

ISSRE Industry Workgroup Meeting Report

Ram Chillarege
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Bengaluru, India

Hosts: Sachin Garg, Chandra Kintala
Industry Committee: Madhav Marathe, Veena Mendiratta
Industry Workgroup: List on Page 3

Table of Contents

ISSRE Industry Workgroup.....	1
Meeting Report	1
Table of Contents.....	1
Executive Summary	2
Members of the Workgroup:.....	3
Topics Identified through Brainstorming.....	5
Descriptions of consolidated Items	6
Workshops	6
Tutorials:.....	10

Executive Summary

This year we created an Industry Workgroup drawing representatives from across industry segments. Each of the companies was approached for a senior person to represent the company's interest and be a champion within the company. These ~ 20 major software companies represent a few hundred thousand software engineers in India. As we build on the success of ISSRE workshops in recent years, we also need help to address the faltering Tutorials and Tools Fair programs. This process is new to ISSRE and will help us develop a more relevant program.

The meeting was held at Yahoo! in Bengaluru, chaired by Ram Chillarege and hosted by Sachin Garg and Chandra Kintala. We began with an introduction to ISSRE, its history, strengths and weaknesses. We addressed several questions on the organization of the conference, the process of peer review and paper selection and concerns on the high registration rates in India for IEEE conferences. Once the team developed a fair idea of the opportunities and challenges facing ISSRE we embarked on a brainstorming session with these objectives:

1. Attract practice contributions from the local areas
2. Define workshops that are most relevant
3. Help identify tutorial topics most needed
4. Examine the possibility of a tools fair
5. Identify initiatives that provide value to the community

26 items were identified by the team. These are listed on page 5 and mapped into Workshops, Tutorials, Panels and Papers. The tutorial needs were identified by this group, which for the first time in ISSRE helps us gain insight into market demand. This can hopefully change our tutorial issues from a demand generation problem into an instructor staffing problem. These workshops and tutorials still need to be developed and the ownership assigned. We will do this soon after we include input from the worldwide community. We will post these findings on the web and advertise through our mail list to remind the community to submit their inputs. We then need to narrow down the selections and get them owned and executed. We have enrolled a few past ISSRE workshop organizers to help new organizers with their knowledge and experience.

The idea of a Tools Fair had good reception. This task has been assigned and a small team (Pavithra Krishnamurthy, Naresh Choudhary and Nina Fazio) are already running this ball. We have space identified at the conference venue and there seems to be considerable interest expressed by a few tool vendors.

This Industry Workgroup in Bengaluru has expressed significant interest to continue to meet on a regular basis. This forum is unique in that it cuts across several industries and verticals. We will figure out the next steps once we get the current tasks launched.

Members of the Workgroup:

Shivani Arora	Alcatel-Lucent
B. Ashok	Microsoft
Ashok, Ajit	Philips
Narendra Babu	Google
Narasimha Bhatta	TCS
Ram Chillarege	Chillarege Inc.
Srinivasan Desikan	HP Labs
Rinku Dubey	SAP
Sachin Garg	Yahoo Labs
Subu Goparaju	Infosys
R. Krishnan	Bosch
Madhu M Kumar	GE Health Care
Madhav Marathe	Cisco
Ashish K Mathur	IBM
Veena Mendiratta	Alcatel-Lucent
Sudarshan Murthy	Wipro
Raghu Nambiar	Siemens
Sheenam Ohrie	SAP
Srinivas Padmanabhuni	Infosys
K. Prasad	Motorola
Ganesan Ramalingam	Microsoft
S.V. Sankaran	SAP
Santonu Sarkar	Accenture
Kalyani Sekhar	Cognizant
Rajeev Shorey	General Motors Research
Shyam Suri	Cisco
Ramesh Tumuluru	TCS
Shivshankar Vasnad	EMC
Shyam Vasudev	Philips
Sridhar Venkateswaran	CAT



Sitting [L-R]: Narendara Babu/Aithal?, Chandra Kitala, S.V. Sankaran, Rinku Dubey, Sheenam Ohrie, Madhu Kumar

Standing [L-R]: Ram Chillarege, Subu Goparaju, Ashish Mathur, K. Prasad, R. Krishnan, Sridhar, Narashima Bhatta, Ganesan Ramalingam, Anand, Santonu Sarkar, Raghu Nambiar, B. Ashok, Srinivas Padmanabhuni, Sachin Garg

Not in the picture, but at the meeting: Rajeev Shorey, Kalyani, Shiv Vasanand, Kalyani Sekhar, Sridhar Venkateswaran, Shyam Vasudev ??

Topics Identified through Brainstorming

ITEM	TOPIC		Group/Map	TAG
1	Dependable Web Engineering	Workshop		W1
2	Global Software Development	Workshop		W2
3	Reliability Techniques for Zero Tolerance Systems	Workshop		W3
4	Robust Design for Safety Critical Systems	Workshop	Merge to 3	W3
5	Automation to Improve Reliability - Tools	Tutorial		T1
6	Reliability in Cloud Computing	Workshop		W4
7	Embedded Software Reliability	Workshop		W5
8	Security Risks in Embedded due to Malware	Workshop	Merge to 7	W5
9	Advanced Reliability Prediction Techniques	Tutorial		T2
10	Agile and Test Driven Development for Reliability	Tutorial		T3
11	Customer Escalation handling for Reliability	Workshop	Merge to 12	
12	In-Process Measurement	Workshop		W6
13	Synergy among CMMi, ISP, TL, Six Sigma	Workshop		W7
14	Reliability techniques for Embedded OS	Workshop	Merge to 7	
15	Concurrency and many Core Testing for Reliability	Tutorial		T4
16	Metrics for Reliability	Workshop		W8
17	Compare R methods between Embedded and Commercial	Paper		W5
18	Compliance		Merge to 13	
19	Definition of Reliability in Different Market Segments	Panel		P1
20	Reliability vs Hardware / Software Tradeoffs	Paper		
21	Experiences with Formal Methods in Reliability	Tutorial		T5
22	Statistical techniques with Program Analysis	Workshop	Merge to 12	
23	Defect Prevention through Reliability Testing	Tutorial		T6
24	Cost of Quality	Paper		
25	Enterprise Multi-Platform Testing	Workshop	Merge to 6	
26	Customer View of Reliability Business Value	Panel		P2

Descriptions of consolidated Items

Workshops

W1 WEB AVAILABILITY ENGINEERING

- Whatever that is delivered with a web front end, has several “ities” that are vital to this platform. Predominantly: reliability, scalability, availability, and security.
- Every 5 minutes there is a crash of the Amazon server, but as far as the users are concerned there is total availability.
- What are the methods, tools, techniques, and bag of tricks to achieve higher reliability?
- What are the data available to gain an understanding of the current state of the practice? Given a spread in the back end reliability and performance how can we articulate the experience in quantitative terms?
- Interested Parties: Srinivas.

W2 GLOBAL SOFTWARE DEVELOPMENT

- The bread and butter of Indian software development is Services.
- Note: While there are several product development captive units, Services attracts mind space. Regardless, these discussions will apply to Products and Services.
- What does it take to carry out a testing service?
- What does it take to establish quality processes?
- What uniformity of tools and processes do we need to ensure globally?
- Service centers naturally focus on functionality since that is what builds the business proposition.
- What are the issues that are not related to functionality but equally vital to the business proposition? Reliability and Scalability certainly grab attention, therefore what are the issues specifically related to them?
- SEPG is a popular forum in India. There is synergy between the discussions in that forum and what we have here.
- There is a marked shift toward a greater focus on product development these days. For instance we see at least 100 product company start-ups in the past six months.
- Sun iPlanet server was developed here.
- How does the shift towards product development impact these “ities”
- Interested Parties: Srinivas + Madhu + Rinku

W3 ZERO TOLERANCE SYSTEMS AND SAFETY CRITICAL

- Organizations such as NASA and ISRO have near zero tolerance for failure.
- Many embedded systems have similar requirements
- What are the methods used to achieve these low failure rates?

- To what extent are fault-tolerant techniques currently in use?
- Many zero tolerance systems are run with little or no fault-tolerance? They depend entirely on testing to ensure that the failure probabilities are low. What is the future of this design point?
- Is robustness in design only present when it is warranted by law for safety?
- What are the tradeoffs in the design point? To what extent does the legacy of our systems still dictate development methods and practices?
- What are examples of a system re-design in recent years, that helped reduce development cost and cycle time?
- Interested Parties: Bhatta + Sridhar

W4. RELIABILITY IN CLOUD COMPUTING

- What are the needs for reliability in cloud computing?
- The shift in paradigm where hardware and software are time sliced, provides an intrinsic model for redundancy. How can this be leveraged for reliability and scalability of applications?
- What are the business models for startup companies where this changes the game for offering services?
- How can we leverage these resources for development and test in ways that were not possible before?
- What are some case-studies that illustrated the exploitation of cloud computing? What are the costs and infrastructure needs necessary to get started? Where does it not provide value?
- Interested Parties:

W5. EMBEDDED SOFTWARE RELIABILITY

- We have had to very successful workshops in embedded software reliability in the past two years – Sweden and Seattle. Each had around 30-35 participants and there is considerable documentation on the program, talks, structure and feedback on these workshops.
- A substantial amount of information on organizing this workshop is available in the previous year's websites.
- http://www.issre2007.hv.se/extra/pod/?id=1103&module_instance=1&action=p
- The past workshops had two inter-twined themes. (1) Process Management (2) Model based development
- The past workshops also list a series of some 30-40 issues of interests, and discussions are often centered among this subset of issues.
- Interested Parties: Several

W6. IN-PROCESS MEASUREMENT

- What are the in-process measures that are in common use?
- Are there specific measures that are pertinent to reliability that can be used early in the development cycle?
- A number of reliability measures are after the fact that only yield a report card. Are there predictive measures that are valuable earlier in the development cycle?
- What are the major groups of product measures and how can we relate them to process measures?

W7. SYNERGY ACROSS PROCESS IMPROVEMENT MODELS

- We have several process improvement methods, models and practices. CMMi, Six Sigma, TL, ISO, being the prominent ones.
- What is common among them, and what is different?
- What are the experiences in using one over the other?
- Did some institutions begin with one and find it too hard to sell and then switch to another?
- Are there some specific advantages of one over the other based on industry or market segment?
- Some industries require compliance with a specific practice. Are there lessons learnt in the use of another model that make it more effective to implement?
- Some institutions have modified the original models or extended them so that they provide value in more than one business or technical realm. For instance, ROI analysis is particularly valuable when margins erode and we need to survive business cycles. What are the insights gained?
- There is resistance to use of these models across different product companies? What are the major arguments in favor for or against a model?
- The services businesses have been the ones that gave the CMM a big boost. The product company pickup has been slower. What are the lessons learnt from this experience?

W8. METRICS FOR RELIABILITY

- What are the metrics that are commonly used for reliability?
- The use of execution time measures has for long been hailed as better for reliability measurement. However, the collection of execution time is not as easy and not as widespread. What are the experience and best practices in the collection of execution time?
- What are the product measures that help improve reliability? There have been papers at ISSRE that use code analysis metrics that help guide the enhancement of specific sections of code. Experience reports in this area are welcome. Is this something that is gaining traction in our community or are the one-off instances?

Panels

P1. RELIABILITY DEMANDS BY MARKET SEGMENT

- What does reliability mean in different market segments or industries? For instance the notion of failure or the promise of a service is different by markets. A failure in aerospace and its consequences is quite different from the notion of failure in a desktop application. Thus, we need to separate the notions of failures, and associate with them the consequences.
- Financial impacts, by industry, market segment, application is valuable to document.
- Responses to failures and techniques of reliability are valuable to document.
- Practices for manual intervention and recovery,.

P2. CUSTOMER VIEW OF RELIABILITY AND ROI

- What is the business value of reliability?
- Value or Impact of reliability need to be measured in dollars, market opportunity, competitive advantage or safety and security impact that can be related directly to customer experienced value.
- Interested Party: Subu

Tutorials:**T1. AUTOMATION TO IMPROVE RELIABILITY – TOOLS**

- This tutorial should provide an overview of what the broad classes of tools and their possibilities. For instance there are a variety of tools for unit testing each with their strengths and weaknesses. For this class of tools we need to articulate the parameters that are significant so that one gains an understanding of how to evaluate tools in this class. Thus, when presented with a list of tools for unit testing – some of which may be open source, and some proprietary, one gains the knowledge to review the list of tools.
- For each class of tool we would want to learn:
 - What are the tools?
 - How does one interpret the different parameters for evaluation?
 - What should one consider when presented with choices?
 - How should one make decisions for their own purposes?
- There was unanimous interest expressed for this tutorial.
- Rinku, Santanu and Prasad have offered to write up an RFP for this tutorial
- The larger Industry Committee should try to indentify a suitable tutorial instructor – Action item for Mod and Veena to assign.

T2. ADVANCE[Error! Hyperlink reference not valid.](#)D RELIABILITY PREDICTION

- This topic has a well established tutorial that used to given by the late John Musa.
- Professor Laurie Williams can offer this tutorial.

T3. AGILE AND TEST DRIVEN DEVELOPMENT FOR RELIABILITY**T4. CONCURRENCY AND MANY CORE TESTING FOR RELIABILITY**

- Interested Party:

T5. EXPERIENCES WITH FORMAL METHODS FOR RELIABILITY

- This has probably not been offered at ISSRE
- Interested Parties: Rama

T6. DEFECT PREVENTION METHODS FOR RELIABILITY

- The ODC (Orthogonal Defect Classification) tutorial is in this broad area.
- It has been offered at ISSRE a few times and usually has a good turnout.