COSMIC

# Development of Educational Games for teaching Software Estimation

# Committee-Taskforce Report



# COSMIC 2025 Annual Meeting

# Contributors

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ÉTS

Le génie pour l'industrie

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# Achievement over the previous 12 months

# Initial planning

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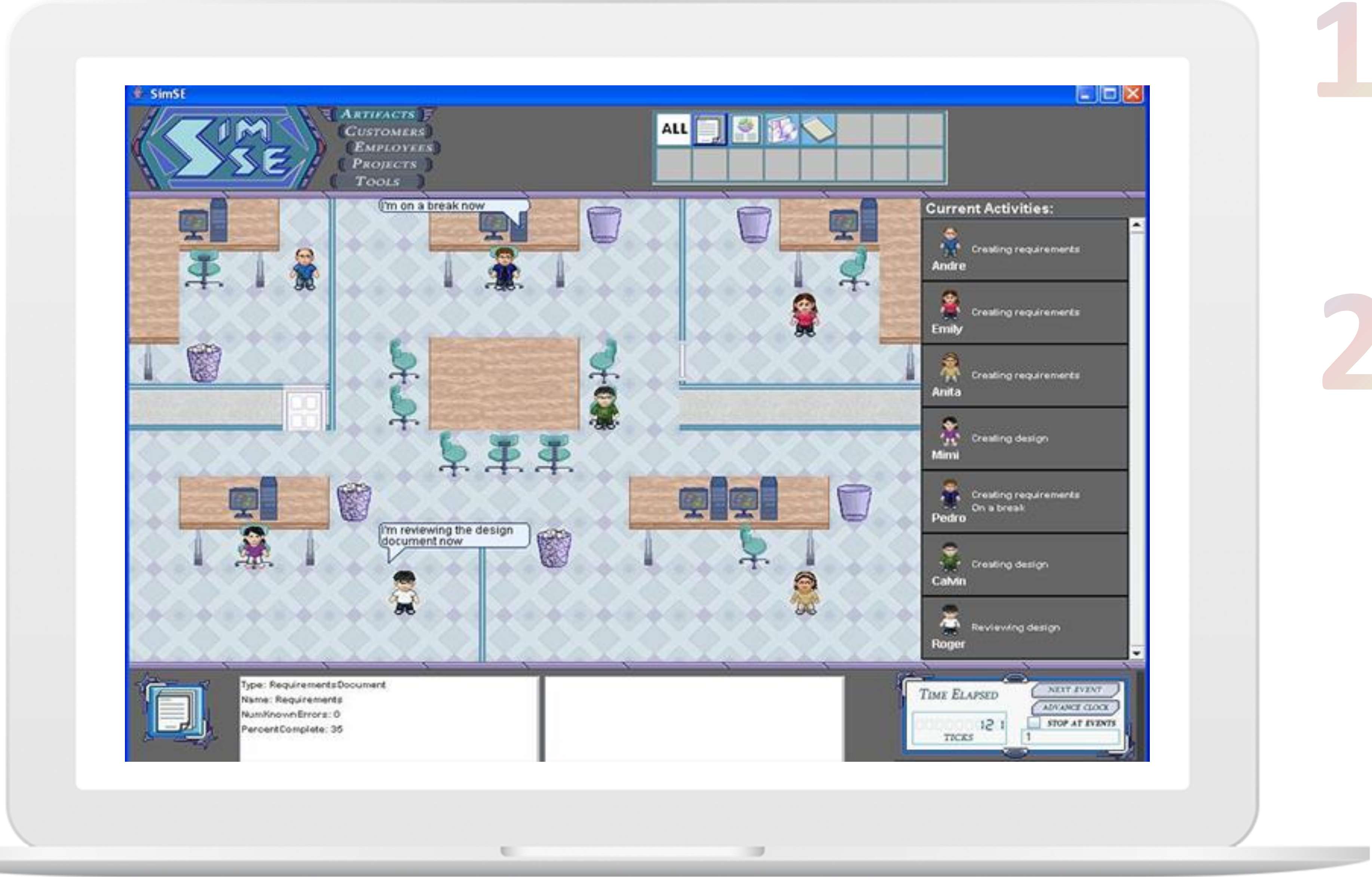



## OVERVIEW

1

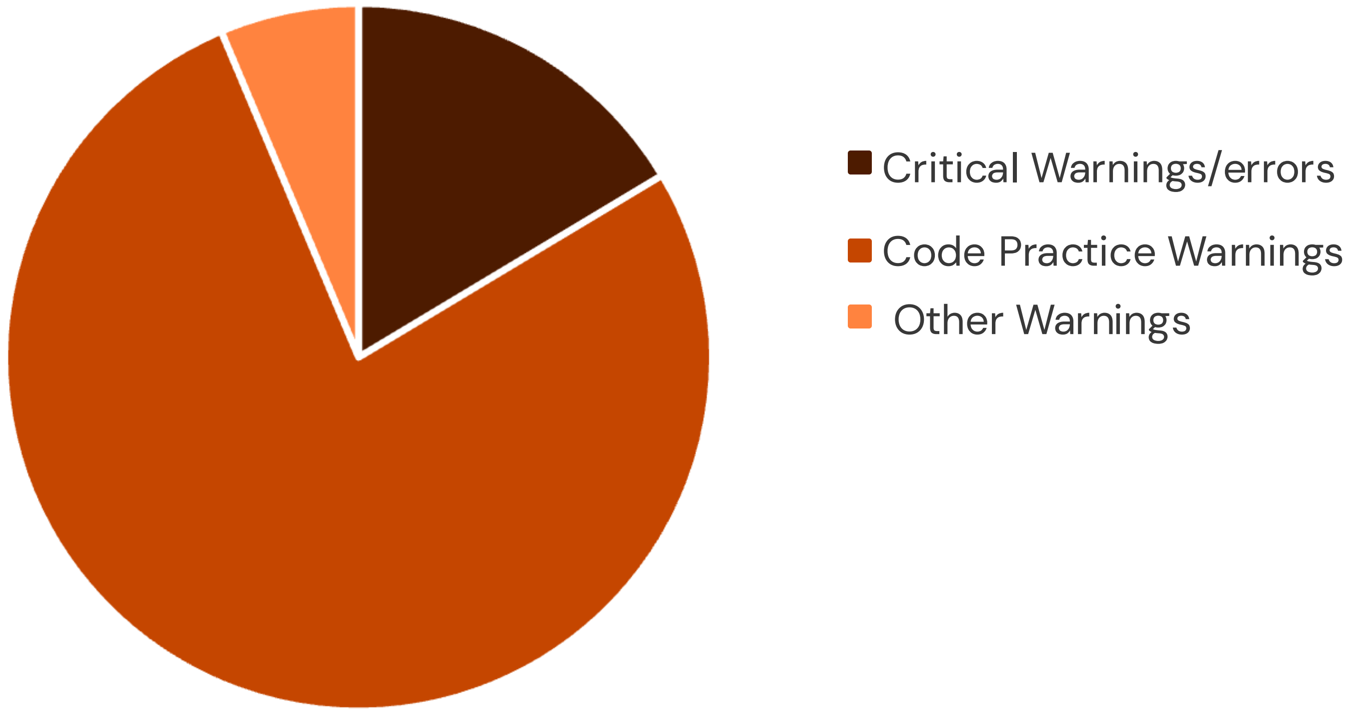
### JAVA UPGRADE PROJECT

A conversion project from old version of Java to a new version of Java compatible with different platform (IOS, Microsoft,..)

2

### CREATE 5 NEW MODULES RELATED TO COSMIC

1. Early sizing of software functional and non-functional requirements in the early project stages (Early Software Sizing, Practitioners - Cosmic Sizing .
2. A-posteriori estimation models for the identification of plausible ranges of estimated efforts, instead of a single-point estimate.
3. Integration of early software sizing into both a-priori and a-posteriori estimation models to develop decision making models for selecting a specific budget value together with a related contingency.
4. Project monitoring and Re-estimation analysis.
5. Portfolio estimation and monitoring in organizations managing multiple concurrent projects.




# Code Upgrade Scope and Process

1

### Identify Issues

Compile with Java 17 to identify all deprecated constructors and critical warnings/errors.

2

### Replace Constructors

Replace with Integer.valueOf(int), Double.valueOf(double), and Boolean.valueOf(boolean), etc.

3

### Update Generator

Modify code generation logic to ensure generated code follows modern Java standards.

4

### Verify Changes

Conduct testing to verify correct functionality is maintained.

**The upgrade process focused solely on critical warnings to minimize risk while ensuring compatibility. We systematically reviewed the entire codebase to eliminate all occurrences of deprecated constructors.**

# SimSE New Educational GAMES

## (As of Oct. 30, 2025)

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**1**

Early Sizing Game ✅

**2**

Statistical Interpretation Game ✅

**3**

Linear Regression Analysis based on Software Size as the Independent Variable ✅

**4**

Effort Estimation Selection on NFR Evaluation Game ✅

**5**

Project monitoring and Re-estimation analysis. ➡

Portfolio estimation and monitoring in organizations managing multiple concurrent projects ➡

**6**

Productivity Game ⏸
-Goals are not clear

Statistical Interpretation and Calculation Game ⏸
-Too complicated

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# In Progress & Next Step

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# In progress - 2025

## Game 4 development:

- Identification of productivity drivers, and of their levels
- Identification of their combined impact on effort estimation intervals

## Game 5 development:

- Identification of risk factors, their individual impact
- Scenarios of combined effort impact
- Identification of impact of probabilities on the development budget decision
- Identification of relevant effort contingency intervals

# In progress - 2025

## Document types for each educational game

1. Instructions for the professors
2. Instructions the students
3. Overview of each educational game
4. Technical instructions for the software engineers
5. Game scorings rules via Excel
6. MDL (application generator model for each game)
7. JAR (executable game module)

## Academic publications

1. Sizing of applications generators & generated applications
2. A portability NFR (software version upgrade) size-based strategy
3. Teaching key software estimation concepts with SimSE educational games

# 2026-2027 Extension Proposal

## Next games development:

- Project monitoring & Re-estimation analysis.
- Portfolio estimation and monitoring in organizations managing multiple concurrent projects – Management of portfolio contingencies

## Java Upgrade:

- Address remaining non-critical warnings and continue functional testing, for better maintainability.
- Adapt to a web platform

## Academic papers:

- Teaching key software estimation concepts with SimSE educational games.
- ………

# Contact

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