

Workshop: E-commerce for Humans and AI Agents

Bridging Physical, Digital and Spatial Commerce for Humans and AI Agents

Web Standards – Samsung Research and Development Institute UK (SRUK)

Matthew Tylee Atkinson, Ehsan Toreini and Muadh Al Kalbani

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01. Quick introduction



1.1 Who Are We?



**Matthew Tylee
Atkinson**

Head of Web Standards at
SRUK



**Ehsan
Toreini**

Web Standards
Technologist (Privacy)



**Muadh
Al Kalbani**

Web Standards
Technologist
(XR)



02. How can agents interpret immersive or AR-assisted shopping experiences?



2.1 How immersive product experiences reach the Web today

Web Platform

WebXR and related Web APIs provide the underlying capabilities for immersive experiences



Libraries/Components

Developer tools, custom and bespoke solutions to build 3D product and e-commerce experiences



Emerging declarative Web primitive

Proposed <model> element for integrating 3D content directly into HTML



Different ways of delivering immersive e-commerce experiences, **but what can an AI agent actually understand about the resulting experience?**



2.2 Human visible ≠ Agent readable?

Which of these layers does an agent actually need?

Product Semantics

What is this product?

- Name
- Dimensions
- Materials
- Price / availability
- Product identifier

Spatial/3D Representation

How does this product exist spatially?

- 3D model / asset
- Real-world dimensions / scale
- Orientation
- Model alternatives / fallbacks
- Accessibility description and metadata

Interaction States

What is happening in the experience?

- Product currently selected
- Product being placed / moved / rotated
- Current configuration
- Tracking quality
- User active or inactive

Sensor data / environmental context

What does the immersive experience know about the user or their surroundings?

- Camera frames
- Environment information
- Device pose
- Face/body/marker derived information
- Other sensor data



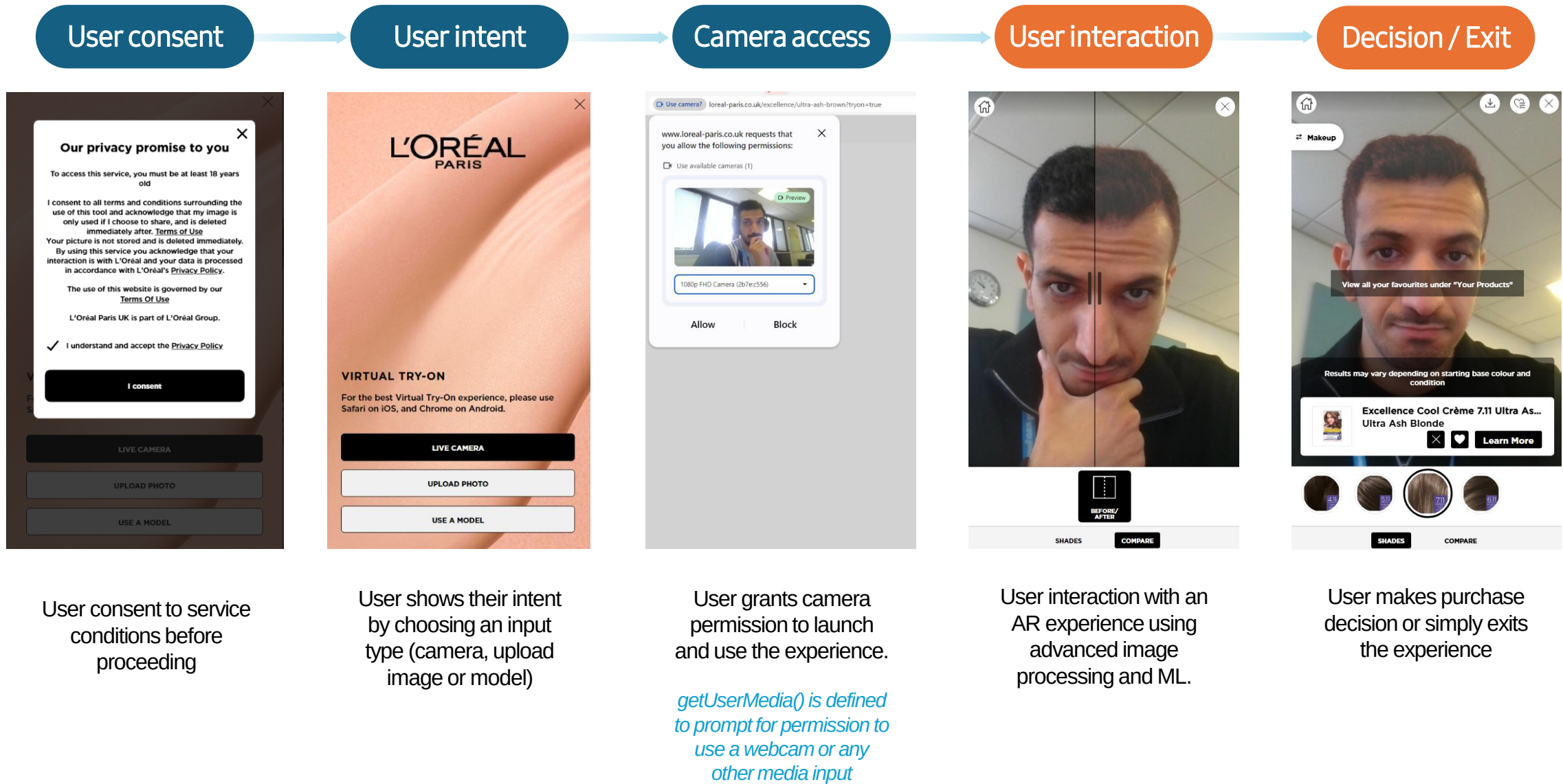
2.3 There are already guardrails – before we add an agent

Existing Guardrails / Considerations	
Product Semantics	Conventional Web content can retain DOM semantics, text alternatives and structured information rather than forcing meaning to be interpreted <i>only</i> visually.
Spatial/3D Representation	Emerging <model> element work explicitly explores user-agent rendering, accessible fallback content and use of privileged spatial/environmental information without exposing it to JavaScript.
Interaction States	WebXR capabilities are exposed through specific APIs/modules rather than giving sites unrestricted access to everything the XR system knows.
Sensor data / environmental context	Ordinary WebXR AR explicitly does not expose passthrough camera images to page content.

These boundaries were designed around site/content access. What changes when an agent becomes another consumer of that information?

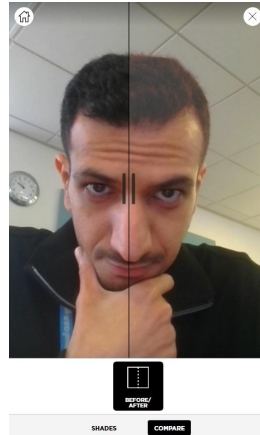


2.4 AR-assisted shopping workflow



2.4 AR-assisted shopping workflow

User interaction



AI can assist

Can be derived from semantic state (e.g. trackingQuality is poor):

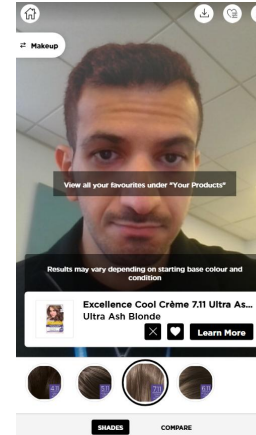
“move closer to the camera to track your hair more accurately”

AI can recommend

Can be derived from semantic state (e.g. current shade applied) or image processing results (current hair colour) or raw camera frames:

“would you like to try another shade that may complement you better?”

Decision / Exit



AI can act

“would you like me to add this shade to the basket?”

Can we expose useful semantic information without exposing unnecessary raw sensor data?

More access than necessary

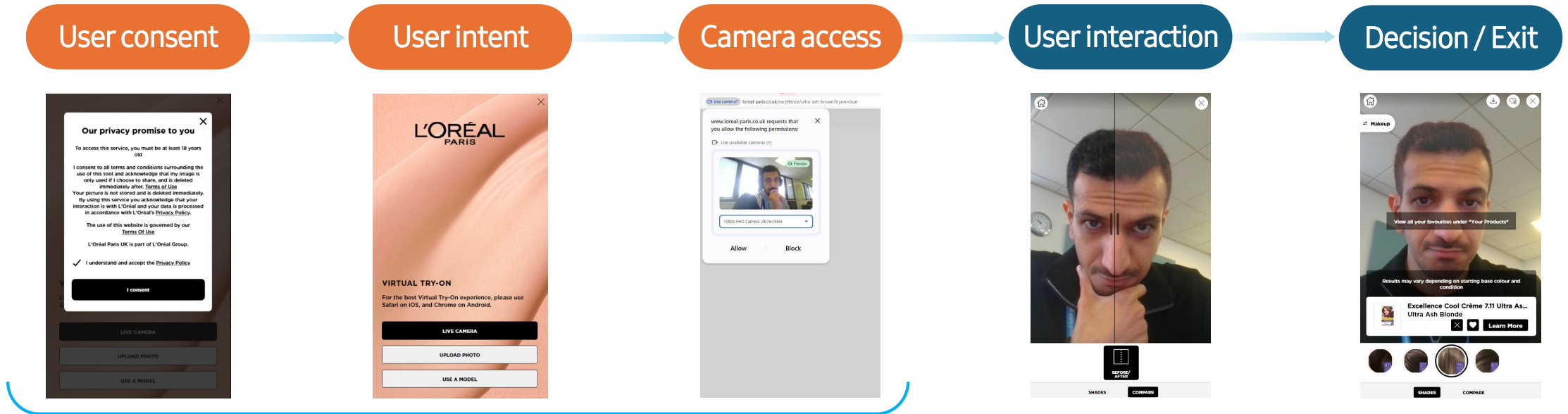
Camera frame → Agent interprets tracking problem

Constrained semantic access

trackingQuality = poor → Agent provides assistance



2.4 AR-assisted shopping workflow



What did the user actually consent to in this scenario?

- ✓ Service terms and data protection policy
- ✓ Use of live webcam footage for the experience
- ✓ Granting the site access to their camera
- ✗ **General purpose AI agent to consume (and act upon) information derived from the immersive experience**

Does agent involvement constitute a new purpose or prompt that needs to be visible to the user? If so, where should that boundary be expressed?
Heavily discussed within W3C (communication between agent and web page).

AI can assist

"move closer to the camera to track your hair more accurately"

AI can act

"would you like me to add this shade to the basket?"

AI can recommend

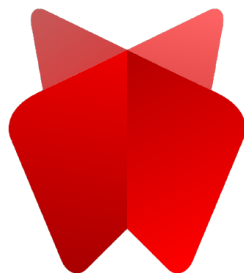
"would you like to try another shade that may complement you better?"



03. Marker tracking as a bridge between physical and digital commerce



3.1 Marker tracking on the web, why now?



marker-tracking

marker-tracking / explainer.md

m-alkalbani Update explainer.md

bc5666d · 3 days ago History

Preview Code Blame 275 lines (144 loc) · 23.3 KB

Raw Copy Download Edit More

WebXR Marker Tracking API - Explainer [DRAFT]

Introduction

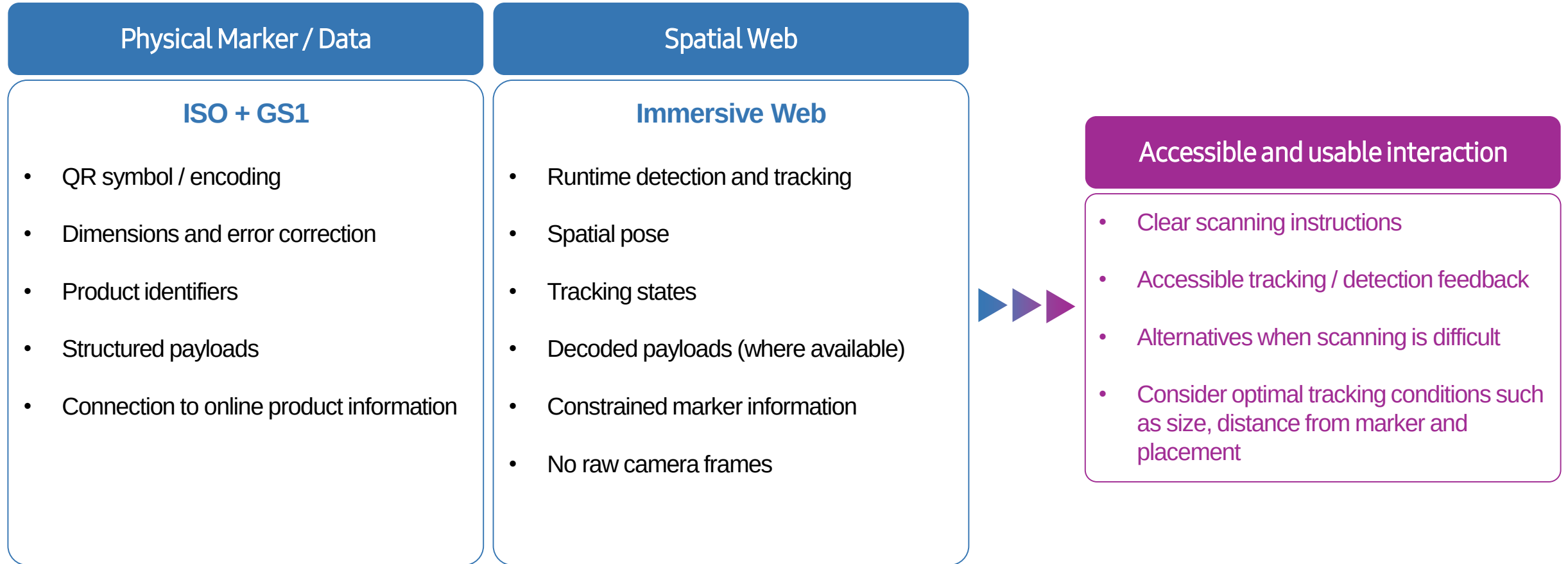
The Marker Tracking proposal aims to extend the [WebXR Device API](#) with a WebXR way to detect, decode and track physical machine-readable markers in the user's environment. The initial version focuses on QR codes, while keeping marker tracking separate from the existing [image tracking proposal](#) for developer supplied image targets.

Marker detection and tracking is expected to be performed by the XR device and user agent in a privacy-perserving manner. This allows WebXR applications to receive useful marker information and spatial tracking results without being given access to raw camera images. Marker detection, pose and decoded data may still reveal sensitive information about the user's environment, so privacy and permission considerations are an important part of the proposal.

- Developing proposal by the Immersive Web WG at W3C
- Encouraged by support for QR code detection and tracking on native platforms during runtime
- Builds on previous image-tracking efforts to support physical marker tracking use cases in WebXR
- Focused on supporting QR code detection and tracking as initial scope



3.2 Standards already underneath marker tracking experiences



Existing standards define markers and their data, WebXR adds spatial capability; **accessible interaction still has to be designed around the user.**



04. Standardising Agents Trust: Personalisation, Cross-Origin, Transparency, Accountability



- The AI agent integration into user agent is happening, (gradually?)
- Some hard problems to solve:
 - Balance between personalisation and privacy invasion
 - Balance between cross-origin information sharing vs tracking or advertising
 - Balance between transparency and uncertainty
 - Balance between accountability and user agent duty

Priority of constituency must be considered in all the steps



4.2 Compatibility with the Web Platform Architecture

- The non-deterministic nature of AI agents can be problematic
- The identity-delegation is tricky with uncertainty
- Is it compliant with the TAG's **“Preventing Abuse of Digital Credentials”**?
- Any spec related to AI Agents, needs to provide evidence for:
 - Is it compliant with core **W3C Principles**?
 - Is it compliant with the **Ethical Web Principles**?
 - Is it compliant with **Web Sustainability Principles**?
 - Is it compliant with **Web Privacy Principles**?
 - Is it compliant with **Web Platform Architecture Principles**?
 - Is it compliant to **Web Machine Learning Ethical Principles**?

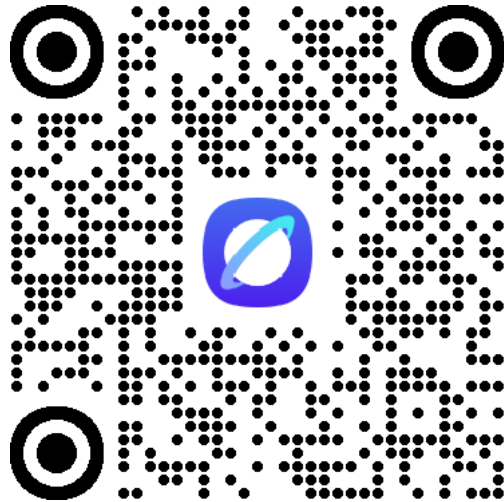


05. Reports on Novel Trends in Web Advertising



5.1 Workshop on “Emerging Trends in Web Advertising” at WWW

- Brought together researchers and industry participants to explore emerging trends and challenges in Web Advertising
- Advertising is moving from page-based journeys towards increasingly agent-mediated journeys
- What happens when agents increasingly mediate discovery, recommendations and commercial decisions?



Thank You!

