

**DESIGNING FOR DIGITAL PRESENCE:**  
“A VR PLATFORM FOR CURATING AND EXPERIENCING  
ART IMMERSIVELY

*By*

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## 1 – Introduction

Emerging artists continue to face various structural barriers in accessing the art world, including high gallery commission fees, limited access to curatorial networks, and the dominance of well-established institutions concentrated in metropolitan centres (*Mignogna, 2016*). These barriers not only reduce visibility and income but also help define contemporary definitions of artistic professionalism and value. While digital platforms aim to democratise access, they often emphasise scale and commercial viability over immersion and creative autonomy (*Mignogna 2016; Grau, 2003; Andrejevic, 2009; Halpern, 2015; Terranova, 2000*).

Mainstream online platforms such as *Google Arts & Culture* or *Saatchi Art* offer visual access to large volumes of artwork but tend to rely on static image grids and e-commerce frameworks. This structure flattens the artist's presence and curatorial intention, as *Grau (2003)* notes, technological mediation of art often prioritises surface-level replication rather than experiential depth. These limitations are reinforced by algorithmic systems that prioritise clicks, likes, and sales over artistic merit or emotional impact. As *Holdgaard and Klastrup (2014)* note, complex or unconventional work often struggles to compete in environments optimised for virality, while *Mignogna (2016)* highlights how metric-driven platforms tend to marginalise artists whose practices fall outside dominant visual trends or formats. Recent empirical studies by *Finnis and Kennedy (2020)* further document how platform algorithms systematically undervalue experimental or process-based artistic practices.

This thesis introduces *Antro*, a web-based platform that re-imagines how digital art is curated, experienced, and accessed. By integrating a virtual reality (VR) gallery system, *Antro* enables emerging artists to create immersive, spatial exhibitions that prioritise presence, narrative, and viewer engagement. Rooted in research on virtual embodiment and spatial presence (*Slater & Wilbur, 1997; Riva, 2018; Slater et al., 2020*), the platform positions the online gallery not as a static container, but as an interactive environment shaped by the artist and responsive to the viewer. It aims to

provide an alternative approach to digital art engagement that goes beyond flat, transactional, or disembodied interactions, although the actual effectiveness of this approach will require empirical testing beyond the scope of this thesis.

Designed with emerging artists, curators, and the user in mind, *Antro* aims to provide both visibility and curatorial agency. Artists can upload their work, define their curatorial logic, and share exhibitions directly with audiences. Unlike traditional digital platforms, which often monetise engagement and limit creative autonomy, VR environments may empower curators with greater control over exhibition design and narrative. As noted by *Zhang (2024)*, VR platforms like *Prism XR* facilitate curated exhibition experiences, enhancing interactivity and collaborative learning in art and archaeology contexts. Similarly, *Parry (2007)*, as reviewed by *Galloway (2010)*, argues that virtual exhibitions enable re-interpretation and remote curatorial engagement by allowing for new media practices within museum contexts. *Antro* shares a commitment to empowering users to actively shape exhibition narratives. By offering customisable layouts and multi-image uploads, *Antro* prioritises creative authorship and accessible design as central components of the digital exhibition experience.

The platform was developed using a user-centred, iterative design process, although as noted in the limitations section, direct user testing remains a critical area for future development. Core features include profile creation, multi-image artwork uploads, a *Three.js*-powered VR gallery, and an opportunities section. The backend, built with *Node.js* and *MongoDB*, enables cross-device accessibility and scalable performance, with specific attention to data security through encrypted connections and access controls.

This report traces *Antro*'s development from concept to implementation. It begins with a literature review covering digital curation, platform inequality, and immersive interaction design. It then presents the project's key user research findings, outlines the technical and design architecture, and reflects on the current state and future directions. Through this work, *Antro* contributes to ongoing conversations about how immersive technologies might support more equitable and emotionally engaging

digital futures, while acknowledging the limitations in technology-dependent approaches to democratisation.

## 2 – Review of Relevant Research

### 2.1 Context and Research Gap

The integration of digital platforms into the contemporary art world has transformed how artists exhibit their work and how audiences engage with it. While these platforms have improved accessibility across geographies and institutions, they predominantly use two-dimensional, scroll-based display formats that prioritise image display over sensory depth (*Bishop, 2012; Manovich, 2001*). This approach often reduces artistic engagement to passive visual consumption, affecting not only visual but also cognitive and emotional interactions with artworks.

Despite the growing availability of immersive technologies, their potential remains underexplored in the art context. Most research on presence and emotional interaction in virtual environments is grounded in educational and simulation-based contexts (*Slater & Wilbur, 1997; Makransky & Lilleholt, 2018*). These insights have yet to be meaningfully translated into curatorial practice. This review addresses three major challenges in current digital art platforms: lack of emotional presence, constrained user experience, and consistent structural exclusions. Each theme highlights the need for a reinvented model of digital exhibitions – one that prioritises experience, artistic authorship, and equal opportunity.

### 2.2 Emotional Disconnection and Presence

A dominant criticism of current digital art platforms is their failure to create emotionally resonant experiences. While digital platforms have improved access, most platforms treat artworks as content tiles rather than as multi-sensory, spatial events. The common way of presentation – often structured around static grids and linear scrolls – reinforces a passive model of engagement (*Bishop, 2012*). As *Slater and Wilbur (1997)* define it, 'presence' – the psychological sensation of 'being there' – is essential for meaningful interaction with digital environments, yet this aspect is rarely incorporated into the design of online exhibitions. *Slater et al. (2020)* have

further refined the concept of presence through empirical studies that demonstrate how spatial navigation and embodied interaction significantly enhance emotional engagement compared to passive viewing.

*Google Arts & Culture* exemplifies the limitations of mainstream digital art platforms. While it offers high-resolution images and immersive 360-degree tours, these features are largely reserved for major institutions or well-known street art. This emphasis reinforces a form of institutional gatekeeping that prioritises visibility for already renowned artists, marginalising emerging creators. This platform, though valuable in reach and reputation, ultimately reflects systemic obstacles that limit equitable access and exposure within the digital art ecosystem. As *Pangrazio and Sefton-Green (2021)* document through interview studies with emerging artists, these constraints have real economic and professional consequences, particularly for creators from underrepresented backgrounds.

Studies on immersive learning environments indicate that emotional connection and cognitive retention are significantly enhanced in settings that simulate depth, movement, and responsiveness. *Makransky and Lilleholt (2018)* found that immersive VR increases learner's sense of presence and motivation, leading to improved learning outcomes. *Freina and Ott (2015)* highlight that spatial interaction within VR environments contributes to emotional immersion by allowing users to navigate and engage with virtual spaces actively. Additionally, research by *Allcoat and von Mühlenen (2018)* suggests that narrative-based VR experiences can elevate engagement and positive emotional responses, encouraging empathy and ethical reflection.

These insights from immersive learning directly contribute to the conceptual foundation of *Antro*, where spatial navigation, narrative curation, and presence are implemented not simply as design choices, but as mechanisms for emotional and cognitive impact. However, it is important to note that these potential benefits remain theoretical until verified through specific testing of art-focused VR platforms with diverse user groups.

## 2.3 UX Design and the Constraint of Interaction

Beyond emotional disconnection, most digital platforms constrain how users navigate and interpret artworks. The dominance of modular, image-based templates standardises viewer behaviour and restricts curatorial control. *Manovich (2001)* observes that digital media often inherits visual logics from cinema and print – linearity, framing, and fixed perspective – instead of creating new visualisations that are specifically designed considering the cognitive experience of digital interactions.

Platforms like *Artsy* and *Saatchi Art* reflect this limitation. While they provide high-resolution visuals and access to emerging artists, their layouts mimic e-commerce formats, reducing artworks to searchable, filterable inventory. Artists typically lack control over how their work is presented or interpreted, and contextual framing is minimal to none. Both platforms emphasise commercial visibility but provide little curatorial agency. Empirical studies by *Thompson and Macdonald (2017)* with emerging artists confirm this frustration with platform constraints as a significant barrier to digital exhibition and professional development.

*Dickey (2005)* advocates for three-dimensional, spatially navigable environments that support embodied interaction – interfaces that invite active exploration. *Norman (2013)* and *Johnson (2020)* similarly stress the importance of the perceived qualities of an object, which should be intuitive cues that guide users through the digital space. Despite these studies, current art platforms struggle to allow artists control over how their work is experienced and rarely incorporate advanced virtual technologies. *Nieborg, Poell, and van Dijck (2019)* argue this is a feature, not a flaw, of platform architecture: standardisation and scalability take precedence over creative autonomy. *Zhang and O'Halloran (2021)* provide updated empirical evidence on how platform interfaces actively shape both creator and viewer behaviours in ways that prioritise commercial metrics over artistic integrity.

In terms of immersive experience, *VR-All-Art* is a platform that enables spatial curation using VR rooms. While it allows galleries to host immersive exhibitions, it primarily serves institutional or commercial ends and lacks deeper integration with artist career-building features such as portfolios, CVs, or opportunity access.

Similarly, *New Art City* empowers artists to build virtual spaces but assumes familiarity with 3D tools and is limited to digitally produced art, limiting accessibility. The platform proposed in this thesis, *Antro*, brings together spatial VR exhibition design with professional visibility tools – allowing artists not only to curate work but to contextualise it with descriptions, upload CVs, portfolios, and access to open calls or residencies. This represents a potential advancement in platform design, though quantitative metrics for evaluating such improvements remain to be developed and tested.

## 2.4 Structural Inequality and Platform Capitalism

Even as digital platforms claim to democratise access, they frequently reinforce existing hierarchies. Increased reach does not guarantee equitable visibility, recognition, or progression. As *Sholette (2011)* argues, most artists operate as "dark matter" – the mass of artistic labour that is essential to the art world but remains unacknowledged or invisible. Mainstream platforms rarely address this imbalance, instead reinforcing it through algorithmic metrics. *Noble (2018)* provides empirical evidence of how supposedly neutral technical systems often reproduce and amplify existing social inequalities in ways that particularly impact marginalised creators.

This is especially visible on *Instagram*, where engagement is governed by hidden algorithms. Artists are pressured to optimise their work for attention rather than authenticity, aligning with *Hsu's (2020)* critique of the performative creative economy, which centres on how digital platforms force artists to engage in continuous self-promotion, effectively transforming their practice into a sort of labour that prioritises visibility over artistic integrity. Even *Artsy Premium* privileges those who can pay for promotional placement. These models reproduce gatekeeping, favouring artists already included in networks of capital and exposure.

*Scholz (2016)* describes this structure as platform capitalism: a system in which labour – whether creative, emotional, or logistical – is commercialised without compensation or control. *Hsu (2020)* deepens this critique by showing how artists are increasingly burdened with roles once handled by institutions, such as visibility management, marketing, and audience engagement – a pressure largely ignored by

the platforms that impose it. This analysis is further supported by empirical work from *Duffy and Hund (2019)*, who document through participant interviews how creative workers must perform increasing amounts of uncompensated digital labour to maintain visibility.

Experimental models like *The Wrong Biennale* and *New Art City* present alternatives. They offer decentralised, artist-led spaces for exhibition, with fewer barriers to entry. However, they often lack sustainable infrastructure or visibility outside niche networks. *Antro* builds on these efforts by incorporating exhibition, professional development, and opportunity discovery into a unified platform, though it will face similar sustainability challenges that will require careful consideration of funding models and governance.

## 2.5 Synthesis and Positioning

The preceding sections identify three interrelated limitations in current digital art platforms: emotional disconnection, constrained user interaction, and structural inequality. These challenges are not incidental but embedded within the architectures and economic models of contemporary platforms. The prioritisation of scalability, algorithmic visibility, and commercial optimisation often comes at the expense of curatorial voice, emotional engagement, and equitable access.

*Google Arts & Culture* and *Artsy* exemplify this tension. While they expand access through high-resolution archives and global reach, their immersive or spatial features are reserved for renowned institutions and artworks, reinforcing existing hierarchies. *Saatchi Art* and *Instagram* similarly present artworks within flattened, standardised templates that emphasise marketability over meaning. Artists are pressured to perform visibility, conform to algorithmic preferences, and relinquish narrative control. Emotional resonance is sidelined, and curatorial authorship is reduced to content tagging or promotional tiers. These observations align with *Graham (2021)* recent survey-based research that found a significant gap between artists' curatorial intentions and the presentation options available on mainstream platforms.

On the other end of the spectrum, platforms like *VR-All-Art* and *New Art City* offer partial alternatives. *VR-All-Art* enables spatial exhibition but remains institutionally aligned and lacks integration with career development tools. *New Art City* supports decentralised, artist-led curation, but its reliance on 3D design tools and focus on digitally produced art can limit accessibility for those working in traditional or mixed media. These models gesture toward change but remain fragmented, addressing either emotional experience or structural inclusion, rarely both.

*Antro* responds to this gap by proposing a unified platform model that integrates immersive VR exhibition design with artist agency and professional opportunity. It reframes the digital platform as infrastructure for creativity rather than a container for commodified content. *Antro* enables artists to build spatially navigable exhibitions, embed contextual material such as CVs and portfolios, and access open calls or commissions – all within an environment designed for emotional presence and intuitive interaction. Its architecture is grounded in user-led design, curatorial flexibility, and ethical platform governance, though the actual implementation of these values will require ongoing assessment.

In this sense, *Antro* represents an attempt to re-imagine what a digital art platform can be – artist-centred, emotionally engaging, and structurally inclusive. It brings together insights from presence theory, interaction design, and platform studies to offer a model that supports not only how art is seen, but how it is experienced, authored, and contextualised in the digital age. However, as will be addressed in the limitations section, the platform's success in achieving these goals cannot be fully evaluated without direct user testing and empirical validation.

### 3 – Beneficiaries

*Antro* is designed to support emerging artists, independent curators, and art-engaged audiences who are frequently underserved by conventional art institutions and mainstream digital platforms. These users often face structural barriers such as high gallery fees, limited access to curatorial networks, and

algorithmic visibility systems that prioritise virality over artistic merit (*Sholette, 2011; Hsu, 2020*). *Antro* aims to address these challenges by offering an immersive platform where users can upload, curate, and experience artworks within customisable VR galleries – though the actual effectiveness of this approach in democratising access will require empirical validation through user testing (*Creative Access, 2024; Terranova, 2000*).

For emerging artists, particularly those from marginalized backgrounds, *Antro* proposes a potential alternative exhibition space. Early-career creatives frequently cite institutional gatekeeping, high fees, and limited network access as significant barriers to visibility and career advancement (*Creative Access, 2024; Terranova, 2000; Scholz, 2016*). Many online platforms treat physical artworks as static images or product listings, potentially flattening materiality, context, and curatorial intent (*Manovich, 2001; Bishop, 2012*). By designing a system that enables artists to build VR exhibitions with control over layout, mood, and spatial interaction, *Antro* attempts to offer greater creative agency – positioning the artist as an active narrator of experience rather than merely a content supplier (*Scholz, 2016; Duffy & Hund, 2019*).

For independent curators, *Antro* introduces tools that may make sourcing and presenting new work more accessible and less dependent on elite institutions. Research suggests that freelance curators frequently struggle with limited discovery mechanisms and logistical hurdles when collaborating across geographic or institutional boundaries (*On Curating, 2021*). VR platforms supporting artwork metadata and curated navigation could potentially offer scalable solutions for digital exhibition-making (*Weibel et al., 2022; MDPI, 2023*). *Antro* supports this by allowing curators to browse artist-led galleries and envision shows that reflect artistic context, though the effectiveness of these tools compared to existing alternatives remains to be empirically tested.

For audiences, particularly those who are geographically distant, physically disabled, or underserved by traditional art spaces, *Antro* offers a potentially more immersive way to experience art. While many digital platforms encourage scrolling and passive

consumption, research suggests that immersive environments might improve emotional engagement, presence, and memory retention (*Makransky & Lilleholt, 2018*; *Freina & Ott, 2015*). *Bishop (2012)* criticises the "disembodied viewing" experience of most digital platforms. *Antro* attempts to address this through a presence-oriented approach that combines scale-accurate rendering with personalised interfaces, though it's important to note that VR technology itself requires decent hardware and technical literacy, which may create new access barriers (*Pangrazio & Sefton-Green, 2021*).

It's worth acknowledging that while *Antro* aims to provide a more equitable platform, the reliance on VR technology presents its own accessibility challenges. As *Pangrazio and Sefton-Green (2021)* note, technology-dependent solutions can inadvertently reinforce certain barriers while attempting to remove others. The requirement for VR-capable devices may limit access for users with financial constraints or limited technical proficiency. This tension between innovative technology and truly democratic access remains an important consideration for future development and represents a limitation that would need to be addressed through additional features or alternative viewing options.

Beyond individual users, *Antro* also serves curators, institutions, and arts organisations seeking accessible tools for exhibition and collaborative presentation. Research in immersive learning environments suggests that narrative structure and user agency may enhance emotional and cognitive engagement (*Pan et al., 2016*; *Allcoat & von Mühlenen, 2018*). While rooted in educational contexts, these findings offer potentially transferable design principles for virtual exhibition spaces. By integrating features such as portfolio sharing, profile visibility, and modular VR layouts, *Antro* positions itself not merely as a display platform, but as digital infrastructure that aims to facilitate curatorial authorship, professional visibility, and cross-institutional connection.

In this way, *Antro* represents an attempt to offer an alternative to extractive platform logics, though its actual effectiveness in creating a more equitable system will require concrete metrics and user testing to validate. The platform proposes a

re-imagining of digital art curation as a collaborative, spatial, and emotionally meaningful practice – with aspirations toward fairness, authorship, and presence. Future iterations would benefit from direct engagement with diverse user groups to ensure the platform truly meets the needs of those it aims to serve.

#### 4.1 Personas

To guide *Antro*'s development, five detailed user personas were created to represent the key groups the platform aims to serve: emerging artists, installation artists, freelance curators, institutional curators, and art buyers. These personas were generated through assumption-based modelling and desk research, drawing from existing user studies, creative industry reports, and platform analysis (*Jansen et al., 2021; Creative Access, 2024; Arts Council England, 2020*).

It is important to note that these personas, while informed by secondary research, remain hypothetical constructs rather than representations of actual users. This represents a significant methodological limitation of the current project. Without direct user research or interviews, these personas cannot fully capture the nuanced needs, behaviours, and frustrations of real-world users. This limitation is acknowledged as an area for improvement in future iterations of the platform.

Each persona outlines the user's goals and frustrations, motivations, digital habits, and broader relationship to the art world. The purpose was to design something distinct from existing platforms and approach development from a position of empathy – a core principle in user-centred design (*Norman, 2013*).

These personas informed design decisions throughout development, from feature prioritisation and UI structure to user control and metadata architecture. Their perspectives were revisited continuously to maintain focus on potential user needs, though the lack of direct validation means that some assumptions may not accurately reflect the experiences of actual users in the target groups.

To improve the validity of these personas in future iterations, direct research methods such as interviews, surveys, and observational studies would be valuable.

This would help refine the personas with empirical data rather than relying primarily on secondary sources and assumptions. *Thompson and Macdonald (2017)* demonstrate the value of directly engaging emerging artists when designing digital platforms, revealing needs and behaviours that might not be captured through assumption-based modelling alone.

USER PERSONA 1		INTERESTS	Mixed media painting, contemporary art exhibitions, feminist art history, residencies.
		CHALLENGES	She's eager to build a professional career but lacks the resources to exhibit in traditional galleries. Most calls for entry charge submission fees, and affordable platforms rarely offer professional visibility.
		STEPS TAKES TO FIX THAT	Maya turns to Antro to create a free virtual gallery that mirrors her ideal real-life exhibition. She uploads photos of her physical artworks and customizes her VR space to reflect her aesthetic and intentions – which she can now share with curators and peers.
		GOALS	To present her real-life artworks professionally without fees, connect with curators or institutions, and build her portfolio with exhibitions that feel credible and meaningful.
		MOTIVATION	To be taken seriously as a young artist without relying on institutional access or paying to be seen. She wants her work to be experienced with the spatial context and emotion it deserves.
		FRUSTRATION	Calls for entry are expensive and competitive. Online portfolios feel flat. She often worries her physical work isn't translating well online – and that she's being overlooked.
		SOURCES OF INFO	CuratorSpace, artist forums, Instagram, university art networks, newsletters from art nonprofits.

USER PERSONA 2		INTERESTS	Large-format painting, texture and materiality, exhibition design, archival documentation, analog photography, studio visits.
		CHALLENGES	His physical works are large and rely heavily on texture and spatial arrangement. Online portfolios flatten the experience. Many platforms prioritize commercial selling over presentation. Tarek often misses curatorial opportunities because his portfolio doesn't properly convey the physicality or scale of his work.
		STEPS TAKES TO FIX THAT	Uploads his photographed paintings to Antro, using its VR gallery features to recreate his solo show layouts. He shares these immersive exhibitions with curators and collaborators instead of sending static PDFs.
		GOALS	To professionally showcase his 2D physical artwork in a way that honors scale, layout, and intention – without needing to rent a space. To gain curatorial attention and secure invitations to shows, residencies, or funding opportunities.
		MOTIVATION	To create self-curated exhibitions that reflect his vision. To archive past shows virtually and plan future ones. To find platforms that prioritize artistic quality over commerce.
		FRUSTRATION	Static photos don't reflect how his artwork lives in a space. He feels invisible on commercial art platforms. Submission fees for exhibitions often feel exploitative.
		SOURCES OF INFO	CuratorSpace, Artsy features, academic art journals, Instagram, artist mailing lists.

USER PERSONA 5		INTERESTS	Interior design, contemporary art, slow living, independent creators, sustainability, storytelling through art, creative home decor.
		CHALLENGES	She wants to buy meaningful, original physical artworks but feels overwhelmed by e-commerce platforms that prioritize mass-produced prints. It's hard to judge scale, presence, or how a piece will feel in her space when shopping online.
		STEPS TAKES TO FIX THAT	Begins using Antro to browse curated, immersive VR galleries that showcase real-world artworks with context, dimensions, and artist backstories. This helps her visualize how a piece might feel in her home – and builds trust in the creator.
		MOTIVATION	She values authenticity and emotional connection. Buying art isn't just decoration – it's about finding something personal and intentional.
		FRUSTRATION	Most online platforms feel impersonal and commercial. Product-style galleries don't help her connect with the artist or feel confident in the purchase.
		SOURCES OF INFO	Instagram, Pinterest, design blogs, curated newsletters, personal referrals, independent concept stores.

USER PERSONA 4		INTERESTS	Modern and contemporary art, cross-cultural curation, educational programming, digital exhibition strategies, archival systems, emerging artists.	MOTIVATION	o expand access to quality art without depending on travel or physical limitations. To stay ahead in curatorial innovation and integrate VR into museum practice in a purposeful, art-first way.
		CHALLENGES	He often reviews proposals and artist portfolios digitally, but static images fail to convey the true scale, layout, or presence of physical artworks. Traveling for studio visits is not always possible, and current online platforms don't reflect how works interact with space.	FRUSTRATION	Digital portfolios feel flat and fragmented. Most VR platforms are either too commercial or lack curatorial tools. Reviewing artists remotely often leads to uncertainty about how the work would function in a space.
		STEPS TAKES TO FIX THAT	Uses Antro to view professional, immersive presentations of physical 2D artworks. He can assess layout, sizing, and curatorial compatibility remotely, and save promising artists for institutional projects or educational collaborations.	SOURCES OF INFO	Museum networks, academic art journals, grant proposals, portfolio submissions, artist residencies, curated digital platforms.
		GOALS	To discover emerging talent working in traditional media, assess their work spatially, and explore hybrid (physical + virtual) exhibition formats. He also wants to archive past museum exhibitions virtually for future access.		

USER PERSONA 3		INTERESTS	Thematic curation (identity, memory, ecology), artist discovery, critical writing, feminist art, contemporary photography, emerging talent.	MOTIVATION	Clara believes in dismantling traditional gatekeeping in the arts. She wants to uplift underrepresented voices by creating curated shows — even virtually — that offer professional visibility and conceptual integrity.
		CHALLENGES	Struggles to find the right physical artworks for specific curatorial themes. Online platforms are unfiltered and overwhelming, and social media lacks details like medium, scale, and availability. She often spends hours chasing information across artist portfolios.	FRUSTRATION	Submission platforms are too rigid or expensive. Social media doesn't show what's available or usable for curation. She feels stuck between inspiration and logistics when sourcing work.
		STEPS TAKES TO FIX THAT	Uses Antro to explore curated artist galleries in VR, viewing artwork dimensions, materials, and context in one space. She saves and organizes artists whose work aligns with future themes and reaches out directly through the platform.	SOURCES OF INFO	CuratorSpace, artist-run spaces, Instagram, arts newsletters, Substack blogs, online art journals.
		GOALS	To efficiently discover artists working with physical media who fit her curatorial vision. To mock up exhibition ideas using real works and pitch them to venues, galleries, or funders. To create accessible, no-cost opportunities for both herself and the artists she supports.		

TO THINK ABOUT		PRODUCT POSITIONING		PRODUCT UX	
				WRONG AUDIENCE	
Antro must balance immersive experience with simplicity. Artists like Maya and Tarek need intuitive upload flows and professional gallery visuals. Curators like Clara and Joaquin require structured artwork metadata and layout tools. Buyers like Aisha want emotional connection and spatial awareness — not just images.		Antro is a VR-based platform for real-world 2D artworks, enabling artists to showcase their work in professional, spatially immersive galleries without paying fees. It's not an e-commerce marketplace or NFT gallery — it's a discovery, exhibition, and connection tool designed for creators, curators, and collectors.		Users span from beginner to advanced tech comfort level. The UX must feel intuitive and guided. Uploading, arranging, and sharing galleries should be seamless, with tooltips, onboarding, and examples. Curators need clear tagging and filtering systems. Visitors should navigate galleries effortlessly.	Digital artists looking to mint NFTs, users expecting a Metaverse or gaming experience, or buyers wanting cheap mass-produced prints. Antro isn't for speculative or purely commercial digital art — it's a tool for physical artists who need affordable, immersive, professional presentation.
<b>HIGH QUALITY</b>					
Artists want their real-life pieces represented with accuracy and visual fidelity. High-res image handling, true-to-scale display, customizable layouts, and minimal design are key to gaining credibility with curators and institutions. The product must reflect professionalism, not gamification.					

## 4.2 Ideation

The ideation phase focused on translating the needs and frustrations identified through the user personas into implementable design strategies. Each persona embodied a different relationship to the art world – ranging from early-career artists to experienced curators and potential buyers. These perspectives revealed gaps in current digital platforms and helped imagine what features a more equal, immersive, and inclusive art space could offer.

Rather than beginning with technology infrastructure, the ideation process started with research in psychology and interaction design. Drawing from principles of design thinking (*Brown, 2009*), the personas were analysed not only for their goals, but also for the emotional and logistical constraints they faced. *Maya*, for instance, was struggling to find spaces that allowed her to express the materiality and narrative flow of her mixed-media work. This insight informed the initial proposal of a virtual environment designed to replicate the spatial layout and curatorial flow of a physical exhibition, rather than presenting artworks as isolated, scrollable thumbnails. Similarly, *Clara*'s desire to explore artists thematically and assess work in the moment informed the proposed inclusion of search filters based on medium, theme, and visualised metadata and an option to use AR to visualise artworks in physical spaces. While these features may not be fully implemented within the current project timeline, they represent key directions for future development.

The process involved mapping each persona's frustrations against possible platform features, using sketches and flowcharts to explore interface logic. As *Buxton (2007)* notes, sketching is not merely a visual task, but a cognitive one - it helps translate ideas into tangible forms quickly, allowing for faster feedback and iteration. At this stage, the tension between flexibility and usability came up as a key consideration. Artists needed control over layout and narrative, but the interface also had to be intuitive and accessible to users with varying degrees of technical proficiency. This led to decisions such as collapsible upload forms and modular VR layouts with customisable frames and sizes – all guided by user-centred design principles (*Norman, 2013*).

Another recurring theme was the importance of pacing and presence. Unlike digital platforms that encourage fast scrolling and superficial interaction, *Antro* was designed to support intentional navigation, retained attention, and a sense of spatial presence. These goals shaped early design concepts, such as click-to-see more photos and descriptions, real-scale artwork display, and lighting, the ideation phase was not linear, but circular returning repeatedly to the personas, their pain points, and the core values of authorship, accessibility, and immersion that underpin the project.

By grounding ideation in narrative needs and conceptual values rather than feature lists, this stage laid the foundation for a design approach that treats digital curation as an interpretive, empathetic, and context-driven practice.

#### **4.3 Assumption-Based Evaluation and Planned Testing**

The platform's evaluation process was shaped through the continuous application of persona-based thinking, assumption modelling, and informal peer reflection. It is crucial to acknowledge that this approach does not substitute for empirical testing with actual users, representing a significant limitation of the current project. However, it provided a conceptual framework for identifying potential usability challenges, anticipating user needs, and iteratively refining design decisions.

Throughout the development process, each core feature was assessed in relation to the key personas established in Section 4.1. These theoretical constructs provided a lens through which the platform could be critically examined: "Maya's" lack of exhibition access, for example, prompted evaluation of whether the artwork upload flow and gallery creation tools might offer sufficient autonomy. "Clara's" curatorial process informed decisions about searchability and spatial storytelling. "Aisha's" interest in scale and emotional context helped shape features such as descriptive overlays and real-world artwork dimensions.

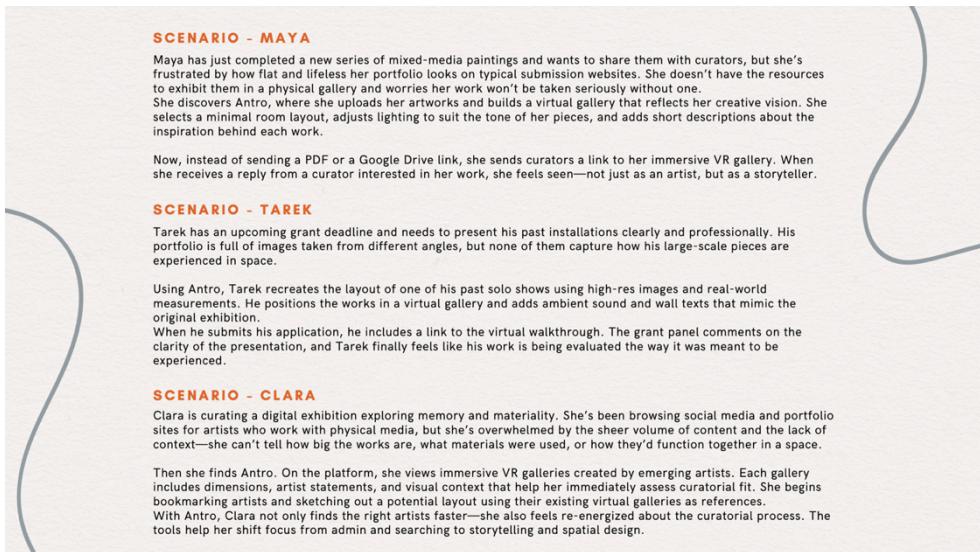
No formal interviews or testing sessions were conducted with actual users, which represents the most significant methodological limitation of this project. The absence of empirical validation means that many assertions about *Antro*'s effectiveness in

addressing user needs remain speculative. Instead, informal feedback was gathered through peer discussions, design critiques, and studio presentations. Observations from these sessions led to several design revisions, including clearer upload instructions, expanded text display for artwork descriptions, and improved interface responsiveness. These improvements were guided by user-centered design heuristics (Norman, 2013) rather than formal metrics or direct user feedback.

The limitations in this evaluation process are substantial and must be clearly acknowledged. Without structured observation or testing with actual users, no measurable data on task performance or accessibility was collected. Many assumptions – such as how users will respond to VR pacing or multi-image uploads – remain entirely speculative. While the iterative use of scenarios and persona logic offered a structured framework for refining design decisions, the absence of empirical validation means that Antro's claims about effectiveness cannot be fully substantiated at this stage.

A concrete plan for future testing has been developed to address these limitations. This includes a full round of moderated usability testing with diverse user groups once ethical approval is secured. Testing will focus on accessibility, spatial navigation, emotional engagement, and curatorial autonomy. It will explore how users interact with gallery layouts and portfolio features, with specific metrics to measure task completion rates, time-on-task, error rates, and subjective satisfaction. This testing will help determine whether Antro actually achieves its stated goals of improving presence, autonomy, and accessibility compared to existing platforms.

This planned testing represents a critical next step for validating the platform's effectiveness and addressing the methodological gaps in the current project. As Pangrazio and Sefton-Green (2021) note, it is particularly important to include users from traditionally marginalized backgrounds in this testing, as they may experience technology barriers differently than those represented in assumption-based personas.

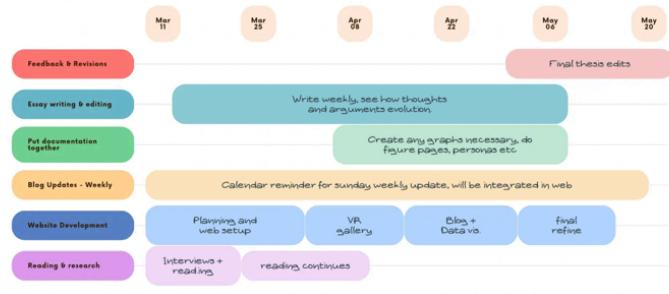


## 5 - Time Management

### 5.1 Gantt Chart

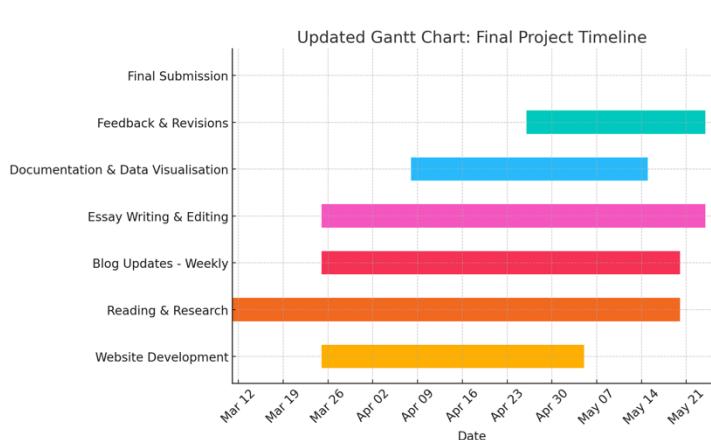
Time management played a crucial role in the development of *Antro*, especially given the scope of both technical implementation and research. The project was planned and executed over a 10-week sprint period, guided by weekly milestones and prioritised deliverables. Tasks were organised into frontend and backend development, VR integration, design iteration, and theoretical research, with clear dependencies identified throughout. The Gantt Chart visualises the work distribution, highlighting dependencies and progress flow.

## Project Gantt Chart



Each weekly sprint focused on completing functional modules while maintaining flexibility for debugging and iteration. The VR gallery integration was prioritised early to ensure sufficient time for testing spatial layouts and loading logic. Backend logic for uploads and role-based user access ran parallel to frontend interface development, with final weeks reserved for polish and refinements based on feedback.

It's important to note that while the timeline included plans for "user testing," this primarily consisted of informal peer reviews rather than structured testing with actual target users. This represents a key limitation in the development process, as thorough user testing would have provided valuable empirical data to validate design decisions. Future iterations would benefit from allocating specific time for formalised testing with diverse participants from the intended user groups.



The timeline supported alignment with broader academic deliverables, including literature review completion, persona development, and continuous blog documentation. From May 6–20, focus shifted to academic writing and essay editing, informed by blog reflections and informal feedback. This adjustment helped avoid last-minute rush and accommodated thoughtful iteration on both the platform and thesis documentation.

## 5.2 MoSCoW Prioritisation

To manage scope and focus throughout the development of *Antro*, I adopted the MoSCoW method to categorise features by necessity. This framework ensured that time and resources were allocated effectively, especially when balancing technical complexity with potential user impact.

**Must-have** features formed the backbone of the platform and included core functionalities such as profile creation, artwork uploads, a VR-powered gallery, responsive web design, and weekly blog documentation. These were considered essential to achieving the project's aims of accessibility, immersion, and artist autonomy, though it's important to acknowledge that without direct user validation, the effectiveness of these features in meeting these goals remains theoretical.

**Should-have** features, while not critical for launch, were identified as potentially valuable for enriching user experience. These included social media-linked artist profiles, artist verification, and the ability to like or save artworks – features that might enhance discoverability and engagement without blocking primary usage flows.

**Could-have** elements represented potentially valuable additions if time allowed, such as augmented reality previews, search and filtering mechanisms, and messaging spaces. These were partially explored during development but scheduled for post-launch iteration due to their complexity and the need for further research into their actual utility for the target audience.

**Won't-have** features were consciously excluded to avoid scope creep; these included mobile app versions, payment integrations, and multiplayer VR experiences. While potentially valuable, these features were deemed beyond the feasible range for this phase. It's worth noting that some of these excluded features, particularly mobile optimisation, might significantly impact the platform's accessibility and reach. This tension between technical scope and inclusivity represents an important consideration for future development.

This prioritisation method was especially useful during time-sensitive sprints, helping maintain momentum and focus on delivering a coherent platform prototype by the submission deadline. However, it's important to acknowledge that feature prioritisation was based on assumption-derived personas rather than direct user feedback, which represents a methodological limitation.

### 5.3 SMART Goals

To manage the complexity of developing both a technical platform and an academically grounded thesis, I established a set of SMART goals - Specific, Measurable, Achievable, Relevant, and Time-bound. These goals provided clear benchmarks throughout the process, helping maintain momentum and ensuring alignment between practical development and conceptual depth.

It's important to note that while these goals effectively structured the technical development and academic writing processes, there was a notable absence of specific goals related to empirical validation. Future work would benefit from including explicit goals around user testing methodologies, success metrics, and evaluation frameworks to strengthen the project's empirical foundation.

Goal	Specific	Measurable	Achievable	Relevant	Time-bound
1. User Research & Personas	Draw on desk research to create detailed user personas	Personas visualised in thesis documentation	Synthesised from Creative Access (2024), Arts Council (2020)	Grounds design in research-informed needs	Completed by April 15, 2025
2. Core Platform Development	Implement user authentication, profiles, artwork upload	5+ sample profiles, 15+ artworks	Built with HTML, CSS, JS, Node.js, MongoDB	Delivers MVP and base for VR	Complete by April 28, 2025
3. VR Gallery Implementation	Three.js environment with real-world scale	5+ artworks dynamically rendered and navigable	Spatial layouts, frame options, descriptions	Explores VR for art experiences	Completed by May 5, 2025
4. Development Blog	Weekly posts on progress, decisions, challenges	8+ posts with milestones and reflections	Managed in Notion alongside development	Documents iterative design process	March 15-May 20, 2025
5. Academic Thesis	5000-word thesis with literature review and documentation.	Draft (May 15), Final (May 25)	Organised in thematic sections	Synthesises theory and practice	Completed by May 25, 2025

## 6 - Design Processes

### 6.1 User Interface and User Experience (Frontend)

The frontend of *Antro* was designed to prioritise clarity, accessibility, and emotional engagement, especially for users navigating digital art spaces without advanced

technical expertise. Following a user-centred design approach, the interface was informed by cognitive psychology, interaction design theory, and best practices in virtual environments and creative platforms (*Johnson, 2020; Norman, 2013; Slater & Wilbur, 1997*).

The platform was built using HTML, CSS, and JavaScript, with a mobile-responsive layout to improve accessibility across screen sizes, though full VR functionality remains limited on mobile devices – a significant limitation for truly democratising access. Layouts were deliberately minimalist – monochrome backgrounds, bold headers, and soft pink accents – chosen to minimise visual clutter and direct attention to the artworks themselves. This decision aligns with affective interface research, which emphasises the role of colour harmony and visual simplicity in enhancing user focus and emotional response (*Kuo, Chang, & Lai, 2022*).

Navigation and content structure were grounded in *Johnson's (2020)* guideline that users prefer recognition over recall. This principle was implemented through clearly labelled buttons, consistent iconography, and a familiar top navigation bar that reduces cognitive load. Core features such as profile management, artwork uploads, and file previews were made easily discoverable. Forms were grouped into collapsible sections to prevent user fatigue – a technique known as progressive disclosure, which improves usability by revealing complexity only when necessary (*Tidwell, 2010*).

Artworks are displayed in a Pinterest-style grid that dynamically adjusts to screen size, supporting both aesthetic appeal and usability. Irregular, image-dominant grids have been shown to encourage exploration and retain attention in visual platforms, as they mirror the natural variability of visual scanning patterns (*Djamasbi, Siegel, & Tullis, 2010*). Their eye-tracking research found that users tend to engage more with image-rich, asymmetrical layouts, particularly in creative or content-discovery contexts. To enhance interactivity, hover states, responsive visual feedback, and click-to-enlarge modals were implemented – reinforcing *Norman's (2013)* emphasis on affordances and feedback as core components of intuitive interaction design.

Accessibility was addressed using high-contrast elements, scalable fonts, large touch targets, and alt text for uploaded images. These features align with the *Web Content Accessibility Guidelines (WCAG 2.1)* and reflect *Antro*'s broader mission of inclusivity for artists and viewers alike (*W3C, 2018*). However, it's important to acknowledge that the VR component inherently creates accessibility barriers for users without compatible hardware or those with certain visual or mobility impairments. This tension between innovative technology and universal accessibility represents a significant challenge that would require additional features and alternatives in future iterations.

Additionally, the interface is role-sensitive: verified artists are granted access to extended tools such as artwork uploads, while general users can only manage CVs and portfolios. This reduces interface clutter and ensures users are not overwhelmed by features irrelevant to their needs – a principle that echoes modular UX design standards in digital platforms (*Morville & Rosenfeld, 2006*).

While these interface decisions were informed by established research in user experience design, their effectiveness for *Antro*'s specific target audience remains theoretical in the absence of direct user testing. Future development would benefit significantly from structured usability studies with diverse participants to validate these design choices and identify areas for improvement.

### **6.1.1 Similar App Research (User Journeys and Feature Chart)**

To inform the design of *Antro*, I conducted a comparative analysis of existing platforms operating in the digital art and creative e-commerce space. This research aimed to identify common patterns, interface conventions, and user pain points – particularly regarding artwork presentation, artist autonomy, and curatorial tools. Platforms reviewed included *Google Arts & Culture*, *Saatchi Art*, *Artsy*, *New Art City*, and *VR-All-Art*. Each offers distinct features, yet none fully combine immersive engagement with creator-led curation and professional portfolio integration.

**Google Arts & Culture** focuses on digitised museum collections, offering virtual tours and high-resolution scans. While it improves public access to cultural heritage, its

experience is largely passive. Navigation relies on 2D scroll interfaces or rigid 360° panoramas, with minimal interactivity or artist control. Its interface flattens affective engagement and does not support user-uploaded content or profile-based curation (*Bishop, 2012*).

**Saatchi Art** supports emerging artists by allowing them to list and sell work online. However, the platform adopts an e-commerce model, prioritising product discovery over narrative or spatial context. Users browse static images with prices and thumbnails, and artists have limited control over layout or storytelling. It emphasises commercial viability over artistic authorship, which is counter to *Antro*'s ethos (*Hsu, 2020*).

**Artsy** positions itself as a high-end art marketplace, used by galleries, collectors, and institutions. It features search and filter functions, editorial content, and auction listings. While more comprehensive than *Saatchi*, it similarly lacks immersive presentation. Artist visibility is often tiered by account type or gallery affiliation, reproducing traditional hierarchies (*Sholette, 2011*).

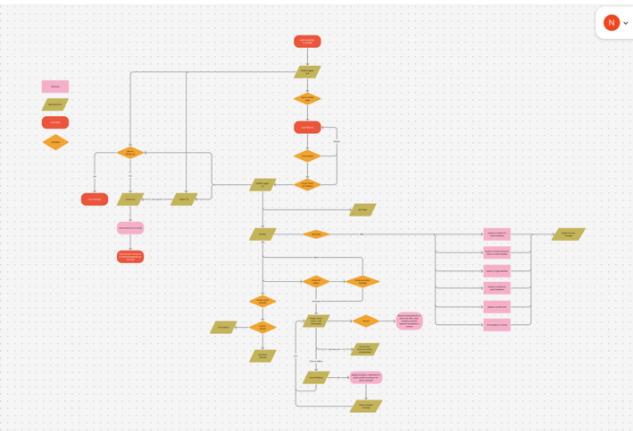
**New Art City** is an experimental platform offering browser-based virtual exhibitions for digitally produced art. Artists can build 3D rooms with creative freedom. However, the interface can be technically demanding, and file handling is non-intuitive for non-developers. It lacks scalable onboarding, integrated portfolio features, or opportunities for direct buyer or curator engagement. Despite its creative potential, it remains niche and inaccessible to many early-career artists.

**VR-All-Art** focuses on premium VR art exhibitions, often built for institutions and collectors. While visually compelling, it assumes access to VR headsets and technical assistance. The upload process is not designed for emerging or independent artists and lacks the accessibility and low-barrier entry that *Antro* aims to provide.

While this analysis provides valuable context, it's important to acknowledge that the comparative assessment was based on secondary analysis rather than direct user studies of how artists and audiences engage with these platforms. Future research

could strengthen this analysis by incorporating interviews with users of these platforms to better understand their lived experiences with the identified limitations.

### 6.1.2 Low-Fidelity Wireframes and Flowchart



In the early stages of *Antro*'s development, low-fidelity wireframes and flowcharts were used to map core interactions, visual hierarchy, and user journeys. These sketches played a foundational role in shaping the structure of key interface components before any visual styling or backend logic was implemented.

By focusing on layout and user flow rather than aesthetics, this stage supported rapid iteration and clarified which elements required conditional logic (e.g., role-based profile visibility).

Wireframes were created using *Figma*, enabling fast feedback and adjustments. The process followed a user-centred logic, with each page and component designed to support the hypothesized user goals identified through secondary research. The goal was to minimise cognitive friction while offering artists and curators creative autonomy over their content.

It should be noted that while wireframes were informed by persona-based thinking, they were not validated with actual users at this stage. This represents a methodological limitation, as early feedback from target users could have identified usability issues or conceptual gaps before moving to higher-fidelity development. Future iterations would benefit from incorporating user testing even at the wireframe stage to ensure the fundamental interaction patterns align with actual user expectations and needs.

### 6.1.3 Brand Guidelines and High-fidelity Prototype

The visual identity of *Antro* was intentionally developed to communicate credibility, inclusivity, and creative openness. These values shaped aesthetic decisions, including colour palette, typography, layout hierarchy, and interaction design. A key objective was to create a visually engaging yet accessible platform that supports both the emotional qualities of artistic expression and the usability expectations of digital interaction.

The final brand palette includes five core colours: a vibrant orange (#E97730), a soft blush pink (#F4AFC3), a rich plum (#601F3F), a subdued olive green (#777033), and a light blue (#AFC9E9), all used against a clean off-white background (#FBFBF9). These colours were selected to convey emotional warmth and individuality while avoiding oversaturation or distraction. However, aesthetic intent was balanced with accessibility requirements. All foreground/background combinations were tested using the *WebAIM Contrast Checker* and assessed against the *Web Content Accessibility Guidelines (WCAG 2.1)* published by the *W3C (2018)*.

Contrast testing revealed that the plum (#601F3F) had an excellent contrast ratio of 11.48:1, passing both *WCAG AA* and *AAA* criteria for normal and large text. The olive (#777033) achieved a 4.88:1 contrast ratio, meeting *AA* standards for normal text but failing *AAA*, but still better than the original chosen green (#AEA434) which scored a 2.48:1, failing both *WCAG AA* and *AAA*. In contrast, the orange (#E97730), pink (#F4AFC3), and blue (#AFC9E9) all fell below accessibility thresholds, scoring 2.83:1, 1.72:1, and 1.64:1 respectively. These results directly influenced how colour was applied: high-contrast colours were reserved for navigational elements, headers, and buttons, while low-contrast tones were limited to secondary accents such as hover states, outlines, or icon fills.

This approach is consistent with cognitive design principles. *Johnson (2020)* notes that inadequate contrast can increase cognitive friction, making it harder for users to understand visual interfaces, particularly for users with visual processing impairments or age-related contrast sensitivity loss. Furthermore, research by *Hall and Hanna (2004)* found that colour contrast significantly affects readability and user

attention in web design. Their study showed that high-contrast combinations improve reading speed and focus, while low contrast can impede task performance and reduce engagement.

Typography was selected to complement the colour system and reinforce usability. A modern sans-serif typeface was used for body text to ensure legibility across screen sizes and devices. Hierarchy was established through size and weight variations, maintaining readability while providing structure. As highlighted by *Sarosha (2017)*, visual rhythm and textual clarity are critical in creating interfaces that feel both intuitive and emotionally balanced.

High-fidelity prototypes were developed using *Figma* and initially rendered in black and white. This decision reflects a deliberate content-first approach that prioritised structural clarity, usability, and functional testing before introducing visual styling. Beginning with grayscale prototypes enabled rapid iteration on layout and interaction flows without the distraction or bias of colour. As *Johnson (2020)* suggests, isolating cognitive elements of interface design allows designers to validate task-based functionality before finalising aesthetics.

Once layout and structure had been validated through peer review, the brand colour palette was selectively introduced in later iterations, primarily in navigational components, hover states, and accent details. These prototypes present a minimalist layout that prioritises visual storytelling while integrating affordances for user interaction. Key components – including navigation bars, action buttons, and modal overlays – follow contrast and spacing rules to ensure compliance with both usability heuristics and accessibility standards.

While these design decisions were grounded in established research on colour theory, typography, and accessibility, it's important to acknowledge that the actual impact of these aesthetic choices on user experience remains theoretical without validation through user testing. Future iterations would benefit from formally assessing how the visual identity affects perceptions of trustworthiness, emotional resonance, and ease of use among the platform's intended audience.

In summary, the brand guidelines and high-fidelity prototype of *Antro* represent a synthesis of visual expressiveness and functional accessibility. These decisions were informed by psychological and behavioural research on digital interaction, though effectiveness for the specific context of digital art curation.

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**EXHIBITION THEME: XYZ**

LOCATION

Description of project/job.

[CONTACT](#) [SAVE](#)**LOOKING FOR STUDIO SPACE**

LOCATION

Description of project/job.

[CONTACT](#) [SAVE](#)**LOOKING FOR X THEME ARTIST**

LOCATION

Description of project/job.

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#### **6.1.4 Design Considerations**

There were key decisions that had to be made, decisions that extended beyond visual aesthetics into spatial logic, user emotion, technical feasibility, and ethical responsibility. This section reflects on the core considerations that shaped the platform's final outcome, discussing not only what was implemented, but why – and how each choice balanced conceptual vision with real-world constraints.

One of the main goals of *Antro* was to avoid the fast-scrolling, over-populated interfaces that digital art platforms tend to be. Referencing *Freina and Ott (2015)*, *Slater & Wilbur (1997)*, and *Riva (2018)*, *Antro* treats the gallery as a navigable space rather than a scrollable page. Grounded by the persona's wish for story-telling immersion, artworks within the VR gallery are hung on each wall and presented at real-world scale using *Three.js*. This intentional pacing encourages viewers to stop and explore and understand – a contrast to the hyper-consumable logic of Instagram or Artsy.

However, this design choice represents a trade-off that warrants critical examination. While potentially creating a more immersive experience, the spatial approach may also introduce new barriers to access. Users on slow devices or with limited bandwidth might experience delays when loading or navigating. To address this, the platform was optimised with lightweight textures and simplified geometries, prioritising immersion without completely sacrificing accessibility. Future user testing would need to validate whether this approach delivers the intended emotional connection compared to conventional interfaces.

#### **Device Compatibility and Resource Limitations**

Given the range of potential users - students through to curators – device inclusiveness was important. *Antro* was purposefully created to be experienced on any typical screen (no VR headsets or special hardware are required). This choice fits the platform's intention of being both inclusive and easy to enter. *Three.js* was selected due to robust WebGL support and compatibility across browsers, allowing an engaging spatial interaction within a basic browser experience.

Despite these efforts toward inclusivity, it's important to acknowledge the technological requirements still present potential barriers. Performance testing showed that attempting to load multiple hi-res artworks simultaneously puts a load on older/lower-end devices. As a result, progressive loading techniques and resolution scaling were implemented to maintain responsiveness without sacrificing visual quality. This technical constraint highlights a tension between the platform's democratising aims and its reliance on relatively recent technology. While no specialised hardware is required, users with outdated devices or limited internet access may still experience barriers – an issue that would need empirical validation through testing with diverse user groups. Future iterations may explore adaptive rendering or server-side preprocessing to further optimise performance across a wider range of devices.

Following *Johnson's (2020)* cognitive design principles, *Antro*'s interface was built to reduce cognitive load through consistency, affordances, and progressive disclosure. For example, collapsible upload forms were used to prevent cognitive overload, and action buttons include hover states and icons to signal interactivity. Typography and spacing followed a strict modular scale allowing the platform to remain legible across screen sizes, and button placement reflected expected navigation patterns (breadcrumbs, navigation tabs, search etc.) identified in *Tidwell (2010)*. The aim was to keep the platform intuitive, particularly for those less familiar with digital tools. However, in balancing minimalism with feature richness, some advanced options (e.g., artwork resizing, optional background music or layout fine-tuning) were deferred to post-MVP updates, based on MoSCoW prioritisation.

## **Accessibility and Ethical UX**

Design decisions were evaluated against *WCAG 2.1* standards to ensure *Antro* could serve users with diverse needs. Tools like WebAIM's Contrast Checker were used to test brand palette legibility, leading to the refinement of accent colours (see 6.1.3). All interactive elements were assigned semantic roles and alt-text, and touch targets were enlarged for mobile accessibility. Beyond technical compliance, the platform embraces what *W3C (2018)* describes as inclusive design: anticipating

variance in vision, cognition, and input method, rather than treating them as after-thoughts.

While these accessibility considerations are important, the choice of a VR-based interface creates tension with full accessibility. Spatial interfaces, even web-based ones, can present challenges for users with certain visual or cognitive impairments. This represents a limitation in the platform's claim to be fully democratising, as some users may still face barriers despite WCAG compliance efforts. This aligns with the ethical intention of equitable digital access, but highlights the challenges of truly universal design when employing immersive technologies.

### **Data Sensitivity and Platform Ethics**

While not handling financial transactions, *Antro* manages sensitive content such as artist CVs, portfolios, and curatorial logic. Back-end systems were built with *Express.js* and *MongoDB*, using token-based authentication and route protection to limit exposure. Files are stored securely with upload paths differentiated by file type and user ID, reducing accidental access or corruption.

The platform avoids algorithmic sorting or popularity metrics, resisting the data-extractive patterns criticised by *Hsu (2020)* and *Scholz (2016)*. Instead, *Antro* prioritises curatorial intent and authorship. However, this ethical approach raises questions about financial sustainability that are not fully addressed in the current implementation. Without metrics-driven sorting or engagement incentives, the platform would need alternative funding models to avoid eventually replicating the commercial pressures it critiques. This economic consideration requires further development to ensure the platform's ethical design principles remain viable in practice. This ethical design posture reflects a broader commitment to platform responsibility – supporting autonomy, transparency, and user agency.

### **Trade-offs and Future Improvements**

Not all design ambitions could be implemented within the current scope. For example, augmented reality features, real-time collaborative features, mobile app

versions, and advanced filtering by medium or theme were all deferred due to time and resource constraints. Additionally, while user interface responsiveness has been optimised through media queries and flexible grids, full mobile-first adaptation for the VR gallery remains a challenge.

These limitations affect the platform's ability to fully deliver on its stated goals of democratisation and accessibility. The mobile adaptation challenges potentially exclude users who rely primarily on smartphones for internet access – often those in demographics the platform aims to serve. This highlights a gap between theoretical intention and practical implementation that would benefit from being more explicitly acknowledged.

Future versions will include a more robust onboarding process, expanded mobile support, and empirically validated accessibility features based on user testing with diverse participant groups.

## 7 – Outcome

The outcome of this project is a fully functional Minimum-Viable Product of *Antro*, a web-based VR platform designed to support emerging artists through immersive digital exhibition. The platform includes core features such as *user authentication, profile creation, role-sensitive access, multi-image artwork uploads, and the construction of scale-accurate VR galleries using Three.js*. All intended must-have features were successfully implemented, including auto-verification for institutional emails, token-based session management, and responsive user interface behaviour across verified and general users.

From a technical perspective, the platform performs all essential interactions as designed: users can create accounts, edit their profiles, upload artworks with real-world dimensions, attach contextual descriptions, and curate virtual exhibitions with precision. The VR gallery builder dynamically renders selected artworks at scale across four gallery walls, preserving curatorial intent through consistent spatial logic and artwork metadata snapshotting. File uploads for artworks, CVs, and portfolios

are handled securely, with user-specific routing and error protection, and the interface follows responsive layout logic and WCAG-informed design choices.

It's important to acknowledge that while these technical achievements demonstrate the concept's viability, their effectiveness in delivering the intended user experience remains theoretical without empirical validation. The final platform aligns with the SMART goals and prioritised features outlined at the start of the project, but the assessment of whether *Antro* truly offers a meaningful alternative to traditional digital art platforms would require structured user testing beyond the scope of this initial development.

Rather than claiming *Antro* definitively '**restores curatorial agency and prioritises presence, authorship, and emotional engagement**', it would be more accurate to say it was designed with these goals in mind, creating a potential framework for these values to be expressed in digital exhibition. Artists now have tools intended to define not only what is shown but how it is experienced, and curators can access artist-led showcases without requiring physical proximity or institutional affiliation, though whether these tools deliver their intended emotional and social impact remains to be validated.

While the core functionality was delivered, several features were intentionally postponed to preserve scope and ensure stability. These include augmented reality previews, in-gallery audio integration, and artwork search and filtering mechanisms. Although sketched out during the ideation phase, they were postponed due to time constraints. This decision reflects a commitment to delivering a cohesive and testable MVP rather than a fragmented or incomplete feature set.

Evaluation was conducted through continuous informal testing, short development sprints, and frequent self-assessment against user needs and personas. While this approach provided valuable development guidance, it represents a significant limitation in validating the platform's effectiveness. Design decisions were iteratively refined based on observed usability issues, such as improving upload flows, refining description visibility, and adjusting spatial parameters in the VR environment. However, these refinements were based primarily on designer

observations rather than diverse user feedback, limiting the confidence with which claims about user experience can be made. While formal usability testing is planned for future development phases, the platform's current state is stable and aligned with the project's research values, though empirical validation of its effectiveness remains a necessary next step.

Ultimately, *Antro*'s MVP stands as a proof of concept for an alternative approach to art platforms – one that aims to foreground presence over passive consumption, and inclusion over gatekeeping. Its successful implementation confirms the technical viability of the concept, while leaving open important questions about its real-world impact that would need to be addressed through formal user research.

## 8 – Reflection and Future Development

Developing *Antro* has been both a technical and conceptual learning journey, exploring what a student-led project can achieve within a limited timeframe. While the initial goals were ambitious – spanning immersive technology, digital curation, and professional visibility – the final MVP reflects a synthesis of these aims through prioritisation, user-centred design principles, and iterative development. The process demanded constant negotiation between research insight, design ethics, and technical feasibility, reinforcing the value of adaptive thinking in creative computing.

One of the most valuable aspects of the project was the inter-play between conceptual values and technical execution. The decision to prioritise presence, curatorial autonomy, and accessibility – rooted in the literature on virtual embodiment (*Slater & Wilbur, 1997*; *Riva, 2018*), platform inequality (*Mignogna, 2019*; *Hsu, 2020*), and affective design (*Johnson, 2020*) – guided everything from layout logic to backend schema design. Implementing spatially scaled artworks and ensuring contextual description overlays required not only a creative approach to frontend logic but also a robust data architecture that preserved curatorial intent over time. At the same time, the use of modular JavaScript and RESTful backend endpoints allowed for scalable features without compromising responsiveness or user clarity.

The project has several significant limitations that must be acknowledged. First, the absence of formal usability testing means that certain assumptions – such as optimal VR pacing or interface clarity for less technically confident users – could not be thoroughly validated. This represents a fundamental methodological limitation that affects the certainty with which any claims about the platform's effectiveness can be made. Informal feedback was useful for development, but structured testing with diverse users is essential for evaluating accessibility, user experience, and long-term engagement.

Second, while the project critiques commercial platforms for their extractive models, it does not yet fully articulate a sustainable alternative economic approach. The current implementation avoids algorithmic sorting and engagement metrics but doesn't address how the platform would remain viable without eventually adopting similar monetization strategies. This leaves an unresolved tension between the project's critique and its implementation.

On a personal level, the process surfaced the challenge of managing both the technical depth of full-stack development and the critical expectations of academic research. While rewarding, this dual demand required constant context-switching – between coding logic, user narratives, accessibility heuristics, and visual coherence. It highlighted the importance of planning, short development sprints, and progressive disclosure of complexity. The most significant challenge was the initial implementation of the VR gallery logic – particularly ensuring artwork positioning and real-world scaling. Solving this required a deeper understanding of *Three.js* spatial parameters and more rigorous testing than originally anticipated.

Looking forward, *Antro* requires several key developments to address its current limitations:

1. **Empirical validation** – Implementing formal user testing with diverse participants to validate whether the platform delivers the emotional connection and enhanced presence it aims to create.
2. **Economic sustainability model** – Developing a clear approach to financial viability that doesn't reproduce the extractive models the platform critiques,

potentially exploring cooperative ownership, cultural funding, or institutional partnerships.

3. **Enhanced accessibility** – Addressing the tension between VR interfaces and universal access through alternative navigation modes, expanded mobile support, and assistive technology integration.
4. **Evaluation metrics** – Creating specific, measurable indicators to assess whether *Antro* achieves its stated goals around democratisation, presence, and emotional connection.

Additional priorities include enhanced search and discovery functionality – allowing users to explore artworks thematically or filter by medium, size, or artist background; community-building features, such as messaging or multiple user gallery access; and a more ethical data model – avoiding extractive engagement metrics in favour of qualitative feedback or collaborative annotation systems.

In conclusion, this project suggests that digital curation has the potential to move beyond the limitations of commercial art platforms. With thoughtful integration of immersive technologies, platform ethics, and inclusive design, *Antro* offers a potential model for reimagining how art is shared online. While the current implementation has significant limitations in methodology and validation, the conceptual framework provides a foundation for future development of more equitable digital exhibition spaces.

## **9 - References**

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