Eclipse Accessibility Tools Framework (ACTF) Status Update (June 26th, 2008)

Kentarou Fukuda, IBM

Michael Squillace, IBM

ACTF Timeline

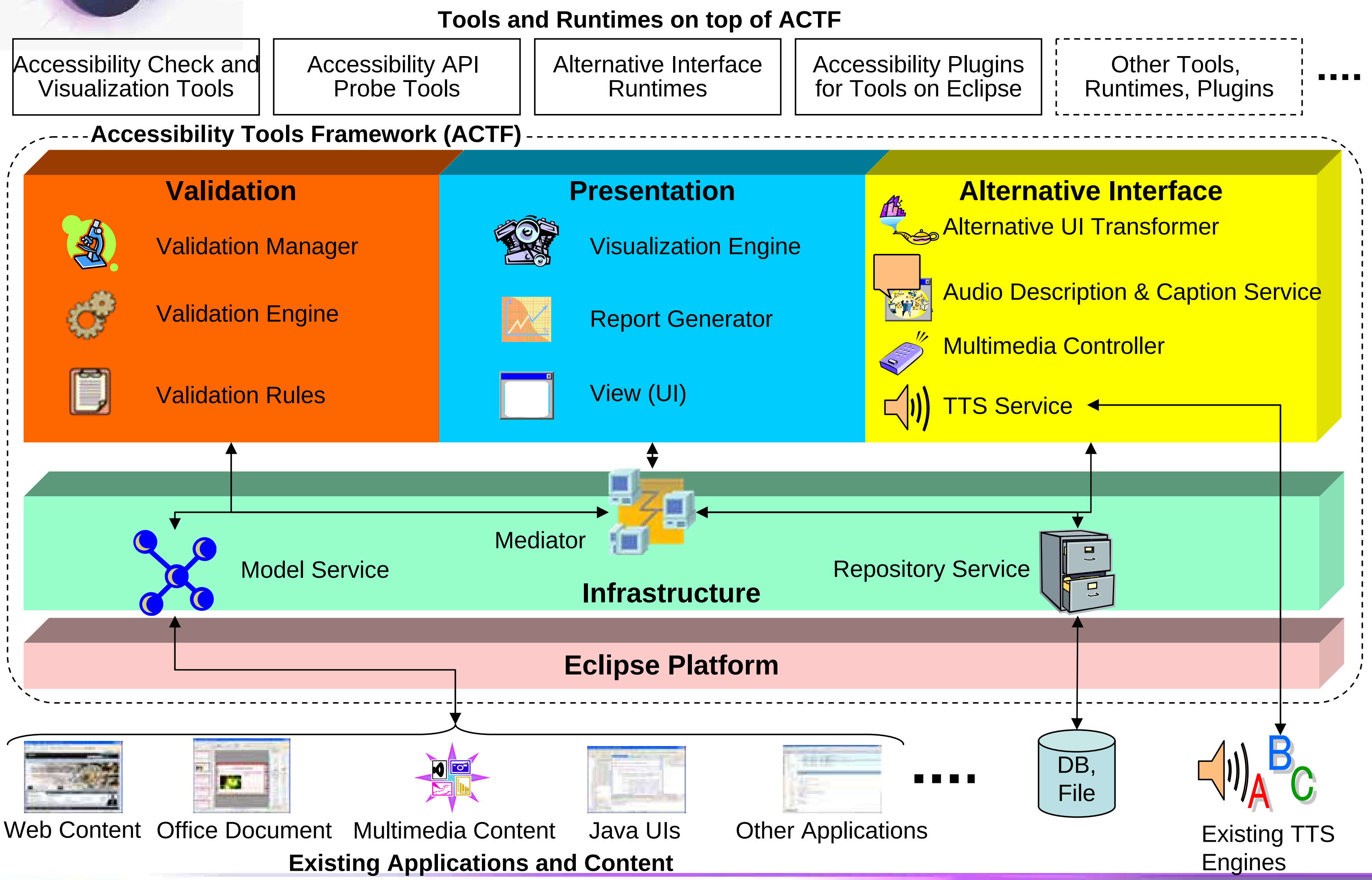
May, 2007	•ACTF project was proposed to Eclipse.org
Jul, 2007	•ACTF project proposal page was published for community review
Sep, 2007	•ACTF project proposal was accepted
Oct, 2007	•ACTF project was launched •Initial contribution was started
Feb, 2008	•Most of initial contribution was completed
Mar, 2008	•Presentations and first F2F meeting at CSUN •Presentations at EclipseCon 2008
2Q, 2008	•Preparation for 0.1 release ★
3Q, 2008	•Build 0.1 release (planned)
4Q, 2008	•Build 0.2 release (planned)
1H, 2009	•Projected first release

ACTF Release Plan

- Release plan
  - 3Q, 2008: Build 0.1 release
    - Validation SDK
    - Visualization SDK
    - Alternative Interface SDK
  - 4Q, 2008: Build 0.2 release
    - ODF Model Component (waiting for IP review)
    - Refinement of APIs
    - Complete Documentation
  - 1H, 2009: Projected first release

- Enhancements currently under consideration include:
  - Support additional applications and contents, e.g., Firefox, etc.
  - Support new accessibility guidelines (e.g., WCAG 2.0, WAI-ARIA, etc.)

Architecture



Tools and Runtimes on top of ACTF

- Accessibility Check and Visualization Tools
- Accessibility API Probe Tools
- Alternative Interface Runtimes
- Accessibility Plugins for Tools on Eclipse
- Other Tools, Runtimes, Plugins
- ....

Accessibility Tools Framework (ACTF)

Validation

- Validation Manager
- Validation Engine
- Validation Rules

Presentation

- Visualization Engine
- Report Generator
- View (UI)

Alternative Interface

- Alternative UI Transformer
- Audio Description & Caption Service
- Multimedia Controller
- TTS Service

Infrastructure

- Mediator
- Model Service
- Repository Service

Eclipse Platform

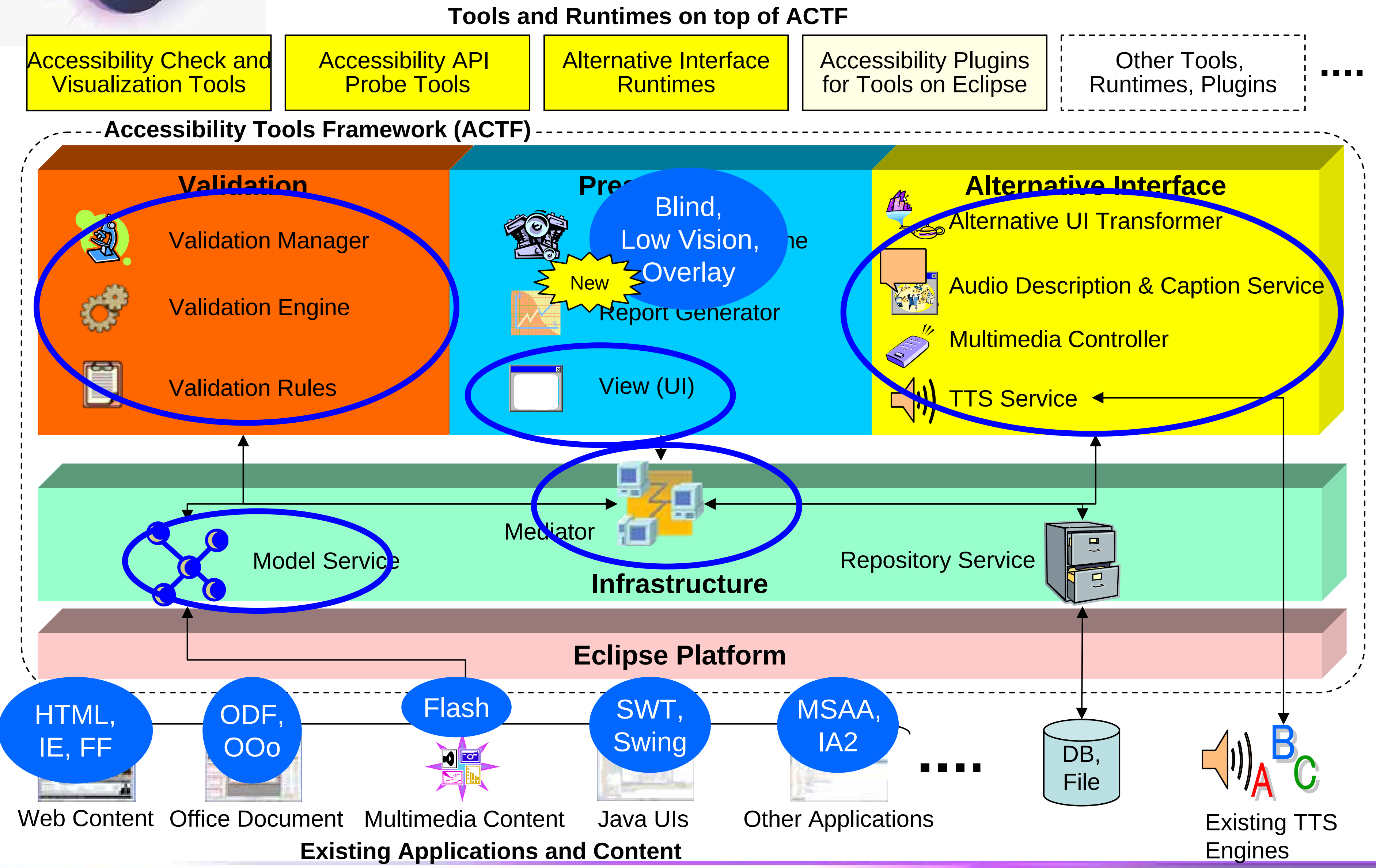
Existing Applications and Content

- Web Content
- Office Document
- Multimedia Content
- Java UIs
- Other Applications
- ....

DB, File

Existing TTS Engines

Architecture (current status)



Tools and Runtimes on top of ACTF

Accessibility Check and Visualization Tools

Accessibility API Probe Tools

Alternative Interface Runtimes

Accessibility Plugins for Tools on Eclipse

Other Tools, Runtimes, Plugins

....

Accessibility Tools Framework (ACTF)

Validation

Validation Manager

Validation Engine

Validation Rules

Pre

Blind, Low Vision, Overlay

ne

New

Report Generator

View (UI)

Alternative Interface

Alternative UI Transformer

Audio Description & Caption Service

Multimedia Controller

TTS Service

Mediator

Model Service

Repository Service

Infrastructure

Eclipse Platform

HTML, IE, FF

Web Content

ODF, OOo

Office Document

Flash

Multimedia Content

SWT, Swing

Java UIs

MSAA, IA2

Other Applications

....

DB, File

Existing TTS Engines

Existing Applications and Content

ACTF Exemplary Applications

- AccProbe
  - Accessibility testing and debugging tool for applications. (pp.13-16)
- aDesigner
  - Accessibility check and usability visualization tool. (pp.17-26)
- aiBrowser
  - Alternative accessible interface for multimedia browsing. (pp.27-30)

New

- Simple Visualizer
  - Example RCP application that includes DOM (Live/Source) access, Screenshot capture, Overlay visualization, etc. (pp.31-33)

http://www.eclipse.org/actf/downloads/

Q/A

Backup

Summary of major components

ACTF Validation Engine

- Provide extensible accessibility validation features with initial support for:
  - Accessibility APIs such as Microsoft Active Accessibility (MSAA) and IAccessible2.
  - Eclipse SWT
  - Flash
  - HTML
  - Java Swing
  - OpenDocument Format (ODF)
- Developers can customize validation rules by using XML configuration files or through Java APIs.

ACTF Visualization Engines

- Provide a visual representation of the PwD users’ usability of content or applications.
  - Blind usability visualization engine
  - Image simulation engine
    - Low vision simulation
    - Presentation simulation
- Objective
  - Provide a tool to **learn** about real accessibility issues
    - Encourage authors/designers to check accessibility whenever they are authoring content.
  - Provide a tool to effectively **demonstrate** accessibility issues
    - Encourage website owners to renovate their pages to be accessible.

ACTF Alternative Interface Part

- Provide middleware components for developing accessible alternative user interfaces.
  - **Multimedia controller**
    - Make multimedia content controllable with unified shortcut keys even if the content does not support keyboard operations.
    - Allow independent adjustment of each sound source.
  - **Audio description & caption service**
    - Provide audio descriptions and captions to multimedia content by using text metadata.
  - **Text-to-Speech service**
    - Provide interface to use TTS from the framework. (Currently, we support SAPI.)
  - **Alternative UI transformer**
    - Support improving the navigating and operating environments by using external metadata without changing the existing applications or content.

ACTF AccProbe

Accessibility Probe (AccProbe)

- Eclipse Rich-Client Product (RCP) application
  - Requires only a Java Runtime Environment (JRE) (5.0 or later)
  - Combines inspection, exploration, and event-monitoring functionality
  - Is fully accessible:
    - passes IBM's own internal guidelines for accessible products and services
    - Designed and used by a totally blind developer

- Built upon components of the ACTF as the result of a requirement for testing by IBM's own Software Group
  - Supports evaluation of both MSAA- and IAcccessible2-enabled applications
  - Plan to support evaluation of Java Accessibility API and AT-SPI on Linux

AccProbe Overview

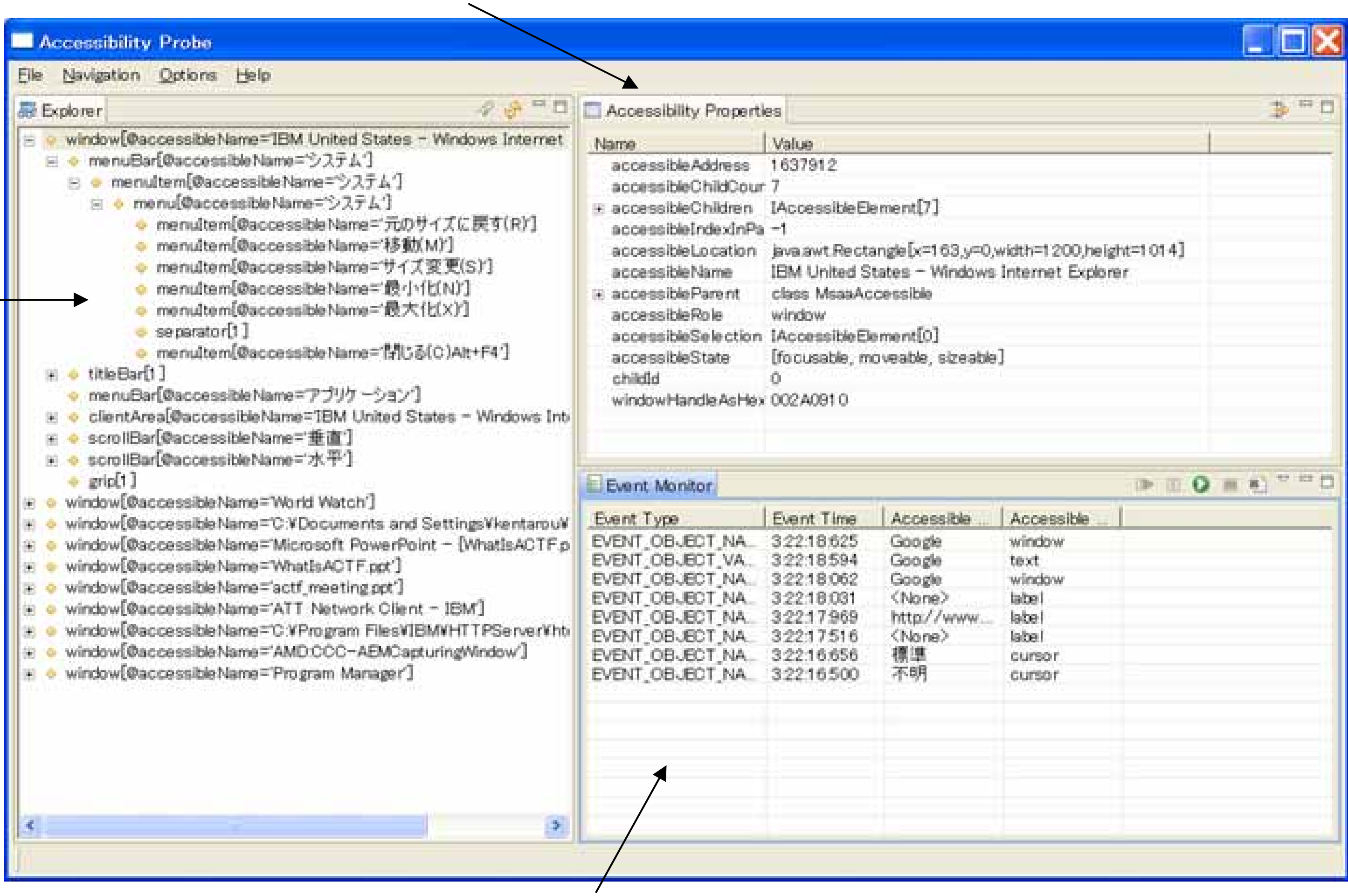
- Three views
  - Explorer View – for navigating among the hierarchy of accessible objects
  - Properties View - for viewing properties (both simple and nested) of accessible objects and invoking methods on these objects
  - Event Monitor - for monitoring the events fired by accessible objects

- Inspecting/monitoring an application
  - On startup, Explorer View is populated with all top-level windows (except AccProbe)
  - Navigate through objects by using the view as a standard tree or via tracking
  - Properties View is automatically updated
  - Window being monitored is the top-level window that is “selected” in Explorer
  - Properties and events displayed depend upon accessibility architecture of underlying accessible object

AccProbe

Properties View - for viewing properties (both simple and nested) of accessible objects and invoking methods on these objects

Explorer View - for navigating among the hierarchy of accessible objects



```
window[@accessibleName='IBM United States - Windows Internet
  menuBar[@accessibleName='システム']
    menuItem[@accessibleName='システム']
      menu[@accessibleName='システム']
        menuItem[@accessibleName='元のサイズに戻す(R)']
        menuItem[@accessibleName='移動(M)']
        menuItem[@accessibleName='サイズ変更(S)']
        menuItem[@accessibleName='最小化(N)']
        menuItem[@accessibleName='最大化(X)']
        seperator[1]
        menuItem[@accessibleName='閉じる(C)Alt+F4']
  titleBar[1]
  menuBar[@accessibleName='アプリケーション']
  clientArea[@accessibleName='IBM United States - Windows Int
  scrollBar[@accessibleName='垂直']
  scrollBar[@accessibleName='水平']
  grip[1]
window[@accessibleName='World Watch']
window[@accessibleName='C:¥Documents and Settings¥kentarou¥
window[@accessibleName='Microsoft PowerPoint - [WhatIsACTF.p
window[@accessibleName='WhatIsACTF.ppt']
window[@accessibleName='actf_meeting.ppt']
window[@accessibleName='ATT Network Client - IBM']
window[@accessibleName='C:¥Program Files¥IBM¥HTTPServer¥ht
window[@accessibleName='AMD:CCC-AEMCapturingWindow']
window[@accessibleName='Program Manager']
```

Name	Value
accessibleAddress	1637912
accessibleChildCour	7
accessibleChildren	[AccessibleElement[7]]
accessibleIndexInPa	-1
accessibleLocation	java.awt.Rectangle[x=163,y=0,width=1200,height=1014]
accessibleName	IBM United States - Windows Internet Explorer
accessibleParent	class MsaaAccessible
accessibleRole	window
accessibleSelection	[AccessibleElement[0]]
accessibleState	[focusable, moveable, sizeable]
childId	0
windowHandleAsHex	002A0910

Event Type	Event Time	Accessible ...	Accessible ...
EVENT_OBJECT_NA...	3:22:18.625	Google	window
EVENT_OBJECT_VA...	3:22:18.594	Google	text
EVENT_OBJECT_NA...	3:22:18.062	Google	window
EVENT_OBJECT_NA...	3:22:18.031	<None>	label
EVENT_OBJECT_NA...	3:22:17.969	http://www...	label
EVENT_OBJECT_NA...	3:22:17.516	<None>	label
EVENT_OBJECT_NA...	3:22:16.656	標準	cursor
EVENT_OBJECT_NA...	3:22:16.500	不明	cursor

Event Monitor - for monitoring the events fired by accessible objects

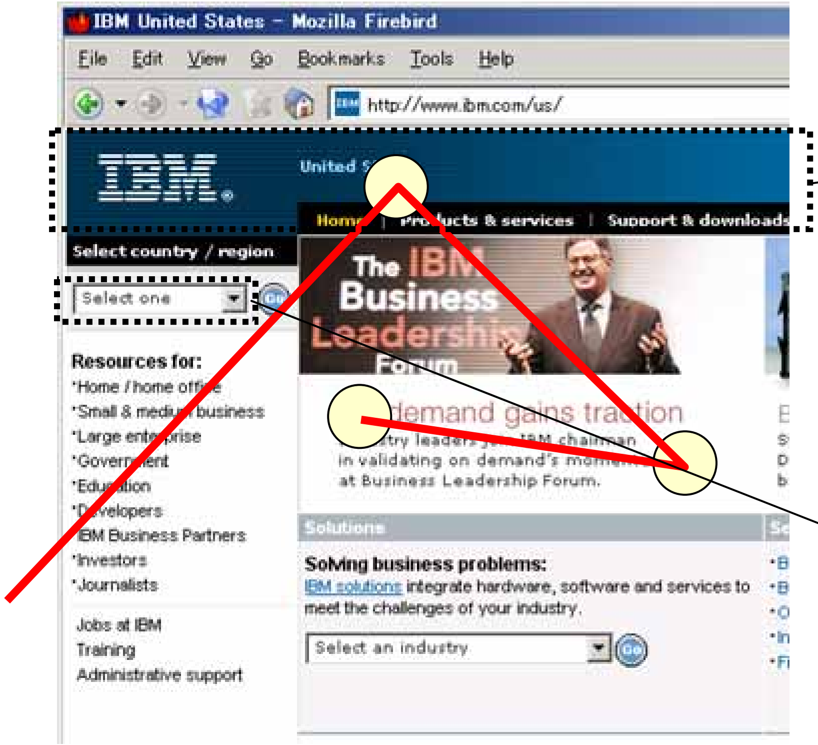
ACTF aDesigner

ACTF aDesigner (Accessibility Designer)

- Exemplary Tool on top of ACTF Visualization component
- Functions
  - **Visualization of blind usability**
    - Reaching time and reading text visualization
    - Integration with a voice browser engine
  - **Simulation of low vision**
    - Weak eyesight, color vision deficiencies, cataracts.
    - Detect color combination problems.
  - **Presentation simulation**
    - Check visibility of presentation slides in large conference rooms.
  - Checking compliance items from the usability point of view
    - Appropriateness of ALT texts and skip-navigation links, etc
    - WCAG, Section 508, IBM CI162, JIS, etc.

Large Difference between Sighted and the Blind

Sighted



demand gains traction

...stry leaders jo... IBM chairman in validating on demand's mome... at Business Leadership Forum.

Solving business problems:

IBM solutions integrate hardware, software and services to meet the challenges of your industry.

Blind

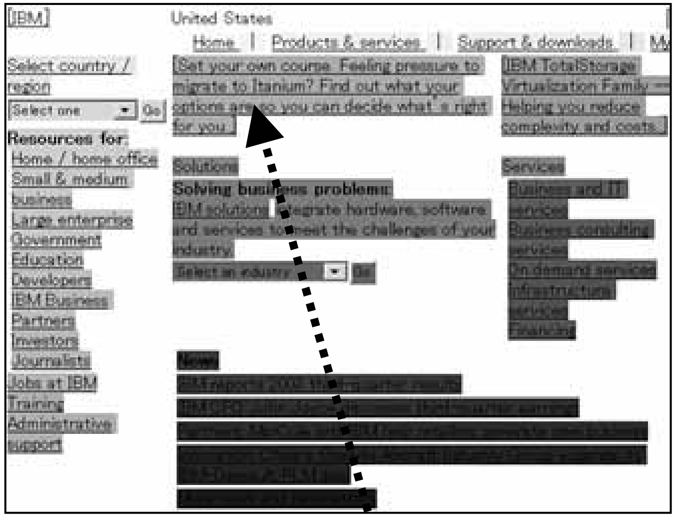
[IBM.]
[Skip to main content.]United States
(Start of form 1.)
[Text.]
[Search: Image Button.]
(End of form 1.)
Home | Products & services | Support & downloads | My account
Select country / region
(Start of form 2.)
(Start of select menu with 10 items.)
Select one[Selected.]
Canada[Off.]
China[Off.]
France[Off.]
Germany[Off.]
Italy[Off.]
Japan[Off.]
United Kingdom[Off.]
United States[Off.]
Full country list[Off.]

Eye-movement-based exploration with visual cues

Keyboard-based exploration without visual cues

Blind Usability Visualization

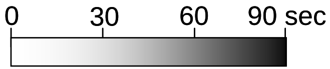
- Objective: “Visualize the non-visible blind usability”
- Approach
  - Reaching time visualization
    - Simulate voice browser and users’ behavior to calculate reaching time to each element in a page
    - Present the reaching times to each part of a page by using background colors.
  - Reading text presentation
    - Presenting the text information extracted or generated by standard voice browsers, while retaining the fundamental visual layouts.

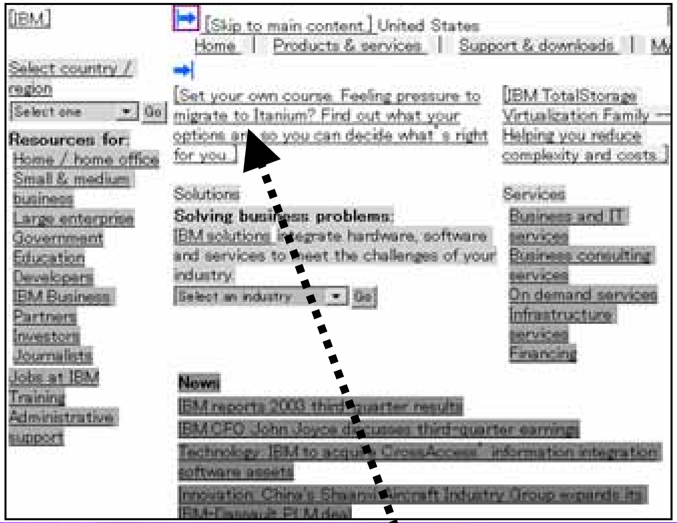

[IBM]
United States
Home | Products & services | Support & downloads | My
Select country / region
Select one
Go
Resources for:
Home / home office
Small & medium business
Large enterprise
Government
Education
Developers
IBM Business Partners
Investors
Journalists
Jobs at IBM
Training
Administrative support
[Set your own course. Feeling pressure to migrate to Itanium? Find out what your options are so you can decide what's right for you.]
[IBM TotalStorage Virtualization Family — Helping you reduce complexity and costs.]
Solutions
Solving business problems:
IBM solutions integrate hardware, software and services to meet the challenges of your industry.
Select an industry
Services
Business and IT services
Business consulting services
On demand services
Infrastructure services
Financing
News

More than **45 seconds** to get to the main content.

Insert “Skip-to-main” link

Reaching time color:

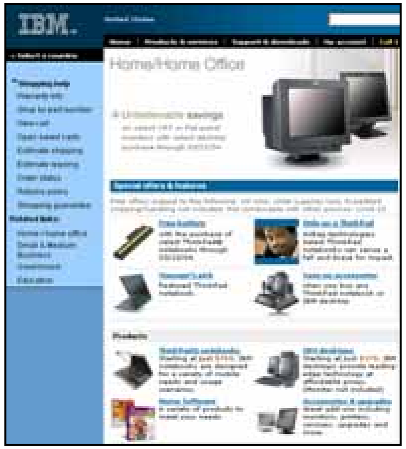



[IBM]
[Skip to main content] United States
Home | Products & services | Support & downloads | My
Select country / region
Select one
Go
Resources for:
Home / home office
Small & medium business
Large enterprise
Government
Education
Developers
IBM Business Partners
Investors
Journalists
Jobs at IBM
Training
Administrative support
[Set your own course. Feeling pressure to migrate to Itanium? Find out what your options are so you can decide what's right for you.]
[IBM TotalStorage Virtualization Family — Helping you reduce complexity and costs.]
Solutions
Solving business problems:
IBM solutions integrate hardware, software and services to meet the challenges of your industry.
Select an industry
Go
Services
Business and IT services
Business consulting services
On demand services
Infrastructure services
Financing
News:
IBM reports 2003 third-quarter results
IBM CFO John Joyce discusses third-quarter earning
Technology: IBM to acquire CrossAccess' information integration software assets
Innovation: China's Shaanxi Aircraft Industry Group expands its IBM-Dassault PLM deal

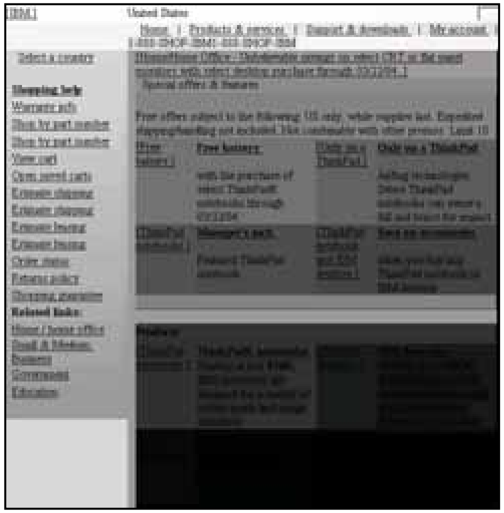
Only **3 seconds** to get to the main content.

Blind Usability Visualization Example

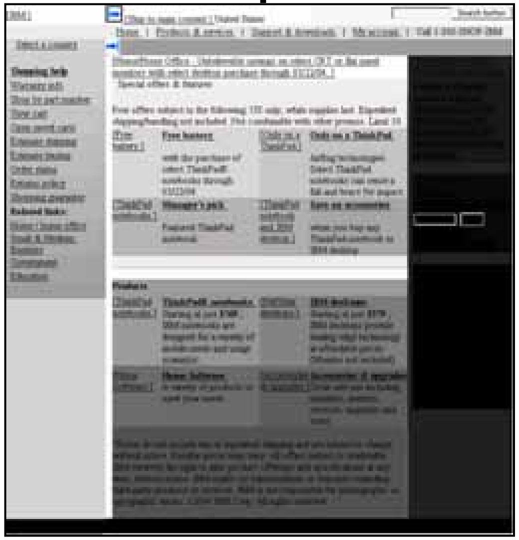
Original



Inaccessible

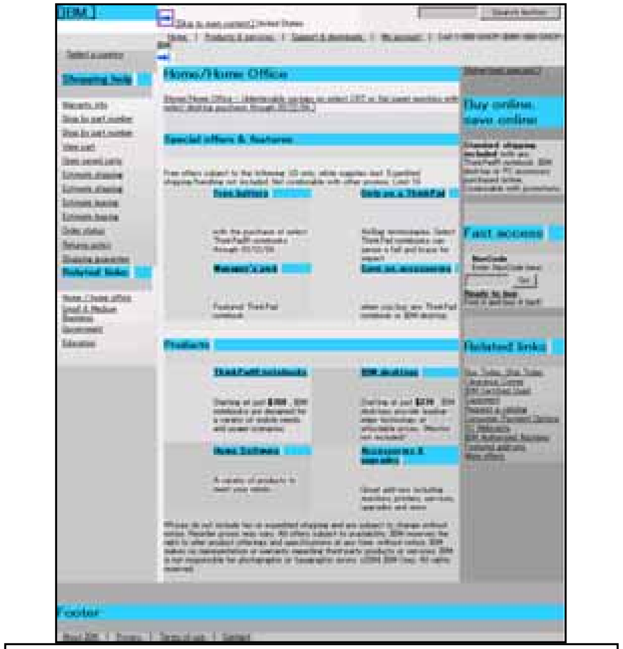


With skip-link



Easy to find main contents

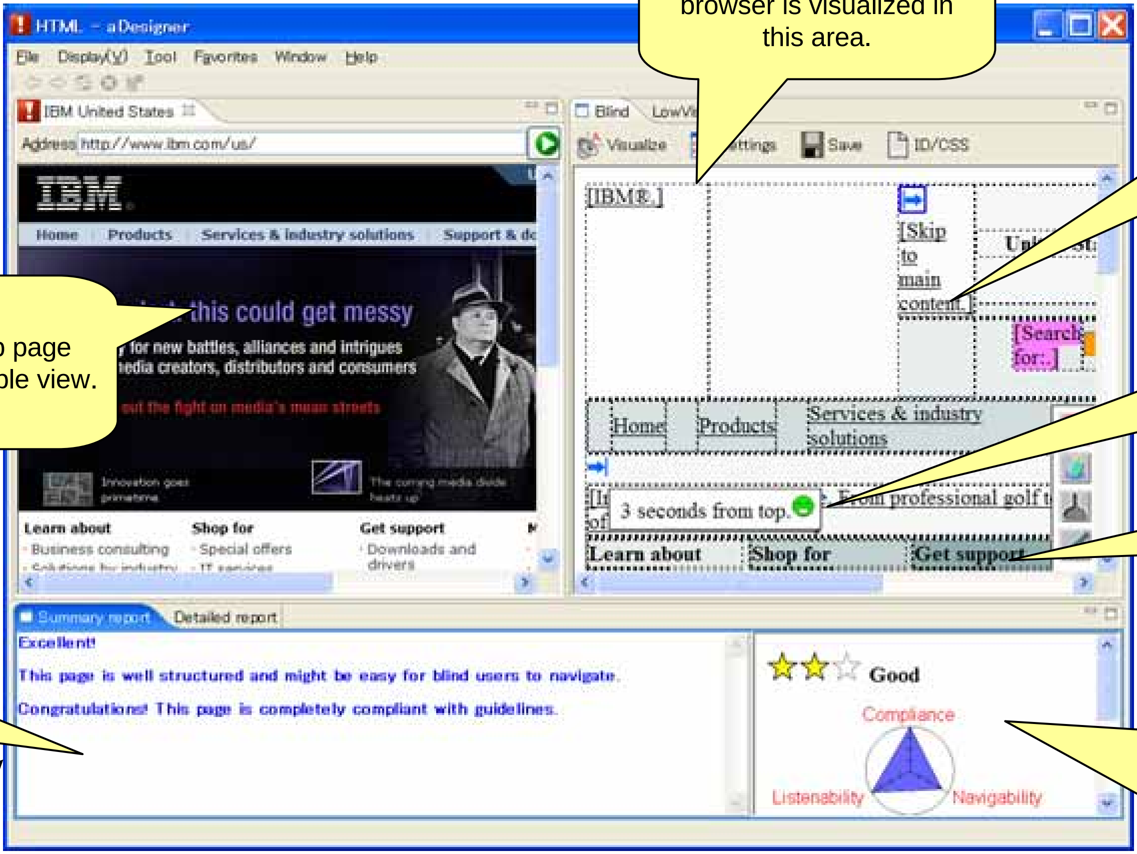
With heading Tags



- Headers can use as TOC
- Easy to navigate through the page

Blind Visualization

Visualize the experience of blind users


HTML - aDesigner
File Display(V) Tool Favorites Window Help
IBM United States
Address http://www.ibm.com/us/
IBM
Home Products Services & industry solutions Support & do
...this could get messy
...for new battles, alliances and intrigues
...media creators, distributors and consumers
...out the fight on media's mean streets
Innovation goes primetime
The coming media divide heats up
Learn about Shop for Get support
Business consulting Special offers Downloads and drivers
Solutions by industry IT services
Blind LowVi...
Visualize Settings Save ID/CSS
[IBM®.]
[Skip to main content.]
Uni... St...
[Search for:.]
Home Products Services & industry solutions
[In... of
3 seconds from top.
From professional golf t...
Learn about Shop for Get support
Summary report Detailed report
Good
Compliance
Listenability
Navigability

Excellent!

This page is well structured and might be easy for blind users to navigate.

Congratulations! This page is completely compliant with guidelines.

Text content that will be read out by a voice browser is visualized in this area.

Lighter background color indicates that it takes less time to reach there by using voice browsers.

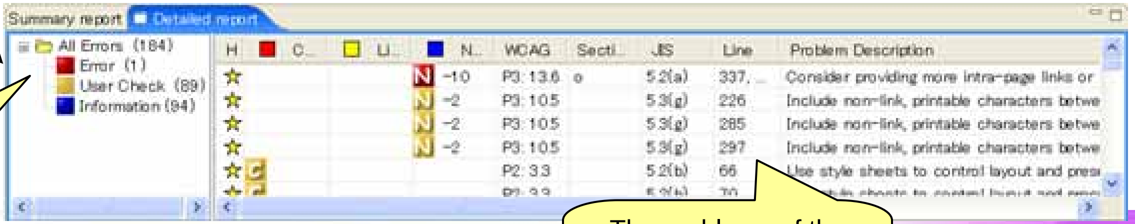
The balloon message shows the exact time to reach the element on which the mouse cursor is placed.

Darker background color indicates that it takes more time to reach there by using voice browsers.

The original Web page which sighted people view.

Summary Report

The overall page rating is calculated from:
1: Compliance to accessibility guidelines
2: Navigability (ease of navigation within the page)
3: Listenability (ease of listening)



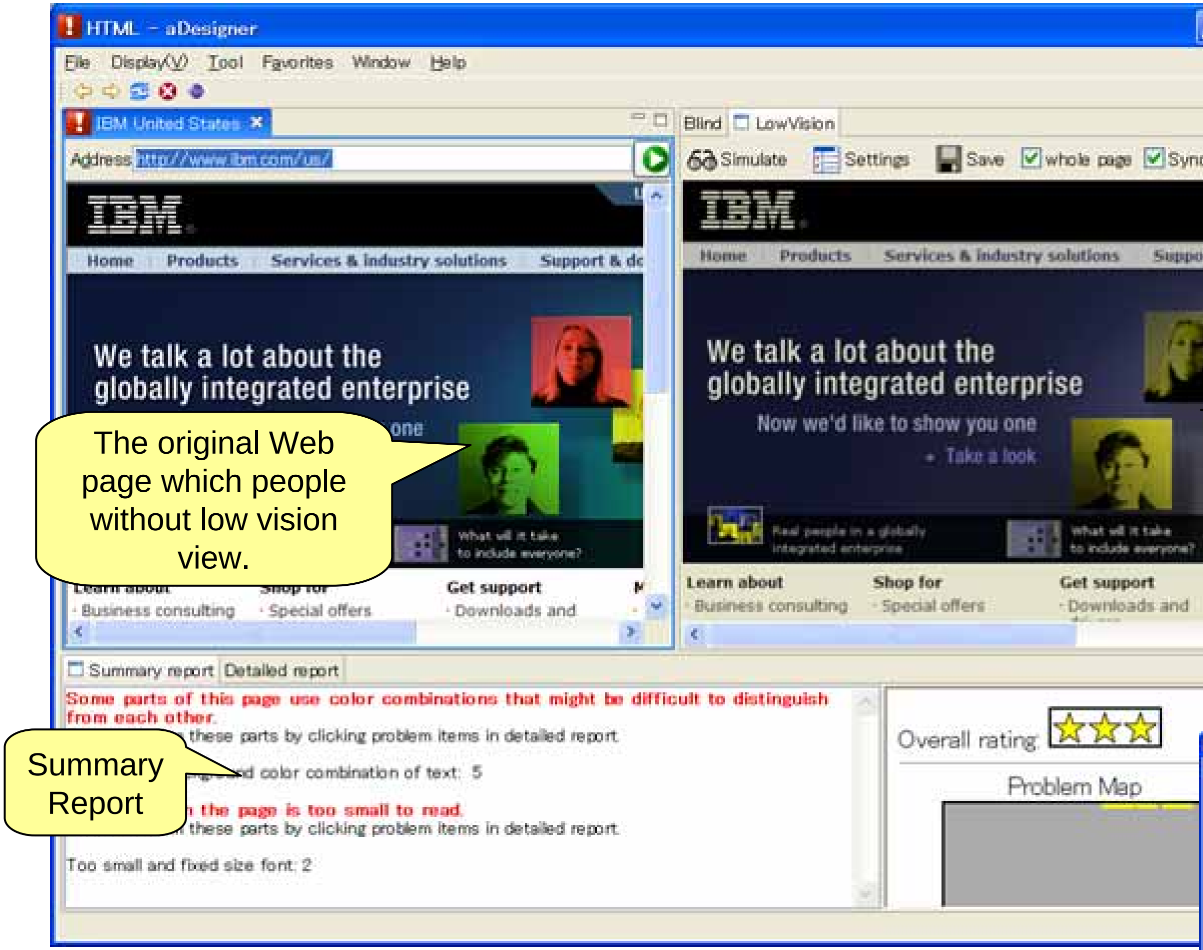
H	C...	U...	N...	WCAG	Secti...	JIS	Line	Problem Description
☆			N -10	P3: 13.6	o	5.2(a)	337, ...	Consider providing more intra-page links or
☆			N -2	P3: 10.5		5.3(g)	226	Include non-link, printable characters betwe
☆			N -2	P3: 10.5		5.3(g)	285	Include non-link, printable characters betwe
☆			N -2	P3: 10.5		5.3(g)	297	Include non-link, printable characters betwe
☆	C			P2: 3.3		5.2(b)	66	Use style sheets to control layout and pres
☆	C			P2: 3.3		5.2(b)	70	Use style sheets to control layout and pres

Detailed Report

The problems of the selected category are listed.

Low Vision Simulation

Simulating the experience of users who have low vision



Some parts of this page use color combinations that might be difficult to distinguish from each other.

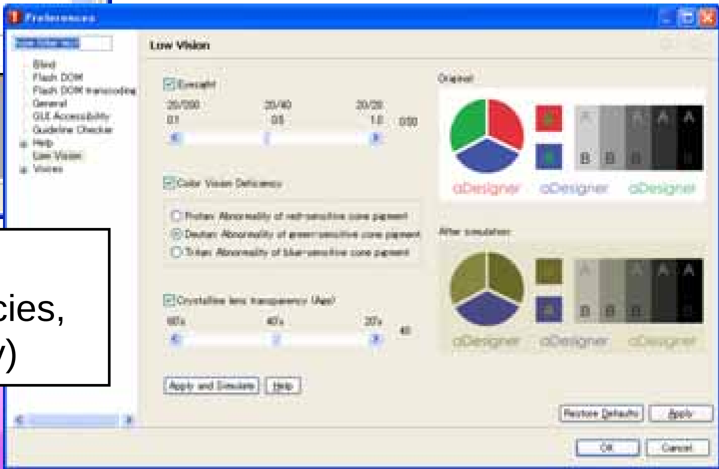
these parts by clicking problem items in detailed report

d color combination of text: 5

the page is too small to read.

these parts by clicking problem items in detailed report

Too small and fixed size font: 2



☑ Eyesight

20/200 0.1 — 20/40 0.5 — 20/20 1.0 — 0.50

☑ Color Vision Deficiency

○ Protan: Abnormality of red-sensitive cone pigment

● Deutan: Abnormality of green-sensitive cone pigment

○ Tritan: Abnormality of blue-sensitive cone pigment

☑ Crystalline lens transparency (Age)

60's — 40's — 20's — 40

The original Web page which people without low vision view.

Low vision simulation. In this example, Color Vision Deficiency (Deutan) and cataract are simulated.

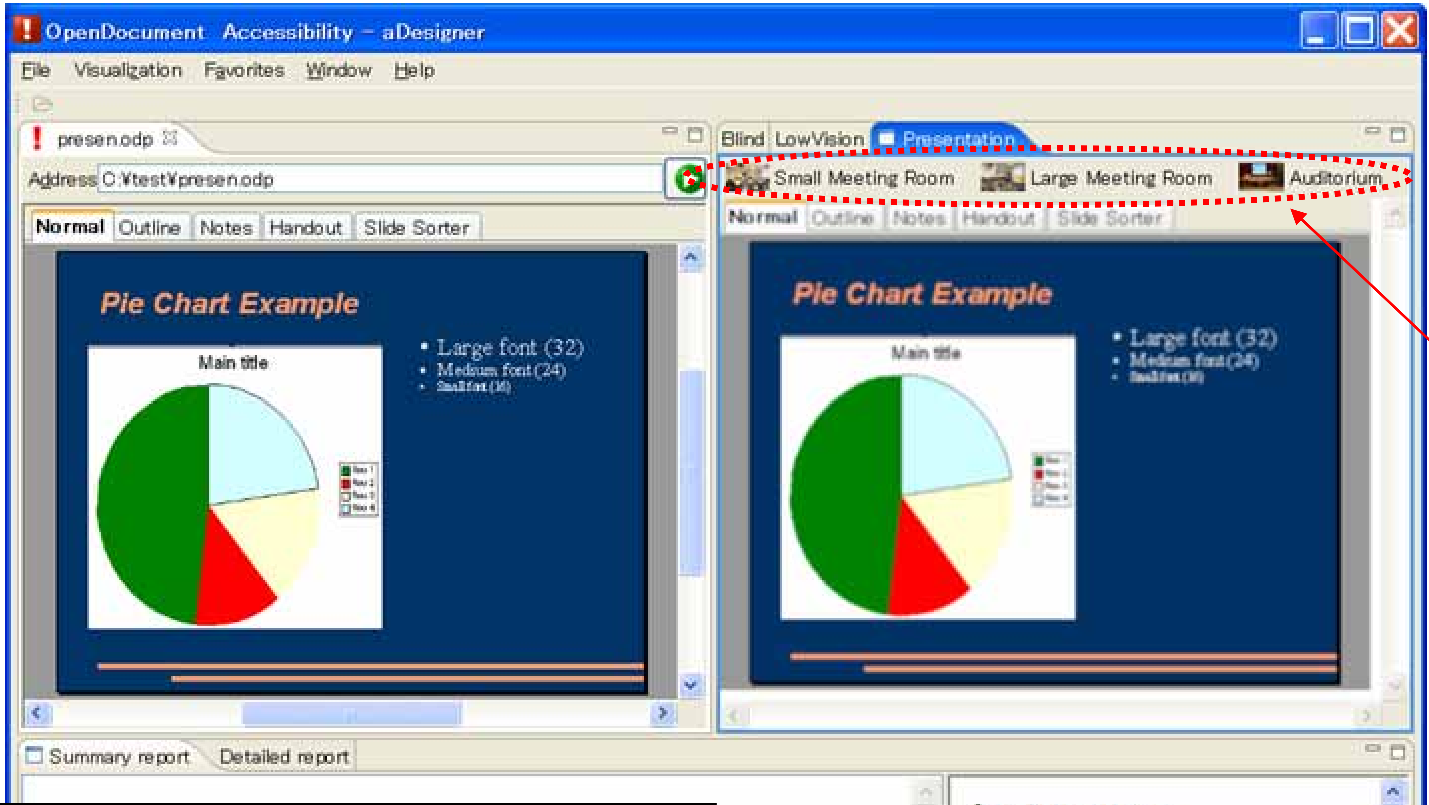
Problem map that indicates the positions of problems.

Summary Report

Setting panel
(Eyesight, color vision deficiencies, crystalline lens transparency)

Presentation Simulation

Check visibility of presentation slides in large conference rooms



Address C:¥test¥presen.odp

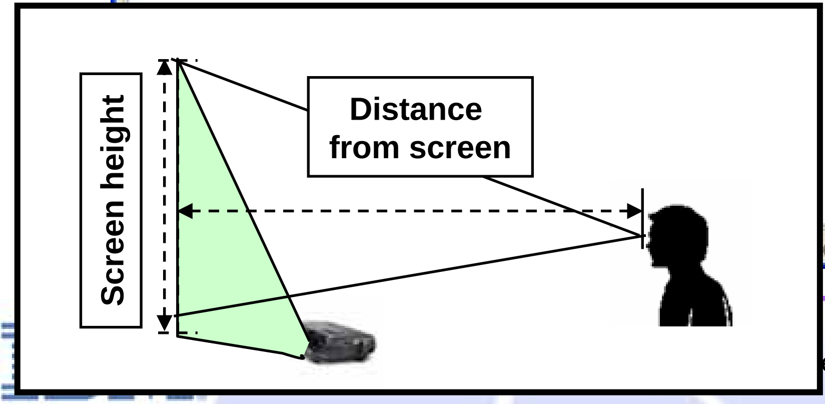
Pie Chart Example

Main title

- Large font (32)
- Medium font (24)
- Small font (16)

Auditorium

of current page is over.

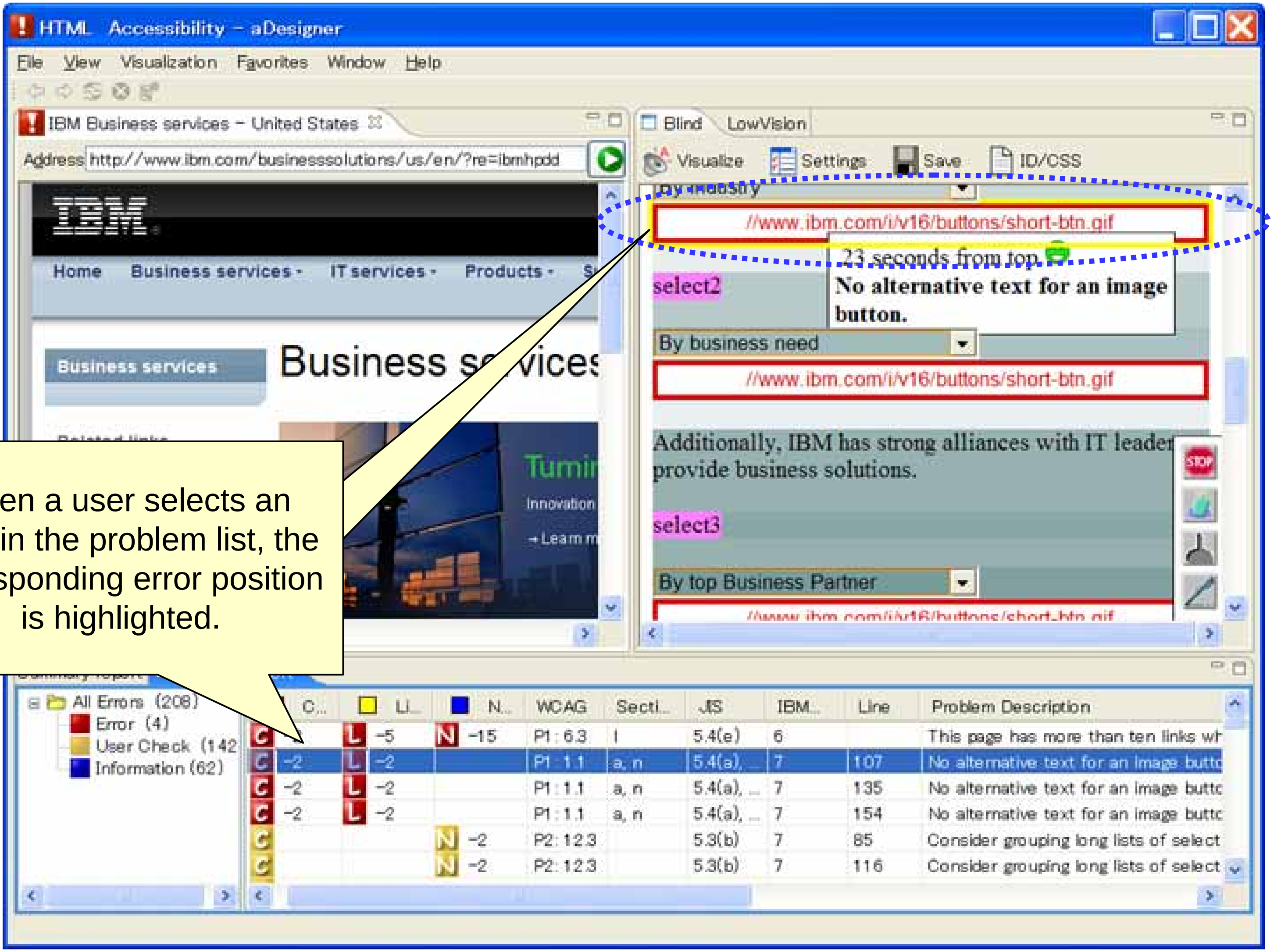


Small Meeting Room

Large Meeting Room

Auditorium

Visual Synchronization


HTML Accessibility - aDesigner
File View Visualization Favorites Window Help
IBM Business services - United States
Address http://www.ibm.com/businesssolutions/us/en/?re=ibmhpdd
IBM
Home Business services IT services Products
Business services
Business services
Related links
Turni
Innovation
→Learn m
Blind LowVision
Visualize Settings Save ID/CSS
Summary report

By industry

//www.ibm.com/i/v16/buttons/short-btn.gif

23 seconds from top.
No alternative text for an image button.

select2

By business need

//www.ibm.com/i/v16/buttons/short-btn.gif

Additionally, IBM has strong alliances with IT leader provide business solutions.

select3

By top Business Partner

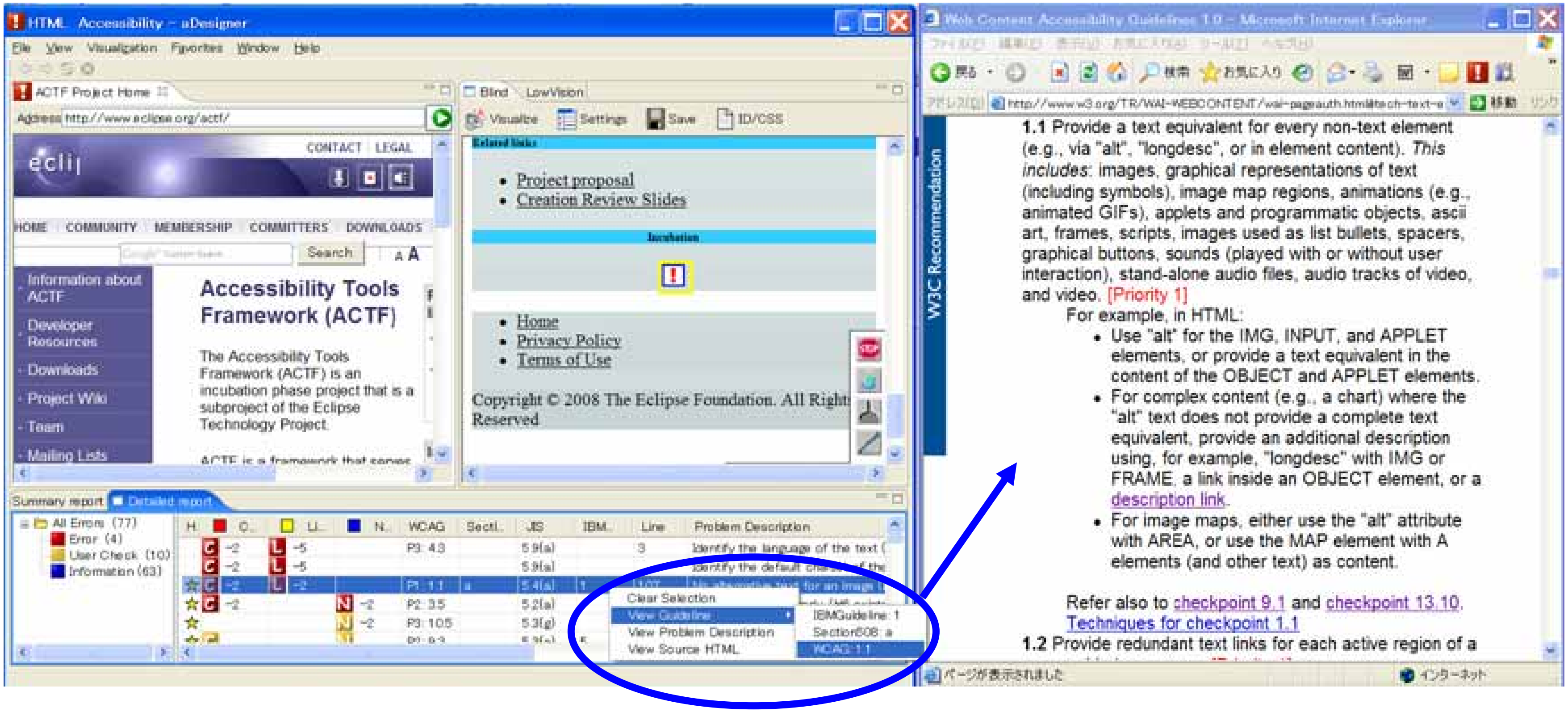
//www.ibm.com/i/v16/buttons/short-btn.gif

- All Errors (208)
  - Error (4)
  - User Check (142
  - Information (62)

	C...		Li...		N...	WCAG	Secti...	JIS	IBM...	Line	Problem Description
C	[illegible]	L	-5	N	-15	P1 : 6.3	l	5.4(e)	6		This page has more than ten links wh
C	-2	L	-2			P1 : 1.1	a, n	5.4(a), ...	7	107	No alternative text for an image butto
C	-2	L	-2			P1 : 1.1	a, n	5.4(a), ...	7	135	No alternative text for an image butto
C	-2	L	-2			P1 : 1.1	a, n	5.4(a), ...	7	154	No alternative text for an image butto
C				N	-2	P2: 12.3		5.3(b)	7	85	Consider grouping long lists of select
C				N	-2	P2: 12.3		5.3(b)	7	116	Consider grouping long lists of select

When a user selects an error in the problem list, the corresponding error position is highlighted.

Synchronization with Guideline/Technique pages



Accessibility Tools Framework (ACTF)

The Accessibility Tools Framework (ACTF) is an incubation phase project that is a subproject of the Eclipse Technology Project.

ACTF is a framework that serves

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H	■ C..	■ L..	■ N..	WCAG	Secti..	JIS	IBM..	Line	Problem Description
	C -2	L -5		P3: 4.3		5.9(a)		3	Identify the language of the text (
	C -2	L -5				5.8(a)			Identify the default ch[illegible] of the
☆	C -2	L -2		P1: 1.1	a	5.4(a)	1	107	No alternative text for an image (
☆	C -2		N -2	P2: 3.5		5.2(a)			
☆			N -2	P3: 10.5		5.3(g)			

1.1 Provide a text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content). *This includes*: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ascii art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video. [Priority 1]

For example, in HTML:

- Use "alt" for the IMG, INPUT, and APPLET elements, or provide a text equivalent in the content of the OBJECT and APPLET elements.
- For complex content (e.g., a chart) where the "alt" text does not provide a complete text equivalent, provide an additional description using, for example, "longdesc" with IMG or FRAME, a link inside an OBJECT element, or a description link.
- For image maps, either use the "alt" attribute with AREA, or use the MAP element with A elements (and other text) as content.

Refer also to checkpoint 9.1 and checkpoint 13.10.
Techniques for checkpoint 1.1

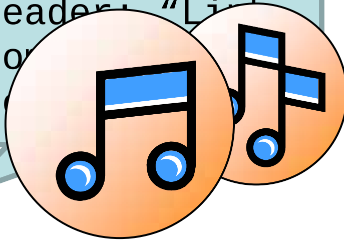
1.2 Provide redundant text links for each active region of a

Users can visit corresponding Guideline/Technique pages
by using context menu

ACTF aiBrowser

Accessibility Issues of Multimedia Content

- The emergence of multimedia content
  - Entertainment, News, Education, E-government, …
  - **Most of these content are inaccessible for the blind…**



Screen
reader: “Li
ho
m

- Major issues
  1. Audio of a streaming video **interferes** with a synthesized assistive voice.
  2. Streaming videos do not provide **audio descriptions** for non-visual users.
  3. **Dynamically changing visual interfaces** can’t be perceived non-visually. (E.g. mouse only operation)
  4. The **work** to make multimedia content accessible for screen readers is too expensive.

ACTF aiBrowser
Exemplary tool on top of ACTF AI Component

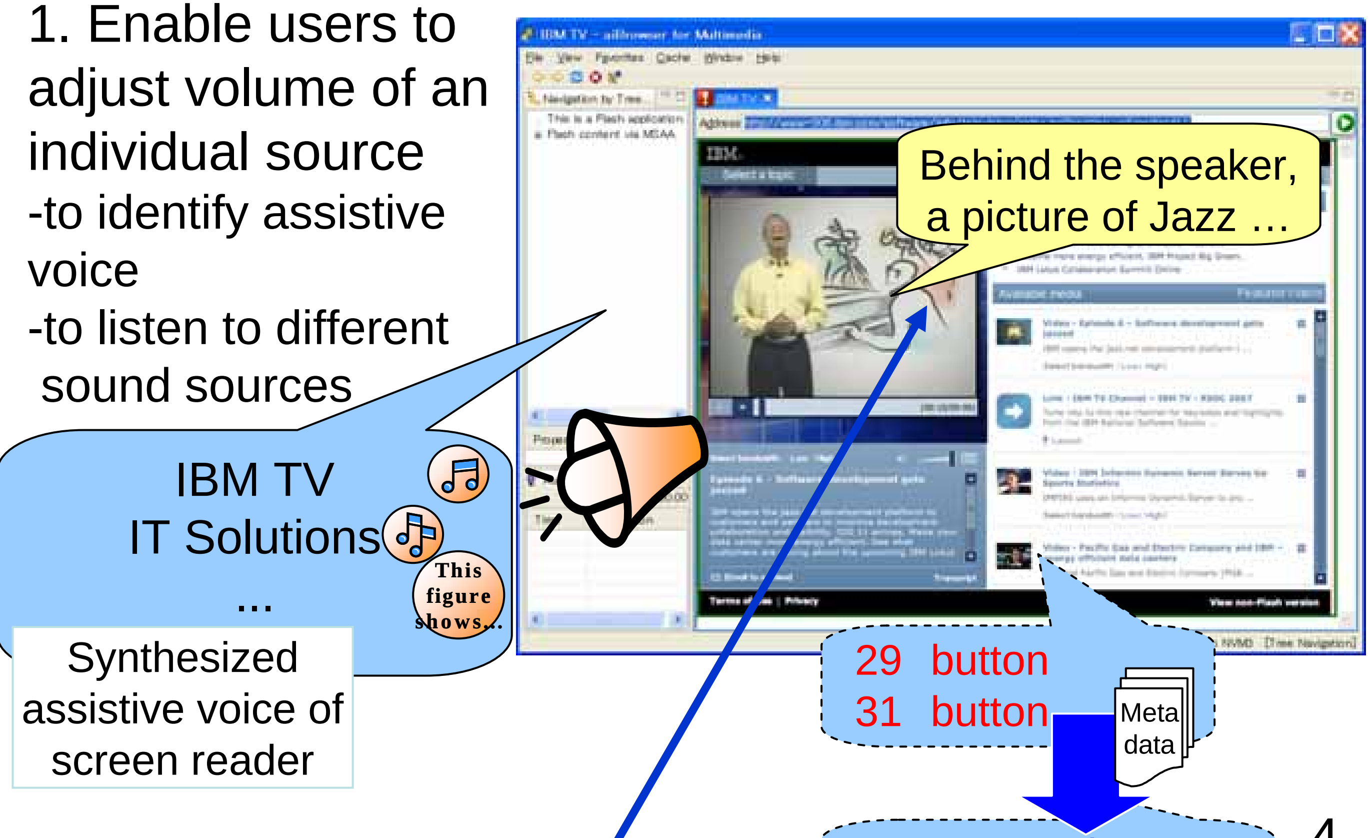
1. **Direct audio control**
   - Allow users to increase or lower the volume, stop or play, and control audio speed by using simple keyboard commands.
2. **User interface simplification**
   - Structurally simplify interfaces by converting dynamic visual interfaces into static text-based interfaces
3. **Video descriptions with text**
   - Infrastructure to provide video descriptions at low cost
4. **Workload reduction**
   - Drastically reduce costs to make existing Flash and AJAX content accessible based on new metadata mechanisms.

"The first multimedia browser for the blind"

aiBrowser

- A tool that enables multimedia content to be enjoyed by people with visual impairments -

1. Enable users to adjust volume of an individual source
-to identify assistive voice
-to listen to different sound sources



3. Enables users to control multimedia by using pre-defined shortcut keys.

Play:	Ctrl+P
Stop：	Ctrl+S
Volume up：	Ctrl+J
Volume down：	Ctrl+K
...	

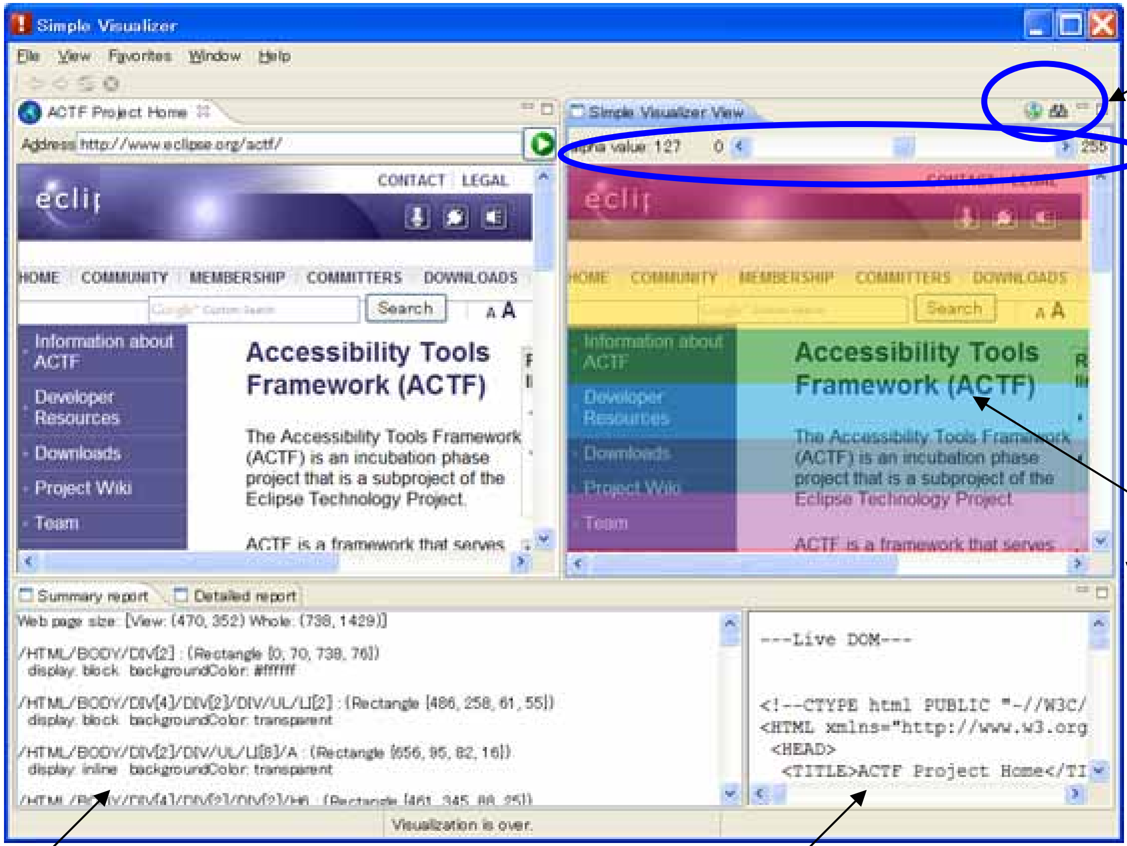
2. Provide audio caption by using text metadata & TTS

4. Provide alternative text information by using external metadata.

ACTF Simple Visualizer

ACTF Simple Visualizer

- Example RCP application that includes DOM (Live/Source) access, Screenshot capture, Overlay visualization, etc.



Accessibility Tools Framework (ACTF)

The Accessibility Tools Framework (ACTF) is an incubation phase project that is a subproject of the Eclipse Technology Project.

ACTF is a framework that serves

```
Web page size: [View: (470, 352) Whole: (738, 1429)]

/HTML/BODY/DIV[2] : (Rectangle [0, 70, 738, 76])
  display: block  backgroundColor: #ffffff

/HTML/BODY/DIV[4]/DIV[2]/DIV/UL/LI[2] : (Rectangle [486, 258, 61, 55])
  display: block  backgroundColor: transparent

/HTML/BODY/DIV[2]/DIV/UL/LI[8]/A : (Rectangle [656, 95, 82, 16])
  display: inline  backgroundColor: transparent

/HTML/BODY/DIV[4]/DIV[2]/DIV[2]/H6 : (Rectangle [461, 345, 88, 25])
```

```
---Live DOM---


<!--CTYPE html PUBLIC "-//W3C/
<HTML xmlns="http://www.w3.org
 <HEAD>
  <TITLE>ACTF Project Home</TI
```

Visualize actions

alpha value of overlay

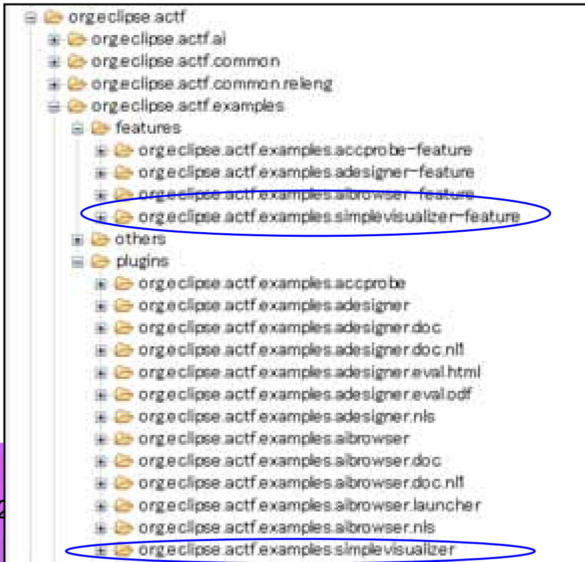
Overlay visualization sample

StyleInfo obtained from Live DOM

HTML DOM (Live/Source)

How to Try “Simple Visualizer”

1. Create workspace based on aDesigner build instruction
   - http://www.eclipse.org/actf/downloads/tools/aDesigner/build.php
2. Check out 2 plugins from Eclipse CVS
   - Repository path: /cvsroot/technology
   - path of plugins
     - org.eclipse.actf/org.eclipse.actf.examples/fetures/org.eclipse.actf.examples.simplevisualizer-feature
     - org.eclipse.actf/org.eclipse.actf.examples/plugins/org.eclipse.actf.examples.simplevisualizer
   - (see http://www.eclipse.org/actf/contributors.php for more details)
3. Launch Simple Visualizer
   - Visit org.eclipse.actf.examples.simplevisualizer
   - Open simplevisualizer.product
   - Select “Launch an Eclipse application”



```
org.eclipse.actf
  org.eclipse.actf.ai
  org.eclipse.actf.common
  org.eclipse.actf.common.releng
  org.eclipse.actf.examples
    features
      org.eclipse.actf.examples.accprobe-feature
      org.eclipse.actf.examples.adesigner-feature
      org.eclipse.actf.examples.aibrowser-feature
      org.eclipse.actf.examples.simplevisualizer-feature
    others
    plugins
      org.eclipse.actf.examples.accprobe
      org.eclipse.actf.examples.adesigner
      org.eclipse.actf.examples.adesigner.doc
      org.eclipse.actf.examples.adesigner.doc.nl1
      org.eclipse.actf.examples.adesigner.eval.html
      org.eclipse.actf.examples.adesigner.eval.odf
      org.eclipse.actf.examples.adesigner.nls
      org.eclipse.actf.examples.aibrowser
      org.eclipse.actf.examples.aibrowser.doc
      org.eclipse.actf.examples.aibrowser.doc.nl1
      org.eclipse.actf.examples.aibrowser.launcher
      org.eclipse.actf.examples.aibrowser.nls
      org.eclipse.actf.examples.simplevisualizer
```