MEDIARAZZI

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Beyond Play

The Architecture, Economics and Future of Personal Video Playback

The MOAP Video Player, modular control interfaces, adaptive presentation and the emerging architecture of viewer autonomy.

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Technology Without Apology.
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Publication note

This founder-authored technical position paper combines documented product design, selected research and standards, and proposed future architecture. The author has a commercial interest in Mediarazzi. It is not peer-reviewed research, an independent security or source-code audit, a certification, or an investment prospectus. Illustrative calculations are not measured results. AI assistance was used in drafting and reference research. The author should review the manuscript and satisfy any venue-specific disclosure requirements before publication.

Abstract

The development of digital video has concentrated considerable engineering effort on compression, network delivery, content discovery and the capabilities of display hardware. The software interface through which the viewer experiences the delivered work, by contrast, is frequently treated as a subordinate component of the publishing platform. This paper examines the architectural, economic and experiential implications of treating the video player as a product in its own right, independent in principle of the destination through which a work is distributed.

The Mediarazzi MOAP Video Player (Mother of All Players) provides the initial implementation for this inquiry. Its documented design combines browser-based playback of direct MP4 and adaptive HLS sources, three switchable control decks, dedicated temporal navigation, picture and sound adjustment, configurable player proportions, publisher-controlled advertising and playback reporting. The design brings together established media technologies within an interface that attempts to reconcile visual restraint with functional depth. Its contribution is a design proposition, rather than an assertion that its individual components are unprecedented.

The paper develops three complementary architectural concepts: Modular Control Deck Architecture (MCDA), Adaptive Presentation Architecture (APA) and a Personal Video Environment (PVE). The first provides an approach to expanding functionality within a constrained interface; the second separates the geometry of presentation from the encoding and transport of media; the third proposes an opt-in, portable configuration of audiovisual preferences, interface modules and personal queues across participating sites and devices. These concepts are evaluated against browser security boundaries, accessibility, rights management, device variability and operational costs.

The economic argument concerns the separation of the presentation layer from centralized content destinations. A professional player may create value for publishers through improved viewer experience, controlled monetization and reduced integration work, and for viewers through greater continuity and individual agency. These outcomes are hypotheses requiring empirical evaluation. A program of interoperability, usability, performance and commercial research is proposed.

The central proposition is that video remains the future of digital media, and its future must include the evolution of the environment in which it is experienced.

Keywords: digital video; HTML5; adaptive streaming; modular interfaces; audiovisual processing; personalization; media economics; interoperability; human-computer interaction.

1. Video remains the future

The recurring prediction that one form of media will displace another has frequently obscured a more durable phenomenon: audiovisual storytelling migrates between technologies. Television, recorded media, web streaming, mobile video and connected television have altered the economics and circumstances of viewing without exhausting the demand for moving images. Even synthetic media and new forms of interactive entertainment depend, in many applications, on recognizable audiovisual conventions.

Two contemporary indicators illustrate the scale of the opportunity. The Interactive Advertising Bureau (2026) projected that U.S. digital video advertising expenditure would exceed $80 billion in 2026. Nielsen (2026) reported that streaming accounted for 49.6 percent of U.S. television viewing in August 2026. The former is an advertising forecast; the latter measures viewing through television, not all Internet video consumption. Neither measures the addressable market for video player software. Together they demonstrate that the economic and behavioral importance of digital video extends well beyond a single distribution channel.

Market indicator	Reported figure	Scope
U.S. digital video advertising	More than $80 billion	IAB 2026 forecast
Streaming share of TV viewing	49.6%	Nielsen, August 2026, U.S. television

The implications are not confined to entertainment. Instruction, commerce, journalism, live events, corporate communications and independent publishing all employ video to convey information that cannot always be conveyed with equal economy through text. Their demands differ: a lecture benefits from precise repetition, a film from fidelity and immersion, and a product demonstration from reliable access and navigation.

If these markets continue to adopt video, the quality of the presentation environment becomes a recurring rather than a transient engineering problem. The relevant opportunity is not merely to sell more video advertising or to deliver more bytes. It is to develop interfaces and infrastructure that accommodate an expanding variety of content, devices and viewer intentions. A common foundation may support specialized experiences without obliging each publisher to invent its own playback technology.

The assertion that video remains the future is therefore a proposition about its continuing utility, not a forecast that all other media will become obsolete.

2. The evolution of video playback

Consumer audiovisual equipment historically separated the work from the apparatus used to experience it. A recording could be played on different compatible devices; amplifiers, televisions and receivers provided controls independent of the distributor of the work. The separation was imperfect, constrained by formats, regions, copy protection and commercial ecosystems, but it offered a familiar principle: the user could own or configure the presentation apparatus.

Early web video was often dependent on separately installed media frameworks and plugins. The emergence of standardized HTML media elements provided a common browser-level interface to playback. The HTML Living Standard defines media state, seeking, playback rate, video dimensions and associated events (WHATWG, n.d.). These capabilities establish a platform on which specialized players can be constructed without requiring a proprietary browser plugin. The browser still determines which formats, hardware capabilities and permissions are available.

Streaming introduced another important separation. A publisher need not send a complete downloadable file before the viewer can begin watching. Segmented delivery and alternate renditions can permit a client to select quality according to conditions. HTTP Live Streaming (HLS), described in RFC 8216, is one such protocol. Media Source Extensions provide a separate browser mechanism for feeding supported media segments into playback buffers where applicable (W3C, Media Source Extensions).

The present generation of players already includes considerable innovation: captions, adaptive quality, playback speed, accessibility, specialized interfaces and operating-system integrations. It would be inaccurate to describe the field as technically stagnant. The narrower criticism is that many distribution surfaces prioritize a recognizable basic set of controls, while richer presentation capabilities remain fragmented among products, menus and device-specific applications.

MOAP asks whether the principles of configurable consumer electronics can be recovered within the economics and constraints of the browser. The objective is not to recreate the control panel of a nineteenth-century instrument or a twenty-button remote. It is to make additional functions available in a coherent software-defined environment that preserves the primacy of the audiovisual work.

3. The neglected presentation layer

Digital media businesses combine several distinct activities: the creation and acquisition of content, the organization and distribution of that content, the commercial relationships that support it, and the presentation of the delivered work. These activities can be integrated within a destination such as a streaming service, but their integration is a business and architectural decision rather than a technical necessity.

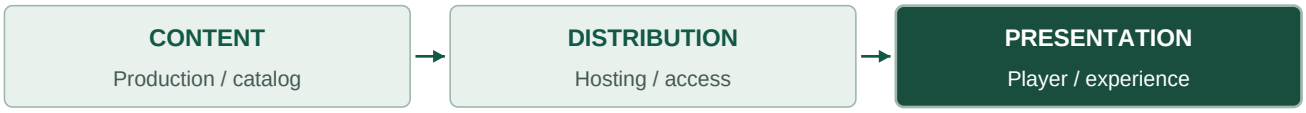

Figure 1. Functional separation of the media value chain. Presentation may be operated independently of the catalog and distribution layer.

The distinction matters because a technically successful delivery is not synonymous with a successful experience. A stream may arrive without interruption yet be difficult to navigate, poorly matched to the display, unpleasant to hear through a particular speaker, or inaccessible to a viewer using a keyboard. Conversely, an elegant player cannot compensate for an unavailable source or insufficient network capacity. The quality of experience emerges from their interaction.

The presentation layer therefore has its own responsibilities: interpreting media state, managing interaction, negotiating available rendering capabilities, preserving intelligible preferences and exposing failures. These responsibilities should be described independently of where the file is stored or who sold an advertisement.

The browser is not a neutral or unlimited appliance. Media decoding is normally delegated to the browser and operating system; display output is constrained by the device; cross-origin access is restricted; and the embedding publisher retains authority over its own document. A player may enhance the experience only within those boundaries.

The MOAP design addresses the presentation layer while retaining integration with Mediarazzi hosting and advertising. The proposed long-term objective is a more portable presentation contract, not the removal of every underlying dependency. This distinction prevents the ambition for viewer autonomy from becoming an unsupported claim of universal playback.

4. Reintroducing the principles of consumer electronics

The interaction model of an online player should be examined from the perspective of the viewer rather than only from that of the software implementer. On a desktop, a seek bar provides a convenient indication of position and a rapid means of moving over a long interval. On a compact touch display, the same control can make it difficult to repeat a short passage without overshooting. Precision and convenience depend on the task and physical conditions of interaction.

MOAP's documented interface restores dedicated rewind and fast-forward commands alongside play and pause. Holding a navigation control permits continued movement. A discreet seek interface remains available rather than occupying the screen continuously. These choices are not claims that seeking or transport buttons are novel; they represent a deliberate reconsideration of their placement and behavior in contemporary browser playback.

In an HTML media element, a relative seek can be modeled as a change from current playback time t to a requested time t + d. For a finite, fully seekable recording of duration T, a simple bound is:

$$t_{new} = \max(0, \min(T, t + d))$$

Actual playback must also respect the seekable time ranges exposed by the browser. A live stream may have a moving window; an unbuffered position may require additional network requests. Repeated button holds should be rate-limited and interrupted when the gesture ends or loses focus. Reverse seeking is not the same as decoding a video in continuous reverse.

This apparently modest feature illustrates a broader design method. Existing capabilities can be reorganized around common tasks rather than technological novelty. A viewer studying a musical performance may want to replay a few seconds. Someone reviewing footage may value a predictable forward jump. A viewer using a remote or assistive input may find distinct commands more convenient than dragging a narrow slider.

A responsible implementation retains a keyboard-accessible position control and announces the resulting time appropriately. The relevant test is whether viewers can complete temporal navigation accurately and efficiently, not whether an interface contains fewer pixels than its competitors.

5. The MOAP Video Player: Technical specifications

MOAP is a browser-based player built around HTML5 media playback. The following describes its published feature contract as of November 2026, drawing on the Mediarazzi product page and installation reference. It does not constitute an independent source-code audit, device certification or guarantee of compatibility with every encoded stream.

Capability	Documented implementation
Media input	Direct MP4 and HLS (.m3u8); browser-compatible encodings
Quality	Adaptive HLS; available manual quality selection
Interface	Three switchable compact control decks; responsive layout
Transport	Play, pause, rewind, fast-forward, discreet seeking
Speed	0.5x to 2x playback
Geometry	Managed 16:9, 1:1 and 9:16 proportions; Fit and Fill
Viewing	Fullscreen and picture-in-picture where available
Picture	Brightness, contrast, saturation, hue and presets
Sound	Volume, three-band equalizer and sound presets, subject to source and browser support
Queue	Publisher-configured JSON playlist; next, previous, start index, optional autoplay and loop
Delivery	Downloadable loader and assets; hosted engine; managed embeds
Advertising	Managed Mediarazzi VAST pre-roll, with supported assignments
Reporting	Recorded loads, starts, watch time, completions; supported exports

The distribution model separates publisher-supplied installation assets and configuration from centrally hosted engine code. A registered installation uses a browser-visible activation key and a release channel. The loader obtains compatible engine resources for the selected release. A centrally managed update can simplify maintenance, but introduces dependency on availability and release discipline.

The public specification does not define supported codec profiles for every operating system, a complete accessibility conformance statement, latency targets, a formal third-party module API or a universal DRM compatibility matrix. Such items require version-specific validation. The terminology in subsequent sections differentiates documented capabilities from architectural proposals for future releases.

6. Minimalism without functional compromise

Minimalism is often interpreted as a process of subtraction. Remove a button, remove an indicator, reduce the number of choices. Applied indiscriminately, the result may be an interface that is visually quiet but functionally impoverished. A more useful definition concerns the amount of information and interaction presented at the moment it is needed, not the total functionality available to the user.

The MOAP interface attempts to preserve this distinction by maintaining a compact visible control surface while making additional functions accessible through switchable decks. The design principle is related to progressive disclosure: common tasks are readily available, while less frequently used functions occupy a secondary interaction layer (Nielsen, 2006). A control can be absent from the default display without being absent from the product.

The objective is to preserve the content as the primary visual element. Unlike a conventional application, where the interface is often the object of the task, a player primarily exists to make another object visible and audible. A persistent overlay consumes part of that object's presentation space. This is particularly consequential on smartphones, compact embeds and vertical media, where relatively small controls can occupy a significant fraction of available pixels.

Functional depth nonetheless creates costs. A feature moved into another deck may require additional actions to reach. A user must learn that further controls exist, understand how to navigate between them and recognize the current state. Minimalism cannot be judged by a screenshot alone. It must account for discoverability, task completion, motor accessibility and the user's ability to recover from errors.

MOAP should be evaluated against a practical rule: the most frequent and urgent actions must remain immediately available, even when other controls are hidden. Essential state such as play/pause, active advertising, mute, captions and errors must remain perceptible where relevant. Visual restraint is justified when it protects attention without concealing operational information.

The principle is that minimalism should describe the interface, not the capabilities of the technology beneath it.

7. Modular Control Deck Architecture

The term Modular Control Deck Architecture (MCDA) is proposed here to describe a design in which related controls occupy interchangeable surfaces within a shared interface region. The existing MOAP interface implements the initial three-deck arrangement; a generalized module system, external extension contract and user-defined deck order are future architectural proposals, not released APIs.

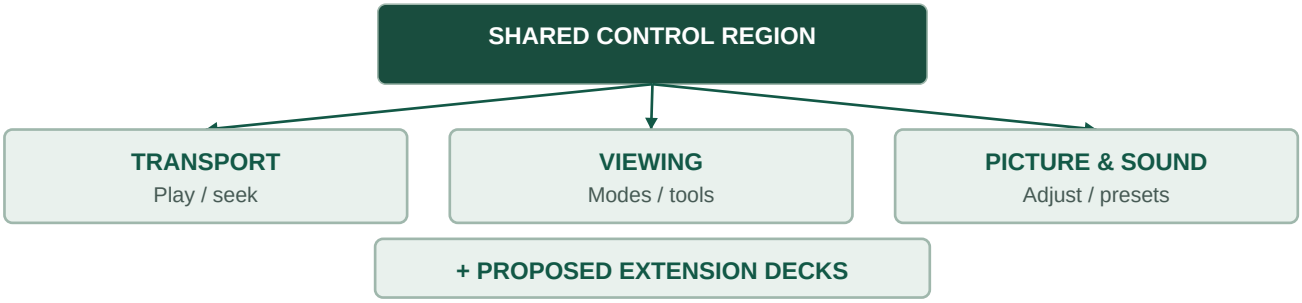

Figure 2. Three existing control groups and a proposed extension surface. The active deck occupies a shared region.

A transport deck groups basic playback and navigation. A viewing deck exposes presentation modes and associated tools. A picture and sound deck provides controls for audiovisual adjustment. The arrangement replaces the requirement to expose every feature in a single horizontal strip with an interaction model that can scale in functional depth.

A mature implementation would separate the lifecycle of a deck from the lifecycle of the media element. A deck would receive a capability snapshot and observable player state, dispatch validated commands through a common control interface, and release its subscriptions when deactivated. Moving to another deck should not recreate the video element, interrupt streaming or reset the active advertisement.

A proposed deck descriptor would define an identifier, schema version, accessible label, required capabilities, declared permissions, supported layout sizes and state persistence rules. Modules should operate within the same validated command boundary rather than receive arbitrary access to account credentials, media authorization or host-page scripts.

The architectural value lies in separating what a player can do from how many controls can be simultaneously displayed. New modules might expose chapter navigation, study tools, advanced audio processing or specialized playback diagnostics without requiring a permanent additional row. Modules that cannot function on a given browser should indicate their limits or be excluded without disrupting essential playback.

This paper proposes the term MCDA as a descriptive working name. It makes no claim to an accredited standard, a patent or priority over earlier modular media interfaces.

8. Progressive disclosure and spatial efficiency

The constraint governing a compact player is not simply the number of functions it supports, but the usable space available for interaction at any instant. If a control region has width W, minimum usable control width a, and inter-control spacing g, a simplified upper bound on equally sized controls in one row is:

$$N_{max} = \text{floor}((W + g) / (a + g))$$

For illustration, a 320 CSS-pixel region using 44-pixel controls and 8-pixel spacing admits six controls. A seventh requires a reduction in width or spacing, wrapping, another surface or a different interaction. These dimensions are illustrative design inputs, not a statement of MOAP's measured geometry or the minimum required by accessibility standards.

A modular interface with D decks can offer more actions while retaining the same visible region, but the total capacity is not simply free. Deck switching consumes interaction effort and hidden controls may be overlooked. Frequently used commands should minimize the expected number of actions required for access. A transport control may warrant permanent or repeated availability; a rarely altered color setting may not.

Design measure	Proposed evaluation
Visible footprint	Control area divided by available player area
Navigation cost	Actions required to reach a requested feature
Discoverability	Unassisted first-use success rate
Interaction quality	Task time, errors and accidental activation
Accessibility	Keyboard, touch and assistive-technology completion

The proposed design should expose a visible indicator of the active deck and provide both gesture-based and discrete navigation. A swipe alone is not an adequate access mechanism for every viewer. The interface should support a predictable focus order, reduced motion preferences and clear labels for controls. WCAG 2.2 provides relevant criteria for target size, keyboard access and focus visibility (W3C, 2023).

The success of a deck architecture would be demonstrated by a smaller persistent footprint without an unacceptable increase in interaction cost. Functional density is a measure to optimize, not a design virtue in isolation.

9. Audio processing and personal sound environments

Video is an audiovisual medium, yet online players frequently offer little control of the sound beyond volume and mute. Listening conditions vary considerably: headphones, laptop speakers, television receivers and mobile devices have different acoustic behavior. A user may prefer clearer speech, reduced bass or a particular tonal balance without requiring the publisher to create another recording.

MOAP documents a three-band equalizer and the Original, Voice, Cinema and Night sound presets. Their availability depends on browser and media-source support. The public product contract describes the controls, not an independently measured frequency response or a verified filter topology.

The Web Audio API supplies a reference architecture for implementing browser-side signal processing. A media element can be connected to an audio processing graph containing filters and gain stages, subject to the security and lifecycle rules of the browser (W3C, 2021). In a proposed implementation, a low-shelf, a peaking and a high-shelf filter can provide distinct adjustable regions. The original signal can be restored by neutral settings or an appropriate bypass path.

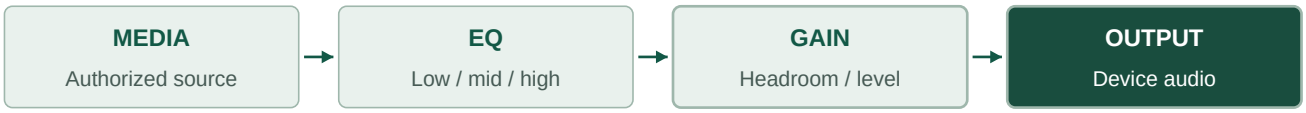

Figure 3. Illustrative Web Audio processing graph; not an audited representation of the current engine.

Combining gains can create peaks that exceed available output headroom. A production design should constrain gains, avoid discontinuities during changes and evaluate clipping, latency and synchronization. A preset named Night need not imply dynamic range compression unless such processing has actually been implemented and validated. It is important to distinguish tonal shaping from loudness normalization, compression and spatial audio.

Security is an equally important constraint. Media originating from another server may be playable in a video element while access to its audio samples is restricted. Web Audio specifies silence for certain cross-origin media-element sources lacking the required authorization. Autoplay policies may also require a user gesture before an audio context can operate. Unsupported processing should degrade to ordinary playback rather than silence an otherwise playable video.

Future portable sound profiles should preserve preference values, not promise identical acoustics on different hardware. Device-specific calibration may need to remain local. The viewer should be able to restore an unmodified presentation at any time.

10. Picture processing and personal presentation

The display of a digital video is influenced not only by its encoded pixels, but by the viewing environment: ambient light, screen characteristics, scaling behavior and user preferences. Traditional display equipment has long offered controls that allow its owner to adjust the presentation of an incoming signal. Browser-based media can make related controls available at the application level.

MOAP documents adjustments for brightness, contrast, saturation and hue, together with Standard, Cinema, Video Game and Vivid picture presets. These controls affect the presentation of the content, not the original stored media. The public product documentation does not specify numerical transfer functions or certify color accuracy.

A browser implementation may use rendering filters or other supported image-processing paths. A conceptual color transform consists of a sequence of operations applied to the rendered picture, with identity settings preserving the input representation. The order matters: changing contrast before brightness can produce different results from reversing the operations. A hue rotation is not equivalent to a professional color-grading system, and browser filters cannot guarantee consistent reproduction across uncalibrated displays.

The technical benefit of client-side adjustments is that a viewer need not request another encoded asset for every preferred appearance. This does not imply zero computational cost. Processing may increase rendering workload, power consumption or dropped frames, particularly on constrained devices. A player should support a neutral mode, avoid expensive effects where necessary and test whether selected adjustments persist when quality or source changes.

Picture adjustments also have limits of interpretation. The creator's intended appearance remains the default reference; customization is a viewer-side choice. High dynamic range, color spaces, tone mapping and hardware display behavior cannot be accurately described as solved by an ordinary brightness control. Future research should examine color-management behavior, reduced-power modes and accessibility-oriented adjustments with clear distinctions between artistic presets and calibrated rendering.

A personal picture profile can become part of a portable viewing environment without rewriting the work itself. The aim is accommodation of viewing circumstances, not appropriation of editorial authority.

11. Adaptive streaming and device capabilities

Adaptive bitrate streaming addresses variability in network throughput, buffering and decoding conditions. HLS organizes media into playlists and may describe multiple variants of a stream (Pantos and May, 2017). A client can choose among compatible renditions to trade picture quality against the likelihood of uninterrupted playback. The player cannot create higher-resolution source detail that was never encoded.

MOAP documents adaptive HLS quality and manual selection when supported by the media and client. The exact selection algorithm, bandwidth estimator and buffering thresholds have not been independently established for this paper. Native HLS support and implementations using a browser media buffer may behave differently across operating systems and devices.

For a simplified adaptive decision, let B be an estimate of sustainable throughput, b_i the nominal bitrate of rendition i and k a safety factor between zero and one. A candidate rule would choose a compatible rendition satisfying:

$$b_i <= k B$$

A real implementation must also account for buffer occupancy, recent throughput variation, codec support, resolution, frame rate, startup cost and the risk of excessive switching. A high bitrate does not necessarily improve perceived quality on a small screen. The highest available rendition is not always the most appropriate.

The W3C Media Capabilities specification describes a mechanism for querying whether a media configuration is supported and expected to decode smoothly or efficiently. Such information can supplement, but not replace, observations of actual playback. The specification is under development and browser support must be assessed before relying on it.

Research by Krishnan and Sitaraman (2012) links streaming performance with viewing behavior using large-scale observational and quasi-experimental analysis. Its numerical findings should not be assumed to apply directly to MOAP or to every contemporary network. The implication for this architecture is that player innovation must protect basic reliability before adding expensive effects or interface modules.

The future player should optimize the complete experience under real device conditions: not merely maximize resolution, but minimize avoidable interruptions, preserve responsiveness and make quality decisions intelligible to the viewer.

12. Adaptive Presentation Architecture

Adaptive bitrate streaming determines which representation of a video is delivered. Adaptive Presentation Architecture (APA), as proposed in this paper, determines how that video and its associated controls should occupy the available display. The distinction is fundamental: changing the shape of a player does not change the encoding of the source.

MOAP currently documents configurable managed proportions of 16:9, 1:1 and 9:16, together with Fit and Fill. The proposed extension is automatic, source-aware geometry across mixed media, constrained by the publisher's layout and the viewer's preferences. Native video metadata and dimension-change events provide inputs to such a system (WHATWG, n.d.). CSS aspect-ratio and object-fit mechanisms provide relevant layout and scaling primitives (W3C, CSS Sizing and CSS Images).

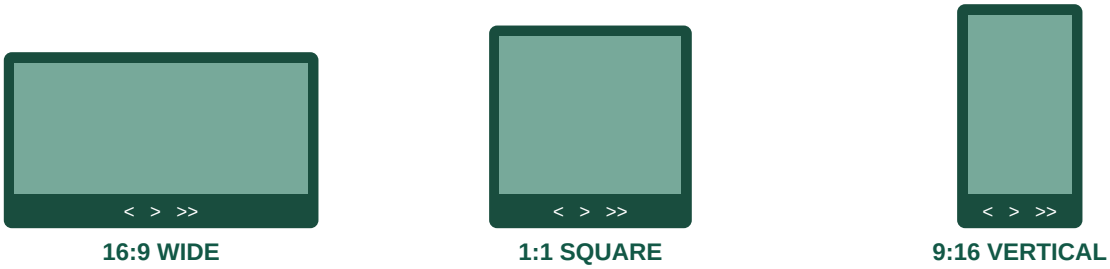

Figure 4. Proposed source-aware presentation using a common control architecture.

Given a source of width w and height h, define its intrinsic ratio r = w / h. For a content region with available width W and height H, a distortion-free adaptive frame can be calculated as:

$$W_{frame} = \min(W, H\,r); \quad H_{frame} = W_{frame} / r$$

The available height must exclude any reserved controls and safe areas. If the publisher fixes the frame geometry, Fit uses the smaller of the width and height scale factors, while Fill uses the larger and may crop the image. Neither should stretch the content without explicit intent.

An adaptive implementation should respond to loaded metadata, source transitions and container changes; handle unknown dimensions using a stable provisional layout; and avoid repeated resize loops. The player should preserve focus and control state during reflow. A manual aspect override should remain possible for intentional creative presentation or predictable page layout.

APA is not a new codec, and it does not infer the meaningful subject of a frame. Automatic crop selection, scene-aware composition and rotation correction are separate research problems. The immediate opportunity is a reliable geometry policy that accommodates films, square clips and vertical recordings without imposing a single frame on every work.

13. FocusLock and immersive browser-based viewing

Fullscreen is a familiar presentation mode, but it is not the only desirable form of immersion. A viewer may wish to retain browser navigation, access adjacent information or remain within a managed web application while expanding a video and minimizing surrounding distractions. FocusLock is proposed as a distinct widescreen-oriented presentation mode for this purpose.

In a cooperating host page, FocusLock could place a player within a viewport-constrained region, preserve its current media state and reduce the prominence of surrounding layout. The viewer would be able to leave the mode without restarting the video. A fixed or top-layer presentation can provide a cinematic environment while the operating system and browser retain their normal authority.

The mode should be implemented as a reversible state transition. Before activation, it would capture the layout context, relevant scroll position and focused element. It would then apply a host-approved presentation policy, respect safe-area insets, constrain the video to the available viewport and maintain access to essential playback and accessibility controls. Upon exit, the previous layout and focus would be restored.

Mode	Scope and limitation
Fit / Fill	Scaling within the existing player frame
FocusLock (proposed)	Expanded, distraction-reduced browser layout; host cooperation
Fullscreen	Browser-managed display mode; permissions and support apply
Picture-in-picture	Browser/OS-managed secondary window; limited custom controls

A cross-origin embedded player cannot arbitrarily modify the parent document. The browser's same-origin policy exists to prevent such interference. An embedded FocusLock mode would require an explicit host integration, for example a documented and origin-validated message exchange. It must not obscure required notices, prevent exit or bypass publisher access restrictions.

Picture-in-picture presents a different constraint: its ordinary browser-managed window may not display the application's complete custom controls or effects. The respective modes should therefore remain distinct, and unavailable modes should fail gracefully. FocusLock is a design proposal in this paper, not an assertion of an already validated production feature.

14. The Personal Video Environment

The most consequential extension of the MOAP concept is not another control. It is a reconsideration of the relationship between the viewer and the playback environment. At present, a viewer navigating between independently operated websites frequently encounters different interfaces, different defaults and different interpretations of the same media controls. A personalized environment could preserve a familiar way of experiencing video across participating destinations.

The proposed Personal Video Environment (PVE) comprises a portable set of presentation preferences, permitted control modules, interface appearance and optional personal queues. It is not necessarily a single executable that moves between websites. Rather, it is a configuration and interaction contract that compatible installations can interpret, subject to their local capabilities and the publisher's declared restrictions.

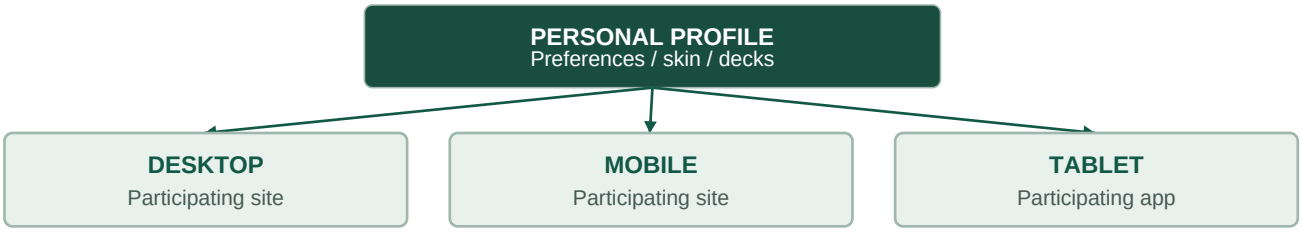

Figure 5. Proposed opt-in preference exchange across compatible installations; not shared viewing history.

A viewer might prefer a particular equalizer profile, a neutral picture setting, a familiar arrangement of decks and an accessible interface theme. On another device, the player could restore these choices when appropriate, without requiring identical screen dimensions or hardware. A device-specific override would take precedence where a saved choice is not suitable.

This architecture should explicitly separate viewer preferences from publisher policy. The viewer may control presentation, but does not thereby acquire the right to remove contractual advertisements, circumvent access restrictions, download protected content or modify the source. A participating publisher remains responsible for access, distribution and lawful monetization.

The proposed configuration should be usable locally without mandatory identity registration. Optional synchronization could offer continuity to viewers who want it. A common profile format would also make export and migration possible. Such portability is meaningful only if its scope and limitations are intelligible, and if opting out does not degrade ordinary playback.

The PVE is a research and product direction, not a currently released cross-site synchronization system. Its potential lies in making the presentation environment an identifiable product independent of a single content catalog.

15. Persistent profiles and cross-device synchronization

A portable viewing environment requires a durable representation of preference state. In a proposed design, this state should be structured, versioned and narrowly scoped. Values that describe presentation should be distinguished from sensitive data that identifies a person or reveals the media they have watched. Synchronizing both indiscriminately would turn a convenience mechanism into a surveillance mechanism.

Proposed profile field	Meaning and handling
schemaVersion	Compatibility and migration identifier
picture, audio	Bounded control values and selected presets
deckOrder, theme	Supported module identifiers and appearance
defaultFit, speed	Preferred presentation defaults
deviceOverrides	Local screen or acoustic exceptions
syncRevision	Concurrency and change reconciliation metadata

The initial implementation could store settings in an origin-local preference store and allow import and export of a validated profile. Optional cross-device synchronization would require explicit authentication and a server-side or otherwise authorized transfer mechanism. Modern browser storage is origin-scoped and may be partitioned across embedded contexts; the Storage Access API is subject to browser policy and permissions (MDN, n.d.). Ordinary third-party storage cannot be assumed to provide universal continuity.

A privacy-conscious synchronization service should use explicit viewer consent, narrow authorization scopes and short-lived credentials. A participating player would request only the preference fields required for presentation. Media identifiers, playback history and private queues should not be shared with unrelated publishers merely to restore a theme or equalizer. Embedded message exchanges must validate both origin and message schema.

Concurrent updates require conflict handling. A revision-based merge can distinguish fields changed independently, with an explicit rule for conflicting updates and a local override where necessary. Old clients must ignore unknown optional fields and migrate known ones without silently losing preferences. Users should be able to inspect, export, reset and delete synchronized state.

The proposed service should preserve ordinary playback when disconnected. Synchronization is an optional enhancement to presentation, not a prerequisite for watching an authorized video.

16. Skinnable interfaces and extensible decks

A modular player architecture can enable specialized user experiences without requiring every publisher or device manufacturer to maintain a fork of the playback engine. Skins could alter visual appearance while decks extend the available interactions. The distinction between those mechanisms is important: changing typography, color or spacing should not confer the ability to execute arbitrary privileged code.

The proposed first stage is a declarative skin contract containing bounded design tokens for color, typography, surface opacity, control geometry and icon variants. A skin must retain contrast, focus indication, touch target usability and state communication. Essential labels, error indications and advertising disclosures cannot disappear because a theme omits them.

A second stage would define a deck extension interface. Rather than granting modules unrestricted access to the host document, the engine could expose an explicit command and event boundary. A module would declare the capabilities it requires and receive only the authorized state necessary for its purpose. A diagnostic deck might receive buffering and rendition information; a theme module should not need access to media URLs or user identity.

Candidate deck	Potential capabilities
Education	Chapter navigation, bookmarks, repeat interval
Accessibility	Caption preferences and accessible presentation
Sports / analysis	Replay intervals and supported frame navigation
Cinema	Presentation presets and expanded viewing options
Developer	Quality, startup and buffering diagnostics

Extension design must account for compatibility, resource consumption and security. A signed or reviewed extension catalog, schema validation, version constraints, explicit permissions and safe fallback modes are possible safeguards. A failing optional deck must not interrupt the core playback engine. Browser sandboxing can help isolate third-party code, but is not a substitute for careful review and a limited API.

A future ecosystem may support third-party developers, user-selected modules and commercially licensed specialized interfaces. The immediate task is to specify a stable contract and validate it with first-party extensions. An extensibility mechanism becomes valuable through compatibility and governance, not merely through the number of available plug-ins.

17. Client-side playlists and personal video libraries

MOAP already documents publisher-supplied JSON playlists and a JavaScript queue interface. A publisher may define multiple compatible media sources, optionally identify content for reporting or advertising, and configure the starting item, next-item behavior and looping. This existing feature should be distinguished from the proposed viewer-owned personal playlist.

The current documented queue functions include getQueue(), currentIndex(), playIndex(index), next() and previous(). The installation reference notes that selecting an item with playIndex presents its start screen rather than necessarily initiating playback. Automatic next-item playback is additionally subject to browser autoplay policy. These distinctions matter for accurate integration.

A future personal library could store references to authorized media from multiple cooperating sources. References would include stable identifiers, display metadata and an authorized mechanism for resolving the current playback source. A durable playlist should not depend on indefinitely storing expiring signed media URLs. If a publisher revokes access or a subscription expires, the corresponding item must no longer be playable merely because it remains in a local queue.

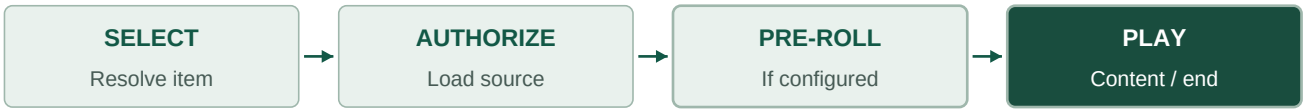

Figure 6. Proposed queue lifecycle; source and ad state are scoped to each playback session.

A client-side queue controller must distinguish selection, authorization, source loading, advertisement execution, content playback and completion. On transition to another item, prior event listeners, timers and advertising state must be released or reset; source-specific callbacks should be scoped to the current playback session. Otherwise a late event from one item may affect the controls or reporting of the next. This is a recommended lifecycle invariant, not a claim that a particular implementation has passed every transition test.

Personal playlists could eventually include bookmarks, resume positions, shuffle and repeat. Their synchronization should be independently optional because viewing history can reveal sensitive interests. Local-only use should remain available. Imported references must be validated, and content must be obtained only through supported, authorized pathways.

The proposal is a media organizer and presentation environment, not a mechanism for extracting videos from arbitrary websites or overriding their access controls.

18. Video advertising and publisher autonomy

A player is an economically consequential interface because it coordinates the content and any commercial messages that accompany it. Video Ad Serving Template (VAST), maintained by IAB Tech Lab, defines an XML-based response describing advertising media, tracking and associated playback behavior. It is a delivery specification, not a marketplace or guarantee of advertiser demand.

MOAP's current managed advertising workflow is connected to the Mediarazzi VAST Ad Manager. Publishers can assign supported pre-roll advertising sources, including an individual creative, weighted rotation or pod, through their registered installation or hosted-video configuration. Local playlist metadata can identify items for supported targeting; arbitrary external VAST URLs are not the documented local configuration path. Mid-roll scheduling should not be inferred from the ability of other VAST-compatible systems to perform it.

Ad playback requires a separate state machine from content playback. A qualifying ad request may return a valid creative, no eligible creative or an error. The player must interpret applicable skip offsets, transitions, click-through destinations and event semantics; avoid duplicate reporting; and return to the intended content state under the configured failure policy. Each new ad or queue item requires independent state initialization. An advertisement must not inherit a previous creative's skip timer or click handlers.

A portable viewer profile must respect the distinction between presentation preferences and commercial policy. Custom decks must not disable contractual advertising, falsify impressions or enable unauthorized navigation through an unskippable break. Equally, monetization should not justify misleading controls, inaccessible exit mechanisms or opaque reporting.

The value to publishers lies in the ability to coordinate their own advertising and viewing environment. The commercial outcome depends on actual demand, audience response, creative quality and costs. MOAP's integrated model does not promise revenue uplift. Future research should compare retention, successful playback and realized net revenue under alternative advertising and presentation configurations.

19. The economics of the presentation layer

The economics of a player should be evaluated in terms of its contribution to the complete media business. Improved interface design may increase retention or make certain tasks easier. Reliable playback may reduce lost sessions. Shared infrastructure may reduce duplicated integration and maintenance effort. None of these relationships establishes a universal return on investment; they require a comparison against a relevant alternative.

Let S denote eligible viewing sessions, p the proportion that successfully begin content playback, and m the expected net commercial contribution per successful session, before fixed player costs. Let F denote the fixed and incremental costs attributable to adopting a player. A simplified contribution model is:

$$C = S\,p\,m - F$$

For illustration, consider 100,000 eligible sessions per month and an expected contribution of $0.04 per successful session. The figures below vary successful playback from 90 to 93 percent and hold all other conditions constant. They are hypothetical and are not reported MOAP performance data.

Scenario	Successful starts	Gross contribution before player costs
Baseline (90%)	90,000	$3,600
Alternative (93%)	93,000	$3,720
Difference	3,000	$120

An incremental monthly cost above $120 would exceed the modeled gain in this example. A real evaluation must include retention, ad and subscription outcomes, integration labor, support costs, privacy obligations and the opportunity cost of other changes. Changes in viewing duration may affect both revenue and delivery costs. Publisher benefits and viewer welfare may also diverge; an interface that maximizes monetizable impressions is not necessarily a better experience.

The economic opportunity is therefore the possibility of generating measurable value through improvements at the point of consumption. Professional playback can be a source of product differentiation rather than a commodity purchased solely on the basis of its license fee.

Mediarazzi has a commercial interest in this proposition. Its relevance beyond the company's own products depends on reproducible results and the availability of meaningful alternatives.

20. Beyond YouTube: Independent video infrastructure

A large centralized video platform typically combines a content catalog, search and recommendation, hosting and delivery, advertising and a playback interface. This integration offers important benefits: discoverability, consistency, convenience, economies of scale and shared tools for creators. The objective of a presentation-layer technology is not to deny those benefits or to assert that every publisher should abandon such platforms.

The question is whether the conventions of online playback should be defined primarily by the needs of the largest distribution destinations. An educational publisher, an independent film distributor and a specialized media service may have requirements that differ substantially from a general-purpose platform. A player architecture that is separable from the catalog can enable such publishers to retain their identities and commercial arrangements while sharing common technical capabilities.

MOAP is an initial approach to this separation. Its documented player accepts compatible externally provided sources and can be integrated with Mediarazzi hosted video and managed advertising. In the future, portable preference profiles and a more general module contract could make the player recognizable across cooperating destinations without requiring those destinations to share a catalog or business model.

The ability to display another platform's content is not implied by this architecture. Content owners and services may restrict embedding, direct access, advertising behavior or protected-media playback. A browser player must honor supported interfaces and terms of access. It cannot treat a URL as proof of authorization.

There are already many capable independent video players and frameworks. The competitive proposition must therefore be specific: modular functional depth, coherent audiovisual presentation, portability and publisher integration, evaluated against credible alternatives. A claim to establish a new standard should be understood as an aspiration to influence conventions through adoption and evidence, not as a declaration of exclusive invention.

A company need not become the next dominant video destination to contribute to the next generation of video technology. The presentation layer offers an alternative locus for innovation.

21. Commercial architecture and ecosystem development

A video player can function as an independent product, a component licensed to publishers, or an entry point into a broader media infrastructure service. The present Mediarazzi model documents basic downloadable playback and a managed membership combining video hosting, advertising and player services. The product page describes a $49.95 payment for 30 days of platform access with an equivalent shared usage allocation; additional hosted usage draws on prepaid funds. The published arrangement uses manual cryptocurrency renewal. These terms are a dated product snapshot, not an immutable technical requirement.

A more mature player ecosystem could develop other sources of commercial value independently of the hosting business. The following are prospective opportunities, not currently offered product commitments.

Opportunity	Potential value proposition
Publisher licensing	Managed deployment, support and configuration
White-label / OEM	Integration into branded applications or devices
Specialized decks	Domain-specific functionality for publishers or viewers
Personal profiles	Optional preference continuity and customization
Enterprise reporting	Playback diagnostics and operational evaluation
Developer ecosystem	Documented extensions, integration and distribution

A sustainable business model must balance adoption with the ongoing cost of maintenance. Browser compatibility, security updates, documentation, testing, support and infrastructure capacity are recurring obligations. Central delivery of the engine can reduce deployment fragmentation, but can also concentrate operational risk. A versioned release and rollback policy, a clear support lifecycle and reliable activation procedures are necessary parts of a professional service.

A portable preference service should not require selling sensitive viewer information to finance its operation. Commercial viability should be investigated through service fees, licensing, support and other transparent value exchanges. Privacy protections and data export should not be treated as optional luxuries available only to premium users.

The economics of a modular ecosystem depend on the extent to which it reduces the marginal cost of integrating additional functionality while protecting the reliability of the core engine. The platform must earn participation from developers and publishers through demonstrable utility rather than contractual dependence alone.

22. Accessibility, privacy and interoperability

The design of a next-generation player cannot be evaluated solely by its aesthetic qualities or the breadth of its feature list. An interface that appears clean while obscuring essential functions from a keyboard user, a person with limited dexterity or a screen-reader user has merely transferred complexity to the viewer.

WCAG 2.2 provides a relevant evaluation framework (W3C, 2023). A player should expose accessible names, current state, a predictable keyboard focus order and alternatives to gesture-only commands. Caption and audio-description handling should respect the available media tracks. A new skin or deck must preserve essential accessibility properties. This paper does not assert that the current MOAP implementation has been independently assessed or certified against WCAG.

Privacy is especially important where a player is embedded across independently operated websites. Presentation preferences may be comparatively benign in isolation, while playback history and catalog identifiers can be sensitive. The proposed PVE should not act as a cross-site advertising identifier. Synchronization, history and analytics should have distinct permissions, documented purposes and retention rules. Identifiers and credentials must not be inserted into ordinary media URLs or publisher-controlled metadata unnecessarily.

Interoperability requires attention to codecs, browser APIs, source permissions, captions, advertising response versions and the behavior of host pages. Fullscreen, picture-in-picture, Media Session and Media Capabilities support varies by browser and device. Capability detection and documented fallbacks are preferable to universal claims. Protected-media playback and live streaming require separate verification where offered.

A player may be proprietary while still implementing open media interfaces and publishing a useful interoperability contract. These are different forms of openness. A hosted engine does not become open-source because its loader is downloadable; a proposed standard does not become established because a product adopts its terminology.

The professional objective is a dependable and inspectable boundary between publisher policy, viewer preferences and browser authority, with graceful degradation when any optional capability is unavailable.

23. Proposed technical standards and research program

The three architectural concepts advanced here should first be expressed as testable implementation contracts. A deck descriptor should define capabilities, accessible labels, state boundaries and lifecycle events. An adaptive presentation contract should define geometry inputs, fit behavior, overrides and source-transition rules. A personal profile contract should define versioning, validation, export and privacy-preserving synchronization. These are proposed Mediarazzi design specifications, not ratified industry standards.

Research domain	Measures and experimental design
Playback reliability	Startup time, buffering ratio, fatal errors; matched browser/source cohorts
Interface usability	Task success, time, errors, discoverability; controlled comparison
Rendering	Aspect correctness, layout shifts, dropped frames, device load
Audio / picture	Neutral output, clipping, latency, fallback; controlled media fixtures
Queue / advertising	Repeated source and ad transitions, skip state, event deduplication
Profile portability	Schema migration, conflicts, opt-out, account isolation
Commercial outcomes	Net revenue per eligible session and retention; controlled publisher trials

A reproducible performance harness should use known test media across a matrix of orientations, bitrates, browser versions and devices. Startup time should be defined consistently, for example as elapsed time from a user playback request to the first rendered content frame, with pre-roll delays reported separately. Rebuffering should distinguish involuntary stalls from user pauses and deliberate seeking. Reporting should include percentiles as well as averages.

Usability studies should compare the deck interface with a conventional control strip using equivalent tasks. Commercial studies should normalize for source, audience and ad exposure, and account for integration and distribution costs. Accessibility evaluation should include assistive technology and participants who rely on it. No single aggregate engagement metric adequately captures the value of viewer autonomy.

Development should proceed from documented contracts to prototype implementations, conformance fixtures and independently reproducible results. Negative findings should guide revision. The ambition of a new standard is credible only when it survives evaluation outside the environment in which it was invented.

24. A manifesto for the next generation of video playback

The following principles summarize the architectural and economic agenda advanced in this paper. They are commitments and proposed norms, not a certification of the current player or a claim that they are unique to Mediarazzi.

I. Video remains a foundational medium. Its continued evolution requires investment in the presentation environment as well as content, delivery and compression.

II. The player is a product in its own right. The experience of a work is shaped by the technology through which it is presented.

III. Minimalism must not become deprivation. An interface should protect attention while preserving useful, discoverable and accessible functionality.

IV. Functional depth need not increase persistent visual clutter. Modular control surfaces should expand capabilities without sacrificing the content's primacy.

V. The player should adapt to the media. Orientation, proportions, device capabilities and viewing conditions should inform presentation without distorting the work.

VI. Viewer preferences deserve continuity. A viewer should be able to retain a familiar presentation environment across cooperating devices and publishers by explicit choice.

VII. Personalization must respect privacy and rights. A portable profile must not become an instrument of cross-site surveillance or unauthorized content access.

VIII. Publisher autonomy and viewer autonomy are complementary. Commercial policy, creative rights and presentation preferences should be separated through clear technical contracts.

IX. Interoperability requires evidence. Documented interfaces, capability detection, exportable preferences and meaningful fallbacks matter more than assertions of universality.

X. Innovation requires measurement. New interfaces and commercial models should be evaluated through reproducible tests, accessibility research and credible economic outcomes.

MOAP is an initial implementation of this broader vision. Its documented control decks and audiovisual capabilities establish a starting point; adaptive presentation, FocusLock, portable profiles and a generalized extension ecosystem establish a program of future inquiry. Their value remains to be demonstrated through engineering and use.

The future of video should not be limited to the conventions inherited from today's largest distribution platforms. We can improve the experience without asking every viewer to abandon familiar media, every publisher to surrender its independence, or every developer to reinvent playback. Video remains the future. The video player deserves a future of its own.

Appendix A. Installation and configuration reference

The following is a minimal illustrative configuration based on the published MOAP installation guide. It uses placeholder values, not working credentials or media. Follow the current distribution instructions for the installed loader and associated assets.

```
<div id="moap-root" data-config="./moap.json"
     data-engine-host="https://mediarazzi.com/player/"
     aria-label="Video player"></div>
<script src="./assets/moap-loader.js" defer></script>

{
  "license": "MOAP-YOUR-KEY-HERE",
  "updateChannel": "stable",
  "advertising": true,
  "analytics": true,
  "startIndex": 0,
  "autoplayNext": true,
  "loopPlaylist": false,
  "playlist": [
    {"videoId": "film-001", "category": "films",
     "title": "Example Film", "src": "./media/film.m3u8"},
    {"videoId": "clip-002", "category": "clips",
     "title": "Example Clip", "src": "./media/clip.mp4"}
  ]
}
```

Published queue method	Behavior
getQueue() / currentIndex()	Read queue metadata and selected item index
playIndex(index)	Select item; present the start screen
next() / previous()	Select adjacent item

Register the actual hostname, host the matching loader and companion stylesheet, and supply valid JSON. Keep private credentials out of browser configuration. Managed advertising is assigned through the dashboard, not by adding arbitrary VAST URLs to the playlist. Cross-origin sources must permit the requests required by the selected playback implementation. The example has not been executed against a live account.

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Market indicators refer to the scope and time period identified by their publishers. They do not constitute forecasts of MOAP adoption, player-market size or financial performance.

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Online sources consulted 26 November 2026. Product descriptions are based on published documentation and founder-supplied design context; production code, filter coefficients, release behavior and browser coverage were not independently audited. MCDA, APA, PVE and FocusLock are working design concepts, not accredited standards. All diagrams are conceptual and all financial examples are illustrative.