Raytheon

CMMI®

11TH ANNUAL
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CONFERENCE AND
USER GROUP

Some Assembly Required: Using Agile Methodologies to Develop an Interactive Software User's Guide

Agile Methodologies
Some
Assembly Required

Presentation Agenda

- Some Assembly Required: Agile Methodologies

- Introduction / Problem Statement
  - Why pursue a new technical document development platform?

- Part 1… Background: Enabling Technologies, Software Architecture and Development Platforms
  - Object-oriented programming (OOP)
  - Rich Internet Application (RIA) / Rich Desktop Application (RDA)

- Part 2… SUG Development
  - Agile and Technical Documentation
  - The Pilot Project
  - User stories

- Part 3… SUG Lessons Learned

Why Pursue a New Development Platform?

- Current development platform (Authorware) is ‘abandonware’
  - **Vendor (Adobe) discontinued development in August of 2007**
    - **Strengths**
      - broad acceptance in the marketplace; rapid prototyping; particularly well suited to creating e-learning content

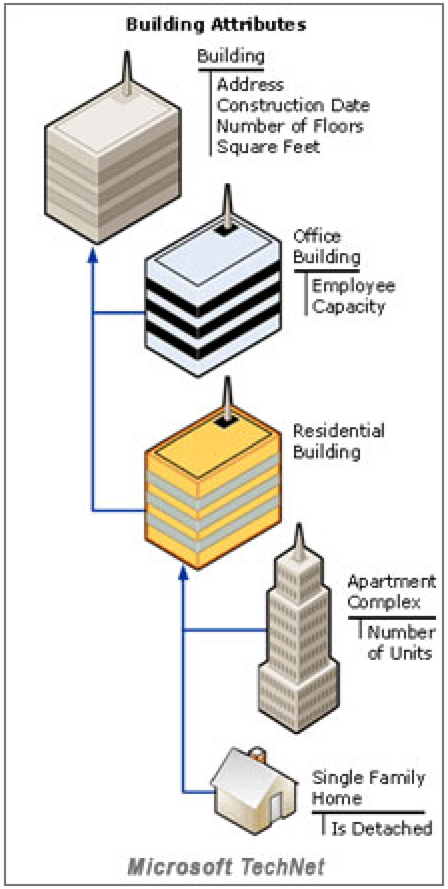
    - **Weaknesses**
      - XML handling is sub-optimal; web delivery and desktop delivery is problematic; ‘Protection Mode’ and runtime errors with IE7 and Vista

- Need a development platform that’s ‘future-proofed’
  - leverage Broadband proliferation and enabling technologies
  - accommodate multi-channel delivery: web, desktop, mobile, and print

Object-oriented programming (OOP)

- What is an Object Oriented Programming language?
  - Programming oriented around objects - self-contained collections of computational procedures and data structures.

A computer language can be said to be Object Oriented if it provides support for the following:	
Class	A class is a blueprint, or prototype, that defines the variables and the methods common to all objects of a certain kind.
Object	An instance of a class. More than one instance of the same class can be in existence at any one time.
Encapsulation	The act of placing data and the operations that perform on that data in the same class. The class then becomes the container for the data and operations.
Inheritance	The reuse of base classes to form derived classes (subclasses). Methods and properties defined in the superclass are automatically shared by any subclass.
Polymorphism	ability of objects belonging to different types to respond to method, field, or property calls of the same name, each one according to an appropriate type-specific behavior.

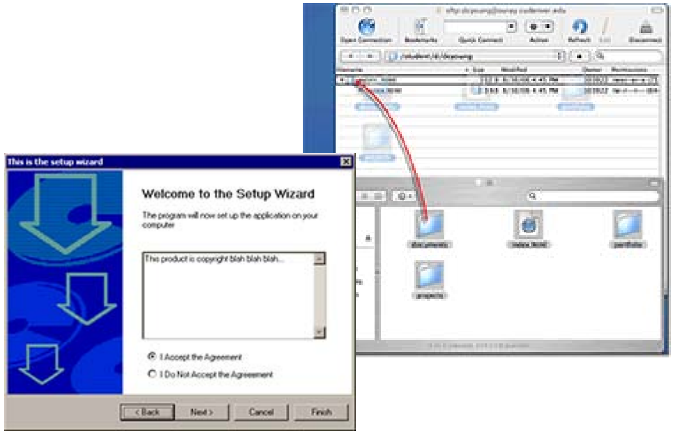


- Why use it?
  - OOP is an efficient methodology for minimizing development time and maximizing code reusability.
  - OOP creates a modular design that is easily modified without having to restructure the entire system.

Rich Internet Application (RIA)

Web-based application that approaches the speed and elegance of a local (installed) application

- Traditional desktop features
  - Drag and drop, windows, wizards, and panels



This is the setup wizard

Welcome to the Setup Wizard

The program will now set up the application on your computer

The product is copyright blah blah blah...

○ I Accept the Agreement

○ I Do Not Accept the Agreement

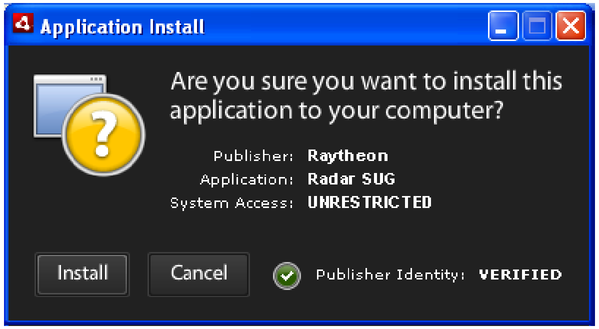
- Cross Platform
  - Cross Browser
    - IE, Mozilla Firefox, Safari
  - Cross Operating System
    - Windows, Linux, MAC OS
- No installation, and accessible just about anywhere
- MVC pattern on client and server
  - MVC pattern(s) can manage the interaction between user and the user interface, and requests to the server

Rich Desktop Application (RDA)

Platform-independent web applications
that can be run on a user's desktop

- In contrast to RIA’s, RDA’s are able to run off-browser and off-line
- Applications have network connection awareness
- Cross Platform… browsers and operating systems

- Desktop security model - applications can be packaged and digitally signed



Application Install

Are you sure you want to install this application to your computer?

Publisher: **Raytheon**
Application: **Radar SUG**
System Access: **UNRESTRICTED**

Publisher Identity: **VERIFIED**

RIA in the Browser / RDA on the Desktop

Feature	RIA in the Browser	RDA on the Desktop
Application delivery	Applications can be easily discovered, explored, and used.	Installed applications have more persistence, power, and functionality.
Installation	No application installation is necessary.	Applications install seamlessly from the browser or install like a traditional application
Background capability	RIAs can only run in a visible browser window	Applications can run in the background and provide notifications like traditional desktop applications
Persistence	Activity is limited to the browser session. When the browser is closed, information is lost.	RDAs are installed on the desktop. They store information locally and operate offline.
Desktop integration	Applications are sandboxed, so desktop integration is limited.	Applications can access a desktop file system, clipboard, drag and drop events, system notifications, and more.
User interface control	RIAs run within a browser window that has its on controls, branding, and integration with the desktop.	RDAs have a customizable user interface and desktop integration, enabling branding experiences.
Data storage	Applications have limited local storage, which the browser can destroy.	Applications have unlimited local storage and access to a local database, plus encrypted local storage

RIA and RDA Development Platforms

- Adobe Flash/Flex/AIR
- Sun JavaFX
- Microsoft Silverlight
- Google GWT
- OpenLazzlo
- AJAX

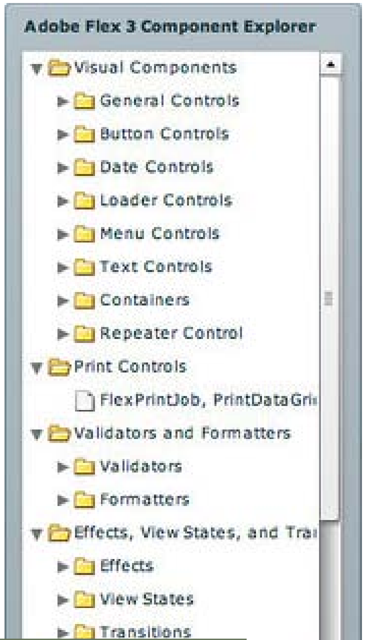
"By 2010, at least 60 percent of new application development projects will include RIA technology, and at least 25 percent of those will rely primarily on RIA."

Source: Gartner RAS Core Research

Flash Builder and Adobe AIR

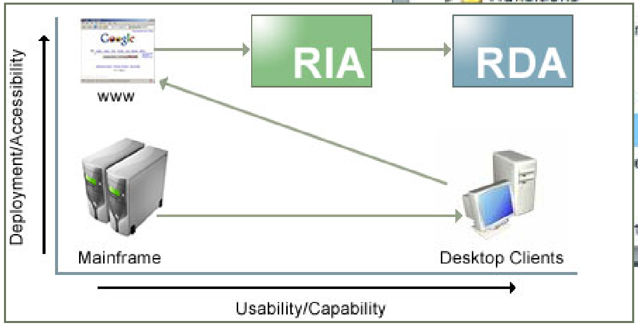
Application

- Flash Builder
  - Adobe’s platform for developing and deploying RIAs for the **browser**
    - Leverages the nearly ubiquitous Flash Player (98% penetration level)
    - Flex applications can be built using the free open source Eclipse framework
- Adobe AIR (Adobe Integrated Runtime)
  - Adobe’s platform for deploying RIAs for the **desktop**
    - Allows you to transform a RIA into a Rich Desktop Application (RDA)
    - Air applications run outside of the browser, on multiple operating systems



Adobe Flex 3 Component Explorer

- Visual Components
  - General Controls
  - Button Controls
  - Date Controls
  - Loader Controls
  - Menu Controls
  - Text Controls
  - Containers
  - Repeater Control
- Print Controls
  - FlexPrintJob, PrintDataGri
- Validators and Formatters
  - Validators
  - Formatters
- Effects, View States, and Trai
  - Effects
  - View States
  - Transitions



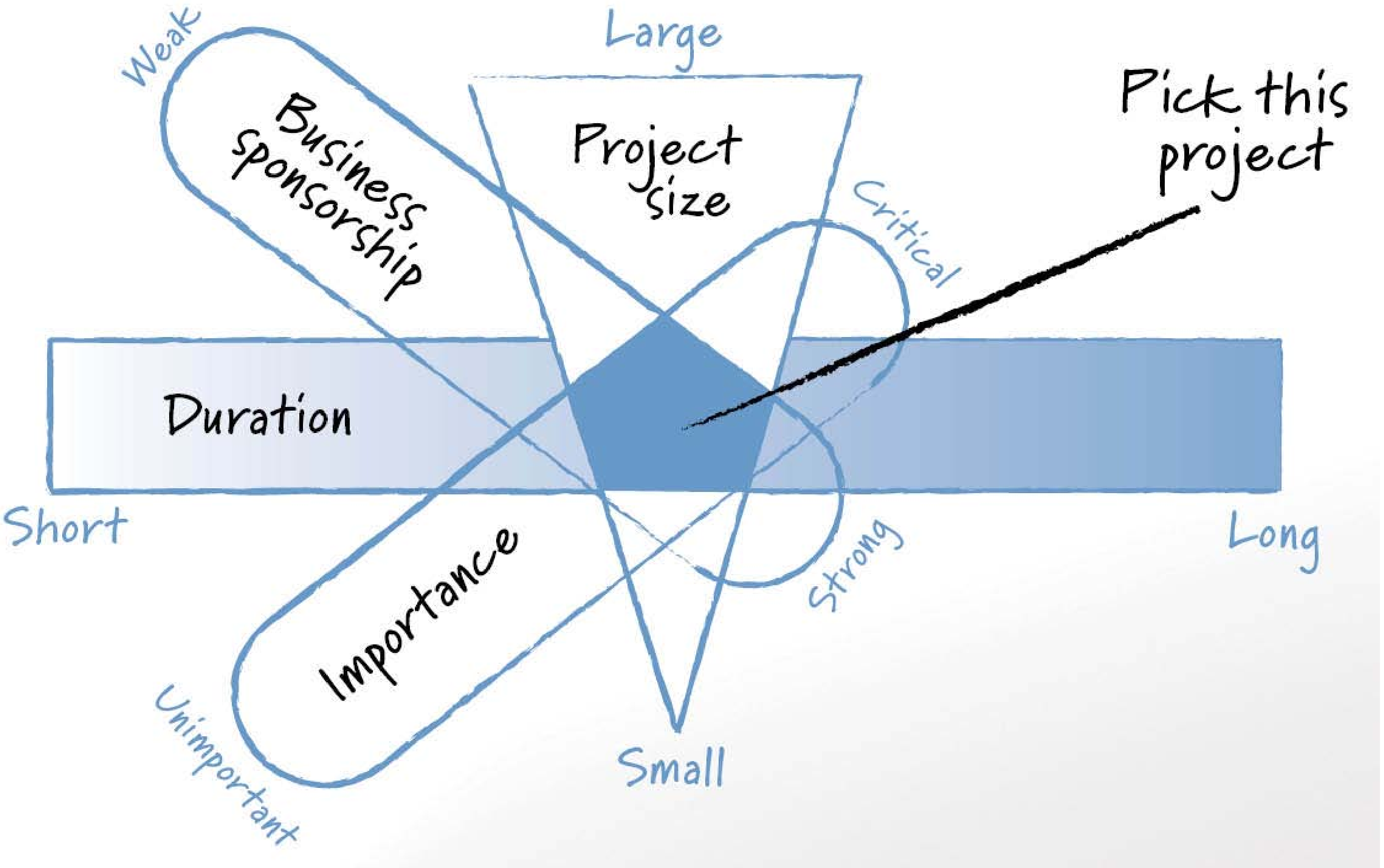
Flash Builder and Adobe Air… Who’s Using It?

- Flash Builder and Adobe AIR are reaching critical mass
  - SAP, HP, Google, NASDAQ, eBay, AOL, Yahoo, MINI…

Agile and Technical Documentation

- Traditionally, Agile methodologies focused on software development or product engineering
- Recently, Agile practices have extended to other areas such as technical documentation
- Agile methodologies encourage/allow:
  - A means to accommodate content that is more and more malleable and requires more touch points
  - Effective communication and collaborative spaces for technical communicators and Subject Matter Experts (SMEs)
  - The use of Scrums and user stories to create a platform by which to develop customer-facing documentation

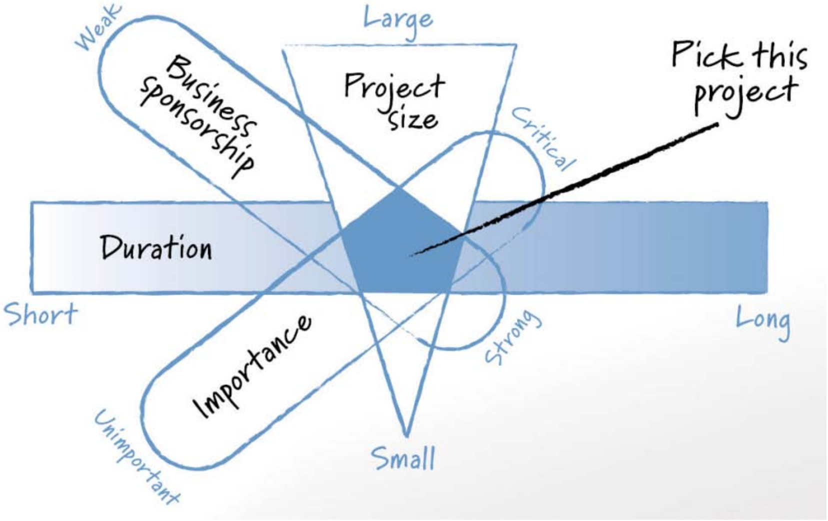
Attributes of the Ideal Pilot Project



http://blog.mountaingoatsoftware.com/four-attributes-of-the-ideal-pilot-project

Attributes of the Ideal Pilot Project

- Duration
  - A project that could be completed in 8 weeks
- Project Size
  - A project that could be supported by one team
- Importance
  - Medium priority
- Business Sponsor Engagement
  - Reasonably strong



Agile and User Stories

- Substitute of formal requirements documents
- Summaries of functionality that leave space for expansion and refinement
- Prioritized based on costs and their value

As a designer, I can customize the look and feel of my deliverable

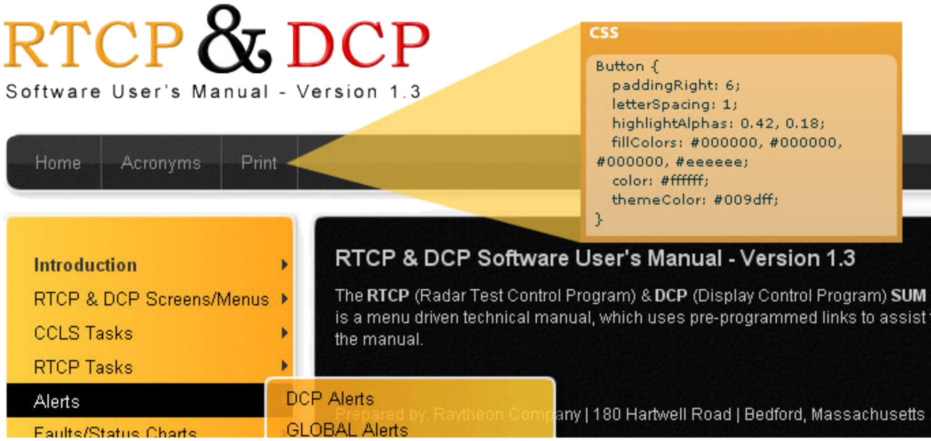
As a user, I can drill down to specific information using multi-level menus

As a user, I can display/use the SUG on multiple platforms

User Stories

Software User’s Guide (SUG) … Prototype

- Skinning and styling
  - As a designer, I can customize the look and feel of my deliverable



RTCP & DCP
Software User's Manual - Version 1.3

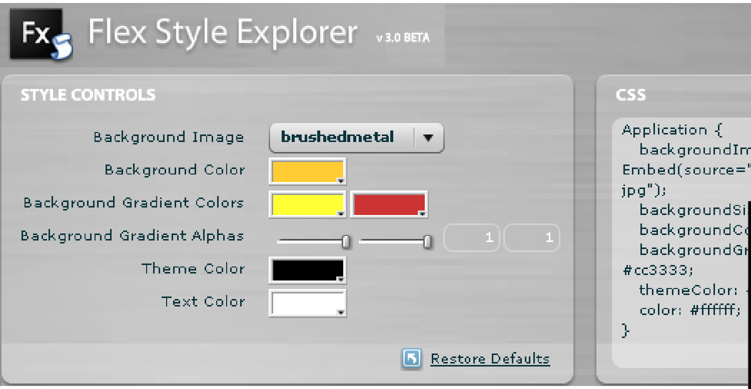
CSS

```
Button {
  paddingRight: 6;
  letterSpacing: 1;
  highlightAlphas: 0.42, 0.18;
  fillColors: #000000, #000000,
#000000, #eeeeee;
  color: #ffffff;
  themeColor: #009dff;
}
```

RTCP & DCP Software User's Manual - Version 1.3

The **RTCP** (Radar Test Control Program) & **DCP** (Display Control Program) **SUM** is a menu driven technical manual, which uses pre-programmed links to assist the manual.

Prepared by: Raytheon Company | 180 Hartwell Road | Bedford, Massachusetts



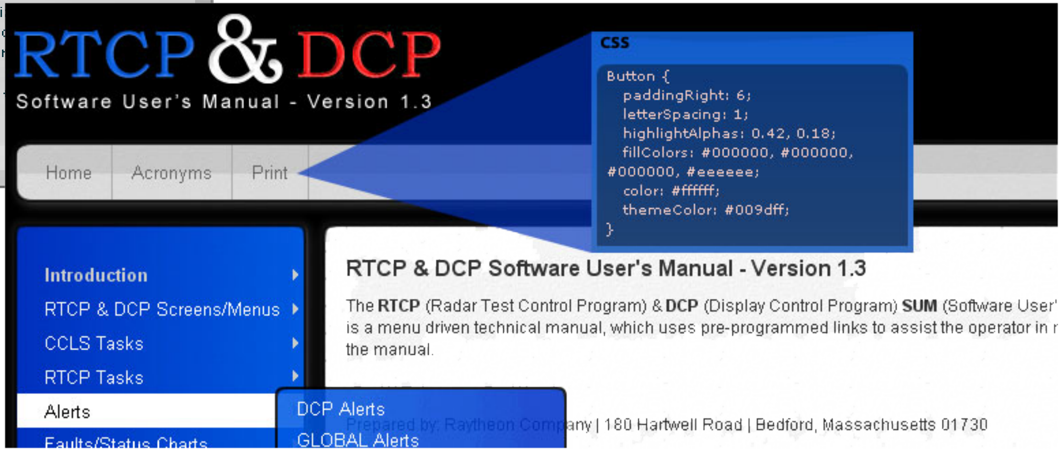
Flex Style Explorer v 3.0 BETA

STYLE CONTROLS

Background Image: brushedmetal
Background Color
Background Gradient Colors
Background Gradient Alphas: 1 1
Theme Color
Text Color

CSS

```
Application {
  backgroundImage:
Embed(source="assets/brushedmetal.
jpg");
  backgroundSi
  backgroundCo
  backgroundGr
#cc3333;
  themeColor:
  color: #ffffff;
}
```



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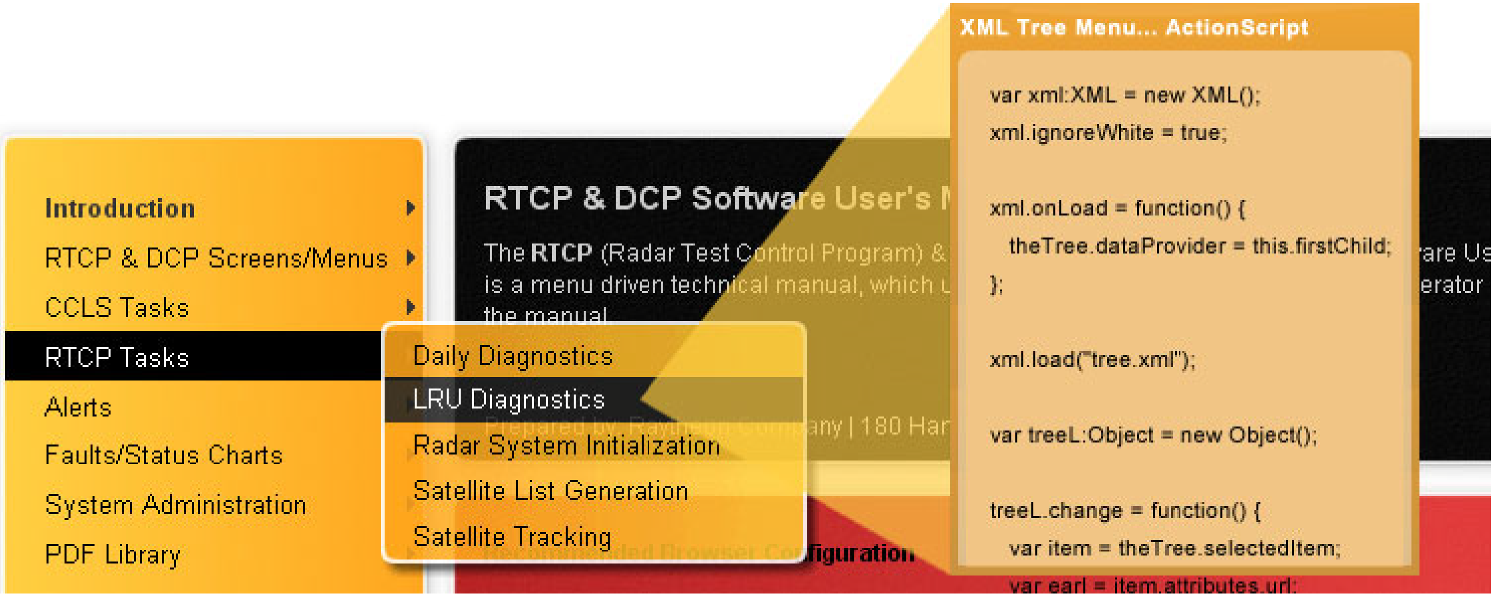
Prepared by: Raytheon Company | 180 Hartwell Road | Bedford, Massachusetts 01730

User Stories

Software User’s Guide (SUG) … Prototype

- Versatile Menu System
  - As a user, I can drill down to specific information using multi-level menus
  - As a designer, I can pull data from external XML collections



RTCP & DCP Software User's M

The **RTCP** (Radar Test Control Program) &
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the manual

are Us
erator

Prepared by: Raytheon Company | 180 Har

Recommended Browser Configuration

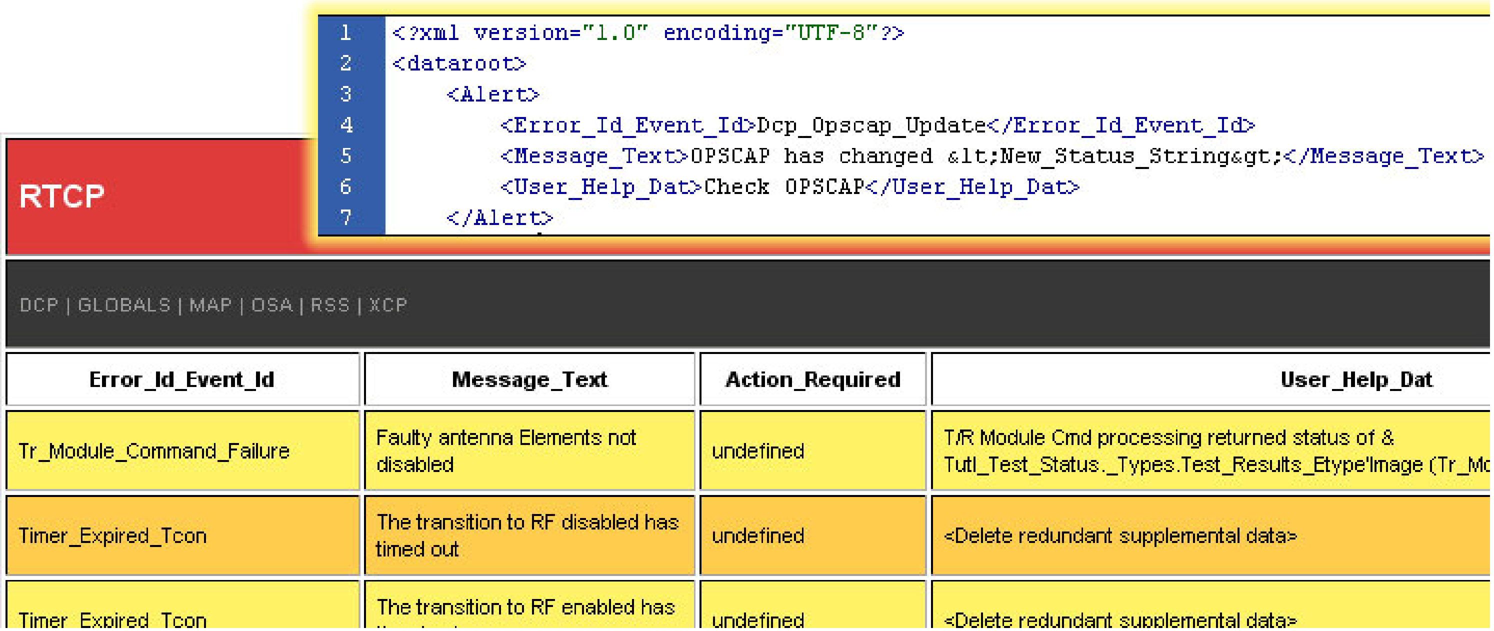
XML Tree Menu… ActionScript

```
var xml:XML = new XML();
xml.ignoreWhite = true;

xml.onLoad = function() {
  theTree.dataProvider = this.firstChild;
};

xml.load("tree.xml");

var treeL:Object = new Object();

treeL.change = function() {
  var item = theTree.selectedItem;
  var earl = item.attributes.url;
```

User Stories

Software User’s Guide (SUG) … Prototype

- Data Grids and Tables
  - As a user I can resize, and sort column layouts



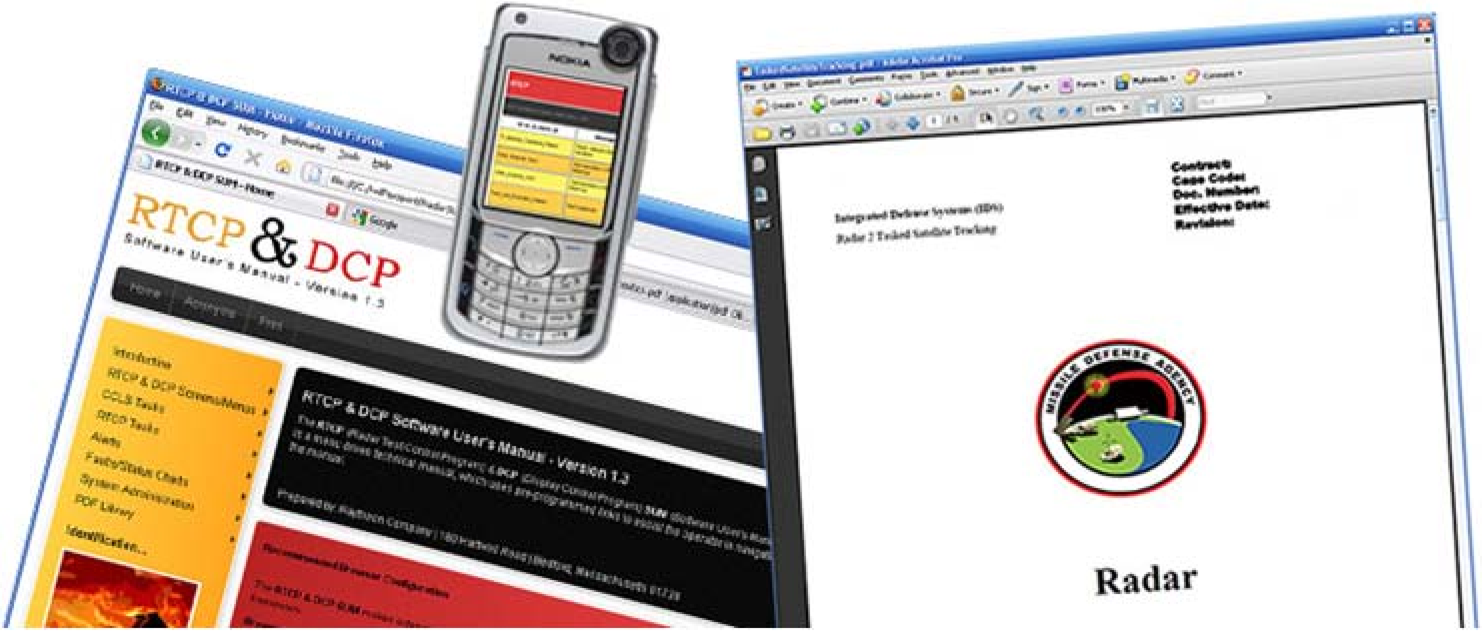
```xml
<?xml version="1.0" encoding="UTF-8"?>
<dataroot>
    <Alert>
        <Error_Id_Event_Id>Dcp_Opscap_Update</Error_Id_Event_Id>
        <Message_Text>OPSCAP has changed &lt;New_Status_String&gt;</Message_Text>
        <User_Help_Dat>Check OPSCAP</User_Help_Dat>
    </Alert>
```

Error_Id_Event_Id	Message_Text	Action_Required	User_Help_Dat
Tr_Module_Command_Failure	Faulty antenna Elements not disabled	undefined	T/R Module Cmd processing returned status of & Tutl_Test_Status._Types.Test_Results_Etype'Image (Tr_Mo
Timer_Expired_Tcon	The transition to RF disabled has timed out	undefined	<Delete redundant supplemental data>
Timer_Expired_Tcon	The transition to RF enabled has	undefined	<Delete redundant supplemental data>

User Stories

Software User’s Guide (SUG) … Prototype

- Multi-channel delivery
  - As a user, I can display/use the SUG on multiple platforms



Lessons Learning

Software User's Guide (SUG) … Prototype

- Team
  - Team was not co-located
  - Could have been better formed

- Short stories
  - Need to be short
  - Need to have clear value to the user
  - Divide the feature (story) into smaller pieces and add value incrementally

- Momentum
  - When the team sees visible progress, progress and creativity increase
  - Relates back to keeping "stories short" and fostering team communication and demanding whole team collaboration

Lessons Learning… cont.

Software User’s Guide (SUG) … Prototype

- Feedback
  - Rapid feedback cycles make for quicker adjustments and improvement
  - Easy to fall into a vacuum – little feedback to sanity check decisions
  - Relates back to keeping “stories short”
- Acceptance testing
  - In hindsight – ad hoc
  - Different hardware/software platforms led to “faux” behavior/performance/scenario testing
- Conclusions
  - Practice iterative, incremental development
  - Encourage active customer participation and demand whole team collaboration
  - Deliver business value at regular intervals at a sustainable pace

Questions?

Some Assembly Required: Agile Methodologies

Raytheon

Ron Stauffer

Senior Tech Suport Engineer I

401 Jan Davis Drive
Huntsville, AL 35758
256.217.6376 office
256.797.2644 cell

XML Tree Menu... ActionScript

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