SOFTWARE DESIGN AND ANALYSIS
CS 3004

Inception

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Outline

1. Inception is NOT requirements
2. Questions during inception
3. Problem statement
4. Inception Artifacts
5. Use Case Model
6. Risk Plan

Inception is NOT requirements

- Purpose is to decide whether to proceed with development, not to define requirements.

- Only key requirements are investigated.

Questions during inception

- What is the vision for this project?

- What is the business case?

- Is the project feasible?

- Should we buy or build?

- Rough estimate of cost?

- At end of inception: Go or No Go?

Inception in one sentence

- Determine the product scope, vision, and business case.

Problem statement

- Do the stakeholders have basic agreement on the vision of the project, and is it worth investing in serious investigation?

Inception Artifacts

Artifact†	Comment
Vision and Business Case	Describes the high-level goals and constraints, the business case, and provides an executive summary.
Use-Case Model	Describes the functional requirements. During inception, the names of most use cases will be identified, and perhaps 10% of the use cases will be analyzed in detail.
Supplementary Specification	Describes other requirements, mostly non-functional. During inception, it is useful to have some idea of the key non-functional requirements that have will have a major impact on the architecture.
Glossary	Key domain terminology, and data dictionary.
Risk List & Risk Management Plan	Describes the risks (business, technical, resource, schedule) and ideas for their mitigation or response.
Prototypes and proof-of-concepts	To clarify the vision, and validate technical ideas.
Iteration Plan	Describes what to do in the first elaboration iteration.
Phase Plan & Software Development Plan	Low-precision guess for elaboration phase duration and effort. Tools, people, education, and other resources.
Development Case	A description of the customized UP steps and artifacts for this project. In the UP, one always customizes it for the project.

Vision and Business Case

- Describes the high level goals and constraints, the business case, and provides an executive summary.

- Usually has an estimate of costs (+/- 100%) and expected benefits stated in financial terms.

Use Case Model

- Describes the functional requirements and related non-functional requirements.

- Preliminary only, usually the *names* of most of the expected use cases and actors, but usually only about 10% of the use cases are detailed.

- Do not confuse a use case *diagram* with a use case. It is mostly text.

Supplementary Specification

- Describes non-functional requirements that do not appear elsewhere.

- Functional requirements describe the functionality of the product.

- All other requirements that must be met are considered non-functional requirements.

Glossary

- Describes the key terms in the business domain.

Risk Plan

- Contains a list of known and expected risks.

- Includes business, technical, resource, and schedule risks identified by probability and severity.

- All significant risks should have a response or mitigation plan.

Prototypes / Proof of concepts

- These may be developed to clarify the vision, or to validate technical ideas.

- Inception phase prototypes are throw away prototypes, not evolutionary prototype that may be evolved into a product. They are often done with a prototyping tool.

Iteration Plan

- Describes what to do in the first iteration of the product.

- Usually implements the core functionality of the product.

- Eliminate biggest risk first. The worst risk is usually that the final product will not meet the most important requirement.

Development Case

- A description of the Unified Process steps and artifacts for the project. Note that the UP is always customized for each project.

- All of these artifacts are partially completed in this phase and wait for iterative refinement.

You know you don't understand Inception when…

(signs of trouble)

- It is more than "a few" weeks long for most projects.

- There is an attempt to define most of the requirements. Estimates or plans are expected to be reliable.

- You define the architecture (this should be done iteratively in elaboration).

- You believe that the proper sequence of work should be:

    1) define the requirements;

    2) design the architecture;

    3) implement.

- There is no Business Case or Vision artifact. All the use cases were written in detail. None of the use cases were written in detail; rather, 10–20% should be written in detail to obtain some realistic insight into the scope of the problem

Schedule

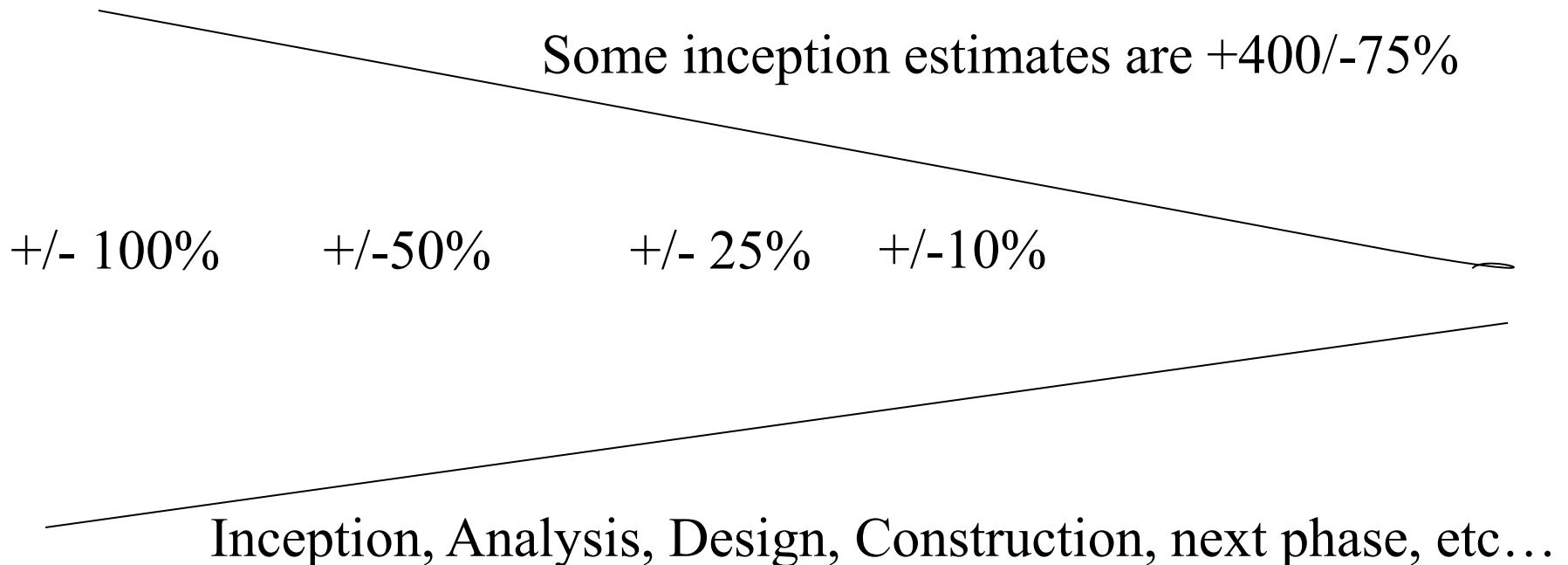- Inception should last a few weeks at most.

Requirements defined

- Only key requirements should be described during inception. Save the rest for later phases and later iterations.

Accuracy of estimates

- There is a funnel of cost estimates. The earlier the estimate, the less accurate it is.

Some inception estimates are +400/-75%

+/- 100%   +/-50%   +/- 25%   +/-10%

Inception, Analysis, Design, Construction, next phase, etc…

Do not design architecture

- Architecture should be done iteratively during elaboration.

- Defer decisions as late as possible. The more you know, the less chance that you will make a bad decision.

Path to disaster

- The Waterfall method is too risky:
  - Define the requirements
    - Design the architecture
      - Implement the product
- Use iterations instead.

Always needed

- The most essential inception document is the Business Case or Vision artifact.

- The main purpose is to decide whether or not to proceed with the project. Note that there are usually further Quality Gates that also must revisit the Go/No Go decision. (Just because you wasted $1 million is no reason to waste $10 million.)

Use Cases and Actors

- You should have identified most of the use cases and actors during inception.

- Do not detail all of the use cases. Only document the most important ones. About 10 or 20% of the use cases should be detailed enough to estimate the scope of the total project.