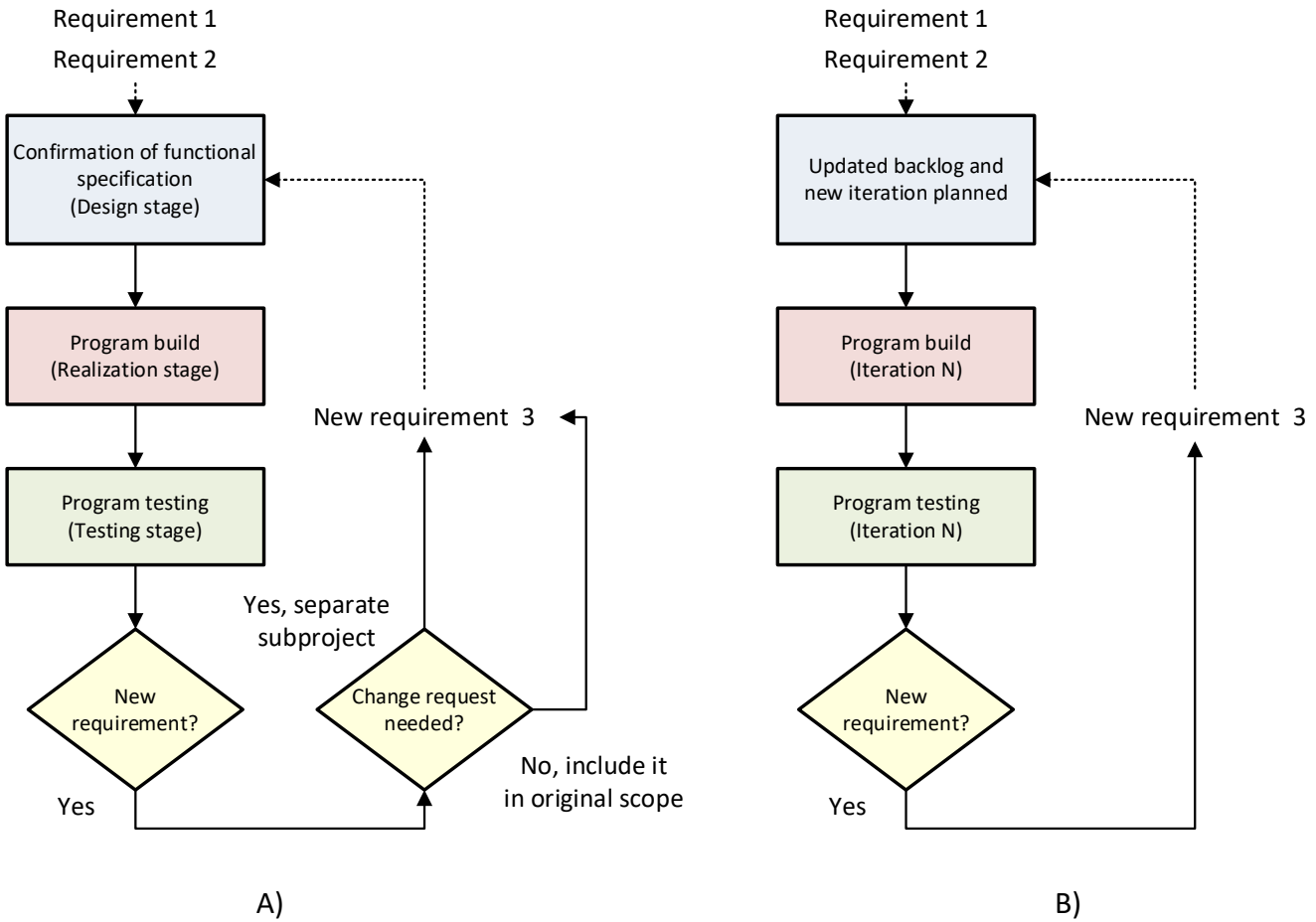


Fig. 7. Managing new business requirement in one-pass (A) and (B) multi-pass implementation models

4.3. Impact of new requirements on existing program architecture

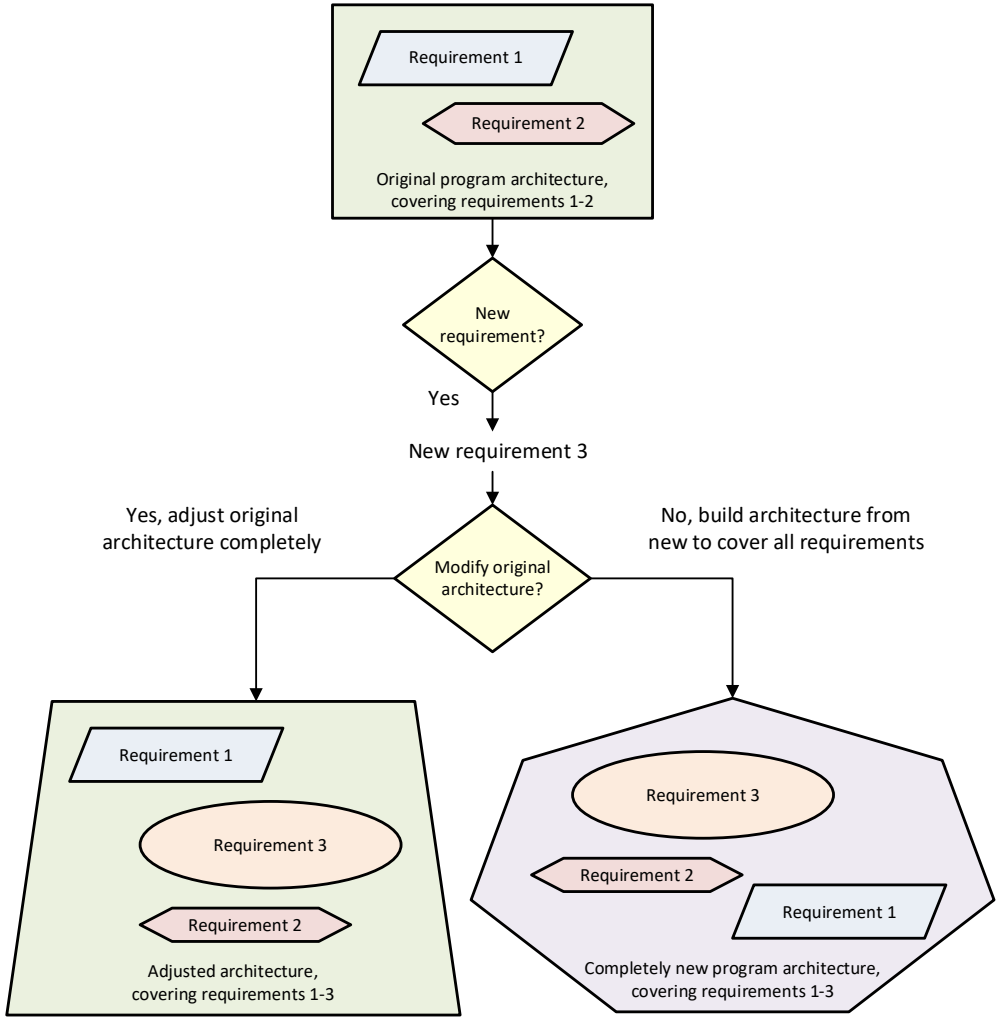


Fig. 8. Violation of functionality principal while processing new requirement

5. Evaluation of models per ERP-project type

Table 1. Usage of implementation models in case of business uncertainty

Business uncertainty	Model	Project type	Realization type
High	Cascade	From the scratch or rollout	Development and configuration
High	Cascade	Evolution	Configuration
High	Cascade Multipass (Agile)	Evolution	Development
Low	Cascade	From the scratch or rollout	Development and configuration
Low	Cascade	Evolution	Configuration
Low	Cascade	Evolution	Development

6. Conclusion

- ERP-systems have limited number of business objects and functions to cover user requirements. ERP-projects are characterized by high level of business uncertainty and low level of technology uncertainty.
- Business uncertainty leads new requirements. The requirements impact on already developed ERP functionality and demand it's change. Neither of implementation models can eliminate business uncertainty, that is existing programs will be modified anyway.
- New user requirements in ERP-projects are realized as a separate sub-projects via change requests according to one-pass implementation model. Multi-pass model manages new requirements by means of planning it to next iterations.
- Though multi-pass models (Agile) are very popular nowadays, they do not bring much value in comparison with one-pass model. All implementation models are weak to business uncertainty in ERP-projects, however they have ways how to manage it.

Thank you!

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