

A scenic view of a winding road through a forest. In the foreground, a cyclist wearing an orange shirt and a white helmet is riding a road bike. Further down the road, a red SUV is driving. The road is paved and has yellow double lines in the center. The surrounding area is filled with lush green trees under a clear blue sky.

Architectures for Inclusion: the global public inclusive infrastructure

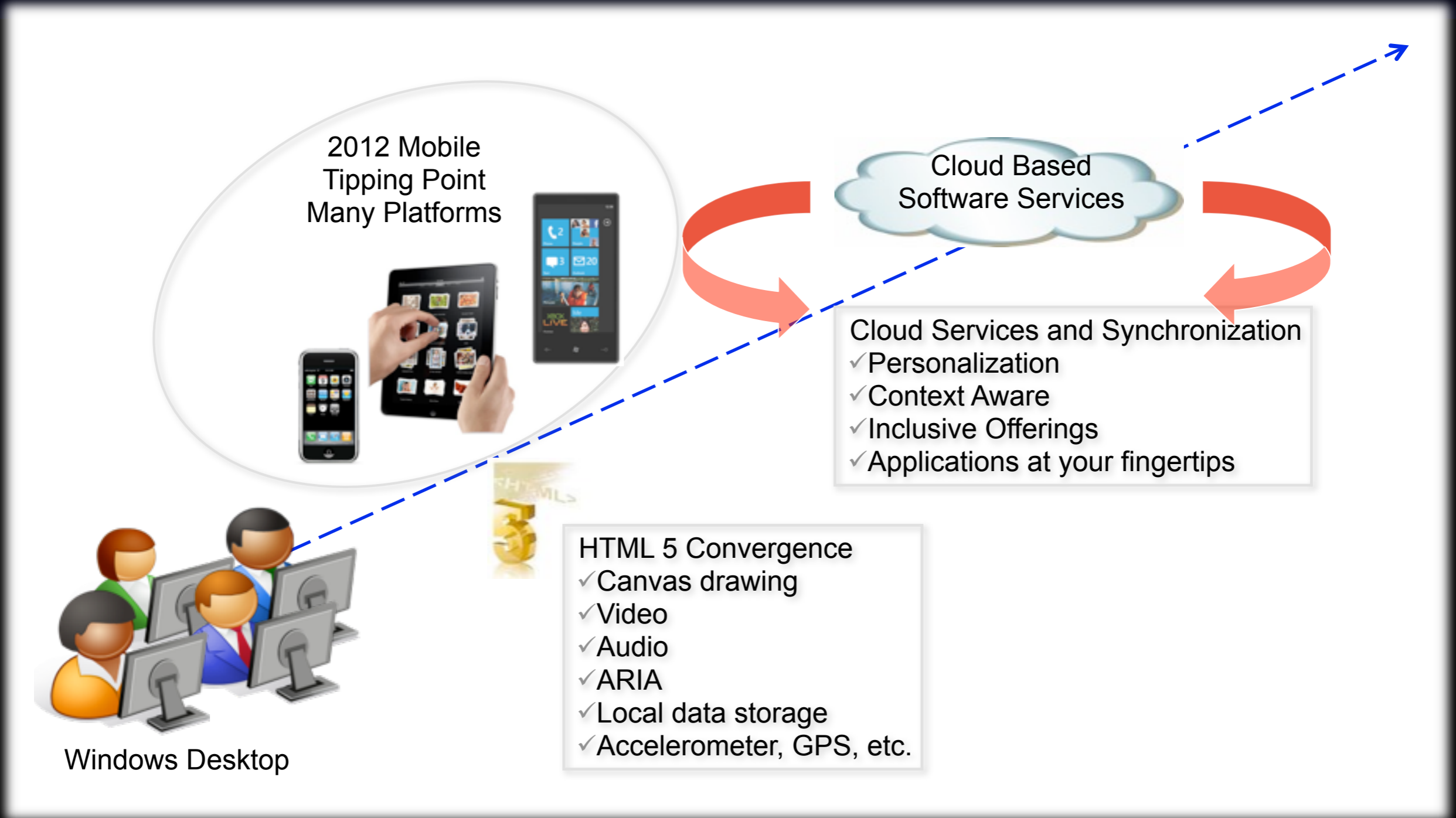
Colin Clark & Rich Schwerdtfeger
Co-chairs, GPII Architecture Team

Topics We'll Cover

- Industry trends
- Goals
- The architecture
- Standards
- Challenges and risks
- Outcomes
- Lots of questions

Industry Trends

Industry Trends – Leading toward need for a GPII



Services and Mashups

The screenshot shows the ProgrammableWeb.com website. At the top, there's a navigation bar with 'Home', 'API News', 'API Directory', 'Mashups', 'Community', and 'How-to'. Below this is a 'Web Services Directory' section with a search and filter interface. The main content is a table of APIs, with the first page showing 30 results for the 'Bookmarks' category. To the right, there are several advertisements, including 'MASHERY', 'HOOPER'S IDEAS & APPS CONTEST', 'e-Similate', and 'brew mp'.

Web Services Directory

Sort by: **Name** | Date | Popularity | Category

Keywords: Category: **Bookmarks** Company: Protocols / Styles:

Data Format: Date: **All** Managed By: **Filter This List**

Viewing 1 to 30 of 30 APIs

| API | Description | Category | Updated |
|-----------------------------|--|-----------|------------|
| BibSonomy | Social bookmarking | Bookmarks | 2007-12-09 |
| Blogmarks | Social bookmarking | Bookmarks | 2005-10-30 |
| Blue Dot | Content sharing community | Bookmarks | 2006-09-18 |
| Cogenz | Social bookmarking service | Bookmarks | 2007-09-20 |
| Connotea | Bookmark and reference sharing for researchers | Bookmarks | 2007-10-20 |
| Copyto | Clever bookmarking service | Bookmarks | 2011-04-11 |
| del.icio.us | Social bookmarking | Bookmarks | 2005-10-30 |
| Diigo | Research bookmarking service | Bookmarks | 2009-04-03 |
| GroupMe | Social bookmarking | Bookmarks | 2007-12-25 |
| hbookmark | Real-time semantic bookmarking via Twitter | Bookmarks | 2010-05-13 |
| Historious | Website bookmarking tool | Bookmarks | 2010-12-20 |
| Instapaper | Bookmark long web pages | Bookmarks | 2010-12-29 |
| Jots | Social bookmarking | Bookmarks | 2005-12-13 |
| linkaGoGo | Social bookmarking service | Bookmarks | 2006-03-09 |

MASHERY The Premier API Management Solution

HOOPER'S IDEAS & APPS CONTEST
Win \$10,000! Enter by August 25th

Payment Processing Simplified
e-Similate [view APIs now](#)

Leah Busque is a DOr
How the other half apps.

twilio She made her errands run themselves...

pingar LEARN MORE

Etsy gains more customers every day. See how.

The problem today: discovery, credibility, quality

Services and Mashups

The screenshot shows the ProgrammableWeb website interface. At the top, there's a navigation bar with links like Home, API News, API Directory, Mashups, Community, and How-to. A search bar is prominently displayed with the text 'Search: accessibility' and a search button. Below the search bar, a message states 'Your search returned no results.' To the right of the search bar, there are several promotional banners for 'Rovi Cloud Services APIs', 'MASHERY', 'HOOPER'S IDEAS & APPS CONTEST', and 'e-Similate'. Below the search results, there is a section titled 'APIs by Category' with a grid of categories and their respective counts. At the bottom, there is a section for 'Top Mashup Tags' listing various tags like mapping, search, photo, social, etc.

programmableweb

Rovi Cloud Services APIs
Powerful web services that let you build clever entertainment apps and sites
explore now
... and try our APIs for free
ROVI

Hot APIs » Twitter YouTube Facebook Google Maps Flickr LinkedIn More » Latest news YouTube Create: Now Any App Can Add Videos

Home API News API Directory Mashups Community How-to Subscribe: RSS Email Twitter Facebook

Search: accessibility

accessibility Search Track this term
Get news and updates for this search term

Your search returned no results.

APIs by Category

| | | | |
|------------------|-----------------------|-------------------------|-----------------|
| Advertising (46) | Feeds (20) | News (49) | Shopping (147) |
| Answers (11) | File Sharing (14) | Office (38) | Social (231) |
| Blog Search (8) | Financial (145) | Other (155) | Sports (36) |
| Blogging (44) | Food (13) | Payment (51) | Storage (40) |
| Bookmarks (30) | Games (47) | Photos (93) | Tagging (12) |
| Calendar (12) | Goal Setting (1) | PIM (23) | Telephony (143) |
| Chat (34) | Government (72) | Project Management (37) | Tools (151) |
| Database (27) | Internet (264) | Real Estate (35) | Travel (81) |
| Dating (2) | Job Search (24) | Recommendations (45) | Utility (71) |
| Dictionary (4) | Mapping (204) | Reference (168) | Video (100) |
| Email (79) | Media Management (12) | Retail (3) | Weather (16) |
| Enterprise (137) | Medical (15) | Search (105) | Widgets (25) |
| Events (33) | Messaging (97) | Security (59) | Wiki (11) |
| Fax (6) | Music (106) | Shipping (11) | |

Top Mashup Tags
mapping search photo social shopping video travel music news mobile messaging deadpool reference sports
microblogging visualization realestate widgets telephony fun uk events games bookmarks auction food blog rss movies
transit

MASHERY
The Premier API Management Solution

HOOPER'S **IDEAS & APPS CONTEST**
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Payment Processing Simplified
e-Similate view APIs now

Alex Bell is a DOer

brew mp.
How the other half apps.

He invented calling grandma on her birthday...
twilio

The problem today: lack of accessibility

A vision for services

- **Lower the cost of building accessibly:** Developers can draw from a diverse range of easy to find adaptive services
- **Foster innovation:** Novel assistive technologies delivered as modular services and components
- **Sustain** a flexible, personalized Web and beyond

Architectural Values

- Transparent to users: **it just works**
- Open
- Resilient to change
- Sustainable



Friday, July 15, 2011

Open

source

community

standards

architecture

... and open to commercialization, too!

Accessible systems are...

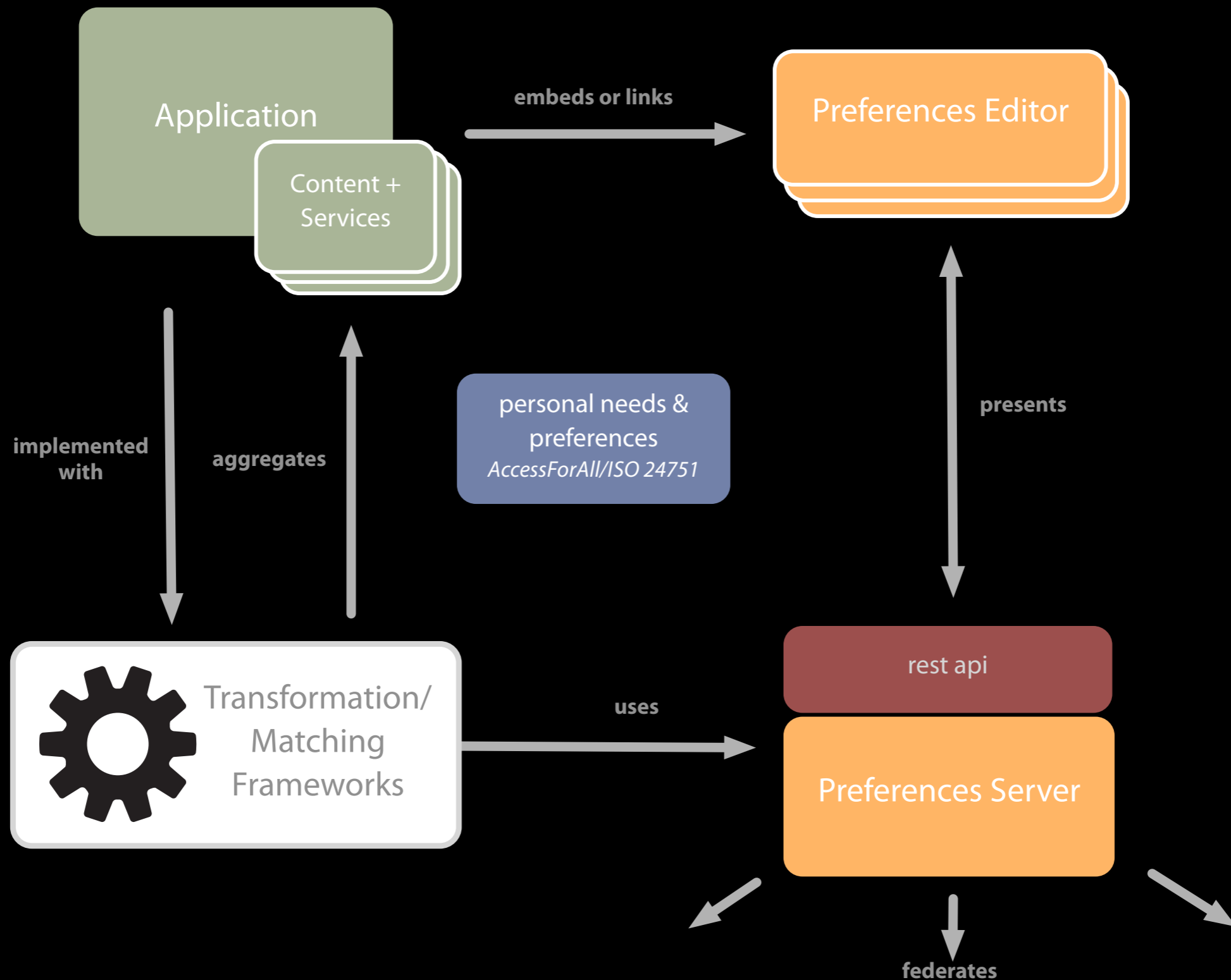
- Flexible
- Separable
- Modifiable
- Declarative



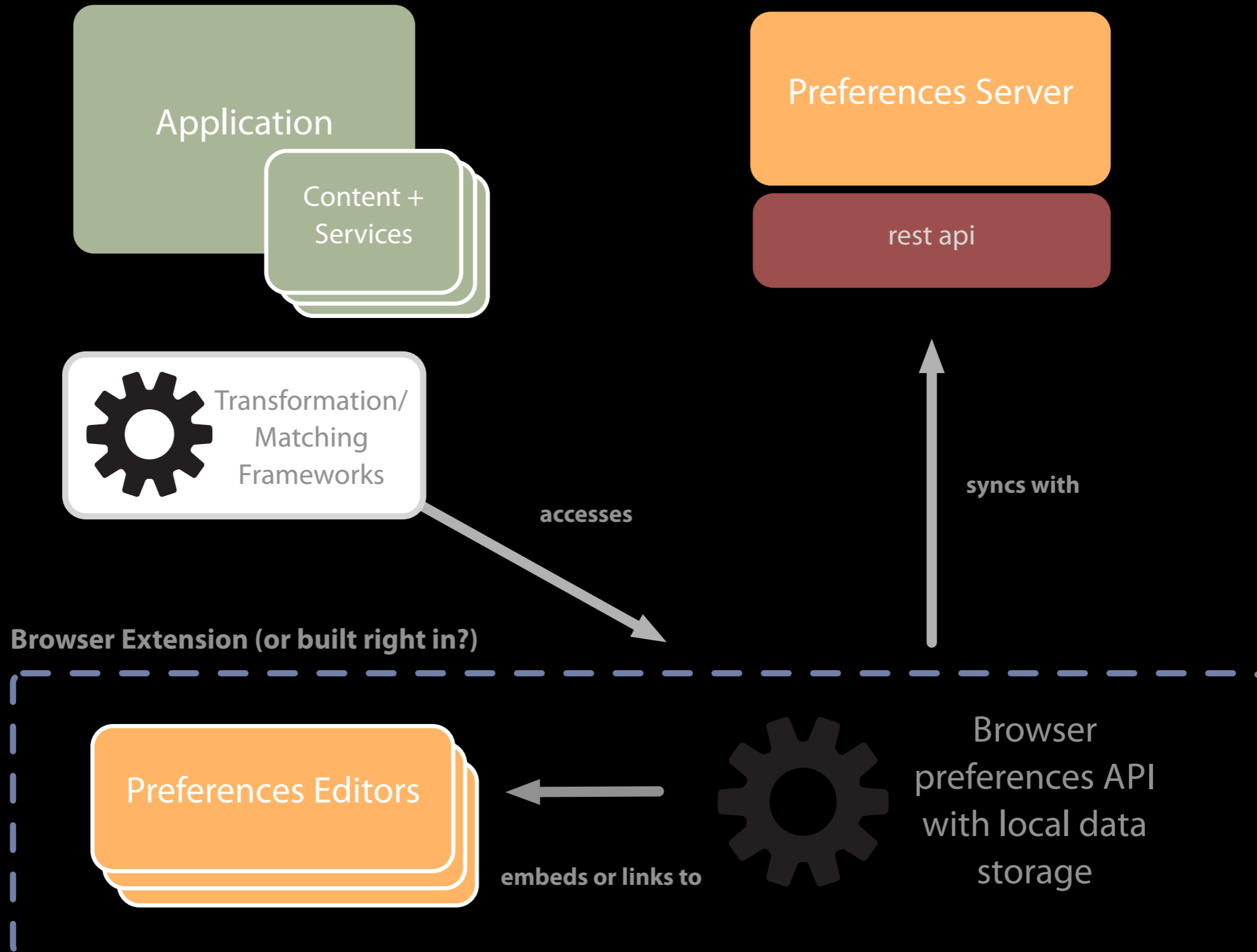
GPII Architecture in a nutshell

- Preferences (editors + server)
- Matching
- Standards & interoperability
- Development tools

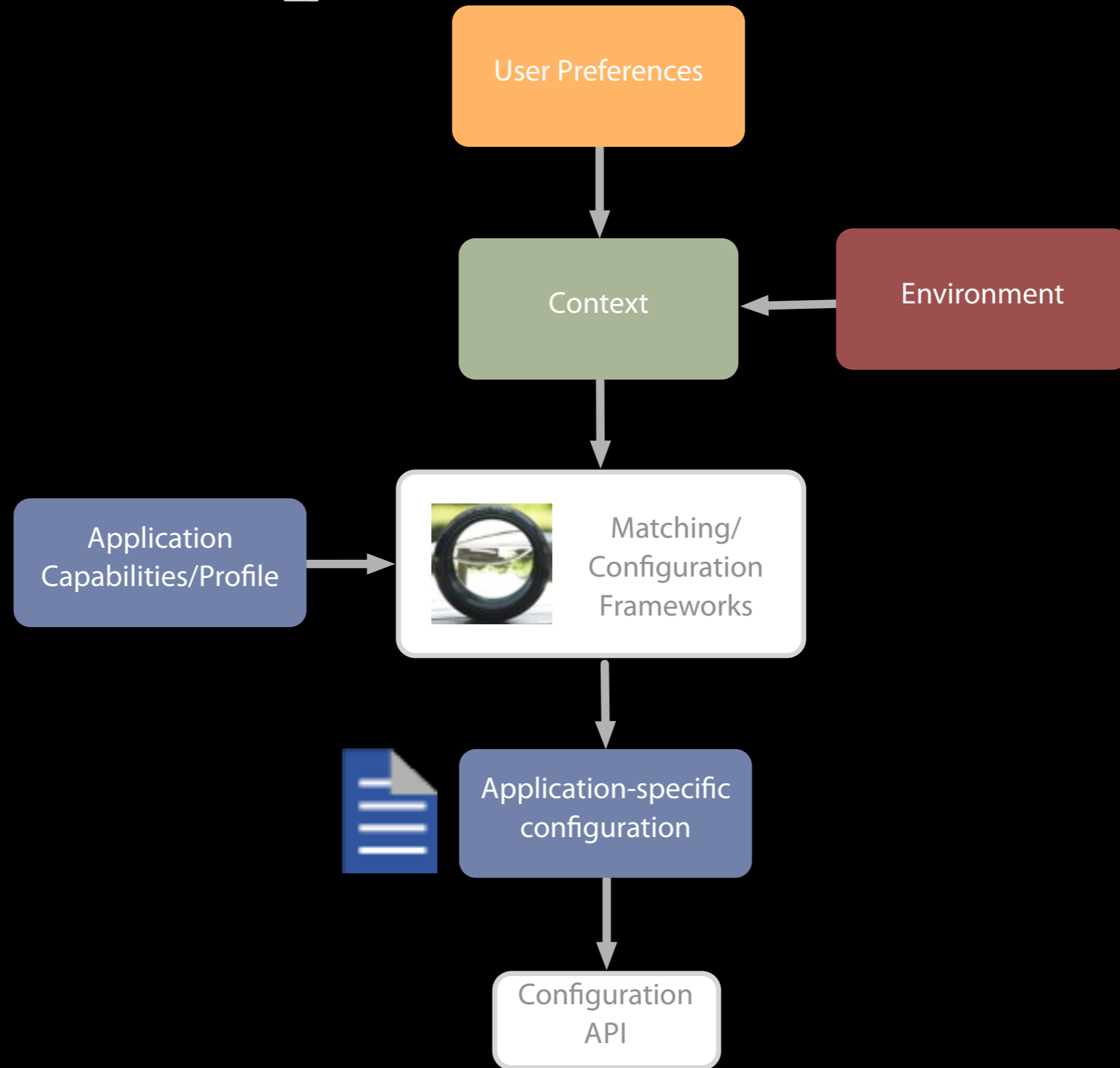
Basic Architecture



In the browser



Desktop Personalization



Preferences

User Experience

- *Easy*: Speaks a language I understand
- *Ubiquitous*: I don't have to constantly reiterate or justify
- *Autonomous*: I can control who sees my preferences

Preferences Editors

Support many preferences editors,
designed for particular **audiences**,
contexts and **needs**

Preferences Editors

Support many preferences editors,
designed for particular **audiences**,
contexts and **needs**:

a **framework** for preferences editing

Case Study: UI Options

A **TEXT AND DISPLAY** LAYOUT AND NAVIGATION LINKS AND BUTTONS RESET ALL

TEXT SIZE **A** **A** times

TEXT STYLE

LINE SPACING times

COLOUR & CONTRAST

Web Pages - HIDE


A web page or webpage is a *resource of information* that is suitable for the World Wide Web and can be accessed through a web browser. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links.

Color, typography, illustration and interaction

[Web pages](#) usually include instructions as to the colors of text and backgrounds and very often also contain links to images and sometimes other media to be included in the final view.


Elements of a webpage

1. Textual
 - [content with a textual representaion](#)
2. Non-textual
 - Static and Animated imagery
 - Audio
 - Video
3. Interactive





Case Study: UI Options

A **TEXT AND DISPLAY** LAYOUT AND NAVIGATION LINKS AND BUTTONS RESET ALL

TEXT SIZE: A  A
1.4 times


TEXT STYLE: Verdana

LINE SPACING:  
1.3 times

COLOUR & CONTRAST: DEFAULT

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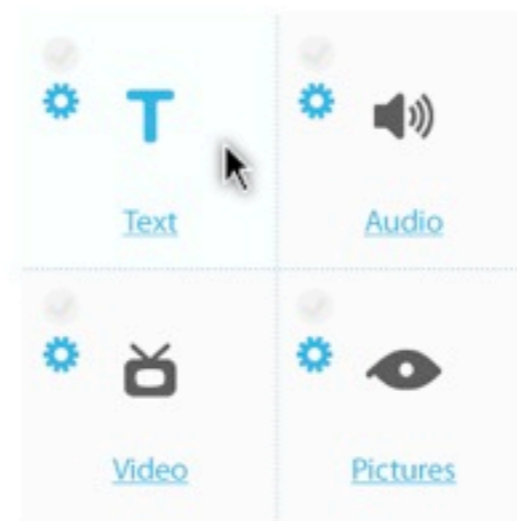
Elements of a webpage

1. Textual

...Learner Options

Set content preferences for Modernist literature

I prefer **Modernist literature** with:



Summary of what's about to happen





We'll be presenting you **Modernist literature** in its original format.

NEXT

...Learner Options

Set content preferences for Modernist literature

I prefer **Modernist literature** with:

| | | | |
|-------------------------|--|---|--|
| Additional text options | <input checked="" type="checkbox"/> Make it easier to read | <input checked="" type="checkbox"/>  Text | <input type="checkbox"/>  Audio |
| | | <input type="checkbox"/>  Video | <input type="checkbox"/>  Pictures |

Summary of what's about to happen












We'll try to present **Modernist literature** to you such that it's largely made up of **text that's easier to read**.

NEXT

...Learner Options

Set content preferences for Modernist literature

I prefer **Modernist literature** with:

| | |
|---|--|
|   T Text |    Audio |
|    Video |    Pictures |

Additional picture options

- [Make it easier to see](#)
- [With detailed descriptions](#)


Summary of what's about to happen

We'll try to present **Modernist literature** to you such that it's largely made up of **text that's easier to read** and **pictures with detailed descriptions**.

NEXT

...desktop configuration

Control Preferences

 Web-4-All Preference Wizard Canada

Control Preferences

I would like an alternative to the standard keyboard

- Enhance the standard keyboard.
- Use an onscreen keyboard.
- Use an alternative keyboard.

I would like an alternative to the standard mouse

- Control the mouse pointer with keyboard.
- Use a mouse alternative.

I would like an alternative to the standard controls

- Use voice recognition.
- Use coded input (i.e. morse, chordic, quartering, or eight cell).
- Use word prediction.

...and a multitude of others

- Directed vs. free form
- Assisted vs. autonomous
- Making it more fun

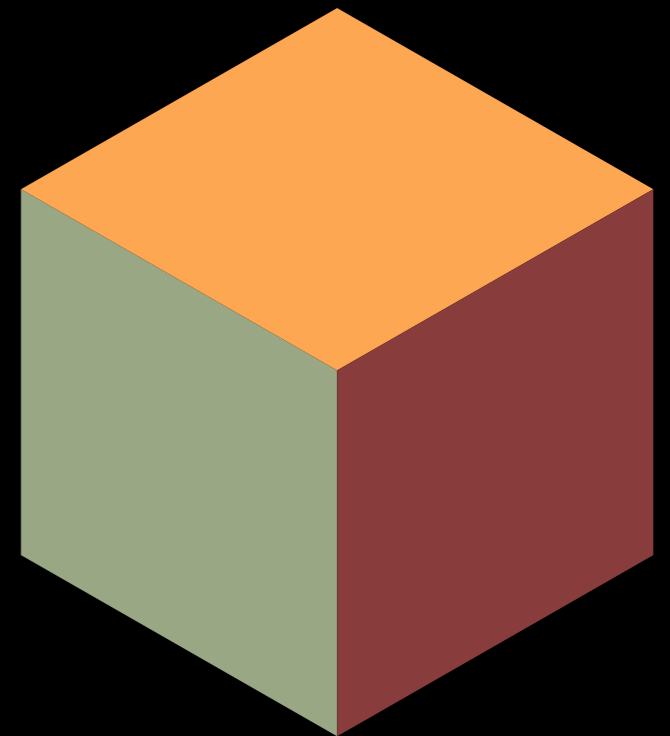
Designed by skilled interaction designers, with users

Preferences Framework

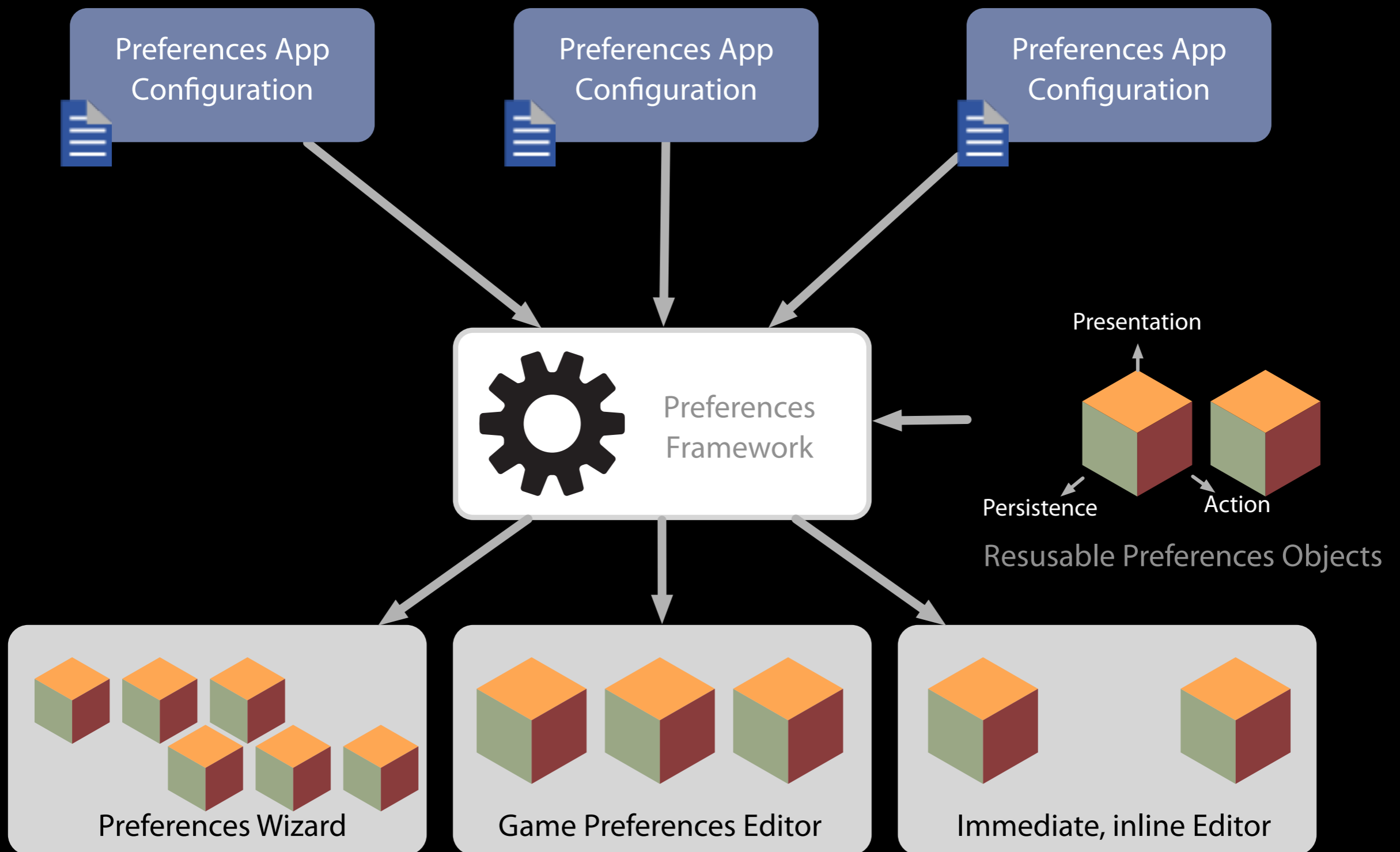
A three-dimensional model for preferences:

- presentation
- persistence
- adaptation

(how the preference is acted upon)



Preferences Framework



Preferences Server

Easy for developers to use

- RESTful API
- JSON-based payloads
- OAuth

Scalable and forward-looking

- Document-based persistence
- Evented, high-concurrency server

Matching & Resolution

User Preferences

+

Device Capabilities

=

Context

+

Environmental Data

Matching & Resolution

Context

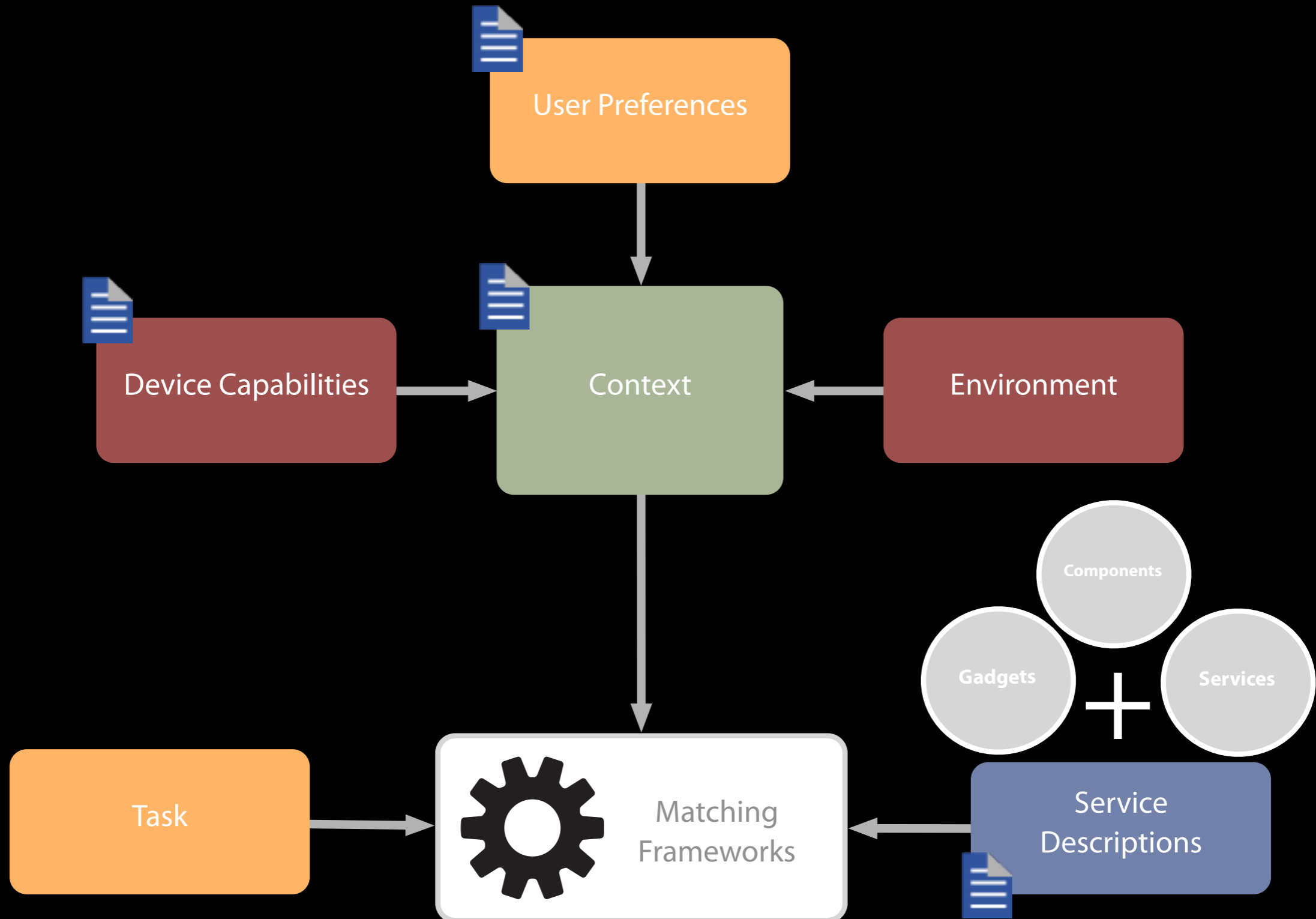
matched with

=

Solution

diverse user
interfaces & services

Matching & Resolution



Matching

Declarative, interoperable formats for representing:

- Preferences
- Device capabilities
- Environment
- Context
- Service & UI capabilities

Standards

Objectives of Standards Strategy

- Facilitate the automatic adaptation of the UI to produce accessible IT in the context in which the user is operating
- Where possible use existing standards and/or support evolving standards that meet GPII needs
- Build standards from open source efforts that meet GPII needs
- Where necessary develop standards in GPII itself

IT Must connect to all Users in the Context in which they Operate

Resources

AFA Resource Capabilities

Alternative Resources

Device Specific Capabilities



Delivery Context

AFA User Preferences

Device Capabilities

Environmental Data



Harmonize and Synchronize Standards for User Personalization



Harmonize and Synchronize

- IMS Global Learning Consortium AfA 3
 - Define Personal Needs and Preferences
 - Define Digital Resource Meta Data in terms of the Preferences
 - Separate Core and Extended vocabulary to facilitate industry uptake
- ISO/IEC JTC1 - SC36 WG 7
 - Take AfA 3 to International Standard
 - Harmonize with ISO 24751 (Individualized adaptability and accessibility in e-learning)
- ETSI ES 202 746 (User Profile Preferences and Information)

Establish *Adaptive Services Standards* Effort in W3C WAI

- Develop Ontology to the define User's context
 - User Preferences (AfA)
 - Device Capabilities
 - Environment

- Define delivery mechanism for delivering user context using one or more of the following
 - HTML 5 Cross-Domain Local Data Storage to allow Context queries
 - New Browser API to provide Context queries
 - Service API for user preferences

- Coordinate efforts between browser vendors and W3C to define standard speech and ID APIs
 - TTS
 - Voice to Text
 - Identity verification

Question: What delivery mechanisms are acceptable based on trust and privacy?

Apply Standards to Open Source Frameworks and Products

➤ Context Aware Standards into Open Social

- Open Social (Schema, metadata, Container, Gadgets API, etc.) to supply resource capabilities and facilitate content adaptation
- Potentially adapt the Container to use GII Services (Mapping, Adaptation, etc.)

➤ Context Aware Standards into Open Education Resources

➤ AfA User Preferences linked to strategic User Identification Services

- OAuth
- OpenID?

➤ Implement provisions for supplying context in browsers to applications

➤ Work with web application (e.g. search engine) providers to develop strategy to apply resource meta data to the broader web

Integrating GII building blocks into the Web Fabric Facilitates Sustainability

Automatic Context Aware Delivery Scenario (Strategic)



*DC – Delivery Context, **DRD - Digital Resource Description, ***PNP – Personal Needs and Preferences

GPII Standards

- Establish a GPII standards effort in Raising the Floor
- Define cloud-based transformation services

Development Tools

- Build personalization supports into everywhere developers work
- Broad reach, diverse tools: web, desktop, mobile
- Adaptive services for easy integration of advanced accessibility solutions

Integration Points

- Service discovery and delivery
 - Open Social
 - Web Intents
 - Fluid Infusion, jQuery, other toolkits
- Authentication
 - OAuth



Challenges and Risks

Culture change!

- Today, software isn't designed to be personalized
- Shifting focus from technology to users
- Ongoing disruption of desktop AT market (by mobile, cloud, web)

Challenges and Risks

New software idioms

- Open data over API encapsulation
- Web mashup security
- Flexible user experience designs
- Loose binding to services

Challenges and Risks

Privacy and Security

- User autonomy over preferences
- Data leakage and tracking
- Trust and credibility

Issues Security and Privacy

- Fetching a Profile without giving up identity
- Reliable verification for someone who cannot recall from one day to the next
 - Without risking identify theft with loss of dongle or exposure through cookies
 - e.g. facial or voice recognition
- Need to know – limiting profiles to necessary data
- Inherent leakage of information by interpreting preferences
- Malware screening of marketplace applications

Challenges and Risks

Sustainability

- Beyond project funding
- Infused into development tools and practices
- Evolving with technological shifts

Outcomes

- Applications can adapt to user needs without onerous development effort
- Users can seamlessly move from one device to another (desktop, mobile, web)
- Innovative new assistive technology and adaptive services
- Built into mainstream tools and apps

Questions?

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