SERG

Software Engineering Research Group

Lund University, LTH, Sweden
http://serg.telecom.lth.se
http://www.lucas.lth.se

Software Engineering Research Group

SERG established in 1993.
Today's status:

- 4 faculty members
  Dr. Per Runeson, Dr. Martin Höst, Dr. Björn Regnell, Dr. Thomas Thelin
- 1 adjunct professor, 1 adjunct lecturer
  Dr. Even-André Karlsson, Dr. Joachim Karlsson
- 6 full-time PhD students, 1 part-time
- 1 industrial PhD student

SERG Core Competencies

Requirements Engineering
Verification and Validation
Software Quality Process
Software Architecture

http://serg.telecom.lth.se

SERG Enabling Technologies

Empirical methods
Statistical methods
Simulation
Natural Language Processing

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SERG Research Partners

Academia

- Local
  - LUCAS Center for Applied Software Research, Linguistics, Statistics
- Regional
  - BTH, HiS
- National
  - SERPS, SiREN
- International
  - ISERN, ESERNET, MaTeLo, WSU

Industry

- Industrial PhD Students
- Case Studies in Industry
- Technology Transfer
  - ABB
  - Ericsson (*3)
  - Telelogic
  - SPIN-syd

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SERG Courses

Software Engineering Process (C)
Methodology for Software Development (D)
Software Development for Large Systems (all)
Requirements Engineering (C, D, E +IPV)
Software Verification (C, D, E)
Software Quality (C, D, E)
Software Quality and Verification (IPV)

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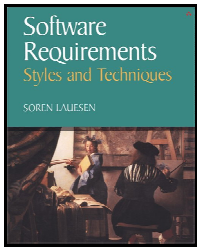
SERG

Requriements Engineering Education



- Lectures
- Study Groups
- Exercises
- Project
- Reading papers
- Lab Sessions

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SERG
PhD Courses in RE

- Topics in SE (RE+V&V+SQ)
- Industrial Training
- Reading Assignment in RE
- Product Management

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SERG
Requirements Engineering Research

Dr Björn Regnell

Dr Joachim Karlsson

Johan Natt och Dag

Lena Karlsson

Focus: **Market-driven RE**

- Decision-support in release planning
- Managing large sets of NL reqs
- Process efficiency
- Empirical Studies

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Johan Natt och Dag

Hantera stora mängder krav i naturligt språk

Lena Karlsson

Diagnostisera beslutskvalitet i kravselektering

http://serg.telecom.lth.se

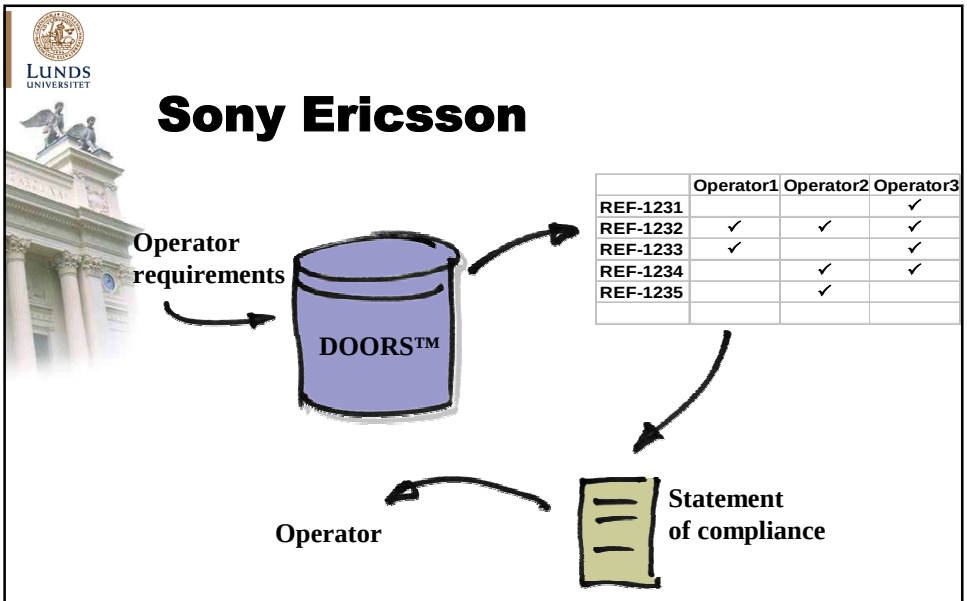
Stöd för hantering av stora mängder krav

Forskningsprojekt
LTH + Sony Ericsson

Johan Natt och Dag

LUND UNIVERSITY

Sony Ericsson



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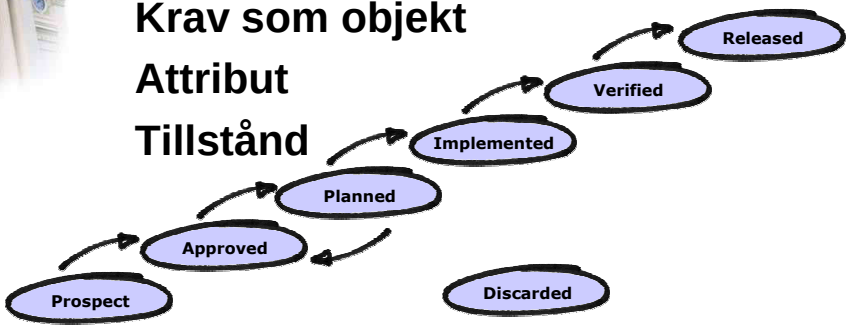
Förutsättningar

Databas

Krav som objekt

Attribut

Tillstånd



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Problemställning

Hitta krav (ärenden) bland befintliga som liknar eller motsäger de inkommande.

Jämför med:

- tidigare inkomna
- hanterade
- planerade
- implementerade
- förkastade

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Exempel

VF-2750		GSM0157 DISPLAY TEXT MUST VGTR-GSM (general) ver2_0.xls from Vodafone Specs v2_0 -Q1 2002
SAT-40	▪▪▪▪▪▪▪	1.6 DISPLAY TEXT must GSM0157
SAT-41	▪▪▪▪▪▪▪	DISPLAY TEXT packed must GSM0160
SAT-42	▪▪▪▪▪▪▪	DISPLAY TEXT unpacked must GSM0160
SAT-52	▪▪▪▪▪▪▪	DISPLAY TEXT UCS2 display
SAT-53	▪▪▪▪▪▪▪	DISPLAY TEXT long text
VF-2751		GSM0158 DISPLAY TEXT: The terminal shall be capable of displaying Text string of up to 240 characters long. MUST VGTR-GSM (general) ver2_0.xls from Vodafone Specs v2_0 -Q1 2002
SAT-65	▪▪▪▪▪▪	DISPLAY TEXT Display of Text string up to 240 Bytes
SAT-53	▪▪▪▪	DISPLAY TEXT long text
SAT-302	▪▪▪▪	SET UP IDLE MODE TEXT Min nr of characters to be supported must GSM0254
SAT-45	▪▪▪▪	DISPLAY TEXT Support of DISPLAY TEXT USER TO CLEAR must GSM0165
SAT-404	▪▪▪	SET UP MENU Min nr of characters per item to be supported must GSM0259
VF-2752		GSM0159 DISPLAY TEXT: if it is not possible to display a complete string on one screen, there shall be a mechanism to scroll through the complete message MUST VGTR-GSM (general) ver2_0.xls from Vodafone Specs v2_0 -Q1 2002
SAT-56	▪▪▪	DISPLAY TEXT scrolling must GSM0159
SAT-31	▪▪▪	CALL CONTROL BY SIM The number translated to should not be displayed.
SAT-61	▪▪▪	DISPLAY TEXT Min acceptable length for the Text String must GSM0158
SAT-65	▪▪▪	DISPLAY TEXT Display of Text string up to 240 Bytes
SAT-40	▪▪	1.6 DISPLAY TEXT must GSM0157

Reella vinster

Inte perfektion i träffsäkerhet!

Stöd för kontinuerligt/iterativt arbete

- **Sökning**
- **Sortering**
- **Utsållning**
- **Indikatorer (dubletter, kompletteringar, skräp)**

Stöd till förbättringsarbete

- **Hur skriver vi kraven?**
- **Hur grupperar vi kraven?**
- **Hur hanterar vi kraven?**
- **Hur skriver andra kraven?**

Stöd för ökad förståelse

- **Har vi förstått kraven?**
- **Har vi kontroll över kraven?**

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Post-Release Analysis of Requirements Selection Quality – an Industrial Case Study

Lena Karlsson[1], Björn Regnell[1], Joachim Karlsson[2], Stefan Olsson[2]

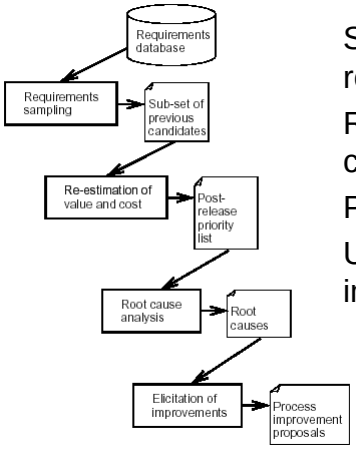
[1]*Dept. of Communication Systems,Lund University, Sweden*

[2]*Focal Point, Linköping, Sweden*

Purpose of the paper

- Introduce a method for post-release analysis
- Investigate requirements selection quality in an industrial setting
- Identify process improvement areas

The post-release analysis method



- Selecting a set of prior requirements from database
- Re-estimating cost and value, creating a new priority list
- Perform root-cause analysis
- Use the root-causes to elicit improvements proposals

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Case study

- Small-sized organisation developing stand alone software packages
- Qualifies for all foundation practices
- Focal Point tool used as database and prioritisation method

www.focalpoint.se

http://serg.telecom.lth.se

Requirements sampling

45 requirements from 3 different releases (A, B and C) were selected from the database

A release launched 18 months ago was selected as reference release (A)

Re-estimation of cost and value

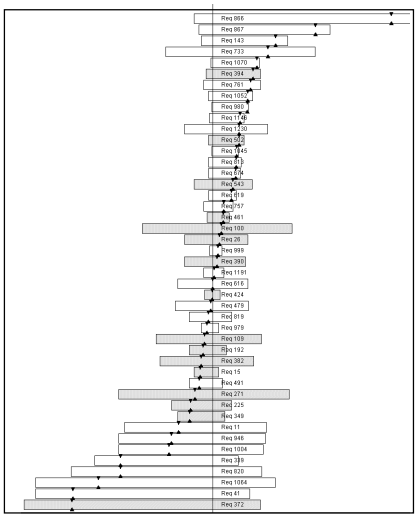
Market value re-estimated using pair-wise comparisons

Implementation cost re-estimated using expert judgement

”Which of the requirements would, from a market perspective, have been the best choice for release A?”

Creation of bar-chart

Bar chart



Illustrates the discrepancies between the prioritisations

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Root cause analysis

The requirements identified in the bar chart were discussed

- How can we improve decision-making?
- What would have been needed to make better decisions?
- Which changes to current practices can be made to improve requirements selection in the future?

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Root causes

Root Causes		Req 192	Req 382	Req 15	Req 271	Req 225	Req 349	Req 372	Req 41
Implem. issues	RC1: Under-estimation of development effort	■	■		■				
	RC2: Part of release theme		■		■			■	■
	RC3: A quick fix to provide customers opportunity to give feedback		■		■				■
Customer issues	RC4: Requirement ordered by a specific customer								■
	RC5: Requirement specifically important for a key customer				■			■	■
	RC6: Over-estimation of customer value			■		■	■	■	■
	RC7: Impressive on a demo					■		■	■
	RC8: Competitors have it, therefore we must also have it							■	
	RC9: Competitors do not have it; gives competitive advantage			■		■			■

Root Causes		Req 143	Req 733	Req 1070	Req 761	Req 1052	Req 980	Req 1146	Req 1045	Req 813	Req 674	Req 866	Req 867
Implementation issues	RC10: Over-estimation of development effort	■							■	■			
	RC11: Insufficient understanding of scale-up effects			■				■					
	RC12: No good design solution available		■		■								
	RC13: Sub-optimal decision based on requirements partitioning		■										
	RC14: Only partial implementation in a first increment				■	■	■				■		
Cus. issues	RC15: Requirement ordered by a specific customer											■	■

Elicitation of improvements

Trim the division of large requirements into smaller requirements

Enhance the overall picture of related requirements

Additional elicitation effort for usability requirements

Improve estimations of market-value of features in competing products

Improve estimations of development effort

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Q?

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