

Towards Multimodal Web Interaction

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W3C

- ◆ Consortium, ~380 members
- ◆ Cooperation between MIT, ERCIM, Keio
- ◆ “W3C team” of ~20 in Europe
- ◆ Founded and directed by Tim Berners-Lee
- ◆ “Standards”: XML, VoiceXML, HTML, SVG, SMIL, ...

MWeb Project

- ◆ FP6 EU project
- ◆ One Goal: Increase European participation in specific W3C activities
 - Device Independence
 - Voice Browsing
 - Multimodal Interaction
- ◆ “Mobile” is “European strength”

The Dream

- ◆ Extend Web to enable multiple modes of Interaction
 - GUI, Speech, Vision, Pen, Gestures, Haptic interfaces, ...
- ◆ Augment human to computer and human to human interaction
 - Multiple devices, multiple people
- ◆ Anywhere, Any device, Any time
 - Service adapts to device, user preferences and environmental conditions

W3C Multimodal Interaction Activity

- ◆ Extend web user interface allowing multimodal interaction
- ◆ Input: Voice, key pad, keyboard, mouse, stylus
- ◆ Output: Spoken prompts, audio, graphics
- ◆ Goal: royalty-free specifications

Target: Mobile Industry

- ◆ Speech for one-hand/hands-free operation
- ◆ Choice of modality depending on situation
- ◆ Producers of smart phones, PDAs
- ◆ Providers of tools+technology to support multimodal services
- ◆ High level of innovation

Target: Automotive Telematics

- ◆ Navigation systems
- ◆ Entertainment services
- ◆ Non-critical car functions (wipers, ...)

Target: Multimodal Interfaces in the Office

- ◆ Wall-mounted interactive displays
- ◆ Desktops
- ◆ Pen+Speech as alternative to mouse and keyboard

Target: Multimodal Interfaces in the Home

- ◆ Remote control of home entertainment systems
- ◆ Producers of embedded systems and consumer electronics

Current Situation

- ◆ W3C WG launched in 2002
- ◆ Contributions: SALT, XHTML+Voice
- ◆ W3C Multimodal Interaction Framework published

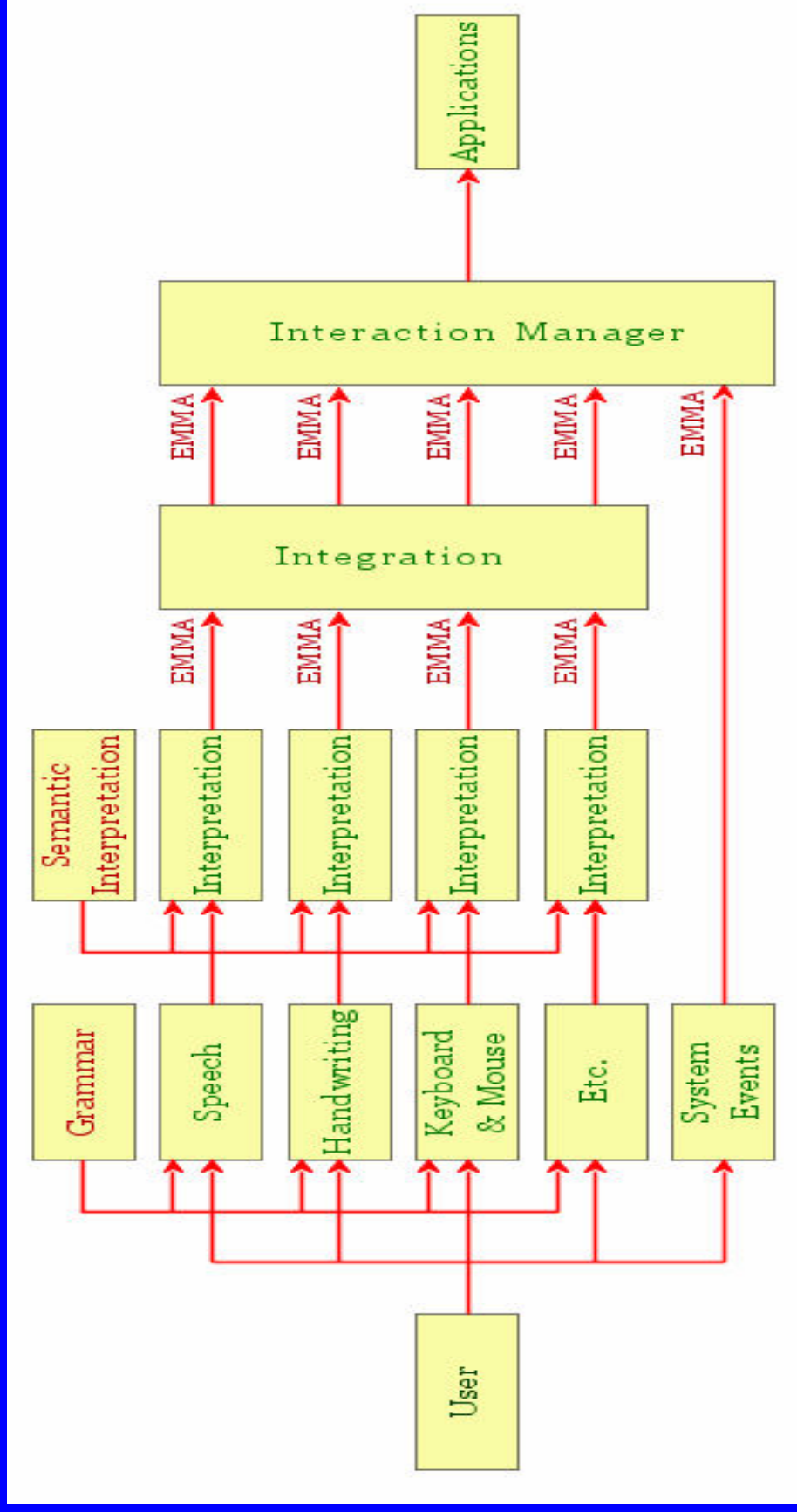
Ongoing work

- ◆ Extensible multimodal annotations (EMMA)
- ◆ InkML
- ◆ Integration of composite multimodal input
- ◆ Dynamic adaptation to delivery context
- ◆ Modality component interfaces
- ◆ Study of interaction management approaches

Participants

- ◆ Access, Alcatel, Apple, Aspect, AT&T, Avaya, BeVocal, Canon, Cisco, Comverse, EDS, Ericsson, France Telecom, Fraunhofer Institute, HP, IBM, INRIA, Intel, IWA/HWG, KAIT, Kirusa, Loquendo, Microsoft, Mitsubishi Electric, NEC, Nokia, Nortel Networks, Nuance Communications, OnMobile Systems, Openstream, Opera Software, Oracle, Panasonic, ScanSoft, Siemens, SnowShore Networks, Sun Microsystems, Telera, Tellme Networks, T-Online International, Toyohashi University of Technology, V-Enable, Vocalocity, VoiceGenie Technologies, Voxeo

W3C Multimodal Interaction Framework



EMMA

- ◆ Exchange format between input processors and interaction management system
- ◆ Recognizer can annotate application specific data with
 - Confidence score
 - Time stamp
 - Input mode
 - Alternative recognition hypotheses
 - Partial recognition results

Modality Interfaces

- ◆ DOM-based communication between user interface components and interaction manager
- ◆ Interfaces for Speech, DTMF, ink, keystrokes, gestures
- ◆ For authentication: Integration of biometric interfaces (voice, fingerprint, handwriting, ...)

Interaction Management Study

- ◆ Dialogue management (State machines
etc.)
- ◆ Standalone/distributed solutions

Integration of Composite Multimodal Input

- ◆ Combination of speech and pen gestures
- ◆ Nearly done

System and Environment

- ◆ Enables application to dynamically adapt to
 - Current device capabilities
 - Current device configuration
 - » Camera snapped on
 - » Bluetooth connection between camera phone and color printer
 - User preferences
 - Environmental conditions
 - » Loss of battery
 - » Loss of network connection

InkML

- ◆ XML format for ink entered with electronic pen
- ◆ Server-side processing of
 - handwriting
 - gestures
 - drawings
 - specific notations (math, music, chemistry, ...)

Conclusion

- ◆ «Mobile Web » drives development
- ◆ Multimodal Web
 - First results available
 - A lot of work remains to be done
- ◆ You have great ideas - bring them to W3C
- ◆ Comments+Suggestions
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