

Reasons to Invest in RE and Key Problems in the Task

Uolevi Nikula, Lappeenranta
University of Technology

Goal

✦ The purpose of this presentation is to
clarify:

- ◆ Role of requirements in software development project
- ◆ Requirements and software engineering maturity and trends
- ◆ Issues in software process improvement in requirements engineering area with methods

Software Project Cost and Time Overruns

Percentage overrun	Cost overrun-%		Time overrun-%	
	Chaos'95	Cutter'01	Chaos'95	Cutter'01
0	(16)	20	(16)	18
1-50	25	68	12	73
51-100	16	8	11	5
101-200	5	2	19	3
>200	7	2	6	0

- ✦ The software project cost and time overruns have been very common in the past, e.g., in the Chaos report in 1995
- ✦ In the Chaos report 16% of the projects were completed on time and on budget (0% overrun) and 31% were cancelled. Above the overrun projects (53%) are subdivided into smaller categories
- ✦ Later studies have had similar results

Key Factors in Software Development Projects

Success factors	Challenged factors	Impaired factors
1. User involvement	1. Lack of user input	1. Incomplete requirements
2. Executive management support	2. Incomplete requirements and specifications	2. Lack of user involvement
3. Clear statement of requirements	3. Changing requirements and specifications	3. Lack of resources

- ✦ The key success, challenge, and impairing factors for software project from the Chaos report all emphasize the importance of requirements

Universal Software Project Risk Factors

1. Lack of top management commitment to the project.
2. Failure to gain user commitment.
3. **Misunderstanding the requirements.**
4. **Lack of adequate user involvement.**
5. **Failure to manage end user expectations.**
6. **Changing scope/objections.**
7. Lack of required knowledge/skills in the project personnel.
8. **Lack of frozen requirements.**
9. Introduction of new technology.
10. Insufficient/inappropriate staffing.
11. **Conflict between user departments.**

✦ Keil et. al study identified 11 universal software project risk factors

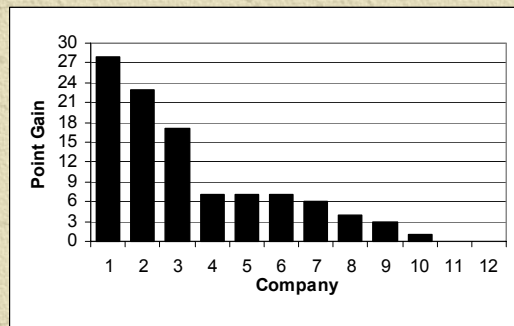
✦ Six of these factors can be considered requirements related

October 15, 2002

Uolevi Nikula, BaRE Justification

5

Software and Requirements Engineering Maturity 1/2



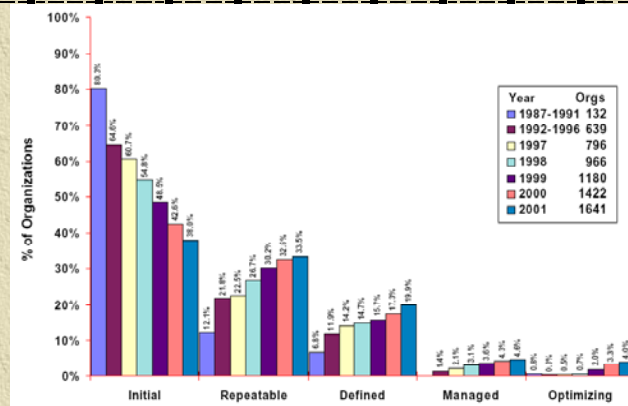
✦ REAIMS Top Ten evaluation in twelve Finnish companies in 1999; the best company got 28 points out of 30 and two did not get any points.

October 15, 2002

Uolevi Nikula, BaRE Justification

6

Software and Requirements Engineering Maturity 2/2



Software Engineering Institute's trends in Capability Maturity Model in March 2002.

Possible Reasons for Industry's Low Use of Methods

- People who work for industry are not sufficiently informed about new methodologies and the way they should be used.
- Methodologies are difficult to use in practice, mainly because they are not well documented or an extensive training program is required before they can be put into use.
- Projects developed by industry are usually small sized projects which are developed for internal use. People who develop them have the impression that they do not need any methodology.

(Chatzoglou 1997)

Issues for the Requirements Development Phase

1. There were not enough resources available.
2. The quality of tools and techniques initially employed were not adequate.
3. The management style and techniques adopted initially did not always seem to be the most appropriate ones.

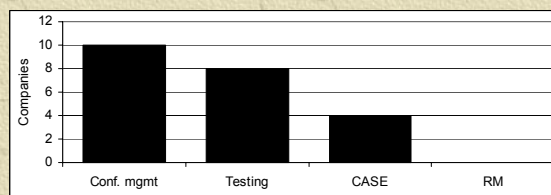
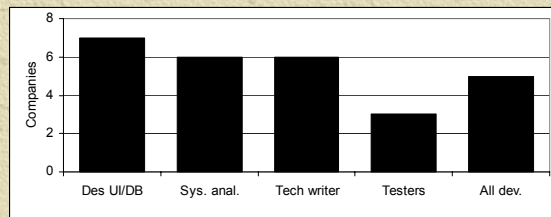
(Chatzoglou 1997)

Organizational Issues in System Development

Major categories for organizational issues	Detailed issues
Organizational alignment	Organization's culture Organization's structure Distribution of power
Organizational contribution	Cost-benefit analysis Information systems strategies Prioritization of work to organizational requirements Consideration of organization's future needs
Human issues	Training Job re-design Consideration of health and safety/ergonomics issues Management and user education User motivation
Transitional issues	Timing of the implementation Perceived level of organizational disruption
Systems integration	Interfaces to existing systems

System development, and RE, are further complicated by a number of organizational issues to consider in improvement efforts

Low Specialization in RE 1/2



- ✦ Specialization in roles and tools in 12 Finnish companies in a 1999 study, note that only half of the systems analysts worked as full time systems analysts

October 15, 2002

Uolevi Nikula, BaRE Justification

11

Low Specialization in RE 2/2

- ✦ Most companies lack specialists in different software engineering areas
- ✦ Lack of expertise makes fluent use of tools and techniques hard if not impossible
- ✦ Lack of expertise makes RE practice improvement and adaptation hard if not impossible

October 15, 2002

Uolevi Nikula, BaRE Justification

12