



# REQUIREMENTS REUSE: THE STATE OF THE PRACTICE

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# Survey Goals

2

- Gain visibility into the state of the practice of software requirements reuse and its benefits.
- Identify common obstacles for adopting requirements reuse.
- Identify main factors impacting reuse effectiveness.
- Provide recommends to help organizations better adopt requirements reuse.

*A complete survey article has been submitted to the Requirements Engineering journal for publication.*

# About the Survey

3

## Purpose

- Collect data from the global IT community

## Tool

- A web-based SurveyGizmo™ tool ([www.surveygizmo.com](http://www.surveygizmo.com))

## Questionnaire

- 22 questions structured into four pages

## Announcement

- Individuals in the author's professional network
- Various professional portals, email groups

## Timeframe

- Six months, from March to August, 2010

# Profile of Survey Participants

4

- 82 people around the globe completed the survey
- 60% of responses came from North America
- Responses by business sectors:
  - Financial/banking – 35%
  - Technology – 23%
  - Government – 13%
  - Other sectors – 29%
- Over 50% of participants are acting business analysts
- 67% of participants have significant BA experience (5+ years)

# Survey Data Analysis

5

Three focuses of research

## Peoples' View of Reuse

- Reuse importance
- Reuse benefits
- Reuse obstacles

## Reuse Adoption Factors

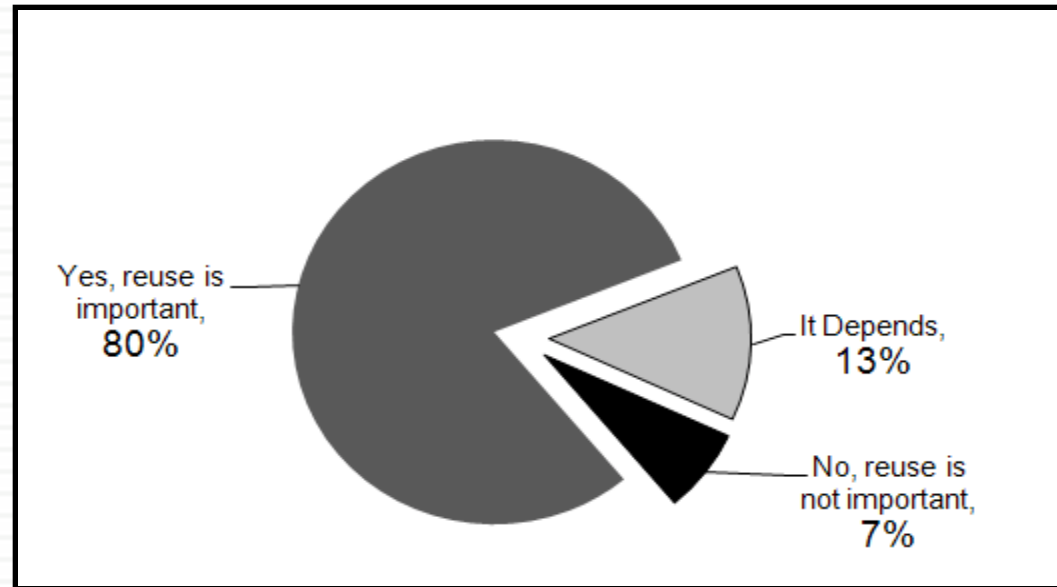
- Overall reuse adoption
- Reuse adoption by context
- Reuse adoption by approach

## Reuse Effectiveness Factors

- Reuse effectiveness by approach
- Separation of requirement types
- Change impact analysis

# Importance of Requirements Reuse

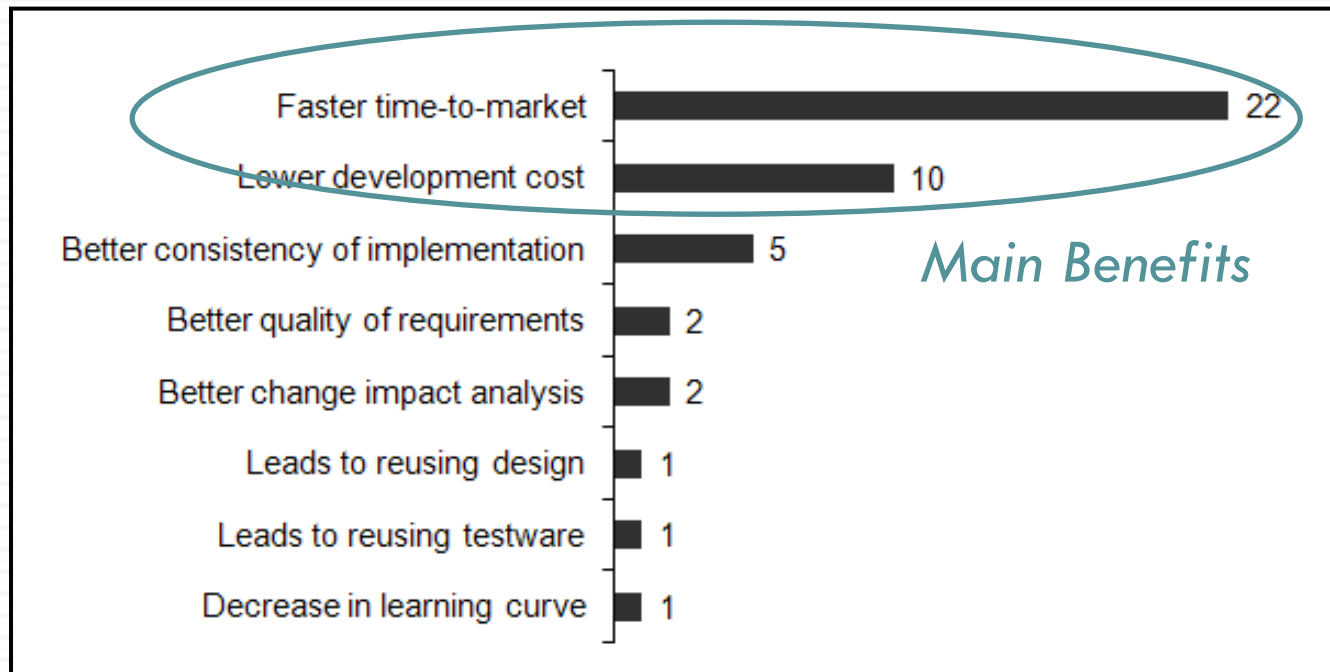
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- Most of respondents believe that reuse is important and brings benefits.
- “It Depends” means that reuse is important but benefits depend on other factors:
  - Requirements maintenance cost
  - Similarity of applications
  - Existing requirements quality
  - Existing requirements structure and the level of abstraction

# Benefits of Reuse

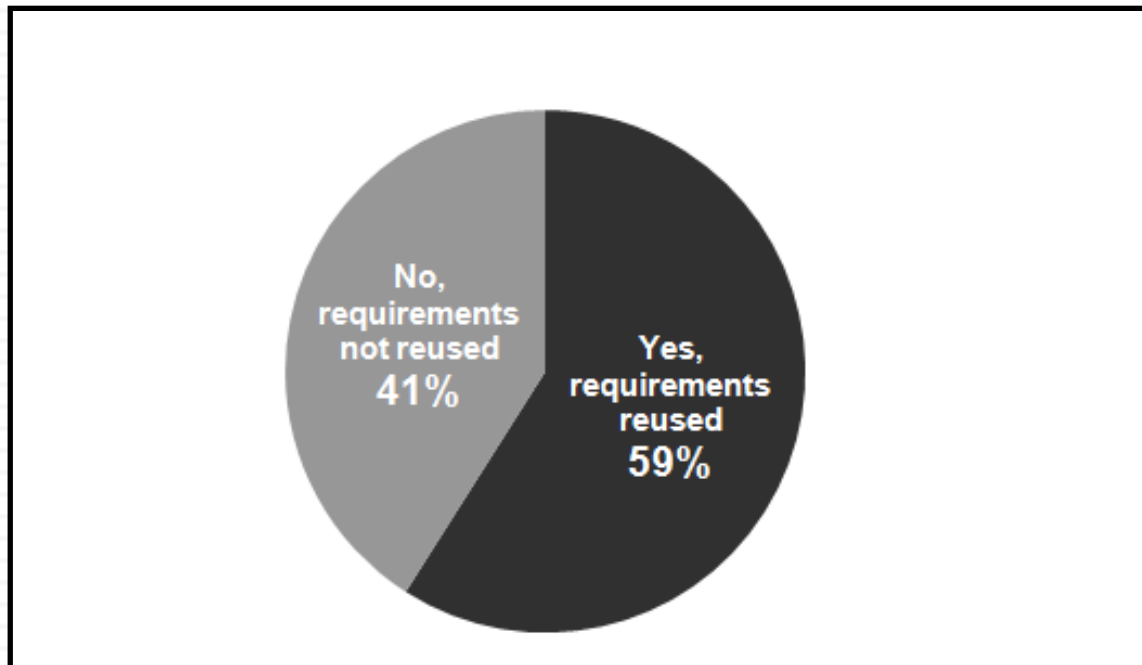
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- Confirmed the main benefits of requirements reuse:
  - Reduction in time-to-market
  - Reduction in development cost
- Consistent with the benefits of other software artifacts reuse

# Overall Reuse Adoption

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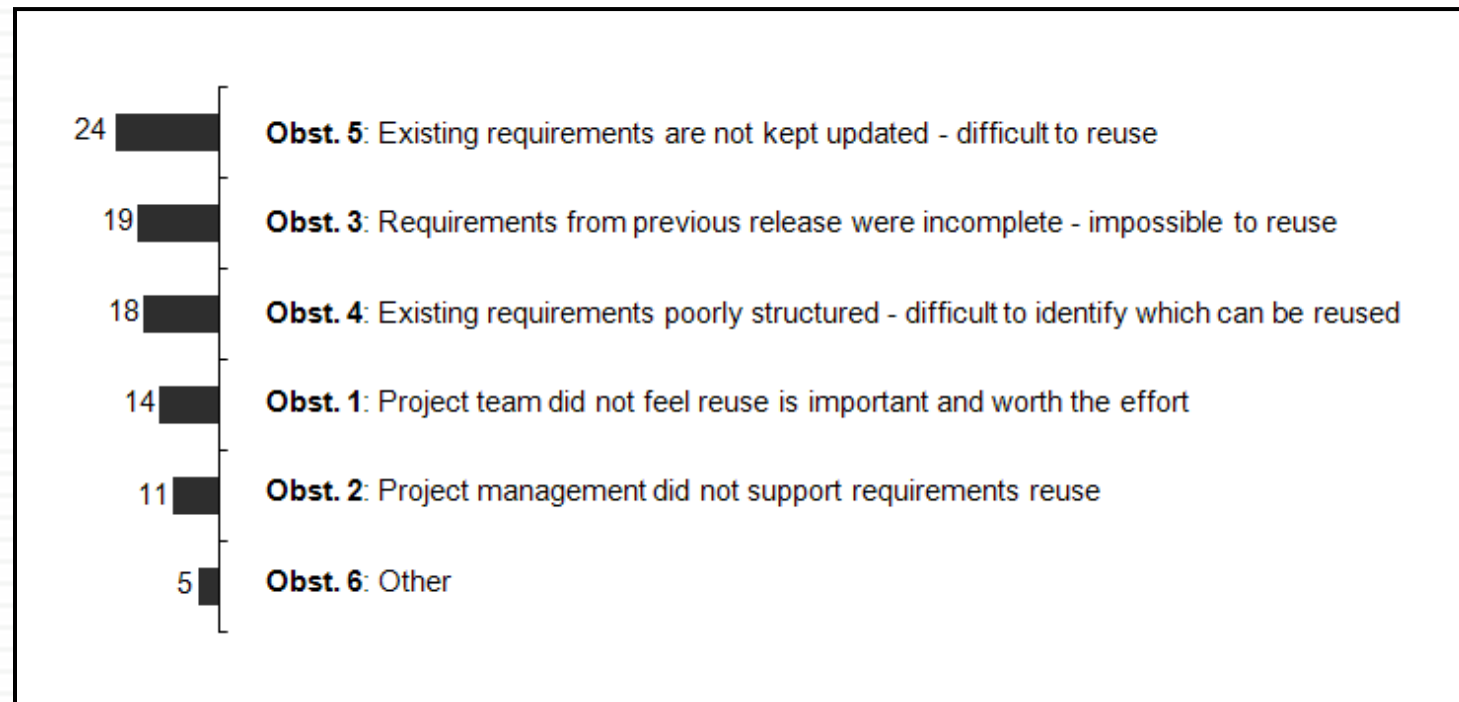


- Implementing requirements reuse remains challenging
- Only half of survey participants actually practiced reuse



# Obstacles of Reuse

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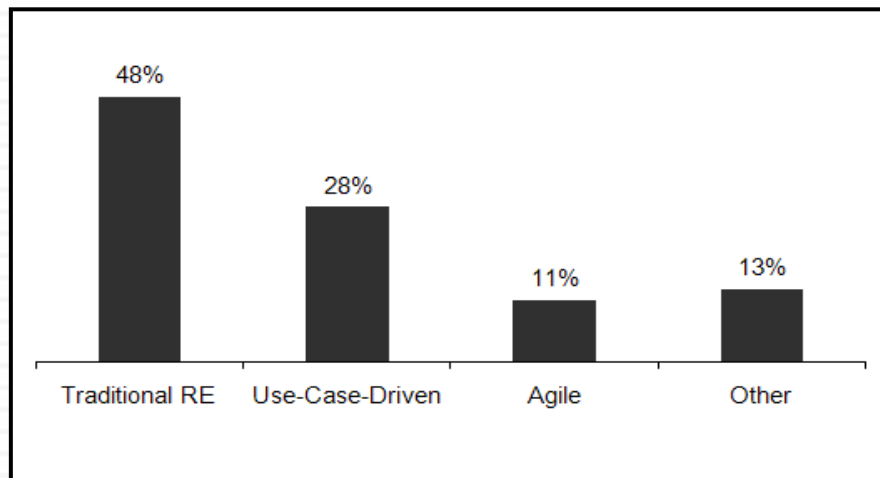


- The main obstacle for reuse adoption is poor quality of existing requirements.
- Unstructured, incomplete, outdated existing requirements make it difficult to reuse them going forward.

# Reuse Adoption as a Function of Approach

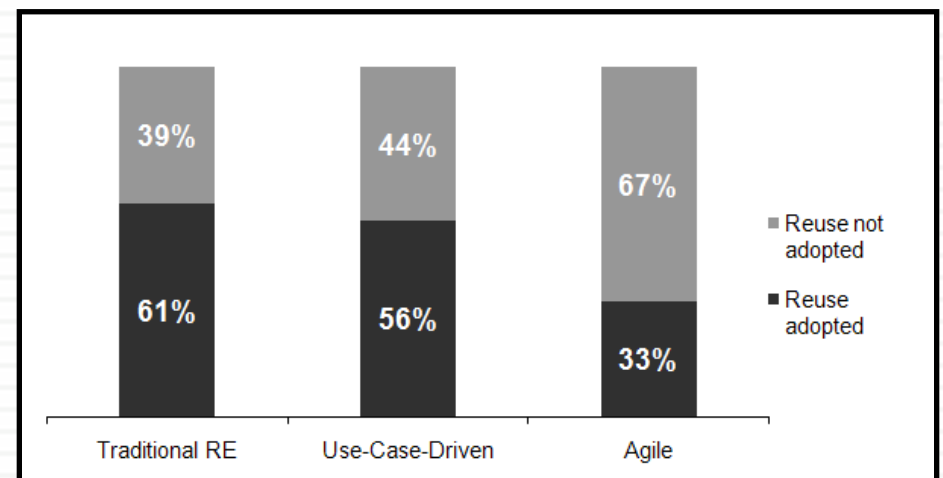
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Approach to developing requirements



- Traditional Requirements Engineering (RE) is still most common (48% of responses), followed by the Use-Case-Driven approach (28%)
- Agile is least common (11%)

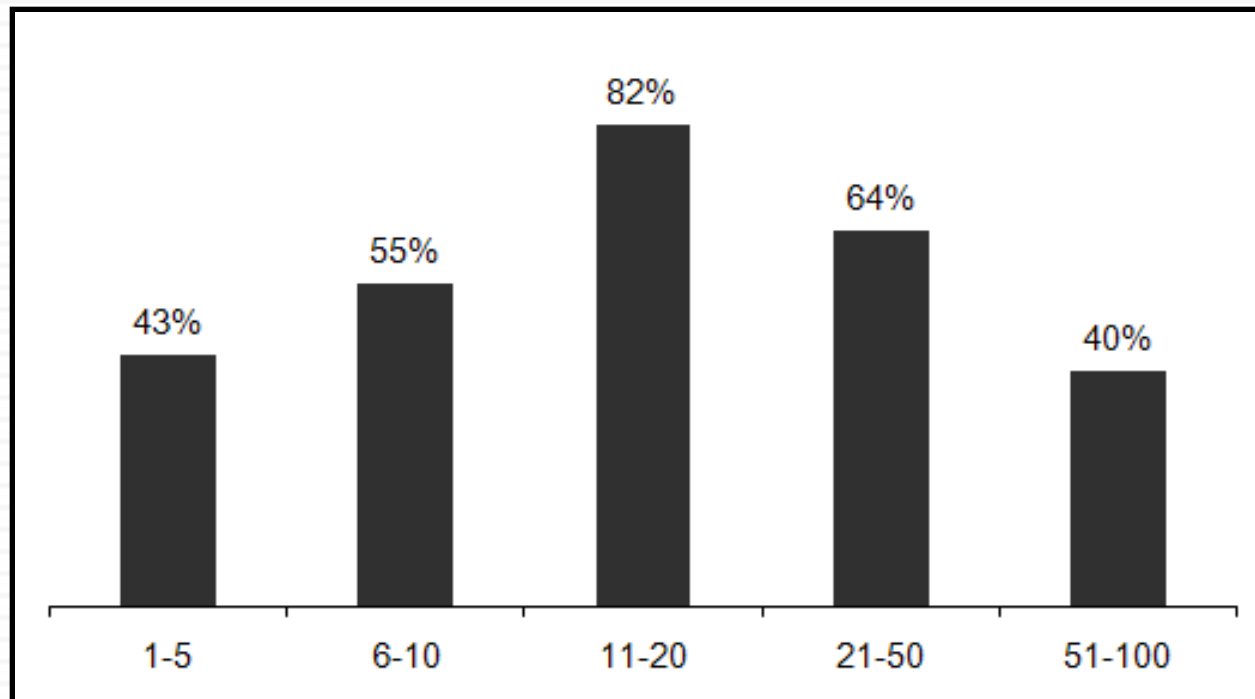
Reuse adoption as a function of approach



- Reuse adoption is most common when teams follow the Traditional RE (61%) and Use-Case-Driven (56%) approaches;
- It is least common when teams follow the Agile approach (33%).

# Reuse Adoption as a Function of Team Size

11



- Reuse adoption differs by the project team size
- Reuse is much less common among the smallest and largest project teams

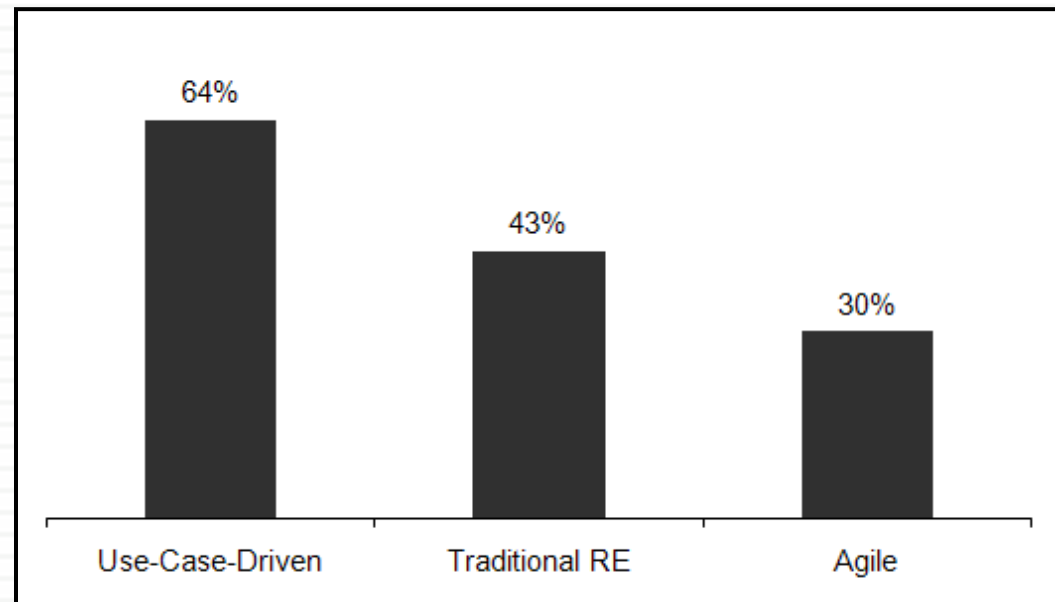
# Reuse Effectiveness as a Function of Approach

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## Definition:

**Reuse Rate** is the ratio between the number of existing requirements reused from previous releases and the total number of requirements used to implement a given release.

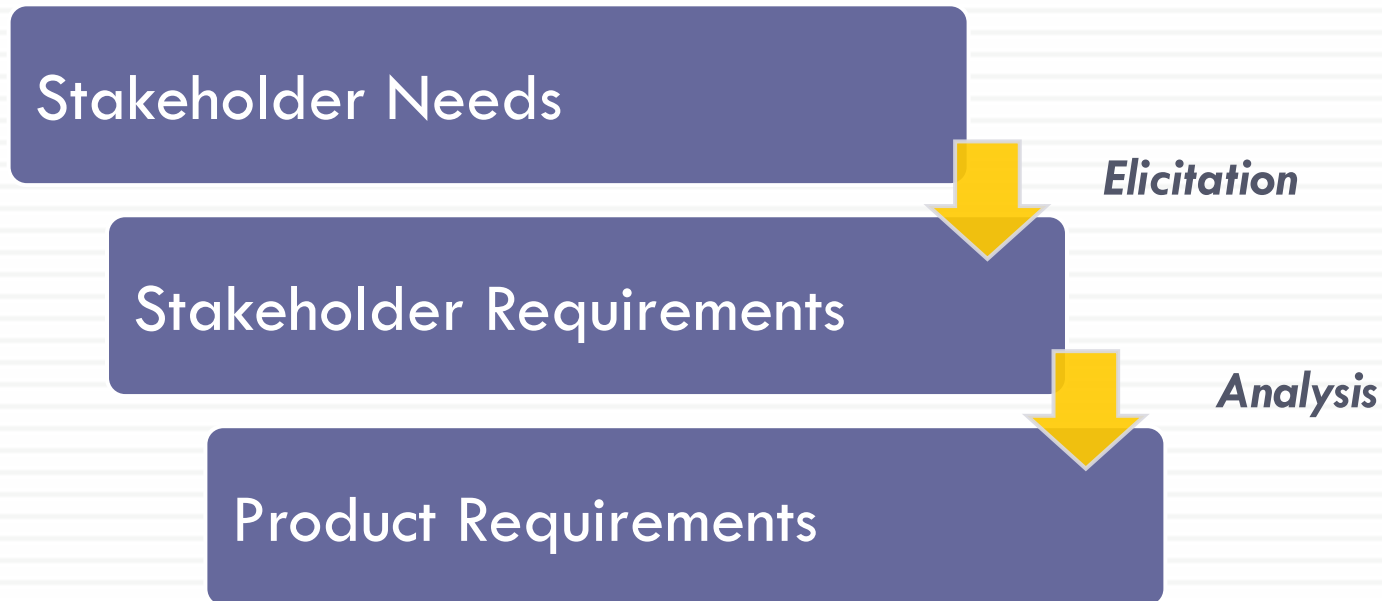
Average reuse rates



- When reusing requirements for releases, the average reported reuse rate was 45%.
- 16% of participants reported a much higher rate from 80% to 100%.
- The teams that follow the Use-Case-Driven approach achieve better average reuse effectiveness of 64%.

# Classification of Requirement Types

13

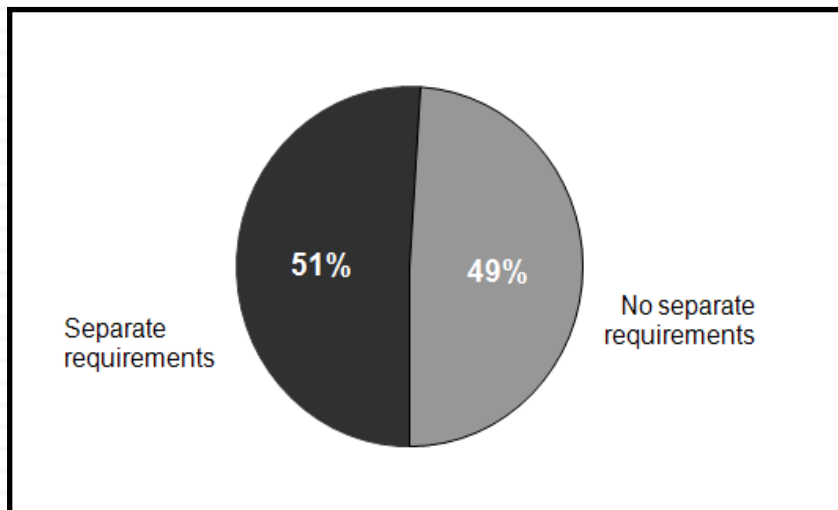


- Only the product type of requirements is subject to reuse.
- Separating between stakeholder and product types of requirements is important for achieving better reuse effectiveness.

# Practicing the Separation of Requirements

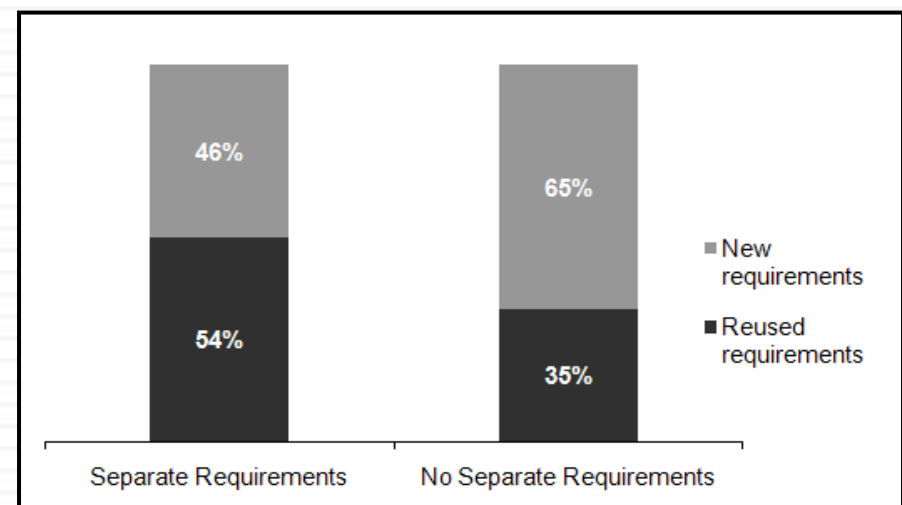
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Following separation in practice



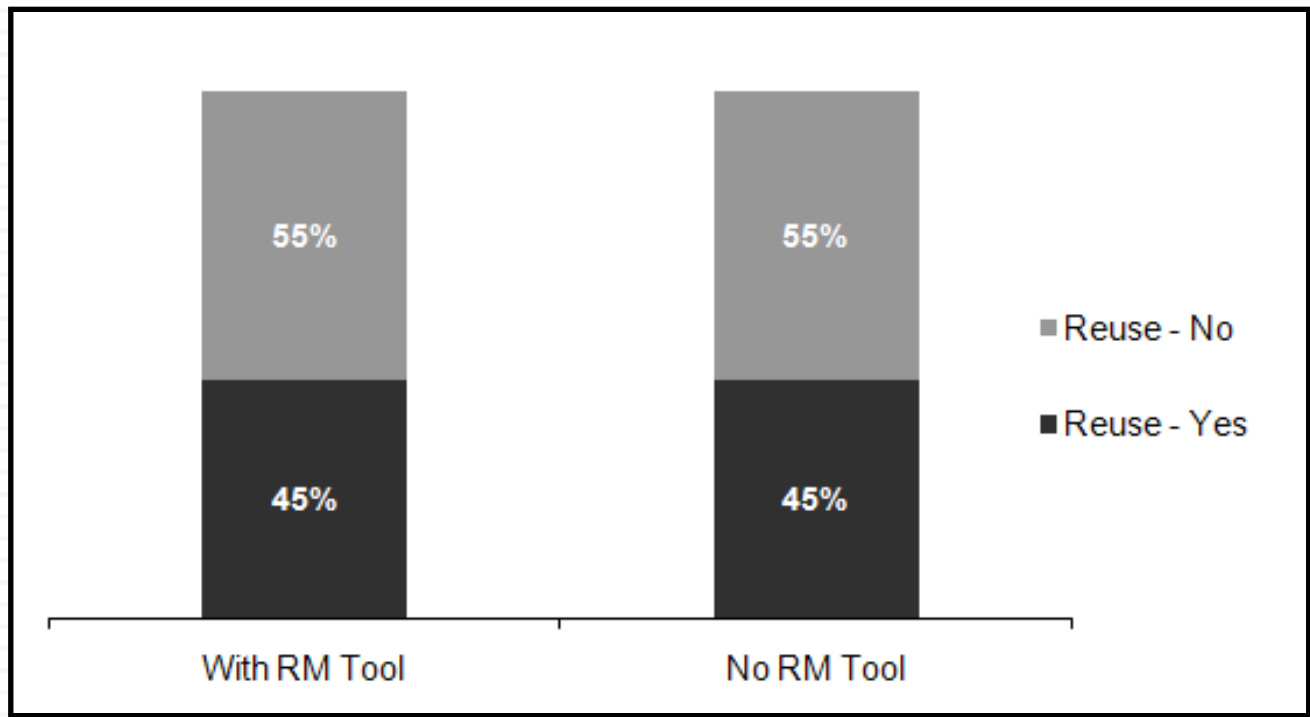
- Separating the stakeholder and product types of requirements is not a common practice.

Reuse effectiveness as a function of separation



- Reuse effectiveness is much higher when we separate stakeholder and product types of requirements.

# Reuse Effectiveness as a Function of Using RM Tools

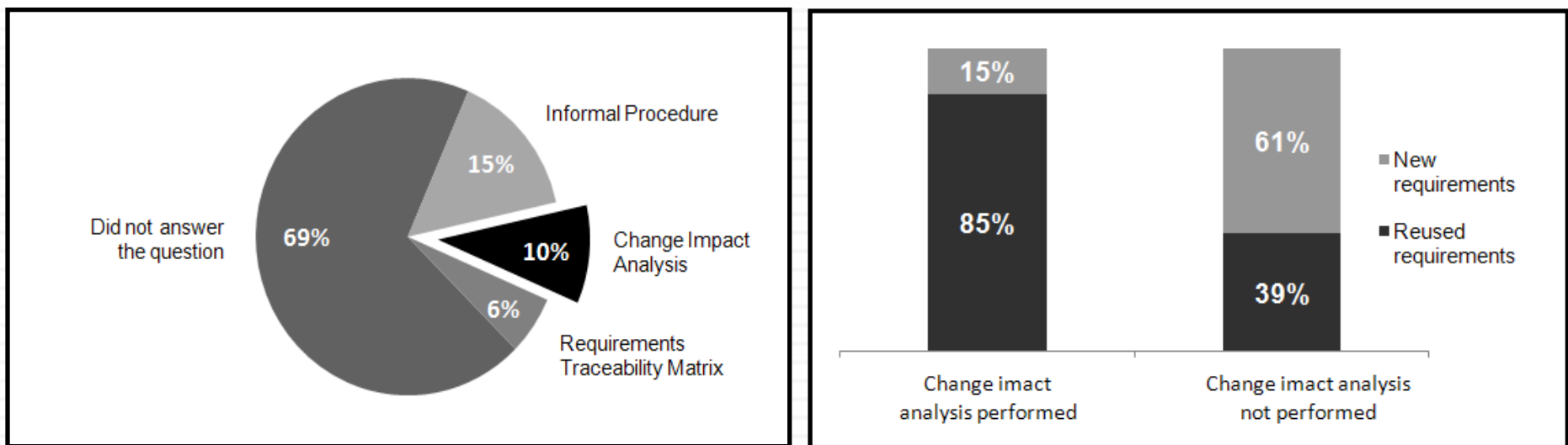


- Using RM Tools has no impact on reuse effectiveness.

# Change Impact Analysis

16

Q: how do you identify which of the existing requirements can be reused for the next release?



- Only 10% of respondents used change impact analysis.
- Most respondents identify requirements for reuse informally.
- Performing change impact analysis results in much higher reuse effectiveness (85% vs. 39%).



# Conclusion

- Most of the survey participants agreed that requirements reuse is important and can provide benefits.
- Better time-to-market and lower development cost are the main reported benefits of requirements reuse.
- Adopting requirements reuse remains challenging.
- Poorly structured and maintained existing requirements are the main obstacles for adopting requirements reuse.
- The teams who follow the Use-Case-Driven approach more commonly adopt requirements reuse and achieve better reuse effectiveness.
- Practices improving reuse adoption and effectiveness:
  - Refactoring the existing requirements into a better-structured model
  - Maintaining a complete requirements model through releases
  - Separating the stakeholder and product types of requirements
  - Conducting formal change impact analysis