

APTIMA[®]
HUMAN-CENTERED ENGINEERING

The DHS HSI Community of Practice (CoP) and Portal Development Effort

HFE/HSI Management and Applications SubTAG
(TAG 64)

26 October 2010

Michael Paley

Sylvain Bruni

Agenda

- Introduction and Requirements
- Phase III SBIR Transition
- Proposed Features and Initial Mock-ups

Introduction

- **Community of Practice (COP)**
 - Process of social learning between people with common interests who collaborate to share ideas, find solutions, and innovate
- **Development**
 - Provide value; relevant content, organized schema.
 - Move users from passive consumers into active participants.
- **DHS COP requirement**
 - Web portal used by members of the Human Factors/Behavioral Sciences practice area within DHS
 - Geared toward solving problems
 - Encourage participation, create connections, generate ideas, and produce meaningful products through collaboration

Initial DHS Requirements

Business Needs	Functional Needs
<ol style="list-style-type: none"> 1. Support the development of a DHS Human Systems Integration Community of Practice (CoP) 	<ol style="list-style-type: none"> 1. Establish a web-based CoP that is accessible to users in the federal government, private sector, and other organizations 2. Establish appropriate role-based access and privileges for users
<ol style="list-style-type: none"> 2. Store and share content for CoP members 	<ol style="list-style-type: none"> 1. Enable online storing, viewing, and modifying of user-generated content for multiple types of user
<ol style="list-style-type: none"> 3. Support internal and external communication and collaboration among CoP members 	<ol style="list-style-type: none"> 1. Use calendars to track meetings, conference calls, and other scheduled events 2. Enable information exchange on projects through blogs, wikis, and/or message boards 3. Create and respond to user surveys 4. Send messages/alerts to individual users based on user preferences

Expected DHS COP User Base

Level 1

- DHS organizations
 - CIS
 - CBP
 - Counter Narcotics Enforcement
 - DNDO
 - FEMA
 - FLETC
 - ICE
 - Intel and Analysis
 - National Protection and Programs
 - TSA
 - USCG
 - USSS
- DHS laboratories
 - Environmental Measurements
 - Plum Island Animal Disease Center
 - Transportation Security

N ≈ 75

Level 2

- DHS direct contract support (i.e. SETA)
- Department of Energy laboratories
 - Argonne
 - Brookhaven
 - Idaho
 - Lawrence Livermore
 - Los Alamos
 - Oak Ridge
 - Pacific Northwest
 - Sandia
- DHS Centers of Excellence
- DoD Organizations
- DoT Organizations
- NTSB
- NIST

N ≈ 100

Level 3

- International Partners and Foreign Government Counterparts
- Industry partners and performers
 - Limited access and selected content only

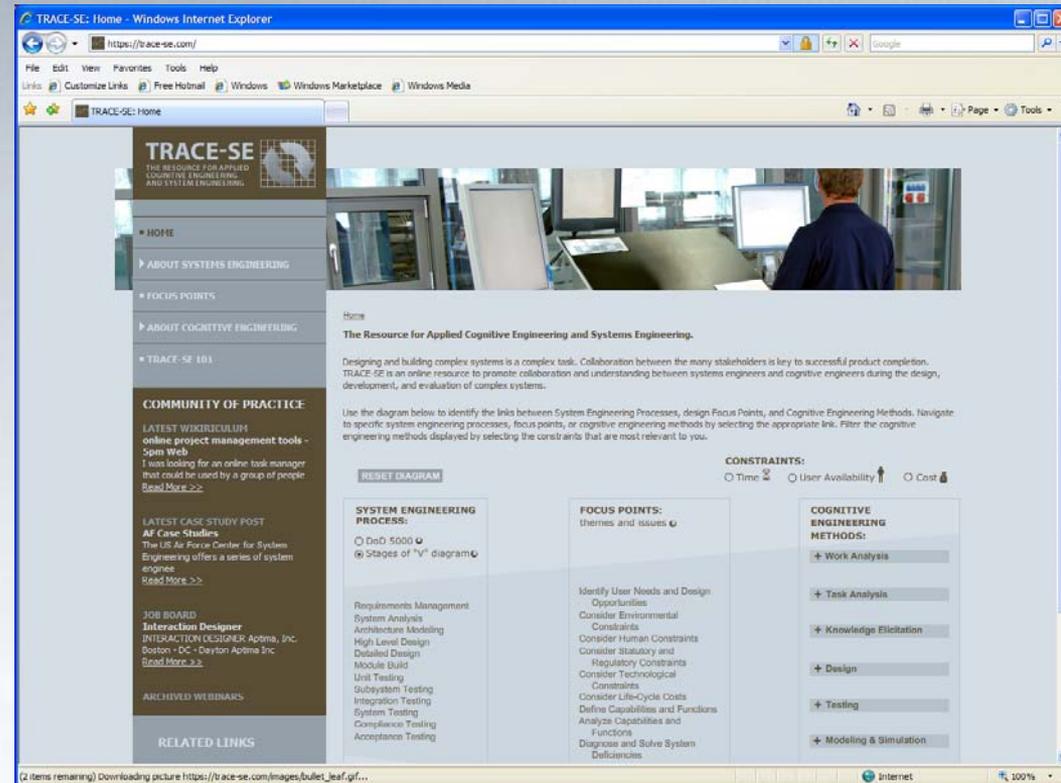
N ≈ 100

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- Introduction and Requirements
- **Phase III SBIR Transition**
- Proposed Features and Initial Mock-ups

Phase III SBIR Transition

- The Resource for Applied Cognitive and System Engineering (TRACE-SE)
 - AFRL/RHC Funded SBIR
- Develop a process and toolset to embed the application of the emerging practices and technologies of cognitive systems into the traditional practice of systems engineering.



TRACE-SE Drivers

- Lack of awareness
 - Know **what** cognitive engineering is and how it can help?
- Lack of knowledge
 - Know **how** to do it, **when** to do it, or **what methods to use?**
 - **Understand the value** (and budget) of cognitive engineering?
- Lack of process
 - Know **where cognitive engineering fits in** system design process?
- Lack of communication
 - Know **how to translate cognitive engineering findings** into a format that systems engineers can understand and use?

TRACE-SE Solutions

- **Build operationally relevant system design aid**
- “One button” approach to structure the system design
 - Guide users through existing systems engineering processes
- Bring traditional and cognitive systems engineers together to design systems
 - Allow them to identify positive opportunities to influence the system development process
- Create a community of practice for both systems and cognitive engineers to share information
 - Learn from each other’s experiences

Focus of Phase III Transition

Method Finder for Best Practices (TRACE-SE Concept)



TRACE-SE: Home - Windows Internet Explorer

https://trace-se.com/

File Edit View Favorites Tools Help

Links Customize Links Free Hotmail Windows Windows Marketplace Windows Media

TRACE-SE: Home

TRACE-SE
THE RESOURCE FOR APPLIED
COGNITIVE ENGINEERING
AND SYSTEMS ENGINEERING

- HOME
- ABOUT SYSTEMS ENGINEERING
- FOCUS POINTS
- ABOUT COGNITIVE ENGINEERING
- TRACE-SE 101

COMMUNITY OF PRACTICE

LATEST WIKIRICULUM
online project management tools - 5pm Web
I was looking for an online task manager that could be used by a group of people
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LATEST CASE STUDY POST
AF Case Studies
The US Air Force Center for System Engineering offers a series of system engine
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Boston + DC + Dayton Aptima Inc
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The Resource for Applied Cognitive Engineering and Systems Engineering.

Designing and building complex systems is a complex task. Collaboration between the many stakeholders is key to successful product completion. TRACE-SE is an online resource to promote collaboration and understanding between systems engineers and cognitive engineers during the design, development, and evaluation of complex systems.

Use the diagram below to identify the links between System Engineering Processes, design Focus Points, and Cognitive Engineering Methods. Navigate to specific system engineering processes, focus points, or cognitive engineering methods by selecting the appropriate link. Filter the cognitive engineering methods displayed by selecting the constraints that are most relevant to you.

RESET DIAGRAM

CONSTRAINTS:
 Time User Availability Cost

SYSTEM ENGINEERING PROCESS:

- DoD 5000
- Stages of "V" diagram

Requirements Management
System Analysis
Architecture Modeling
High Level Design
Detailed Design
Unit Testing
Subsystem Testing
Integration Testing
System Testing
Compliance Testing
Acceptance Testing

FOCUS POINTS:
themes and issues

Identify User Needs and Design Opportunities
Consider Environmental Constraints
Consider Human Constraints
Consider Statutory and Regulatory Constraints
Consider Technological Constraints
Consider Life-Cycle Costs
Define Capabilities and Functions
Analyze Capabilities and Functions
Diagnose and Solve System Deficiencies

COGNITIVE ENGINEERING METHODS:

- + Work Analysis
- + Task Analysis
- + Knowledge Elicitation
- + Design
- + Testing
- + Modeling & Simulation

(2 items remaining) Downloading picture https://trace-se.com/images/bullet_leaf.gif...

Internet 100%

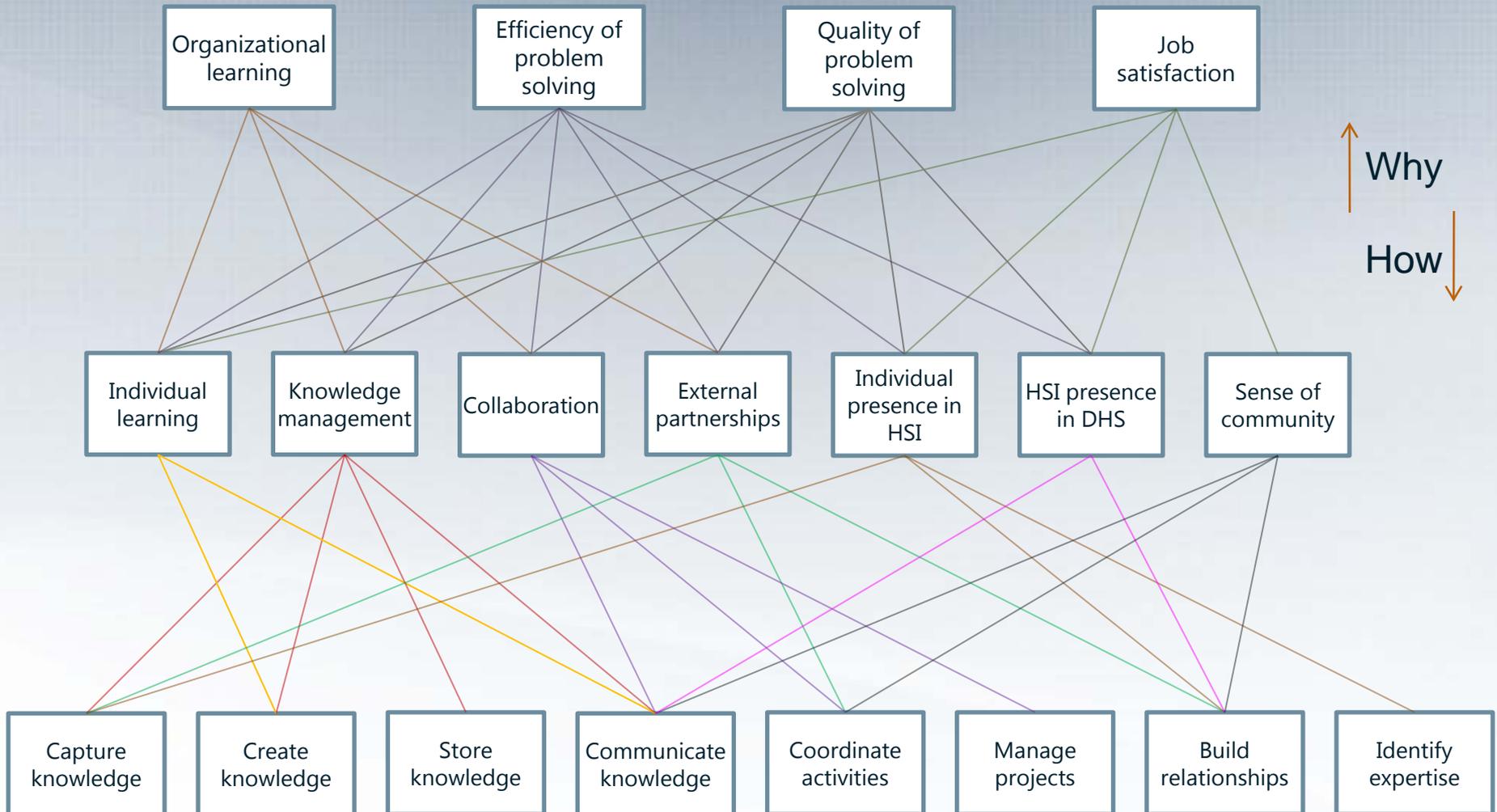
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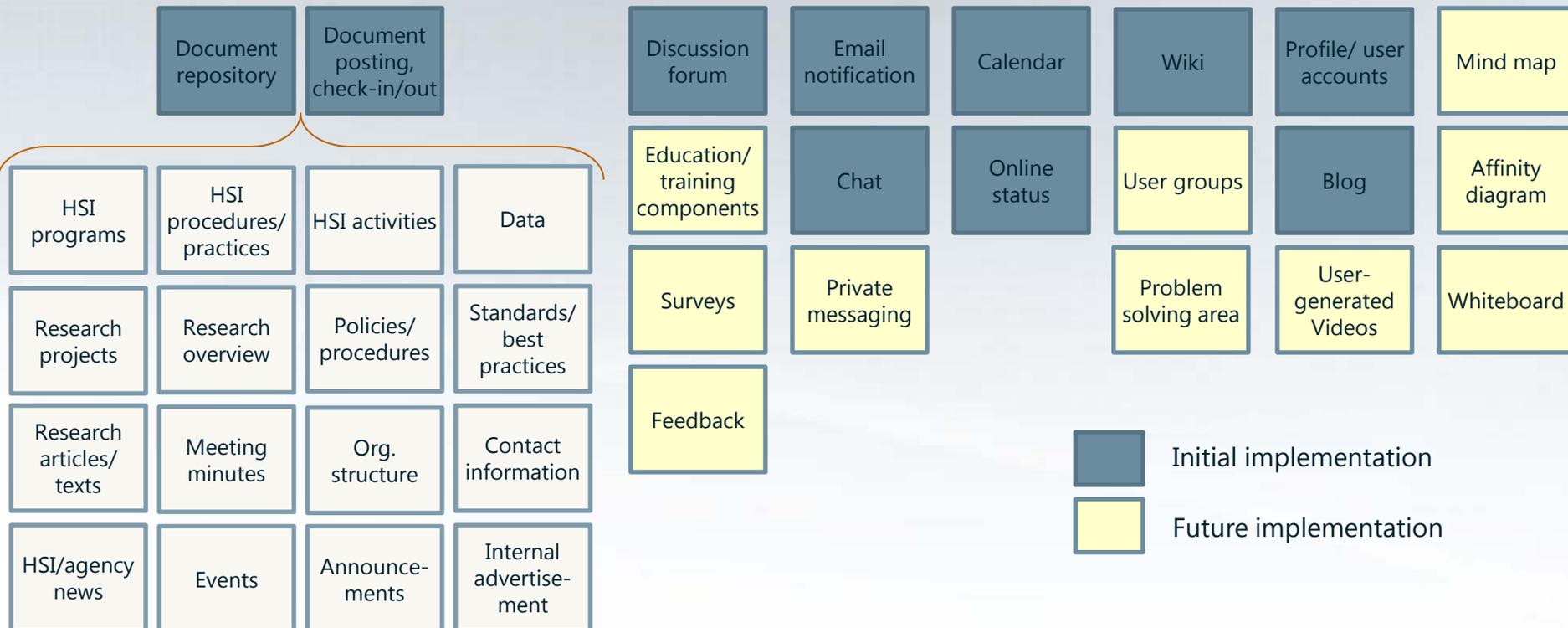
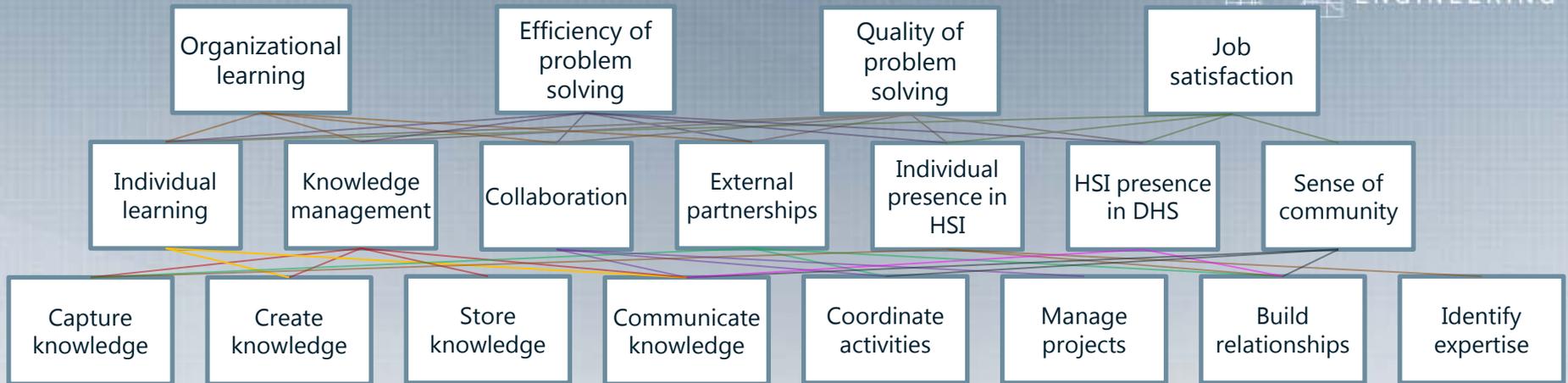
Initial Development Tasking

- Year 1 Tasking (start July 2010)
 - Requirements Definition
 - User needs assessment
 - System Security Plan
 - Content Development
 - DHS materials
 - Industry standards
 - Software Development
 - Wordpress and plug-ins
 - Quality Assurance
- Year 2 Tasking
 - User Testing and Evaluation
 - Updated Requirements Document
 - Additional Software Development
 - Quality Assurance

Abstraction Hierarchy



Hierarchy Linked to Features



Core Features

- User Accounts
- User Login
- User Profile
- Who's Online
- Chat
- Email Notifications
- Calendars
- Discussion Threads/Forums
- Blogging
- Document posting/linking/check-in : check-out
- COP Admin (FAQ, POC...)

Future Features

- **Problem Solving area**
 - Ability to link a number of resources together to help solve a particular problem
- **Digital White board/Online mind mapping**
 - Collaborative brainstorming and sketching
- **Training**
 - Incorporation of multimedia and other computer-based training applications
- **COP member survey tool**
 - Rapid data collection capabilities
- **Interactive Group Affinity Diagram**
 - Electronic version of a sticky note organizational system

Conceptual Interface Mock Up



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Community of Practice

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Overviews
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DHS HP model

September 2010
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12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30

(click date for details)
Event details
HSI CoP meeting

NEW CONTENT

- User interface design guidelines
8/24/10 TSA
- Heuristic evaluation tutorial
8/22/10 TSA
- Measuring human performance in complex environments
7/24/10 FEMA
- Instructional feedback strategies
7/21/10 TSA

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Thread	Last post	Rep	View
Opinions on JCEDM I'm wondering how many people are reading this journal and what they think... ppiciano Cognitive engineering, Journals, Decision making	09/07/2010 2:45 pm mpaley	2	16
Advice on choosing a UI evaluation technique I have a project with TSA that require... ppiciano User interface, evaluation, TSA	09/07/2010 3:31 pm ppiciano	2	25

Community Members
Sort by: name, online status, posts

- Mike Paley TSA 191 posts
- Dave Bauer FEMA 89 posts

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- TRACE-SE serves as a starting point
 - Extensive redesign effort
- Based on DHS S&T Requirements Documents
 - Incorporates key features
 - Vetted against design realities
- Derived from initial abstraction hierarchy
 - Specify the “why” and “how” of the core functions
- Future end-state
 - Blends core and future features



Homeland Security

Community of Practice

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09/29/10 Author Name



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09/27/10 Author Name



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Author: John Doe

Date: 10-01-2010

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	Software to Support U.S. Navy's Distributed, Multi-simulator Training jodriscoll	3	09/29/2010 2:45PM mpaley
	Advice on choosing a UI Evaluation Technique mpaley	7	10/03/2010 5:45PM jodriscoll

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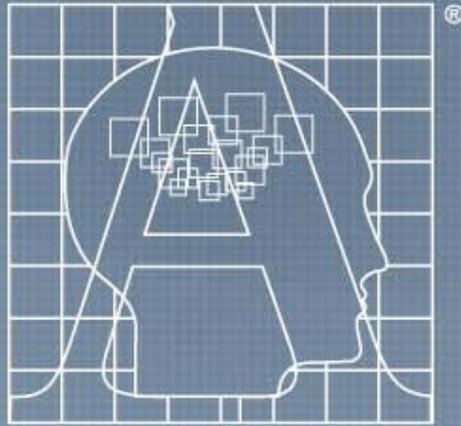
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