SAND2009-0185C

Process Innovation for Very Small Projects and Teams

Session ID: 2105

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Agenda

- My Background
- Presentation Scope
- New Perspective on Process
- Process Improvement Cycle
  - Sponsorship
  - Appraisal
  - Improvement Implementation
  - Practice
- Lessons Learned
- Comments and Questions

My Background

- Member of SCAMPI[SM] B & C Development Team
- Authorized SCAMPI[SM] A Lead Appraiser
- Authorized SCAMPI[SM] B & C Team Lead

- Software Quality Engineer at Sandia National Laboratory
- Lead SCAMPI[SM] appraisals across the Lab, primarily SCAMPI[SM] C appraisals
- Provide consulting services to Lab-wide organizations interested in process improvement for small projects and teams

[SM]SCAMPI is a service mark of Carnegie Mellon University
SCAMPI = Standard CMMI® Appraisal Method for Process Improvement

Problem Statement

- **Small projects and teams**
  - Find it difficult to implement process improvements using the CMMI®
  - Have difficulty allocating funding to process improvement activities
  - Have customers who assume that “quality” is automatic
  - Often need initial assistance and planning support to get a process improvement program running efficiently

CMMI® = Capability Maturity Model® Integration

Presentation Scope

Small projects and teams

Team Size:	1 – 4 individuals, all part time
Funding:	$50K - $250K 1-year project
Process Improvement Experience:	None to minimal; ad hoc processes

Process Improvement from Inside the Box

Formality

- Hard copy/scanned approval signatures
- Processes captured in separate documents
- Separate documents associated with all work products (design document, requirements document, agendas, meeting minutes, etc.)
- Everything placed under formal configuration management
- Large proportion of the project budget used to fund “process improvement” efforts
- All or nothing approach

Process Improvement Outside the Box

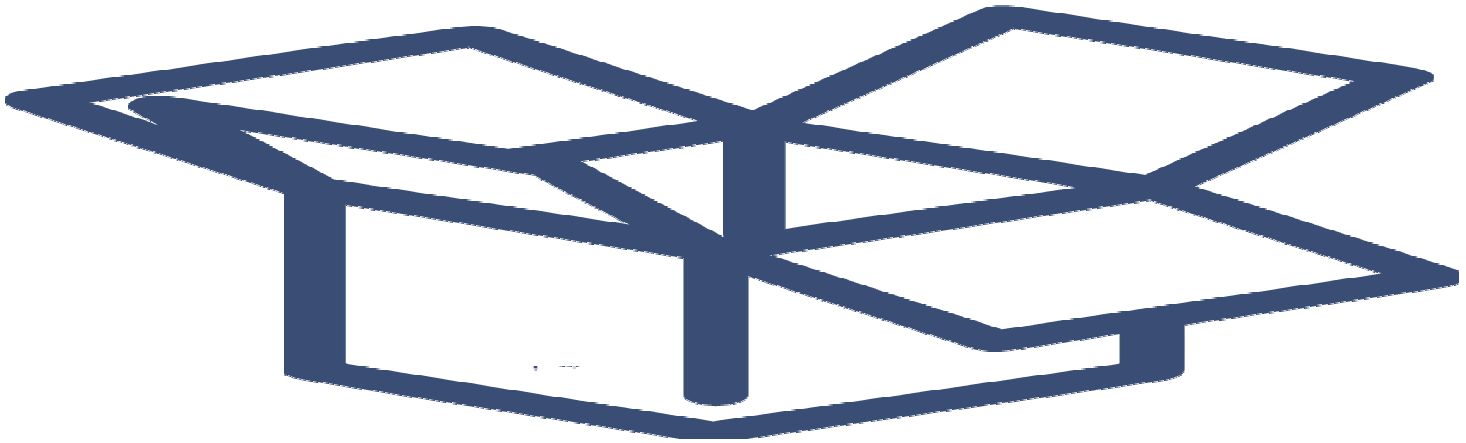
Document work product development in "real time"

Use social networking tools to communicate with team members

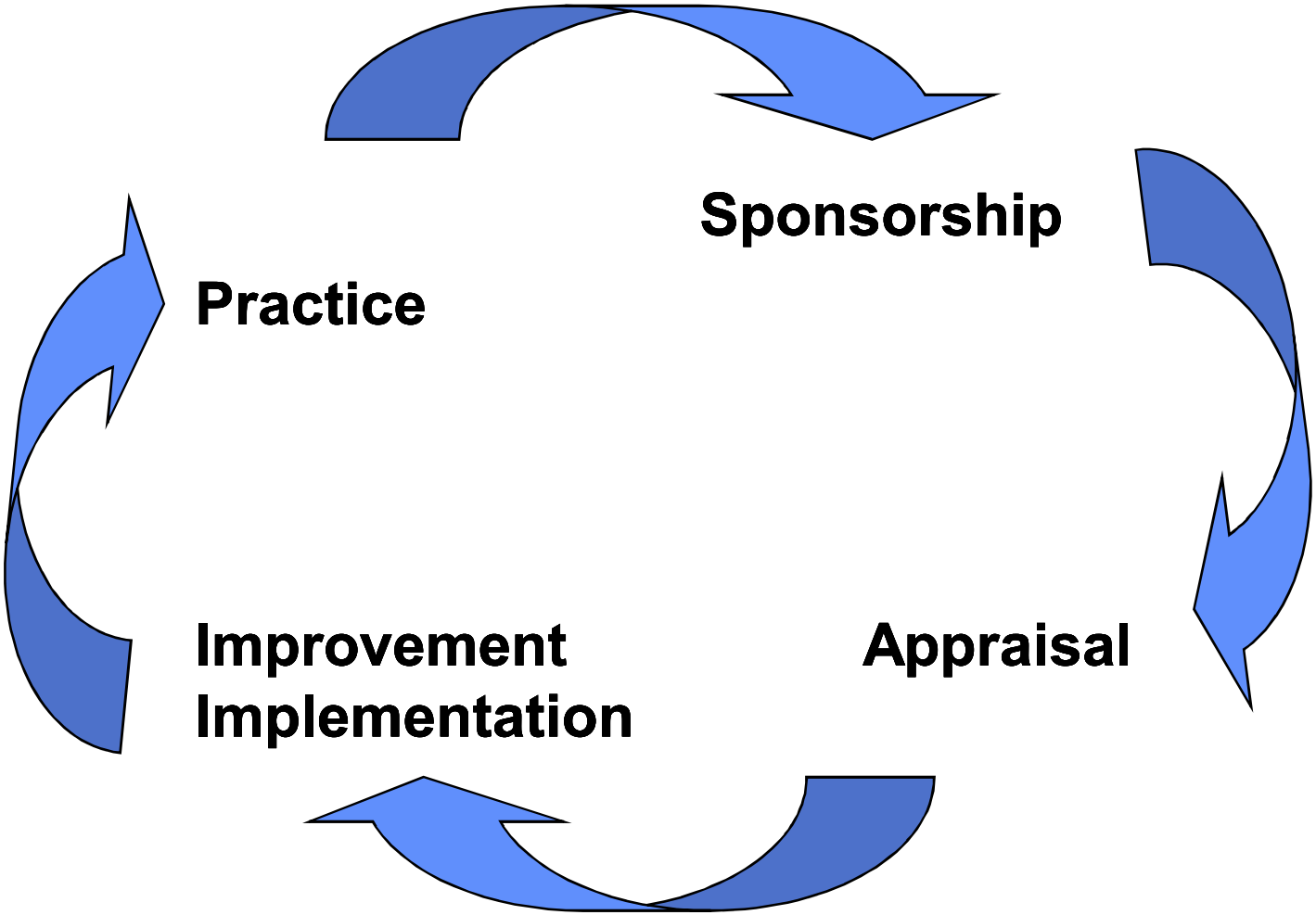
Make team processes collaborative

Find tools to manage project work at an appropriate level

Think "efficient"



Process Improvement Cycle



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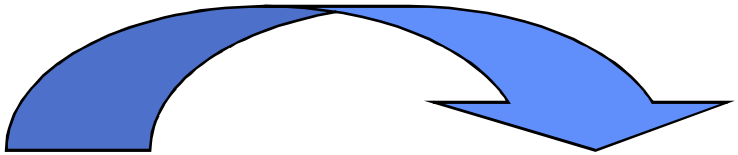
Process Improvement Cycle

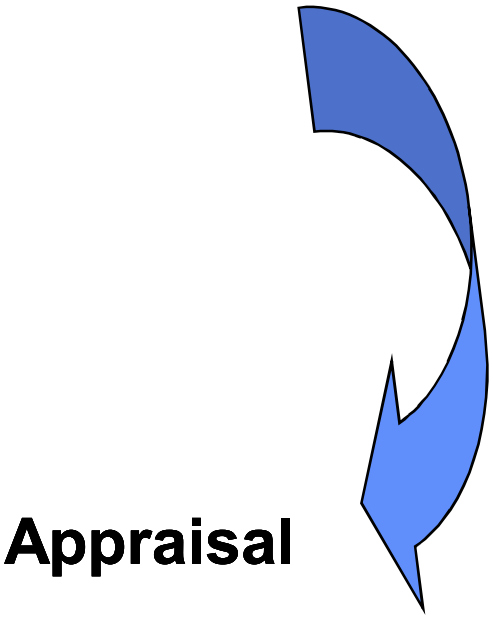


Sponsorship

- Management sponsorship (top down)
- Multiple project sponsorship (bottom up & out)
  - Use economies of scale
  - Share best practices

Process Improvement Cycle

- Conduct a gap analysis
  - SCAMPI^{SM} C
  - Scale the appraisal down to a reasonable size
  - Identify priorities
- Use a standard
  - CMMI®
  - Continuous representation
- Use appraisal “findings” to prioritize process improvements



Staged vs. Continuous

For small projects and teams…

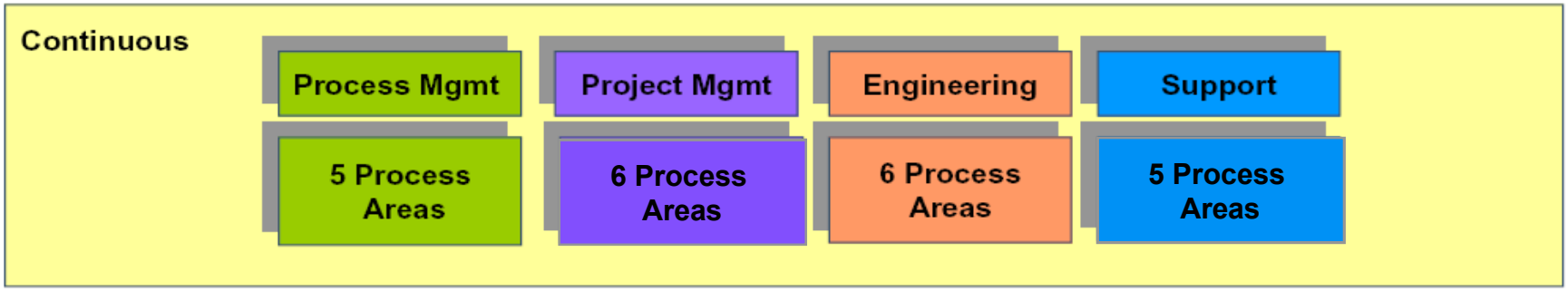
Staged

- Can be costly, especially when maturity levels are selected arbitrarily
- Overwhelming for people new to process improvement
- Can lead to process improvement gone BAD

Continuous

- Cost effective; projects can prioritize where they need to **improve systematically**
- Reduces anxiety by focusing on limited areas
- Supports the need for institutionalization

Continuous Representation



- Organizational Process Focus
- Organizational Process Definition
- Organizational Training
- Organizational Process Performance
- Organizational Innovation & Deployment

- Requirements Management
- Requirements Development
- Technical Solutions
- Product Integration
- Verification
- Validation

- Project Planning
- Project Monitoring & Control
- Supplier Agreement Management
- Risk Management
- Integrated Project Management + IPPD
- Quantitative Project Management

- Configuration Management
- Measurement & Analysis
- Process & Product Quality Assurance
- Causal Analysis & Resolution
- Decision Analysis & Resolution

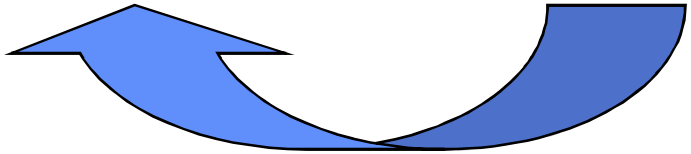
Continuous Representation Generic Goals

Generic Goals	Generic Practices
GG1: Achieve Specific Goals	GP 1.1: Perform Base Practices
GG2: Institutionalize a Managed Process	GP 2.1: Establish an Organizational Policy GP 2.2: Plan the Process GP 2.3: Provide Resources GP 2.4: Assign Responsibility GP 2.5: Train People GP 2.6: Manage Configurations GP 2.7: Identify and Involve Relevant Stakeholders GP 2.8: Monitor and Control the Process GP 2.9: Objectively Evaluate Adherence GP 2.10: Review Status with Higher Level Management
GG3: Institutionalize a Defined Process	GP 3.1: Establish a Defined Process GP 3.2: Collect Improvement Information
GG4: Institutionalize a Quantitatively Managed Process	GP 4.1: Establish Quantitative Objectives for the Process GP 4.2: Stabilize Subprocess Performance
GG5: Institutionalize an Optimizing Process	GP 5.1: Ensure Continuous Process Improvement GP 5.2: Correct Root Causes of Problems

Process Improvement Cycle

- Identify cost-efficient tools to assist with process improvements identified from the appraisal
  - Inventory tools already in use or available
  - Investigate new tools
- Implement improvements holistically, not linearly
  - Do not use a waterfall approach to process improvement

Improvement Implementation



What can Tools do for You?

- Configuration management
- Requirements management and traceability
- Project management
- Risk management
- Issue tracking
- Collaboration
- Documentation of decisions and design rationale
- Other

There's a tool for everything; choose wisely!

Cost-efficient Tools

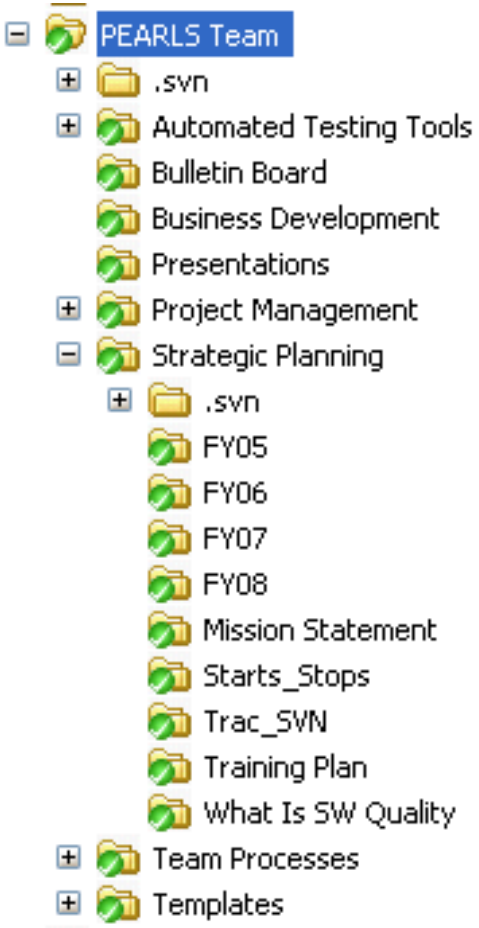
Configuration Management

Subversion and TortoiseSVN

http://www.wdogsystems.com/opencms/opencms/demos/basic_tortoisesvn.html

- **Use SVN for code development and management**
- **TortoiseSVN**
  - **provides a web interface for reviewing the repository**
  - **integrates with Windows Explorer**

TortoiseSVN Screen Shot



- **Use SVN for project files other than code too**
- **Provides a file backup capability so files exist on the SVN server as well a personal hard drive**

Cost-efficient Tools

Project Management and Collaboration

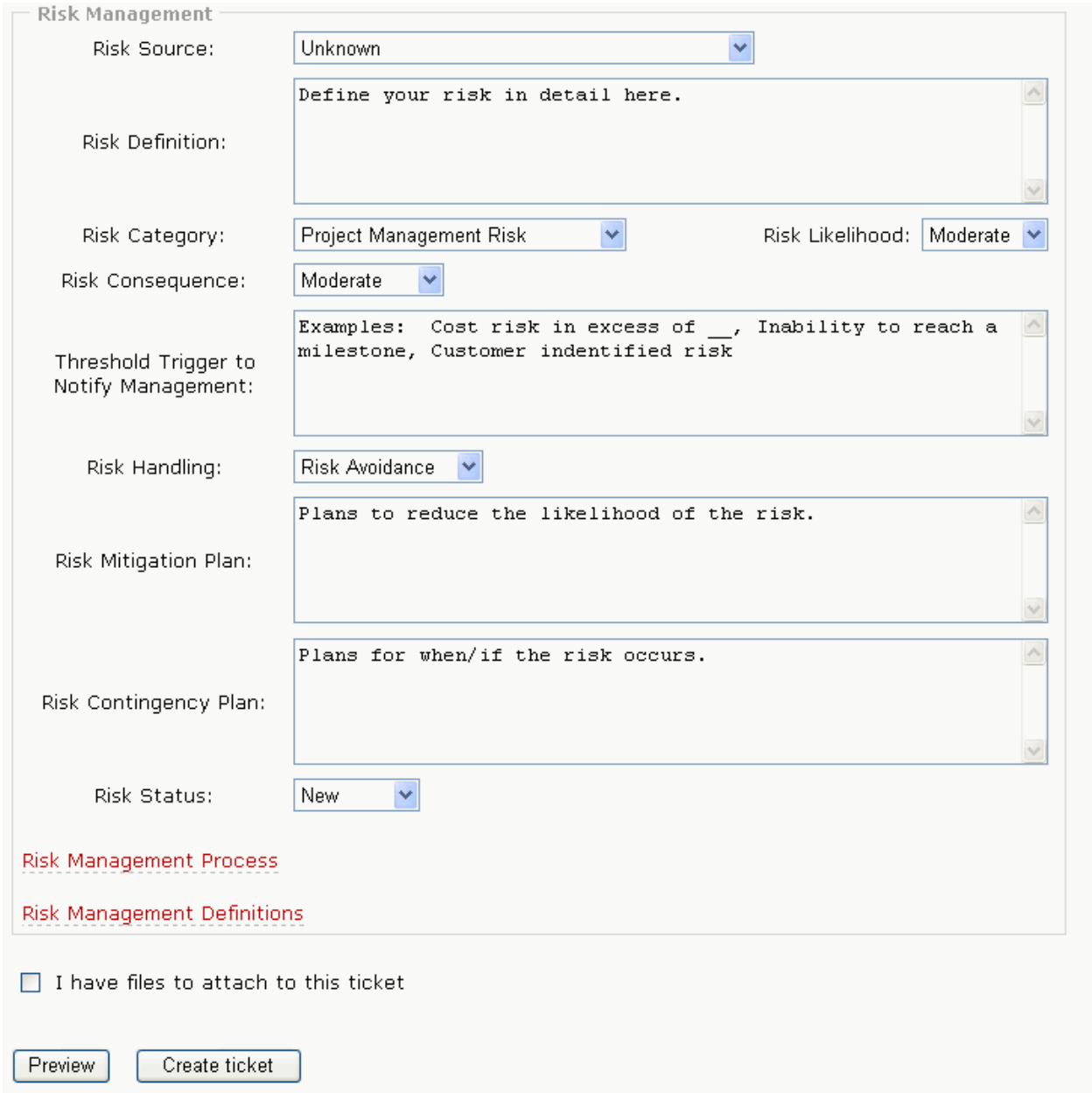
Trac Demonstration

http://www.hosted-projects.com/trac/TracDemo/Demo

- Provides "tickets" that can be customized
  - Issue tracking
  - Action items
  - Risk management
  - Other
- Integrates with email to monitor repository check-ins and tickets
- Tracks project milestones

Trac Screen Shot – Tickets

- Customization is limitless
- Add hints/tips in the text fields to streamline the process
- Allows user to add attachments to a ticket
- Plug-ins exist to create different types of tickets and allow further customization: http://trac-hacks.org/



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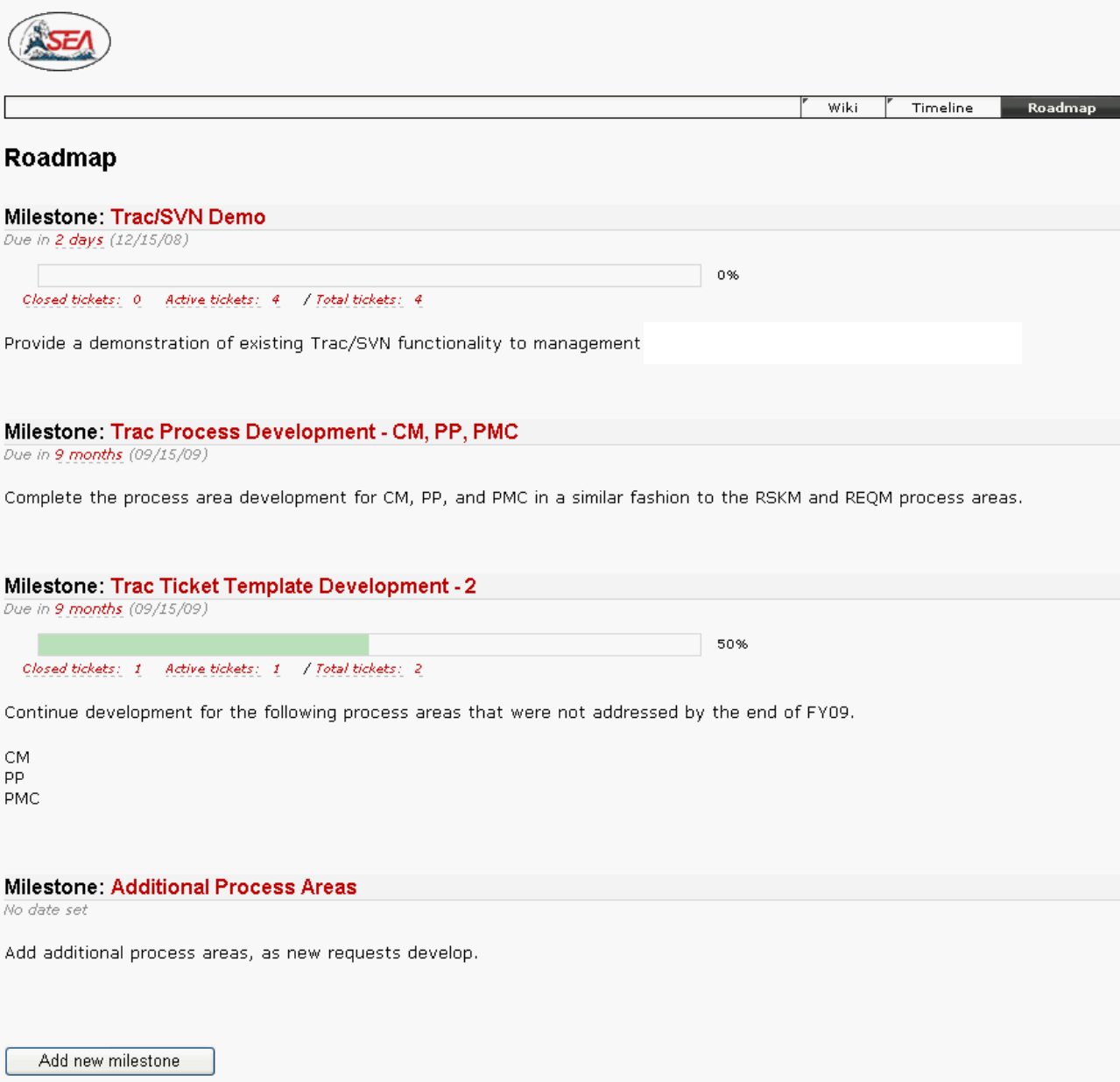
Trac Screen Shot – Roadmap

- Tickets can be used as tasks under a particular milestone
- Milestones and tasks can be linked to code check-ins, bug reports/fixes, and requirements to provide traceability



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Trac Screen Shot – Wiki Pages

Team

Search

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Wiki | Timeline | Roadmap | Browse Source | View Tickets | New Ticket | Search | Admin

Start Page | Index | History | Last Change

Team Wiki Pages

Team Handbook
Candidate Processes
How to Use the Wiki
SEA Home Page

Create New Action Item
Current Action Items

MeetingReports
Team meets in 1008/156 EXCEPT on the 2nd Thur of month - then in 1008/247.

UPCOMING EVENTS

WEEKLY MEETING SCRIBE DUTIES AND ASSIGNMENTS

Scribe Assignments

Date	Name	Date	Name
11/13/08		01/15/09	
11/20/08		01/22/09	
12/04/08	Jeni	01/29/09	
12/11/08		02/05/09	
12/18/08		02/12/09	
01/08/09		02/19/09	

Scribe Duties

- Take meeting minutes and place in Trac (either real time or on your own time)
- Create or update the agenda for the next weekly meeting in Trac.
- Update Team Action Items in "Tickets" section of Trac
- Update the Team Decision Table (as needed) on the main page in Trac (that's this page that you are reading right now)

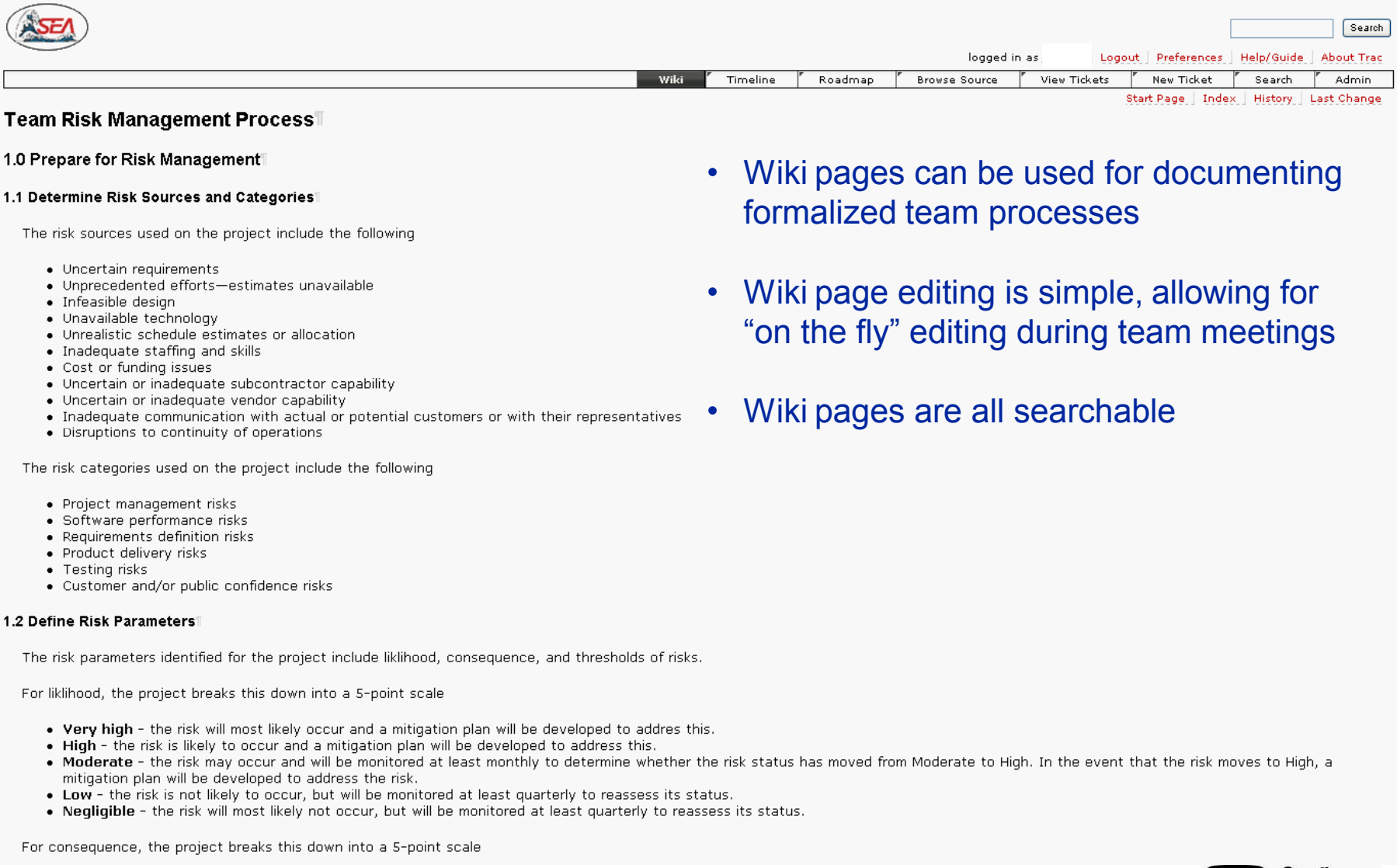
- Wiki pages can be used for documenting team processes
- Wiki page editing is simple, allowing for “on the fly” editing during team meetings
- Wiki pages are all searchable

TEAM DECISIONS

Decision	Pass/Fail	Date of Decision
Decision Making Process	Passed	9/8/2005
Mission Statement	Passed	9/8/2005
Meeting Minutes Format	Passed	10/13/2005
Monthly Reporting Process	Passed	08/10/2006
Meeting Frequency	Passed	10/12/2006
Scribe-Facilitator Assignment	Failed	10/12/2006
Addressing agenda items	Passed	10/12/2006

Edit this page | Attach file | Delete this version | Delete page

Trac Screen Shot – Wiki Pages



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Team Risk Management Process

1.0 Prepare for Risk Management

1.1 Determine Risk Sources and Categories

The risk sources used on the project include the following

- Uncertain requirements
- Unprecedented efforts—estimates unavailable
- Infeasible design
- Unavailable technology
- Unrealistic schedule estimates or allocation
- Inadequate staffing and skills
- Cost or funding issues
- Uncertain or inadequate subcontractor capability
- Uncertain or inadequate vendor capability
- Inadequate communication with actual or potential customers or with their representatives
- Disruptions to continuity of operations

The risk categories used on the project include the following

- Project management risks
- Software performance risks
- Requirements definition risks
- Product delivery risks
- Testing risks
- Customer and/or public confidence risks

1.2 Define Risk Parameters

The risk parameters identified for the project include liklihood, consequence, and thresholds of risks.

For liklihood, the project breaks this down into a 5-point scale

- **Very high** - the risk will most likely occur and a mitigation plan will be developed to addres this.
- **High** - the risk is likely to occur and a mitigation plan will be developed to address this.
- **Moderate** - the risk may occur and will be monitored at least monthly to determine whether the risk status has moved from Moderate to High. In the event that the risk moves to High, a mitigation plan will be developed to address the risk.
- **Low** - the risk is not likely to occur, but will be monitored at least quarterly to reassess its status.
- **Negligible** - the risk will most likely not occur, but will be monitored at least quarterly to reassess its status.

For consequence, the project breaks this down into a 5-point scale

- Wiki pages can be used for documenting formalized team processes
- Wiki page editing is simple, allowing for “on the fly” editing during team meetings
- Wiki pages are all searchable

Trac Screen Shot – Meetings

MeetingMinutesTemplate

NOTE: To make changes to the Meeting Minutes Template, open the above link, modify, and save.
*NOTE: To start a new **Agenda** or **Minutes** page, enter the date and either **Agenda** or **Minutes** for Page Title in the **New Page Here** box.*

New Page Here
Year: 2008 Month: 12 Day: 12
Page Title:
Create

Parking Lot for future Pearls Mtgs

- Roles and Responsibilities
- Professional Quality Customer Presentation
- Web Page
- Review Outstanding Issues
- Modify Identity
- Funding Model for Business Development - ?
- Portfolio Management (balancing urgent vs. on-going work) - ?
- Being a Best Practices Model - ?

12/18/08

- Agenda

12/11/08

- Agenda
- Minutes

12/04/08

- Agenda
- Minutes

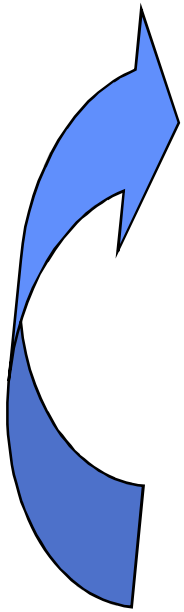
11/27/08

- No Meeting - Thanksgiving

11/20/08

- Trac macros can be implemented to create template meeting minutes and agendas
- Wiki pages allow for flexibility and can be used to track team notes on the fly (see parking lot)
- Search capability makes it easy to search meeting minutes for topics at a later date
- Changes to wiki pages are version controlled through Trac

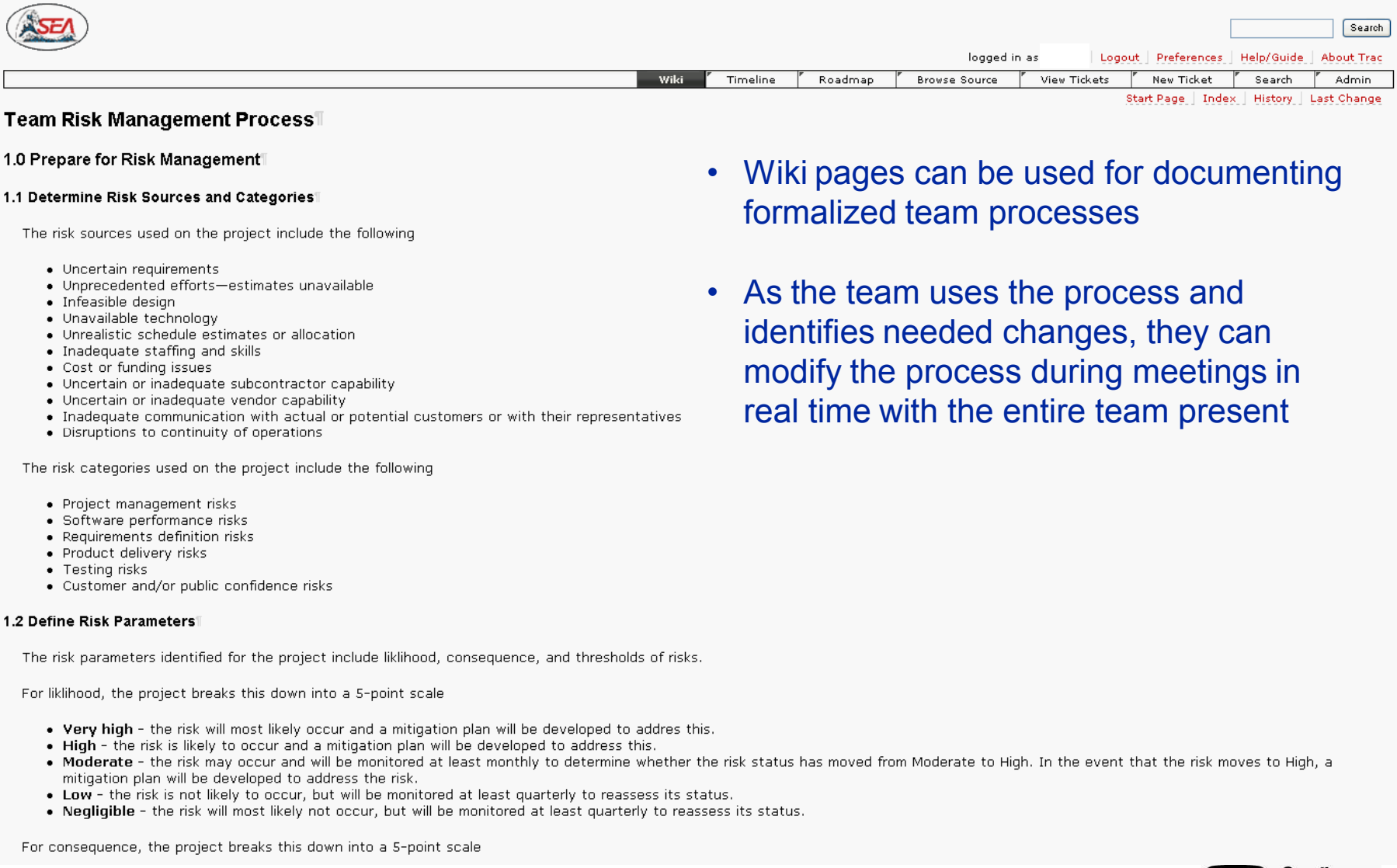
Process Improvement Cycle



Practice

- Use tools following defined team processes
  - As tool and process use improves, refine the defined process
- Document what works well, what doesn't and implement changes, as needed
- Once process changes are minimized and the team has had time to implement, reappraise!

Trac Screen Shot – Wiki Pages



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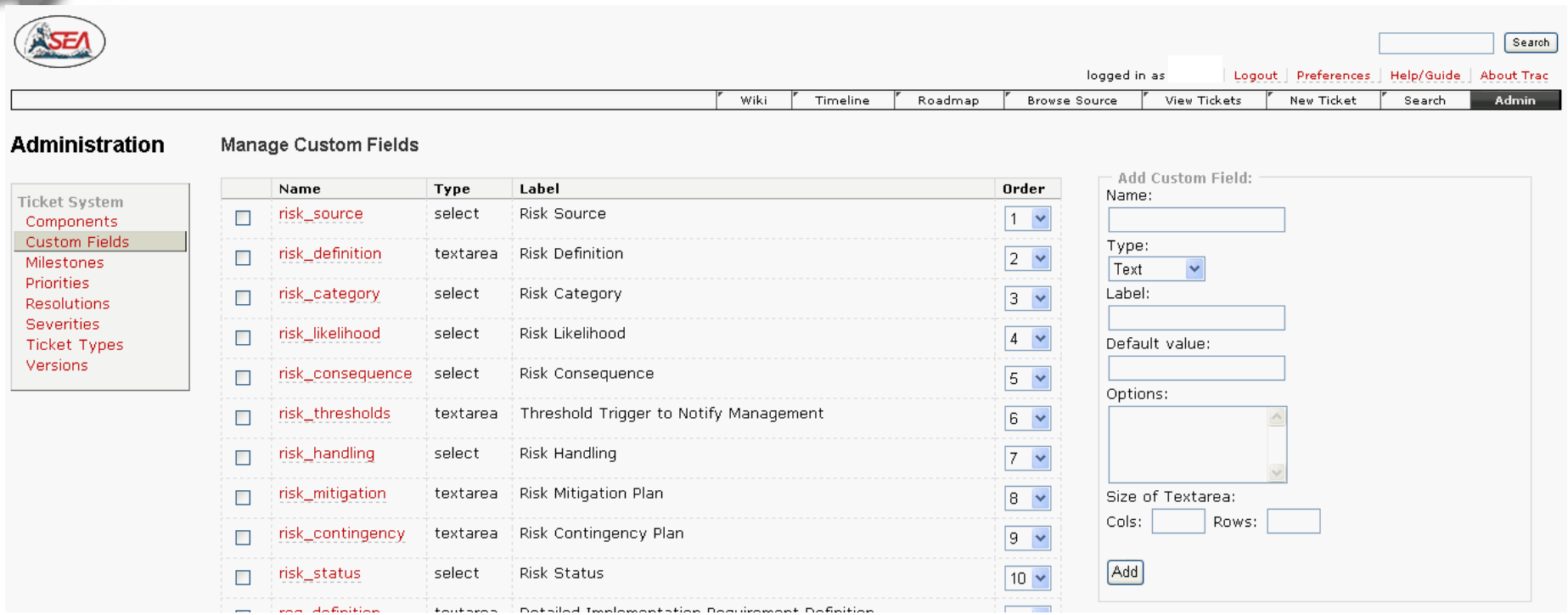
For consequence, the project breaks this down into a 5-point scale

- Wiki pages can be used for documenting formalized team processes
- As the team uses the process and identifies needed changes, they can modify the process during meetings in real time with the entire team present

Trac Screen Shot – Admin



- Many Trac components can be modified by team members using the Trac interface
- Teams can make changes to the site together during process improvement discussions

Lessons Learned

- **Use tools for documentation**
- **Let the use of the tool become the process** (avoid having to reference a process, the tool should walk you through it)
- **Select tools that provide basic functionality** (not too many “bells and whistles”)
- **Keep the change process simple**
- **Communicate with one another and document discussions for future reference**
- **Share ideas and resources across other projects and teams**

Useful Resources

- **Trac Information**
  http://trac.edgewall.org/

- **Trac Demo**
  http://www.hosted-projects.com/trac/TracDemo/Demo

- **Trac Hacks**
  http://trac-hacks.org/

- **Subversion (SVN) Information**
  http://subversion.tigris.org/

- **TortoiseSVN Information**
  http://tortoisesvn.tigris.org/

TortoiseSVN Demo
http://www.wdogsystems.com/opencms/opencms/demos/basic_tortoisesvn.html

Contact Information

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