Design Brief

PROJECT DESCRIPTION

This project introduces augmented interaction and features of photo booth machine to karaoke system that brings a brand-new, playful and shareable experience. When photo booth mode is activated, live video feed appears on screen, and users are then allow to record the karaoke session while engaging with themed AR assets through facial expression, body movement and audio. The footage captured can be saved to mobile devices, and shared to social media platforms as they like.

STAKEHOLDERS & BUSINESS PROSPECT

By optimising the end-user's experience of karaoke, this project also intends to bring commercial benefits to its stakeholders, including:

Record labels and artists of music industry
A new channel for music promotion, artist branding, and fan engagement is one of the probable outcomes of this project. This is an opportunity of obtaining higher exposure and recognition from the public and fans by bringing their promotional materials to interactive AR assets where people's attention is naturally given to (Refer to Contextual Analysis Storyboard in Design Process for a further evaluation and visual explanation).

Karaoke venue operators
Ranging from venue of small karaoke boxes(1-5 people) - mid/large scale karaoke rooms(5-20 people), they might benefit from enhanced experiences that differentiate their services and attract more customers.

PRIMARY USERS (COSTUMERS OF COMMERCIAL KARAOKE VENUES)

Young adults aged 18-25 who visit karaoke venues, particularly:

- Those who value social events and often seek leisure activities with friends (e.g. university students).
- Social media active users who are immersed in sharing culture, enjoy performing socially, capturing and sharing fun moments
- Music enthusiasts who are interested in developing stronger connections with the music & artists they love.
- People who might be self-conscious, unconfident to sing or share their karaoke media (refer to design research)

SUCCESS METRICS

Possible indicators of success may include:
User Engagement

- Increased interaction with AR features during karaoke sessions
- Number of recorded or shared karaoke moments
- User feedback on whether AR features enhance enjoyment of karaoke

Fan Engagement

- Increased recognition of artists featured in AR content
- User interest in exploring more music by featured artists

Venue Impact

- Increased customer satisfaction or return visits to karaoke venues offering the experience

SCOPE & OBJECTIVES

- Enable smooth user flow from singing, applying filters, recording, viewing, and sharing
- Ensuring the experience remains intuitive and does not interrupt the flow of social interaction
- Explore how users engage with AR media with facial expression, body movement and audio captured, and how this can enrich karaoke experience for its end-users and provide a marketing channel to the music industry
- Examine both business and technical aspects of the project to ensure the experience design is practically feasible and viable. (Link to Contextual Analysis)

OUTSIDE SCOPE

- The project will focus on the user experience design rather than visual design, therefore the AR assets seen in the prototype is solely made for concept demonstration (Refer to design process-Ecosystem & Industry Context for the analysis about which party involved might takeover the provision of AR assets.)
- This project will not be developing the full technical implementation of the AR system
- This project will not focus on hardware engineering of karaoke equipment

CONSTRAINTS AND BOUNDARIES

- Existing karaoke room infrastructure (screens, microphones, control systems)
- Designing for commercial Settings over home karaoke systems
- IPad-based karaoke system(should these go to design decisions made by research)
- Privacy considerations when recording users in shared social environments
- Karaoke Licensing and copyrights
- Depending on the distance in between users and the camera, it is expected to have maximum 5 people detected and interact with the AR assets.

EXPLORATION QUESTIONS

User Experience Questions

- How do people currently behave in karaoke rooms?
- What kinds of moments do users want to capture or remember during karaoke sessions?
- How to incorporate the photobooth function without interfering the karaoke experience and the ordinary interface that display the necessary information such as lyrics
- How comfortable are users with sharing karaoke recordings on social media?

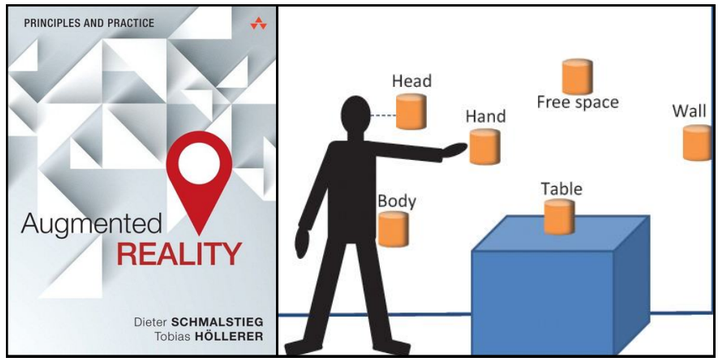
Cultural and Engagement Questions

- Can interactive visual elements deepen users' understanding of music, artists, or song history?
- How can karaoke environments become spaces for discovering music culture, not just singing?
- Can AR face filters or avatars reduce people's anxiety and self-consciousness when performing?
- Would users prefer to appear as avatars or stylized representations instead of showing their real faces?

Business and Industry Questions

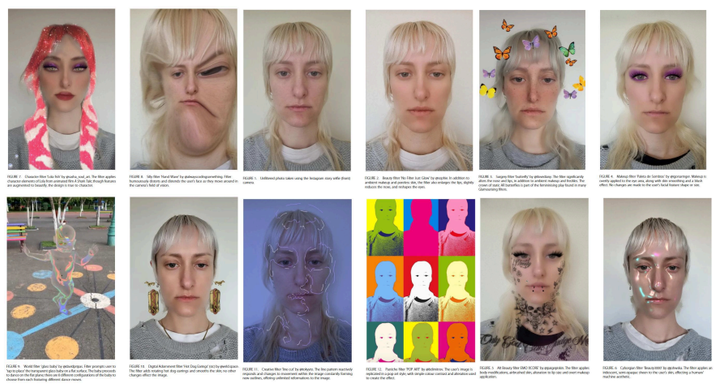
- How do artists and record labels currently build fan engagement and recognition?
- How might exclusive AR assets or campaigns encourage fans to explore artists more deeply?

Design Research



AUGMENTED REALITY: PRINCIPLES AND PRACTICE

Chapter 3. Tracking(Schmalstieg, & Höllerer, 2016a),
& Chapter 8. Interaction(Schmalstieg, & Höllerer, 2016b).



PRESERVING THE EPHEMERAL: A VISUAL TYPOLOGY OF AUGMENTED REALITY FILTERS ON INSTAGRAM

(Miller, 2025).

- **Primary Terminologies**

Tracking- continuous measurement of spatial properties, such as position and orientation.
Registration- the alignment between virtual and physical elements within a shared coordinate system.
Latency- "the time it takes from the occurrence of a physical event, such as a motion, to a corresponding data record becoming available to the AR application". "End-to-end latency encompasses not only the physical measurement of the sensor and the transmission to the host computer, but also all processing required to deliver the AR display to the end user."

- **Technical Practices**

Consolidating the design concepts with the theoretical foundations presented in the book helps ensure the feasibility of this project, while also enabling a deeper exploration of current technological possibilities. One key concept is **"Frames of Reference"**, which categorises virtual information based on its registration target. When a geometric understanding of the environment is available, virtual objects can be placed onto real-world surfaces, in the context of an AR karaoke photobooth specifically, as cameras are mounted and fixed within a defined capture zone, assets such as stage effects and environmental augmentations can be considered **world-stabilized content** with a fixed position. On the other hand, human body is also a powerful reference for AR interaction, it requires no additional instrumentation, enables intuitive and embodied experiences, and as pointed out in chapter 8, "the choice of body part allows the design of several augmentation layouts. **Body-stabilized content**, such as face filters or avatars, is therefore particularly significant for a social and performative activity like karaoke. Finally, for **screen-stabilized content** in this project, this includes the essential karaoke UI elements and song lyrics overlay.
Another important concept embedded in this project is **multimodal interaction**, combining multiple input channels such as gesture, facial expression, movement, and audio. This approach allows systems to leverage the strengths of different modalities and create more natural and expressive user experiences. In addition, if not active input, **augmented browsing** as a lightweight engagement is also part of the experience designed in this project, where people notice and perceive the information contained by the AR assets. This is an unexpectedly necessary engagement for artists and record labels seeking increased visibility and audience engagement through shareable media experiences.

Research on AR filters highlights their role not only as visual effects, but as tools for **self-presentation, social interaction, and identity construction**. Filters allow users to alter their appearance and surroundings, enabling both aesthetic enhancement and playful transformation. While **beautification** remains a dominant use, **entertainment and social connection** are also identified as primary motivations for engagement, led to alternative uses of filters focused on play, creativity, and identity exploration, opening new opportunities for more expressive and less appearance-driven AR experiences.
The ephemeral nature of filter-based media further encourages spontaneous sharing, reducing the pressure associated with permanent self-representation. In this context, AR filters also enable forms of **anonymised self-performance**, allowing users to participate socially while maintaining a sense of privacy, security, and psychological comfort.

Finally, the typology of AR filters demonstrates the diversity of filter functions

Aestheticising Types
- Pastiche – Combines layered visual styles inspired by media and internet aesthetics.
- Aesthetic – Adjusts colour, tone, and visual mood similar to photographic filters.

Glamourising Types
- Beauty – Subtle enhancement that smooths skin and slightly adjusts facial features while maintaining a natural look.
- Surgery – Dramatic modification of facial structure, simulating cosmetic procedures and significantly altering appearance.
- Makeup – Applies realistic cosmetic effects without changing underlying facial features.
- Alt Beauty – Stylised or surreal aesthetics that blend beautification with experimental or subcultural visuals.

Entertaining Types
- Cyborgian – Transforms the user into a human-machine hybrid with futuristic, non-beautifying visuals.
- Character – Turns users into fictional or stylised characters through immersive transformation.
- Silly – Designed for humour and play, often using distortion or game-like interactions.
- World – Augments the surrounding environment rather than the user, creating interactive scenes.
- Digital Adornment – Adds simple accessories or overlays with minimal change to appearance.
- Creative – Focuses on artistic and immersive transformations of space or visuals beyond realism.



TROLLS AR KARAOKE LOYALTY PROGRAM

(Manalac, 2021; CAVR, n.d.).

An AR-infused karaoke mobile application designed to gamify a collectible-based loyalty marketing campaign of Pyaterochka (A large European retail chain), alongside the release of the "Trolls World Tour " animated film.

Features
- Customers unlock new characters, karaoke songs and AR-masks by scanning the collectible physical cards they obtain with the purchase of goods in the Pyaterochka stores.
- 16 AR Troll masks & 24 popular karaoke songs available
- Ability to take and share selfies using AR-masks, and upload AR-karaoke recording to participate in the contest
- Karaoke battle sessions – invite friends from social networks
- Custom avatars generator

OVERALL LEARNING

- From the technical practice of AR, key concepts such as frames of reference and multimodal interaction highlight how AR experiences can be structured within the karaoke setting.
- The typology of AR filters provides a useful framework for understanding the diverse roles filters can play, ranging from beautification and aesthetic enhancement to humour, character embodiment, and immersive world-building. This categorisation can inform the design of AR assets in different experiential contexts.
- The Trolls AR Karaoke campaign demonstrates a real-world case of merging an effective marketing strategy, technology and experience design that combines AR content, avatars, and gamification with karaoke as a high-engagement activity. The key learning of this case arise from their integration of physical collectibles, content unlocking mechanisms, and reward-based participation that forms a structured incentive system. This design progressively guides user engagement and encourages actions aligned with the client's objectives, which could be a good strategy to carry on to the design process,.

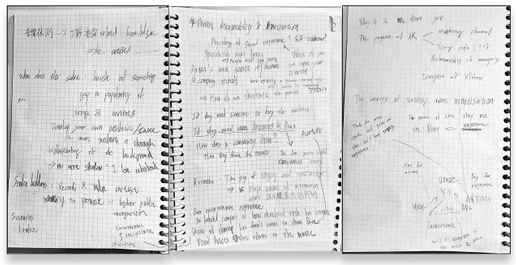
Design Process

1. BRAINSTORM



This brainstorming process explored the potential of Augmented Reality (AR) by examining its common applications, key characteristics, and the types of user needs it can address. Existing use cases and basic technical considerations were reviewed to support early ideation. During this stage, a recurring experience emerged: recognising a song as familiar while lacking knowledge of its title or artist.

This highlighted a gap between auditory recognition and deeper understanding, leading to the idea of using AR visuals to strengthen memory and association. Karaoke was identified as a suitable context, as it naturally includes moments of shared or idle attention within a social setting. This became the starting point for exploring how AR could enhance engagement and support music discovery.



3. STORYBOARD

PASSIVE → CURIOUS → ENGAGED → UNDERSTANDING → RECALL → ACTION

The storyboard below illustrates how this project guides audiences from initial recognition of a song to developing awareness of the artist, facilitating the fan journey from discovery to exploration by strengthening the connection between visual and auditory memory.



Friend A selects a song. Both A and B are fans of the artist and are excited to sing it, while Friend C has no clear memory of the song or the artist.



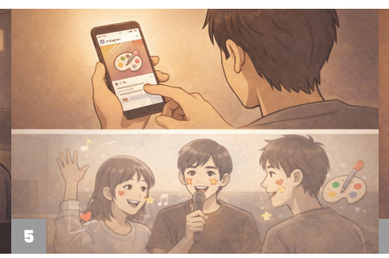
During the instrumental break, Friend B activates photobooth mode on the tablet and applies a themed AR filter based on the song.



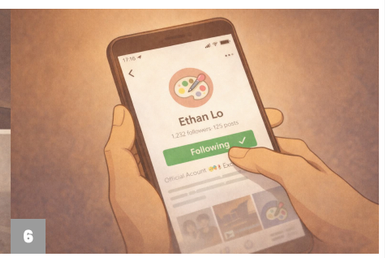
During the instrumental break, Friend B activates photobooth mode on the tablet and applies a themed AR filter based on the song.



Friends A and B introduce the artist to C, explaining that Ethan Lo is a well-known painter and R&B singer, and that the AR filter reflects visuals from his recent tour.



A few days later, Friend C comes across a familiar visual on social media and recalls the karaoke experience and the song they heard.



Friend C decides to follow Ethan Lo on social media, becoming interested in learning more about the artist.

(OpenAI, 2026)

2. CONTEXTUAL ANALYSIS- MARKET, LICENSING & PLATFORM ECOSYSTEM

How can this project not only answer consumer's expectations, but also become a preferable proposal to businesses?

Key decisions and information from this analysis:

- Prioritising commercial karaoke settings over home-based systems to reach a broader and more diverse audience.
- Framing the experience as an "AR Photobooth" rather than a performance stage or studio to lowers user pressure, encourages the generation of short, expressive, and shareable content, and aligns with users' existing behaviours of capturing casual, memorable moments in social settings.
- Defining categories of AR assets based on licensing feasibility and promotional value.

Artists & Record Label Perspective

The Fan Journey Model, extracted from the marketing framework consumer journey, indicates that the first stage "Discovery" often takes place passively when people stumble upon music through playlists, social media, word of mouth and such (Haddad, 2023).

In today's digital age, it's not so hard for a soundtrack to be used in a TikTok video and become viral. People can recognise a trending song while knowing very little about the person who makes the music; and over time, the song is forgotten without the artist ever being remembered.

As identified by Heffernan(2023), the very first step for an artist to grow their fanbase is to define identity and promote themselves as a brand with their own values, public persona, aesthetics, story and messages behind the music pieces. On top of that, the significance of social media promotion for them to plant an impression in the audience's mind is often discussed in articles regarding music businesses(The Institute of Contemporary Music Performance, 2023; Iliev, 2023). Müller(2025) also suggests that "a quarter of the $40 billion earned by tech companies from music comes directly from musicians and labels, whose majority budget is allocated to social media advertising. An estimated $ 10 billion is paid to platforms like Instagram, Facebook, and TikTok to increase their reach."

Insights from Karaoke Systems Market Report

- The karaoke system market is growing at a CAGR 7.5% from 2026 to 2033, and is estimated to reach USD 2.8 billion by 2033, with Asia-Pacific dominates with over 50% market share
- The expansion of the market is largely driven by the increasing investment made in karaoke systems for home entertainment and commercial settings, which is largely fueled by people's rising engagement in social events such as parties, weddings, and family gatherings.
- Immersive and customizable entertainment experiences are highly sought after by Millennials and Gen Z consumers, "karaoke systems will likely incorporate additional features such as artificial intelligence, voice recognition, and augmented reality, alongside social media platforms and live streaming services".
- Establishments such as karaoke bars, restaurants and event organisers therefore pursue high-end equipment to attract customers, which also puts pressure on manufacturers.

(Deep Market 360, 2025; Quantiql Group, 2026)

This part of the analysis points out this project's commercial purpose behind the incorporation of AR lens technology in karaoke system, as well as the value and necessity of making the record sessions shareable to social media, which make this project not just a fun experience for consumers, but also a meaningful advertisement for marketing campaigns.

Licensing and legal considerations

In the Australian context, karaoke venues typically operate under public performance licences obtained through APRA AMCOS, which allows music to be played and performed within the venue. As such, singing and recording karaoke sessions in private rooms is generally permitted at the point of use (Mikkonen, 2023). However, once recordings are shared on social media platforms, the context shifts from private or in-venue use to public distribution. This introduces additional copyright considerations, as the content now involves communication of copyrighted music to a broader audience.

While user-generated contents such as a cover version or karaoke clips are often tolerated on platforms such as TikTok and Instagram, this is largely due to platform-level licensing agreements with music rights holders rather than an inherent right of the user to redistribute the content (Australasian Performing Right Association & Australasian Mechanical Copyright Owners Society [APRA AMCOS], n.d.). In this sense, karaoke recordings exist in a grey area between licensed performance and user-generated content (UGC).

Furthermore, according to APRA AMCOS guidelines on cover songs, while performing and recording covers may be permissible under certain licences, distributing or monetising such recordings typically requires additional permissions.

This investigation specifically bring this project to acknowledge these legal constraints, and thus positioning the karaoke media recorded by photobooth mode as a form of UGC, and approach sharing on social media platforms as a non-commercial, platform-aligned activity. Design strategies such as short-form clips and user consent mechanisms are considered to ensure that content remains closer to user-generated expression rather than direct redistribution of copyrighted material.

Design Process

4. AR ASSET FRAMEWORK & SYSTEM DESIGN PROPOSALS

As indicated in 'Outside of Scope' in the Design Brief, this project will not focus on the visual design of the AR assets, but how they function within the interactive and social context of the karaoke experience; however, it is still important to define and structure the key categories and the potential forms of AR assets, based on the understanding of technical constraints and the design context built in previous research and analysis.

1. Asset Sources & Ownership

AR assets in this project are structured into three categories based on their source and level of control:

- Generic System Assets

Baseline assets such as lighting effects, abstract visuals, and stage simulations that do not require licensing. These ensure that the photobooth experience remains functional across all songs.

- Licensed / Campaign-based Assets

Artist-specific visuals or branded elements developed in collaboration with record labels or stakeholders. These assets enable the platform to function as a promotional channel.

- User-generated / Customisable Assets (Future Expansion)

Personalised elements such as avatars or editable filters that support self-expression and reduce reliance on copyrighted content.

System Logic & Accessibility

Not all songs are paired with customised AR assets. To maintain accessibility:
Generic system assets are always available as a default experience
Campaign-based assets are unlocked after users interact with specific songs
This creates a layered system where promotional content enhances, but does not limit, the core experience

2. Frames of Reference (AR Placement Logic)

An attribute required to decide how AR assets is anchored within the environment :

- Body-stabilised – attached to users (e.g., face filters, avatars)
- World-stabilised – placed in the environment (e.g., stage effects, spatial visuals)
- Screen-stabilised – fixed to the interface (e.g., frames, UI overlays, lyrics)

3. Multimodal Interaction

The system supports multiple input channels that makes AR assets responsive to user's actions:

- Gesture and movement
- Facial expression
- Body positioning
- Audio (e.g., singing intensity, rhythm)

4. Promotional Asset Strategies

Different types of campaigns can be translated into AR assets through various approaches:

- Artist Identity-driven Assets

Visual elements derived from an artist's signature style (e.g., face paint, colour palette, fashion, symbols)

- Song-driven Assets

AR effects inspired by the narrative or visual identity of a song (e.g., reactive environments, mood-based visuals)

- Cross-media Campaigns

Integration of movie or show-related content through theme songs

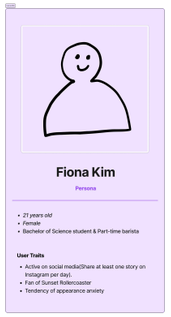
- Screen-based Promotional Frames

Non-intrusive overlays (similar to photobooth frames) that frame the screen without interfering with interaction, suitable for lightweight branding

- Commercial / IP Collaborations (Future Expansion)

Branded characters or icons (e.g., Sanrio, Labubu) adapted into AR elements

5. PERSONA & USER JOURNEY MAPPING



User steps	Arrival & Setup	Song Selection	Ongoing Karaoke Session					
User steps - Photo-booth Mode				Camera Mode Activation	Apply AR Mode / Filters	Recording Moments	Post-Session Review	Save & Share Experience
User actions	• Users enter the karaoke room with friends. • They place bags, adjust lighting, and explore the karaoke interface.	• 1-2 Users browse songs using the touchscreen remote or song books. • Others sit idle with partial attention, often they chat or interact with each other. • **See banner of songs with exclusive AR overlays on the upper part of the page.** • Negotiating song choices • Choosing/Queueing Songs	• Singing (2-4 people, depending on the system capacity) • Choosing/Queueing Songs • Active Engagement as audience: Cheering, Clapping, Singing along from seat, Dancing, Waving lightsticks/phones) • Passive engagement (Filming with phone, Watching lyrics casually, Using Phone, Looking around room, Drinking quietly, Daydreaming) • Eating & Drinking (Depending on the venue	Trigger- • **A user presses "photobooth" on remote/tablet.** • **Pop-up notice** Camera angle options: • Front view • Wide room view Projection screen options: • Main karaoke screen display • Secondary control display (Tablet)	**AR Performance Interface can be accessed on tablet or mobile phone through QR code.** Choose assets and interact with them	• Press Record Highlight anytime. • Or enable Auto Highlight Capture (detects chorus/high-energy moments). • As long as the photobooth mode is activated, users can always interact with AR assets even when it's not recording or no song is playing	When session time finishes: Main screen transitions to: "Tonight's Highlights" Gallery View recorded clips together. Laugh, replay moments. Compare performances.	Users select what to do with recordings: Save Options • Download to phone via QR code • Cloud storage link • Group album Share Options • Social media formatted clips • Artist campaign templates Promotional Integration If artist campaign active: • Unlock exclusive visuals • Concert promotion overlays • Fan engagement badges
System	• The main screen displays normal karaoke UI. • **An onboarding pop-up window introduces AR features.** • **A small icon indicates "AR Camera Available" as an optional feature.** • **Camera remains inactive by default (privacy-first design).**	1. Music videos or background visuals play. 2. Song options display: Home page • **Songs with exclusive AR overlays** • Trending songs • New songs • Song charts • Party mixies • By decade • By music genre Search in system • Search tool: By artist/song name • Filter: Language 3. In most cases 1-2 song books and 1 tablet(or remote) will be provided, depending on the scale of the karaoke venue they could also have two tablets/ remotes.	1. Music videos or background visuals play. 2. Silence gaps in between songs 3. **Suggests optional AR experiences:** • **"Record Highlight"** • **"Performance Mode"** • **"Try AR Stage"**	Default Setting: Front view camera on, display with main karaoke screen. Wall/Ceiling-mounted camera activates. Live video feed appears on screen. **Privacy notification shown briefly.**	Available Assets(body/world/screen stabilized) Human-tracked Assets (Face/Body Filters and Avatars) • Import personal avatar OR choose system characters • Artist-themed assets during campaigns Environmental Assets • Music Knowledge Layer • Artist visuals appear • Instruments highlighted • Song background visuals integrated into environment Performance AR Effects(background) • Virtual stage lighting • Concert crowd simulation • Backup dancers • Music-synced visual effects	• Records short clips instead of full sessions. • **Displays recording indicator.** • Adds AR effects directly into captured footage. • Recording ends automatically as soon a song ends, while users will stay in the photobooth mode unless they choose to exit • Users can toggle the setting of photobooth mode for recoding to be always on • Indication light of recording	Timeline by songs Best moments auto-highlighted AR-enhanced thumbnails	
Goals & experiences	Avoid overwhelming users with technology	Guide & encourage the use of photobooth mode		Karaoke → Performance Space		Capture memories while enjoy the experience		
Feelings, reations and thoughts	Relaxed → Social → Curious	Choosing songs → Anticipation, Nostalgia(from songs), Ownership("this is my song")		Excitement + Playfulness	Confidence ↑ Self-consciousness ↓ Performance fantasy ↑	Fun → Spontaneous → Expressive		Memorable, Personal Connected to music culture
Pain points								
Opportunities								

This interaction mapping was developed to organise the overall user journey and clarify how AR photobooth features integrate into the karaoke experience. By breaking the experience into stages—from arrival and song selection to AR interaction, recording, and post-session sharing—it helped identify key touchpoints, user behaviours, and system responses.

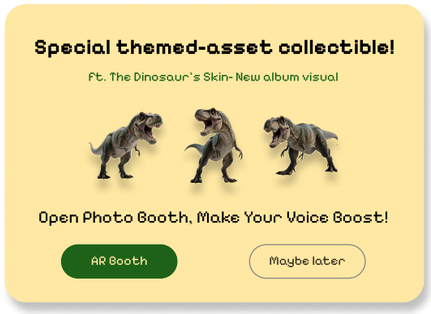
This process was particularly valuable in aligning user actions with system logic, ensuring that AR features are introduced at appropriate moments without disrupting the natural flow of karaoke. It also informed the prioritisation of key interfaces for prototyping, such as AR activation, asset selection, and recording controls.

Beyond structuring interaction, the mapping highlights the balance between passive and active participation within a social setting. It identifies opportunities where users shift from idle observation to engagement, and how AR can act as a trigger for interaction, expression, and memory-making.

This framework ultimately supports the design of a cohesive experience that connects performance, social interaction, and music discovery, while remaining intuitive and adaptable to different user behaviours.

Design Response

ENTRY POINTS- AR PHOTOBOOTH ACTIVATION



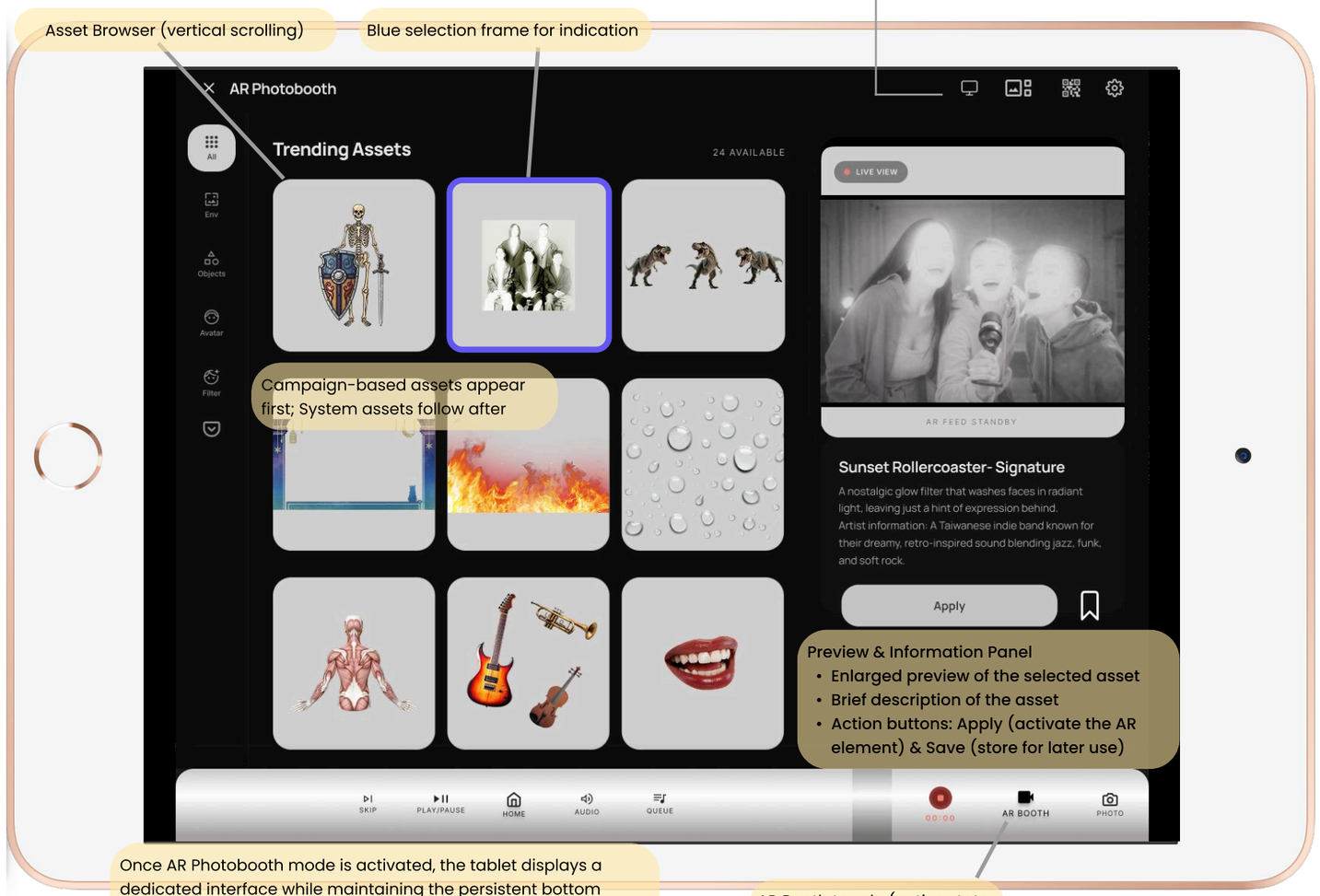
Other than the AR Booth toggle in the bottom menu, whenever the song next in the queue has an exclusive filter available, users might also enter the AR Asset Selection Panel from this pop-up window.

From left to ride:
- Display Mode (Screen Icon)

Project AR output to main karaoke screen/View on tablet only/ Turn off visual display (recording can continue in background)
- Gallery (Album Icon)

Access recorded photos and videos
- Mobile Sync (QR Code Icon)

Allows users to scan and control AR assets via their smartphones

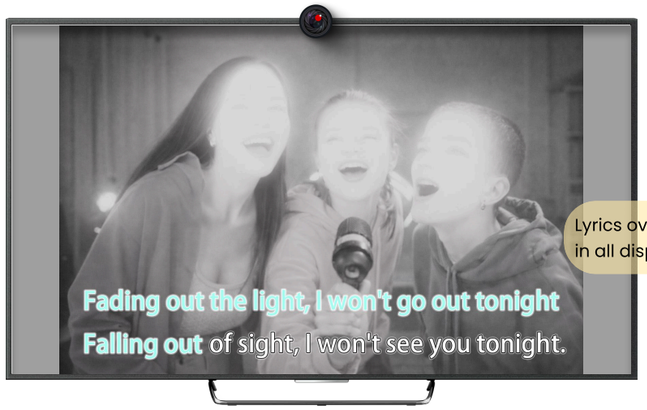


APPLY AR ELEMENTS & RECORDING MOMENTS

This interface serves as the core interaction space where users browse, apply, and record AR-enhanced karaoke moments.



Indication light of recording



Lyrics overlay will always be on in all display mode

INTERACTION LOGIC

The interface is designed to support:
- Simultaneous performance and interaction, seamlessly integrating AR into their karaoke experience without interrupting the flow of the session.
- Quick asset browsing without disrupting singing
- Flexible display across tablet and main screen

(Adobe Stock, 2026; Stitch, 2026; Shazam, 2026; Wongsa-nga, 2025)

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