

Interactive System for Collective Engagement in Live Music Events

Reframing Attention
in Festival Environments

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Politecnico di Milano - School of design
Master Degree in Digital and Interaction Design
A.Y. 2024/2025



POLITECNICO
MILANO 1863

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Index

List of Figures	6
Abstract	8
01 Introduction	10
1.1 Goals and context of the research	10
02 Context	12
2.1 Methodology process	12
2.2 Analysis of the Festival Landscape	13
2.3 Macro-Themes Categorization	14
2.4 Emerging Critical Scenarios in Contemporary Festivals	16
2.5 Relevant Case Studies and Experiential References	19
03 Framework	21
3.1 Double Diamond Process	21
3.2 Focus on Digital Distraction & Audience Passivity	22
04 Discover	24
4.1 Methodology Process	24
4.2 Quantitative analysis: mapping the Italian festival landscape	25
4.3 Correggio Music Festival Evidence	27
4.4 The Festival Ecosystem	29
4.5 What others do	30
4.6 Key Insights from the Discover Phase	37
05 Define	38
5.1 Methodology Process	38
5.2 Who are the users?	39
5.3 Who are the festival-Goers?	40
5.4 User interview	42
5.5 User needs	49
5.6 Personas	49
5.7 Key Insights from the Define Phase	54
5.8 Problem definition	55
06 Develop	56
6.1 Methodology Process	56
6.2 From Insights to design directions	57
6.3 Concept exploration	59
6.3.1 <i>Concept A: Smartphone object detection</i>	59
6.3.2 <i>Concept B: Collective Dancehall</i>	59
6.4 Concept definition	60
6.4.1 <i>Concept A: Scenario of use</i>	60
6.4.2 <i>Concept A: Strength and Weakness</i>	61

6.4.3 <i>Concept B: Scenario of use</i>	62
6.4.4 <i>Concept B: Strength and Weakness</i>	63
6.5 Privacy considerations	64
6.5.1 <i>Concept A</i>	65
6.5.2 <i>Concept B</i>	65
07 Deliver	66
7.1 Methodology Process	66
7.2 Interaction Model	67
7.2.1 <i>Concept A</i>	67
7.2.2 <i>Concept B</i>	68
7.3 System architecture	70
7.3.1 <i>Concept A</i>	70
7.3.2 <i>Concept B</i>	71
7.4 How it works	73
7.4.1 <i>Concept A</i>	73
7.4.2 <i>Concept B</i>	75
7.5 Prototype Constraints	76
7.6 Prototyping Strategy	77
7.6.1 <i>Prototype set-up</i>	77
7.7 Testing Framework	79
7.7.1 <i>Ethical and privacy framework</i>	79
7.7.2 <i>Research Method</i>	80
7.8 Improved prototype	80
7.9 Focus group evaluation	82
08 Results	84
8.1 User test result	84
8.2 Focus group result	86
8.3 Impact and Future development	88
8.3.1 <i>Consolidated Insights</i>	88
8.3.2 <i>Design opportunities</i>	89
8.3.3 <i>Final considerations</i>	90
09 Conclusion	91
Bibliography	94
Sitography	95
Appendix	96

List of Figures

Figure 01	11
<i>Audience members recording a live concert with smartphones, partially obstructing the view of the stage. Source: The Guardian, “Concerts ruined by selfish people using their phones”. Credit: Alamy</i>	
Figure 02	13
<i>Audience at Umbria Jazz Festival during a live performance, 20 July 2025. Source: Umbria Jazz Archive.</i>	
Figure 03	14
<i>Light installation depicting a butterfly structure. Source: LBB Online, “The Future of Festivals: Immersive Trends and Innovative Engagements”.</i>	
Figure 04	15
<i>Rock in Roma Festival, 12 July 2013. Source: Wikimedia Commons.</i>	
Figure 05	15
<i>Terraforma Festival, June 2019,Source: ZERO.eu</i>	
Figure 06	15
<i>Macerata opera Festival, Source: sferisferio.it</i>	
Figure 07	15
<i>Collisioni Festival, Source: hotelcalissano.com</i>	
Figure 08	16
<i>Apolide Festival, 20 Luglio 2022, Source: wumagazine.com</i>	
Figure 09	16
<i>roBOt Festival, 2024, Source: www.atribune.com,Credit: Riccardo Giori</i>	
Figure 10	17
<i>John Travolta dancing “Il ballo del QUA QUA” at Sanremo 2024, Source: laRepubblica.it</i>	
Figure 11	17
<i>A still from a drone video shows vehicles trying to leave the Burning Man festival on Sunday, September 2023, Source: CNN</i>	
Figure 12	17
<i>Bob Sinclar talks about the usage of mobile phones during his performance on his social media profile, Mykonos, 2024, Source: Instagram</i>	
Figure 13	18
<i>Spotify logo, Source: faroutmagazine.co.uk</i>	
Figure 14	18
<i>People waiting in lines to go to the bathroom, Source: Getty images, Credit: Gideon Mendel</i>	
Figure 15	18
<i>Loudspeaker competition in Allahabad, India, 2011. Credit: Rajesh Kumar Singh</i>	
Figure 16	18
<i>Crowd management staff watching a dense crowd, Source: iStock photo</i>	

Figure 17	19
<i>Camera captures a couple on the big screen at a Coldplay concert, revealing a secret relationship, 17 July 2025 Source: laRepubblica.it</i>	
Figure 18	19
<i>Nameless Festival stage, 2024, Credit: Stefano Manzoni</i>	
Figure 19	19
<i>The Offline Experience cover, Source: corriere.it</i>	
Figure 20-21	20
<i>Interactive installation with led floor WOA Studio and LIMITEAZERO, MIDO Eyewear Show, 2024. Source: Instagram // Live iris capture, participant undergoing biometric scanning to contribute her iris to the interactive projection.</i>	
Figure 22	20
<i>Horace Andy and Massive Attack perform live during the Unaltrofestival Festival. Credit: Alessandro Bremec/SOPA Images/LightRocket via Getty Images</i>	
Figure 23	21
<i>Double Diamond diagram, Source: designcouncil.org.uk</i>	
Figure 24	22
<i>Post about Bruno Mars behavior towards mobile phone, Source: Global Pop Groove Icon facebook page</i>	
Figure 25	23
<i>People holding telephone during concert, Source: Envato</i>	
Figure 26	23
<i>Woman using a mobile phone in a theater, Source: Evening Standard, Credit: Getty images</i>	
Figure 27	23
<i>Yondr lockable pouches, Source: laRepubblica.it</i>	
Figure 28	24
<i>Venn diagram showing the interesction between UX design, Interaction design and Live entertainment</i>	
Figure 29	26
<i>Screenshot from the festival landscape excel file gathering more than 600 italian festival</i>	
Figure 30	26
<i>Alluvial diagram showing the distribution of genre in music festival</i>	
Figure 32	27
<i>Correggio Music Festival logo, Credit: CMF</i>	
Figure 31	27
<i>Drone shot of the audience at the first edition of Correggio Music Festival, Correggio, June 2024, credit: CMF</i>	
Figure 33	31
<i>Ecosystem map showing the stakeholder, tools and investments involved in the organization and execution of a festival</i>	
Figure 34	32
<i>Moment factory logo, Source: momentfactory.com</i>	
Figure 35	32
<i>Photo inside the Basilica, Aura, Luminous experience in the heart of Notre-Dame Basilica, Montreal 2017, Source:momentfactory.com</i>	

Figure 36	32
<i>Rhizomatiks logo, Source: rhizomatiks.com</i>	
Figure 37	33
<i>Photo of the stage during Perfume exhibition, Reframe tour, Source: Youtube</i>	
Figure 38	33
<i>Sensory studio logo, Source: sensorystudio.co</i>	
Figure 39	33
<i>Photo of the stage during a set at Blanche, London, Source: sensorystudio.co</i>	
Figure 40	34
<i>Pico Global logo, Source: pico.com</i>	
Figure 41	34
<i>People watching the visual from projection mapping inside a big tent in Coachella, Source: pico-plus.com</i>	
Figure 42	34
<i>teamlab logo, Source: teamlab.art</i>	
Figure 43	35
<i>Two kids interacting with the table, A Table where Little People Live, 2013, Source: teamlab.art</i>	
Figure 44	35
<i>Refik Anadol, Source: UNESCO</i>	
Figure 45	35
<i>Photo of the performance of Visions of America: Amériques, Los Angeles, US 11 June 2014, Source: refikanadol.com</i>	
Figure 46	36
<i>Jacopo Ricci, Source: thevision.com, Credit: Enrico Rassu</i>	
Figure 47	36
<i>Kvant laser on a stage during Fedez live show, Source: plsn.com</i>	
Figure 48	36
<i>LED wristbands used during a concert, Credit: Carlos RM (CC) 2012.</i>	
Figure 49	40
<i>Artist POV, photo during a performance at the OMI festival, Reggio Emilia, 2023, Source: Instagram</i>	
Figure 50	51
<i>Sketch of a man representing the Festival attendee</i>	
Figure 51	52
<i>Sketch of a man representing the Festival organizer</i>	
Figure 52	53
<i>Sketch of a man representing the Emerging artist</i>	
Figure 53	56
<i>Diagram to summarize chapter 5</i>	
Figure 54	59
<i>Concept A, The original image of the massive attack performance has been modified for research purposes.</i>	
Figure 55	59
<i>Concept B, Interactive Shadow Art, Source: www.klmultimedia.com</i>	

Figure 56	60
<i>Sketch showing the system of Concept A in a festival scenario</i>	
Figure 57	62
<i>Sketch showing the system of Concept B in a festival scenario</i>	
Figure 58	68
<i>Sketch showing the Interaction model of Concept A</i>	
Figure 59	69
<i>Sketch showing the Interaction model of Concept B</i>	
Figure 60	70
<i>Sketch showing the System architecture of Concept A</i>	
Figure 61	71
<i>Sketch showing the System architecture of Concept B</i>	
Figure 62	73
<i>Screenshot of touchdesigner network of the prototype of Concept A</i>	
Figure 63 to 68	73
<i>Knots of the touchdesigner network of Concept A</i>	
Figure 69	75
<i>Screenshot of touchdesigner network of the prototype of Concept B</i>	
Figure 70 to 72	75
<i>Knots of the touchdesigner network of Concept B</i>	
Figure 73	77
<i>Kinect position during the test</i>	
Figure 74 to 76	78
<i>Photos of the Microclub party, with the prototype of concept B in use</i>	
Figure 77	81
<i>Screenshot of touchdesigner network of the improved prototype of Concept B</i>	
Figure 78 to 79	81
<i>Knots of the new touchdesigner network of Concept B</i>	
Figure 80	82
<i>New prototype of Concept B set-up for the Focus group evaluation</i>	
Figure 81 to 85	84
<i>Photos of the Microclub party, with the prototype of concept B in use</i>	

Abstract

EN

This thesis explores the relationship between Interaction Design and User Experience in the redefinition of audience engagement in contemporary festivals, parties, and live music events. From the analysis of the Italian context, the thesis has identified a number of emerging critical issues, such as the algorithmic standardization of music offer, the complexity of event organization, and, above all, the increasing use of smartphones during live music events.

By using the Double Diamond methodological framework, the project combines qualitative and quantitative research, mapping of the festival ecosystem, definition of personas, and the identification of design opportunities. The analysis points out how the intrusive use of smartphones changes the live experience into a mediated and documentary act, which decreases presence, shared attention, and emotional intensity. However, instead of adopting a prohibitive approach to technology, the thesis explores its potential as a design lever.

The objective is to develop an interactive system capable of transforming passive presence into active participation, enhancing the collective dimension of the event. The project is conceived as a scalable, low-impact solution, particularly suited to small and medium-sized festivals, where limited resources and complex organizational structures make the introduction of experiential innovations difficult.

The research demonstrates how a structured UX approach, based on the integration of technology, space, and audience behavior, can help restore audience centrality and presence in the live moment, transforming interaction into a catalyst for social engagement.

IT

Questa tesi esplora il ruolo dell'Interaction Design e della User Experience nel ripensare il coinvolgimento del pubblico all'interno di festival, serate ed eventi musicali contemporanei. Partendo dall'analisi del panorama italiano, la ricerca individua una serie di criticità emergenti, tra cui la standardizzazione algoritmica dell'offerta musicale, la complessità organizzativa degli eventi temporanei e, soprattutto, il crescente utilizzo degli smartphone durante il live.

Attraverso il framework metodologico del Double Diamond, il progetto integra ricerca qualitativa e quantitativa, mappatura dell'ecosistema festivaliero, definizione di personas e individuazione di spazi di progettazione. L'analisi evidenzia come l'uso invadente dello smartphone trasformi l'esperienza live in un atto mediato e documentativo, riducendo la presenza, l'attenzione condivisa e l'intensità emotiva. Tuttavia, anziché proporre un approccio proibitivo verso la tecnologia, la tesi ne indaga il potenziale come leva progettuale.

L'obiettivo è sviluppare un sistema interattivo capace di convertire la presenza passiva in partecipazione attiva, valorizzando la dimensione collettiva dell'evento. Il progetto si configura come una soluzione scalabile e a basso impatto, pensata in particolare per festival di piccole e medie dimensioni, dove risorse limitate e strutture organizzative complesse rendono difficile l'introduzione di innovazioni esperienziali.

La ricerca dimostra come un approccio UX strutturato, fondato sull'integrazione tra tecnologia, spazio e comportamento del pubblico, possa contribuire a ristabilire centralità e presenza del pubblico nel momento live, trasformando l'interazione in catalizzatore di coinvolgimento sociale.

01

1.1

Introduction

Goals and context of the research

Music festivals have become one of the most relevant cultural phenomena of contemporary society. Over the past decade, their number has grown significantly, transforming festivals into key social, economic, and cultural infrastructures for cities, territories, and communities⁽¹⁾. They are no longer just moments of entertainment, but complex systems where music, identity, technology, branding, spatial design, and collective experience intersect.

This rapid growth has also generated structural tensions. Festivals increasingly operate within fragile organizational ecosystems, especially in small-medium contexts where limited budgets, volunteer-based teams, and minimal margin for error define operational reality. At the same time, large-scale events face different pressures: standardization of formats, strong brand influence, optimized crowd flows, and fragile crowd management strategies. These dynamics often prioritize efficiency, safety, and scalability over experimentation and experiential depth.

Simultaneously, the experience of live events is undergoing a profound transformation. Smartphones, social media, and constant digital connectivity have reshaped the way audiences participate in concerts and festivals⁽²⁾. While these tools allow people to document, share, and extend the life of an event beyond its physical duration, they also introduce new forms of distraction and passivity. Attention becomes fragmented, moments are mediated through screens, and participation risks shifting from embodied engagement to observational consumption.

Privacy concerns further complicate this landscape. Camera systems, large-scale projections, and digital infrastructures are increasingly embedded within event environments. While they enable immersive scenographies and interactive installations, they also raise questions about data usage, surveillance perception, and informed consent. Designing technological interventions in festival contexts therefore requires careful ethical consideration.

Crowd management represents another critical dimension. Festivals must balance safety regulations, spatial constraints, and audience density, often limiting spontaneity and informal

interaction. The challenge lies in maintaining both security and meaningful collective experience without reducing participants to manageable flows.



Figure 01
Audience members recording a live concert with smartphones, partially obstructing the view of the stage. Source: The Guardian, "Concerts ruined by selfish people using their phones". Credit: Alamy

This multiplicity of pressures defines the broader context of this research. On one side, festivals are becoming increasingly structured, standardized, and operationally constrained. On the other, audiences express a growing desire for meaningful, immersive, and memorable experiences. Moments that feel unique, shared, and rooted in the present.

Within this framework, digital distraction is not treated as an isolated problem, but as a symptom of a deeper transformation in attention, participation, and collective presence. The challenge is not to eliminate technology, nor to nostalgically return to a pre-digital condition. Rather, it is to rethink how interaction design can mediate between technological mediation, organizational constraints, and human desire for shared intensity.

The goal of this thesis is therefore to explore how interaction design and user experience principles can be applied to live music festivals in order to foster embodied participation, collective awareness, and perceptual presence. Rather than discouraging technology, the project investigates how digital systems can be reimagined as tools that enhance engagement while remaining ethically transparent and operationally sustainable.

Through research, analysis, and design experimentation, this

⁽¹⁾ Carvalhal, F. *THE NATURE AND SCOPE OF FESTIVAL STUDIES*.

⁽²⁾ Turkle, S. (2012). *Alone together: Why we expect more from technology and less from each other*.

work aims to propose an interactive system capable of responding simultaneously to audience needs and festival constraints. The focus is to create experiences that motivate users to remain present, not because they are forced to disconnect, but because the shared moment itself becomes more valuable than its documentation.

02 Context

2.1 Methodology process

This chapter adopts an exploratory approach aimed at building a contextual foundation for the design phase. The process started with a set of guiding questions intended to clarify the broader environment in which contemporary festivals operate like:

How do festivals operate as complex ecosystems connecting artists, organizers, and audiences?; How do physical spaces, stage design and installations influence collective experiences?; What motivates people to attend and actively participate in festivals?; How do audiences behave in shared, high-stimulation environments like music festivals?; How can data collection and visualization make audiences feel represented and connected?

These initial questions addressed three main domains: the evolution of the festival ecosystem, audience behavior during live events, and the role of interaction design within entertainment contexts.

The first phase consisted of an exploratory research. Academic articles, industry reports, journalistic sources, and design case studies were consulted in order to obtain a preliminary understanding of the “festival world,” audience participation patterns, and existing interactive practices. This phase was intentionally broad and non-linear, allowing recurring themes and tensions to emerge organically.

Following this initial exploration, the research moved toward a more structured investigation of the Italian festival landscape. Through the consultation of national event aggregators, particularly Trovafestival, a comprehensive reference base was established. This enabled the identification and categorization of festivals into typological clusters, providing a clearer overview of formats, scales, and thematic orientations.

Once this mapping phase was completed, the focus shifted to the identification of recurring critical scenarios within the festival ecosystem. In addition, informal conversations were conducted with peers and frequent festival attendees in order to gather experiential insights and perceptions grounded in lived experience.

Finally, the research expanded toward the identification of positive and inspirational case studies. International references and cross-disciplinary examples were analyzed to understand how interaction design, technology, and spatial strategies have been successfully integrated into live experiences.

2.2 Analysis of the Festival Landscape

Music festivals are not a recent phenomenon, but their contemporary form has evolved significantly over time. Historically, festivals have functioned as spaces of cultural gathering, ritual celebration, and collective exchange. In their modern musical format, they emerged prominently in the second half of the twentieth century, combining artistic experimentation, youth culture, and social identity. As highlighted in recent cultural analyses, festivals have increasingly positioned themselves as platforms for intercultural dialogue and global exchange, facilitating encounters between diverse audiences, genres, and traditions (Deeds Magazine, n.d.). This dimension of cultural exchange remains central to their narrative, reinforcing the idea of festivals as temporary communities structured around shared experience.

However, the rapid expansion of the festival industry has transformed these events into complex economic ecosystems. What began as community-driven gatherings has progressively integrated branding strategies, sponsorship dynamics, tourism infrastructures, and large-scale production models. This evolution has introduced structural tensions within the sector. As discussed in analyses of the Italian context, the “festival supply chain” has become increasingly dependent on financial speculation, sponsorship investments, and institutional funding, creating fragile systems that are highly sensitive to market fluctuations and environmental variables (Il Manifesto, 2023). Festivals are therefore not only cultural phenomena, but also economic operations embedded in broader production networks.

Within Italy specifically, the scale of the phenomenon is striking.

Figure 02
Audience at Umbria Jazz Festival during a live performance, 20 July 2025. Source: Umbria Jazz Archive.



Estimates suggest that more than 42,000 festivals and local celebrations take place annually across the country, yet a significant proportion of these events lack a strong connection to local identity or territorial authenticity. This proliferation raises questions about qualitative differentiation and the sustainability of the cultural offering. When replication replaces rootedness, festivals risk becoming interchangeable formats rather than context-specific experiences.

One of the consequences of this expansion is the growing standardization of programming. It has observed how festival line-ups increasingly rely on similar headliners and touring circuits, leading to repetitive combinations of artists across different cities and countries (Far Out Magazine, 2023). While data-driven booking strategies reduce financial risk, they also contribute to homogenization, limiting experimentation and weakening distinctive identities. In this sense, algorithmic logics and market optimization influence not only communication strategies but also artistic direction⁽³⁾.



Figure 03
Light installation depicting a butterfly structure. Source: LBB Online, "The Future of Festivals: Immersive Trends and Innovative Engagements".

At the same time, new experiential trends are emerging in response to this saturation. Recent industry reports highlight the growing integration of immersive technologies, hybrid physical-digital formats, interactive installations, and multisensory scenographies as ways to differentiate events and deepen audience engagement (LBB Online, 2023). These trends signal a shift from festivals as sequences of concerts toward festivals as designed environments, where spatial storytelling and participatory mechanisms become strategic assets.

Taken together, these dynamics describe a landscape in continuous transformation: historically rooted yet economically industrialized, culturally ambitious yet increasingly standardized, and simultaneously pressured by market forces and driven by innovation. Understanding this evolving ecosystem is essential in order to identify where meaningful design interventions can operate without reinforcing the very dynamics that risk diluting the uniqueness of live collective experience.

2.3 Macro-Themes Categorization

The following categorization derives from the organization of data collected through national festival aggregators and publicly available event platforms. Many festivals already employ descriptive labels to define their identity, and for others, the collected data were interpreted and reorganized into broader

Figure 04
Rock in Roma Festival, 12 July 2013.
Source: Wikimedia Commons.



Figure 05
Terraforma Festival, June 2019,
Source: ZERO.eu



Figure 06
Macerata opera Festival,
Source: sferisferio.it



Figure 07
Collisioni Festival,
Source: hotelcalissano.com



macro-themes in order to facilitate comparison and highlight recurring experiential patterns. The proposed categories do not represent rigid or official taxonomies, but rather an interpretative framework developed to synthesize heterogeneous information into a coherent analytical model.

This is the result of categorizing six macro-themes describing the dominant typologies of contemporary festivals in Italy:

Urban Mega Festivals

These events take place in large cities, arenas, stadiums, or urban parks and are characterized by high attendance numbers, mainstream line-ups, and strong brand presence. Music genres are predominantly pop, rock, and electronic, with a focus on mass entertainment and large-scale production. Their duration typically ranges from three to five days. While these festivals benefit from visibility, accessibility, and economic impact, they often face challenges related to standardization, audience passivity, and digital distraction due to their scale and density.

Nature & Escapism Festivals

Set in natural environments such as forests, mountains, beaches, or remote landscapes, these festivals emphasize immersion, disconnection from everyday routines, and collective rituals. The musical offering often includes electronic, ambient, indie, or experimental genres, accompanied by themes of sustainability, spirituality, and introspection. Usually lasting between two and four days, these festivals attract audiences seeking sensory depth and a strong sense of belonging, positioning the experience itself as central to their identity.

Heritage & Classical Festivals

This category includes festivals hosted in historic centers, theaters, churches, and culturally significant locations. The programming focuses on classical music, opera, jazz, and symphonic repertoires, often extending across seasonal or multi-month schedules. These events are strongly tied to local identity and cultural heritage, aiming to preserve and reinterpret tradition while educating audiences. However, they frequently confront issues related to audience renewal and generational engagement.

Cultural Hybrid Festivals

Cultural Hybrid festivals occupy a middle ground between entertainment and cultural production. They are usually located in medium-sized cities or distributed across public spaces and combine music with contemporary art, performances, talks,

Figure 08
Apolide Festival, 20 Luglio 2022
Source: wumagazine.com



Figure 09
roBOt Festival, 2024
Source: www.tribune.com,
Credit: Riccardo Giori



and social themes. Genres and formats are mixed, and themes often address identity, activism, and inclusion. With durations ranging from three to seven days, these festivals seek to balance accessibility with critical content, positioning themselves as platforms for dialogue as well as spectacle.

Micro & Community Festivals

These are small-scale events rooted in local communities, often hosted in small towns, clubs, or informal social spaces. The focus is on emerging or independent music, folk traditions, and grassroots organization. Typically lasting one to three days, Micro & Community festivals prioritize sociability, craftsmanship, and local networks over visibility and profit. While they foster strong emotional bonds with their audiences, they often struggle with limited resources, communication reach, and scalability.

Crossmedia & Digital Festivals

This category includes festivals that explicitly integrate technology, new media, and digital experimentation into their core identity. They are often hosted in indoor venues, museums, exhibition spaces, or hybrid locations. Musical genres tend toward electronic and experimental, while themes revolve around visual art, sound design, AI, and interactive systems. With shorter durations (one to three days), these festivals function as laboratories where artistic production, technology, and audience interaction intersect, attracting younger, digital-native publics.

The categorization provides a conceptual framework for understanding the diversity of the Italian festival ecosystem. Rather than rigid classifications, these macro-themes highlight recurring experiential models that shape how festivals are designed, communicated, and experienced. They also serve as a foundation for identifying shared challenges and opportunities, which will be discussed in the following sections of this chapter.

2.4 Emerging Critical Scenarios in Contemporary Festivals

The critical scenarios outlined in this section do not primarily emerge from the quantitative mapping of the Italian festival landscape, but rather from the desk research conducted throughout Chapter 2.2, including academic papers, industry reports, and journalistic articles. These sources highlight recurring tensions and structural challenges affecting contemporary live events. In addition, informal experiential considerations gathered

through conversations with festival attendees and practitioners have contributed to framing these issues from a lived perspective. While the quantitative analysis reveals diversification in formats, themes, and scales, the literature and qualitative reflections expose deeper systemic dynamics that influence the quality of audience experience and the long-term sustainability of festivals. These critical scenarios recur across different typologies of events, although their intensity and manifestation vary depending on organizational structure, spatial configuration, and audience composition.

Rather than isolated problems, these scenarios represent systemic tensions within contemporary festival design, where cultural, economic, technological, and experiential dimensions increasingly overlap.

Misalignment Between Identity, Contents and Public

As festivals grow in scale and visibility, a frequent issue is the misalignment between the declared identity of an event and the expectations or composition of its audience. Programming choices, communication strategies, and partnerships may prioritize short-term visibility or sponsorship value over coherence with the festival's original vision. This can result in experiences that feel inconsistent, superficial, or disconnected from the audience they aim to engage, ultimately weakening trust and long-term loyalty.

Fragility and Complexity of the Event

As written before, festivals operate as temporary and highly complex systems, often dependent on external factors such as weather conditions, infrastructure reliability, public safety, and logistical coordination. Large-scale events, in particular, expose their fragility when unexpected disruptions occur, revealing how easily the audience experience can deteriorate. This complexity highlights the need for resilient design strategies that account for uncertainty without compromising engagement.

Digital Distraction and Audience Passivity

The pervasive use of smartphones during live events has introduced a paradox within festival experiences. While digital tools enable documentation and sharing, they also fragment attention and reduce embodied participation. Audience members often oscillate between being physically present and mentally absent, mediated by screens. This dynamic transforms spectators into passive observers, challenging the intensity, collectivity, and emotional impact traditionally associated with live performances.

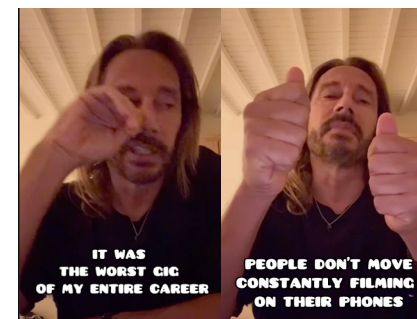
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John Travolta dancing "Il ballo del QUA QUA" at Sanremo 2024,
Source: laRepubblica.it



Figure 11
A still from a drone video shows vehicles trying to leave the Burning Man festival on Sunday, September 2023, Source: CNN



Figure 12
Bob Sinclar talks about the usage of mobile phones during his performance on his social media profile, Mykonos, 2024, Source: Instagram



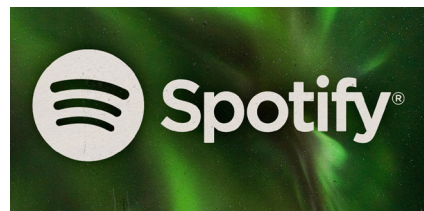


Figure 13
Spotify logo,
Source: faroutmagazine.co.uk



Figure 14
People waiting in lines to go to the bathroom, Source: Getty images,
Credit: Gideon Mendel



Figure 15
Loudspeaker competition in Allahabad, India, 2011. Credit: Rajesh Kumar Singh

Figure 16
Crowd management staff watching a dense crowd, Source: iStock photo



Algorithmic Standardization of Cultural Offerings

Data-driven booking strategies and social media algorithms increasingly influence festival line-ups and communication. While these tools help reduce financial risk, they also contribute to a homogenization of programming, where similar artists, formats, and narratives are repeated across different events. This standardization diminishes diversity and makes it harder for festivals to develop distinctive identities or experimental approaches.

Queues and Waiting Lines

Waiting is an often-overlooked component of the festival experience. Long queues for entry, food, restrooms, or transport generate frustration and fatigue, negatively affecting mood and engagement. These moments of inactivity represent missed opportunities for interaction and storytelling, instead reinforcing a perception of inefficiency and detachment from the event's cultural value.

Sensorial Overload and Physical Risks

High-density crowds, intense sound levels, aggressive lighting, and continuous stimulation can lead to sensory overload, discomfort, and even physical danger. While spectacle is central to many festivals, the lack of modulation and rest spaces can overwhelm audiences, reducing enjoyment and increasing health and safety risks.

In addition to environmental overstimulation, unhealthy behavioral patterns further amplify these risks. Extended exposure to high temperatures, prolonged standing, insufficient hydration, irregular meals, and excessive alcohol consumption are recurrent issues in large-scale festival contexts. Recent research reported by PR Newswire (2024) indicates that 78% of Gen Z attendees state they leave music festivals feeling dehydrated, exhausted, and nutritionally deprived, highlighting how contemporary festival formats often neglect basic physiological needs.

Crowd Management and Security

Managing large crowds requires a delicate balance between safety and freedom of movement. Poor crowd flow design, unclear signage, or ineffective coordination between staff can generate anxiety and disorientation. When security measures become overly visible or restrictive, they may further distance audiences from the sense of spontaneity and immersion that festivals promise.



Figure 17
Camera captures a couple on the big screen at a Coldplay concert, revealing a secret relationship, 17 July 2025
Source: laRepubblica.it

Privacy and Data Awareness

As festivals increasingly adopt digital tools such as apps, RFID wristbands, and tracking systems, issues related to data collection and privacy emerge. While these technologies can enhance personalization and operational efficiency, they also raise concerns about transparency, consent, and surveillance, potentially undermining trust between organizers and participants.

Together, these critical scenarios outline a landscape in which experience design becomes a strategic lever, not only to address logistical or technological challenges, but to re-center the audience within the live moment. Identifying these tensions provides the foundation for the subsequent design phases, where opportunities for intervention and innovation can be explored.

2.5 Relevant Case Studies and Experiential References

Alongside the identification of critical scenarios, the research phase also highlighted a set of positive and forward-looking references that demonstrate how festivals and live events can successfully integrate interaction, participation, and experiential design. These cases do not propose a single solution, but rather illustrate different strategies for re-centering the audience within the live moment.

Figure 18
Nameless Festival stage, 2024,
Credit: Stefano Manzoni

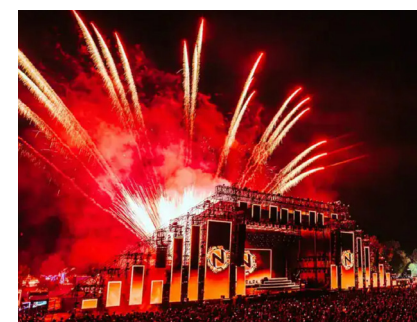
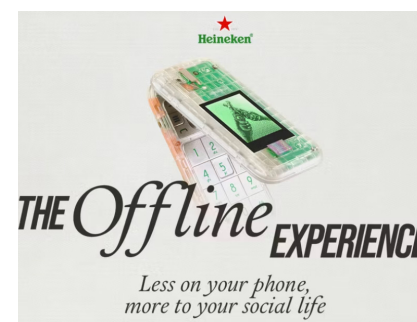


Figure 19
The Offline Experience cover,
Source: corriere.it



Nameless Festival – From Music Event to Experiential Ecosystem

Nameless Festival represents a significant example of transformation from a local event into a national phenomenon. Its growth cannot be attributed solely to musical programming, but to an expanded experiential offering that extends beyond the stage. Immersive activations such as Heineken's Offline Experience, where participants were invited to leave their smartphones behind and high-tech driving simulations developed with Rebel Dynamics introduced moments of active participation and play.

These experiences generated strong emotional engagement and a sense of belonging, positioning the festival as a temporary ecosystem rather than a sequence of concerts. By integrating branded activations into the experiential narrative instead of treating them as peripheral elements, Nameless successfully differentiated itself within a saturated market and fostered audience loyalty and word-of-mouth dissemination.

Figure 20-21
Interactive installation with led floor
WOA Studio and LIMITEAZERO,
MIDO Eyewear Show, 2024. Source:
Instagram



Live iris capture, participant
undergoing biometric scanning to
contribute her iris to the interactive
projection.

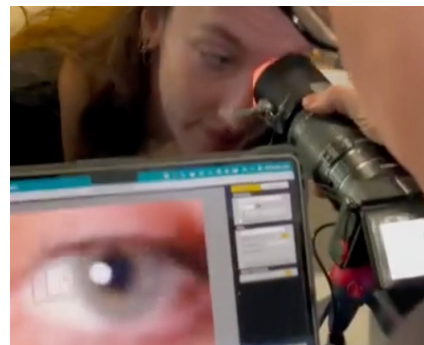


Figure 22
Horace Andy and Massive Attack
perform live during the Unaltrifestival
Festival. Credit: Alessandro Bremec/
SOPA Images/LightRocket via Getty
Images



This case demonstrates how designed interactions can effectively reduce digital distraction; however, it ultimately remains a relatively punitive approach. Although the strategy replaces smartphones with an alternative device or system, it still functions by depriving participants of their personal technology. Rather than reconfiguring the ecology of attention, it enforces a substitution.

WOA and LIMITEAZERO – MIDO Eyewear Show

At the MIDO Eyewear Show, the installation transformed a biometric element, the human iris, into an interactive and collective experience. Visitors were photographed live, and their irises were projected onto a large walkable screen that responded dynamically to foot pressure. This simple interaction translated personal data into a shared, physical, and visually striking environment.

The project shows how data visualization, when combined with bodily interaction, can increase emotional resonance and memorability. Rather than remaining passive viewers, participants became active contributors to the installation, blurring the boundary between individual identity and collective presence. This reference informs the exploration of data-driven visuals as experiential tools, suggesting how audience-generated data can be transformed into meaningful and participatory representations.

Massive Attack – Face Detection as Critical Narrative

During recent live performances, Massive Attack integrated face-detection visuals that randomly labeled audience members with attributes such as “persuasive” or “hoarder.” The intervention was not playful, but deliberately unsettling, functioning as a critique of surveillance, profiling, and algorithmic categorization. By reflecting technological mechanisms back onto the audience, the performance turned spectators into subjects of the narrative, provoking awareness and discomfort rather than spectacle alone. This case highlights the potential of real-time audience visualization as a narrative and critical device, opening possibilities for using live data not only to entertain, but to stimulate reflection on behavior, presence, and participation.

Together, these case studies demonstrate that interaction within live events can operate across different registers: playful, immersive, critical, and reflective. They collectively inform the design process by showing how technology, data, and audience behavior can be integrated into the experience itself, reinforcing presence rather than fragmenting attention. These references provide a conceptual foundation for the subsequent phases

of the project, where interaction is explored as a catalyst for engagement rather than a distraction.

03 Framework

3.1 Double Diamond Process

The project uses the Double Diamond design process⁽⁴⁾. This approach breaks down the design process into four stages: Discover, Define, Develop, and Deliver, with alternating phases of divergence and convergence. This approach is especially helpful for complex systems like music festivals, where the user experience is influenced by social, spatial, technological, and emotional factors.

Figure 23
Double Diamond diagram,
Source: designcouncil.org.uk



» The Discover stage is concerned with the expansion of the problem space. In this project, it encompasses qualitative and quantitative research about the Italian festival scene, analysis of existing efficient model. This stage is concerned with gathering information without limiting the scope of interpretation.

» The Define stage is concerned with the translation of research information into a defined problem statement. By synthesizing information, patterns, and user insights, key needs, tensions, and opportunities are determined. Personas, user needs, and experience gaps are defined in order to develop a specific problem statement that informs the design process.

» The Develop stage involves the exploration of possible

⁽⁴⁾ Design Council (2005; updated 2019). *The Double Diamond: A universally accepted depiction of the design process.*

solutions via ideation, concept development, and prototyping. Various interaction approaches and design paths are explored, assessed, and refined while keeping a close link to the findings made in the research stage. This stage is kept exploratory, promoting various hypotheses before finalizing a design path.

» Finally, the Deliver stage refines and verifies the chosen solution. Prototypes are integrated, interactions are developed, and usability aspects are assessed for their applicability in actual or simulated user contexts. The result is not only the final design solution but a verified system that proves the value of UX approaches in actually enhancing engagement at real-world cultural events.

Through the Double Diamond model, the project is able to strike a balance between exploration and concentration, keeping design choices rooted in research while slowly advancing towards a tangible and applicable solution.

3.2 Focus on Digital Distraction & Audience Passivity

Among the different critical scenarios that emerged in the analysis phase, this project specifically concentrates on Digital Distraction and Audience Passivity as the main area of research.

The widespread use of smartphones during live events has gradually changed the dynamic between audience, performer, and event itself. A collective experience that was once shared and lived has now become a mediated experience through screens, documentation, and distracted attention. This scenario is no longer a mere anecdote but has been openly recognized by performers themselves as a structural problem in live events.

It has been documented several high-profile responses to smartphone use during live performances. As reported by The Guardian (2018), Kendrick Lamar introduced restrictions on professional photographers during his tour, limiting them to the first few songs, and performed parts of his show behind a translucent screen that obstructed audience filming, explicitly addressing the culture of constant recording at concerts. In a separate article, The Guardian (2016) discussed the growing adoption of the Yondr locking pouch system, designed to prevent audiences from accessing their phones during performances. The piece references artists such as Alicia Keys, who used Yondr pouches during her tour, and comedian Dave Chappelle, who also adopted the system to create phone-free environments.

Figure 24
Post about Bruno Mars behavior towards mobile phone, Source: Global Pop Groove Icon facebook page

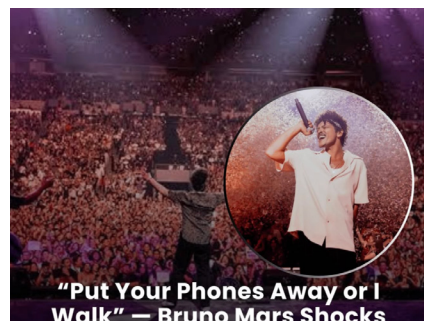


Figure 25
People holding telephone during concert, Source: Envato

The article further notes that Guns N' Roses implemented similar restrictions at selected shows. In addition, Bruno Mars has been reported to use Yondr pouches during performances to limit smartphone use and reduce audience filming.



Figure 26
Woman using a mobile phone in a theater, Source: Evening Standard, Credit: Getty images

Beyond the music industry, concerns about mobile phone disruption have also emerged in theatre contexts. As reported by the Evening Standard (2016), London's West End theatres considered using handheld laser devices to identify audience members using mobile phones during performances. These measures were presented as responses to increasing disturbances caused by illuminated screens in dark auditoriums.



Figure 27
Yondr lockable pouches, Source: laRepubblica.it

These quotes emphasize a collective awareness: digital distraction is not just an individual problem, but a collective problem that affects emotional engagement, presence, and the social aspect of live events. However, the issue is also complex, as audiences use smartphones not as a sign of disinterest but as a way to preserve memories, share experiences, and extend the life of the event beyond the physical space of the event.

This is why the project does not focus on banning technology but on rethinking its role in the live event. Digital distraction is considered an opportunity for design: a moment when interaction design, real-time systems, and experience design can turn passive documentation into active participation.

By choosing this scenario, the project is situated at the intersection of UX design, live entertainment, and digital culture, as it tackles a known problem and explores how design can help people focus

on the present moment without limiting freedom, enjoyment, or expression.

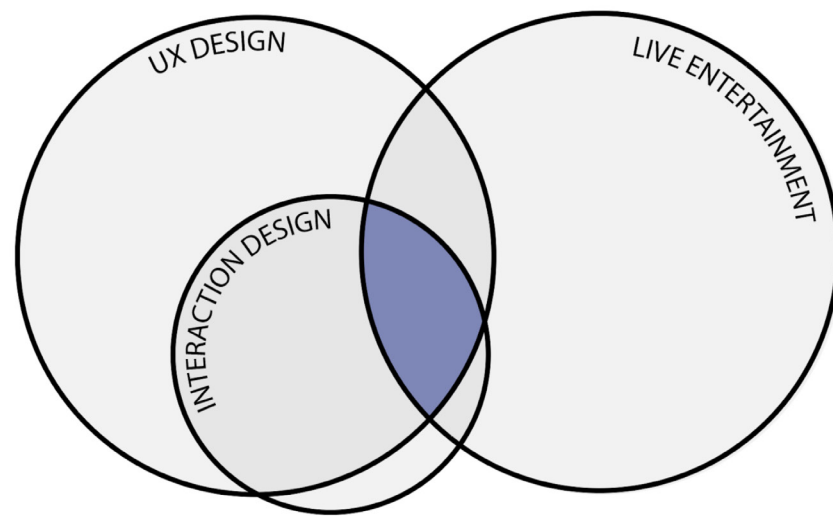


Figure 28
Venn diagram
showing the
intersection
between UX
design, Interaction
design and Live
entertainment

04 Discover

4.1 Methodology Process

This stage of the thesis adopted a multi-step methodological approach. Initially, a preliminary exploration was conducted by identifying well-known promoted Italian festivals through online searches and sector-specific media. However, this approach quickly revealed a bias toward larger and more visible events, excluding the extensive network of small-medium sized festivals that characterize the Italian cultural ecosystem. To address this limitation, the research turned to *Trovafestival.it*, a national portal that aggregates cultural events, local celebrations, and festivals across Italy. Using the web scraping tool WebScraper.io, the section dedicated to festivals that included music among their thematic focuses was systematically extracted. This process generated a structured dataset in Excel format containing festival names, logos, short descriptions, locations, and starting and ending dates.

In a second phase, the dataset was manually enriched. Based on the available descriptions on the portal—and, when necessary, through additional research on official festival websites—each event was categorized according to thematic orientation and predominant musical genres (e.g., pop, rock, electronic, indie, classical, jazz, folk, experimental, and hybrid formats). When

reliable information was not available, the field was intentionally left blank to preserve data integrity.

Once completed, the dataset was processed using RAWGraphs to generate alluvial diagrams, enabling the visualization of relationships, distributions, and concentrations across themes and genres. This visualization phase supported the identification of recurring patterns and informed the subsequent clustering of festivals into macro-categories defined not only by musical genres, but also by spatial context, experiential intent, cultural positioning, and audience expectations.

After that, an informal semi-structured interview was conducted with a member of a festival organizing team in order to obtain precious insight about the internal process of organizing a festival. As in the case of the user interviews, a consent form was signed prior to the conversation to ensure ethical transparency and data usage clarity. The insights gathered from this exchange provided a more concrete understanding of the internal dynamics of festival production, including decision-making processes, resource allocation, technical constraints, and stakeholder coordination. Based on these contributions, an ecosystem map was developed to visually represent the interconnected layers involved in the realization of a festival. The map illustrates actors, tools, processes, investments, and relational dynamics that shape the event from early concept development to on-site execution.

In the final phase of this methodological process, a targeted review of internationally and nationally recognized studios and designers working in real-time interaction, audiovisual performance systems, and interactive installations for live events was conducted. This research aimed to identify precedents and technological approaches capable of translating audience presence into responsive visual or spatial outputs. These references served both as inspiration and as a technical benchmark for defining the potential scope and feasibility of the proposed interactive system.

4.2 Quantitative analysis: mapping the Italian festival landscape

This information represents the quantitative basis of the study. It allows for a systematic mapping of the Italian festival scenario, encompassing information regarding festival type, size, duration, themes, and geographical distribution. By aggregating and

structuring this information, it has been possible to identify recurring patterns, prevalent models, and imbalances in the current cultural offer.

The analysis confirmed a substantial concentration of festivals around music, specifically pop, rock, electronic, and jazz music, thus confirming music as the leading force of festival culture in Italy. At the same time, the information pointed out the increasing relevance of hybrid models that integrate music with visual arts, cultural programming, food, and local identity, as well as the proliferation of small- and medium-sized events geographically distributed.

Figure 29
Screenshot from the festival landscape excel file gathering more than 600 italian festival

	A	B	C	D	E	F	G	H	I	J
	IMG	NOME	THEMES	DESCRIPTION	POPOLAR	PLACE	REGION	STARTING DATE	CLOSING DATE	DURATION
1		A Sounda	Music#Pop#Rock	Festival musicale	1	Maratea	Calabria	22/06/25	31/08/25	70
2		110 Hertz Festival	Music#Pop#Rock#VideoDesign#Radio#Gaming	Un Festival Multidisciplinare con Concerti, Artisti di Strada, Radio Live, Giochi di Ruolo, da Tavolo e Gaming, Artigianato	2	Pisa	Toscana	20/06/25	22/06/25	2
3		A Oslo aperto	Music#Pop#Rock#Indie	Festival di musica	2	Casena	Emilia Romagna	09/07/25	30/08/25	52
4		A Power Festival	Music#Elettronica#Sostenibilità	A Power Festival	1	Cogole	Lombardy	30/05/25	01/06/25	2
5		Aumatica Festival	Music#Elettronica#Digital#Visual#Media	Festival di musica elettronica, performance workshop	2	Ancona	Marche	01/08/25	03/08/25	2
6		Atrichia Sound Festival	Music#Pop#Rock	Festival musicale	2	Fano	Marche	13/06/26	14/06/26	1
7		Atrichia Festival	Music#Rock	Coro delle monache	1	Reggio di Modena	Emilia Romagna	21/06/25	29/06/25	8
8		Atrichia Festival	Music#Indie#Libri#Approfondimento Culturale	Festival musicale e culturale	2	Aicomo	Sicily	30/07/24	03/08/24	4
9		Atrichia Festival	Music#Pop#Rock#Libri	Storica rassegna promossa dal Circolo Ari di Bolito con concerti, letture e partecipazioni civiche	2	Madonnadi Sasso	Piedmont	08/08/25	10/08/25	2
10		Atrichia Festival	Music#Indie	Festival di musica	2	Genova	Liguria	09/08/25	10/08/25	1
11		Atrichia Festival	Music#Radio#Matina	Musicisti alla porta	1	Chianica	Austriale	28/06/25	19/07/25	21
12		AMA Music Festival	Music#Indie#Pop#Rock	Festival musicale	2	Romano d'Ezzelino	Veneto	19/08/25	24/08/25	5
13		Ambrosia Festival	Music#Jazz	Festival di musica jazz nella natura	3	Paolbegno	Lombardy	15/06/25	03/08/25	49
14		Amata Piano Festival	Music#Classica	Appuntamento con la grande musica	2	Canigiano	Toscana	27/06/25	24/08/25	58
15		Amore e Rabbia	Music#Indie#Libri	Festival di musica e altre cose	2	Vicino	Calabria	12/08/25	15/08/25	3
16		Anconajazz	Music#Jazz	Festival di musica jazz	2	Ancona	Marche	01/07/25	10/07/25	9
17		Apollonia Festival	Music#Indie#Rock	Festival musicale	1	Yves	Piedmont	20/06/25	22/06/25	2

Figure 30
Alluvial diagram showing the distribution of genre in music festival

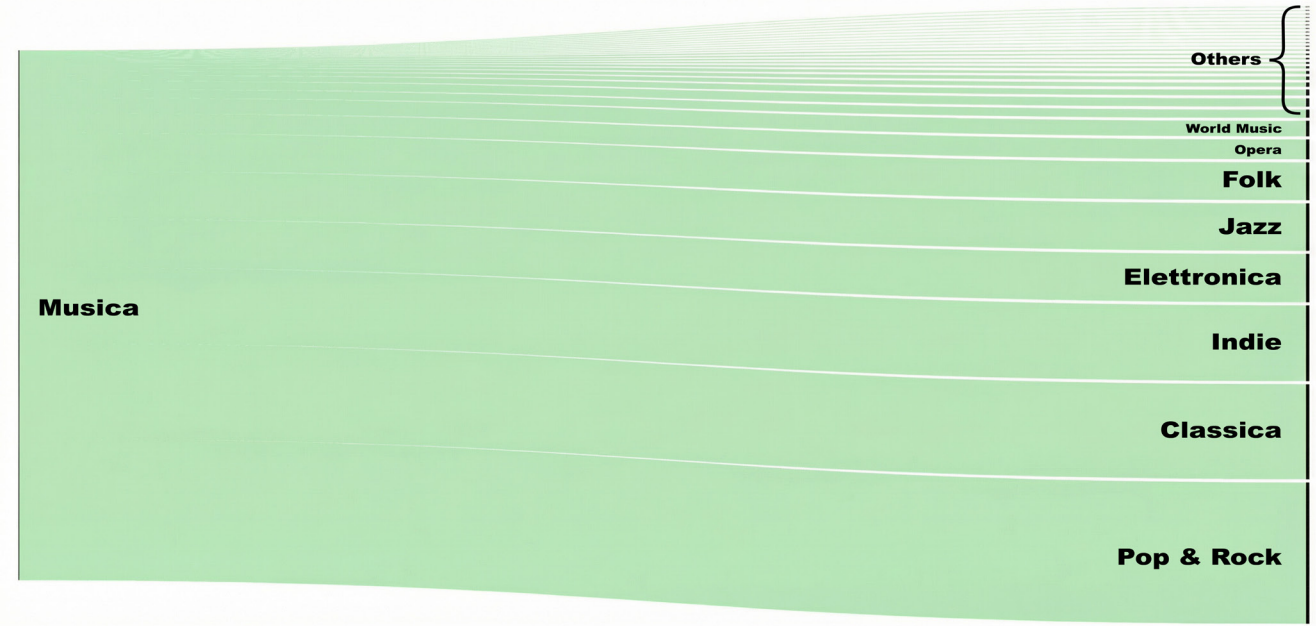


Figure 31
Drone shot of the audience at the first edition of Correggio Music Festival, Correggio, June 2024, credit: CMF

4.3 Correggio Music Festival Evidence



Figure 32
Correggio Music Festival logo, Credit: CMF

In order to complement the quantitative analysis of the Italian festival scenario, a qualitative interview was carried out with a voluntary member of the organizing association of the Correggio Music Festival, a small-medium-sized free-entry festival. The interview offers an insider’s view of the operational, economic, and organizational difficulties that characterize this type of cultural event.

How is the organizational team structured? Do people have clearly defined roles, or does it often happen that one person covers multiple responsibilities?

The festival is organized by a non-profit association consisting of seven members: a president, two vice-presidents, and four other members who work as volunteers. The president has more formal responsibility, but by internal agreement, all members have collective responsibility for the festival’s organization. Each member is in charge of a specific macro-area, which indicates a distributed but well-structured organizational model.

Two members are in charge of logistics and fundraising, especially sponsorship. They sometimes work together with a communication manager who is in charge of the communication

of the festival and the visibility of the sponsors. Sponsors are classified depending on the amount they sponsor, and their visibility in the festival area is arranged according to these levels. Two other members are in charge of the logistics of food and beverages, relations with suppliers, and the gastronomic offer. The same members are in charge of the safety measures and permits. Another member is in charge of the recruitment and training of volunteers during the days of the festival. One individual is in charge of the financial and bureaucratic part of the association, playing the same role as an internal accountant. Another member is in charge of the communication through social media, playing the same role as a social media manager. Finally, one member is in charge of the communication with artist managers and bookings of the lineup.

This organization shows that one of the characteristics of small-medium festivals is that even if there is a definition of roles, the responsibilities are sometimes complex and interwoven.

In your opinion, what is the main difficulty in managing a small–medium-sized festival compared to a very large one?

One of the key takeaways that can be derived from the interview is the vulnerability of smaller festivals as opposed to larger festivals. This is because, in a large festival, there are multiple stages, bars, and food points. Even if one of these fails, the experience is not compromised. However, in a small festival, there is little room for error. If the stage or the only bar fails, the experience is compromised. This means that the services need to be optimized to perfection in order to provide a positive experience to the audience.

Another key difference that can be identified is in terms of sponsorship. Large festivals tend to attract large sponsors based on their name and the density of the audience. There is a competition among the sponsors to get noticed at the festival. However, smaller festivals need to negotiate in order to get their value proposition across.

An important distinction must also be made between ticketed festivals and free-entry festivals. In ticketed systems, for example, financial guarantees are also ensured through ticket sales. In the case of the Correggio Music Festival, which is a free-entry festival, financial viability is almost entirely dependent on food and beverage sales, as well as investment and sponsor contributions. This system is highly susceptible to risks, such as weather conditions, which could significantly impact food and beverage sales.

How does the budget influence the festival’s design, artistic, and organizational choices? Are there recurring compromises?

Budgetary constraints significantly influence organizational and artistic choices. Some expenses are non-negotiable, including safety requirements, stage hire, venue hire, and sponsor commitments. It is only after calculating these fixed expenses that the minimum viable budget for the festival can be determined. The remaining budget is then allocated to the artistic program. From the interviewee’s point of view, this is a source of frustration because the artistic program is viewed as the primary value of the festival. However, budgetary constraints often mean that artists cannot be booked if their cost is beyond the budget.

This evidence supports one of the major arguments of this thesis: that in small to medium-sized festivals, music is the primary and most visible value but is structurally constrained by economic and practical considerations. Therefore, any design intervention that seeks to improve audience engagement must be light, economically viable, and practical within these constraints. Systems that are complex and expensive may be impractical in this environment.

The interview has therefore provided a contextual foundation for the design stage that follows.

4.4 The Festival Ecosystem

To gain a better understanding of how festivals function and where design interventions can have the greatest impact, this research has identified the festival as a complex ecosystem that consists of actors, tools, dynamics, and investments⁽⁵⁾. The user is positioned at the center of this ecosystem map, surrounded by the various layers that contribute to the festival experience as a whole. The layer that is closest to the user is the on-site experience, which encompasses live performances, crowd behavior, spatial design, services, and interaction moments during the festival. This is where attention, engagement, and emotional resonance are most directly addressed. Surrounding this central layer are other essential layers, such as festival promotion and communication, temporary installations and technical implementation, and, further removed, the concept development and organizational structure of the festival.

This ecosystem perspective has made it clear that festivals are not isolated events but the end result of long and complex processes

that involve a variety of stakeholders. These include direct stakeholders, such as festival organizers, artists, technicians, volunteers, and sponsors, as well as indirect stakeholders, such as local institutions, suppliers, media partners, and technology companies.

One of the most important findings that come out of this phase regards the differences between small/medium festivals and large events. In small festivals, due to the limited economic and human resources, there is a prominent need to focus on logistical and operational issues such as setup, licenses, programming, and basic production. As stated in the previous sub-chapter by the CMF evidence, people involved in the organization of the event sometimes have to play multiple, overlapping roles, which in large events would be divided among specialized teams. As a direct result, most of the available energy, both economic and organizational, is invested in ensuring that the event is able to function properly. In this respect, the musical part of the festival is still the main one. This not only emphasizes the importance of music as the core value, but it also leaves no space for the creation of other interactive levels.

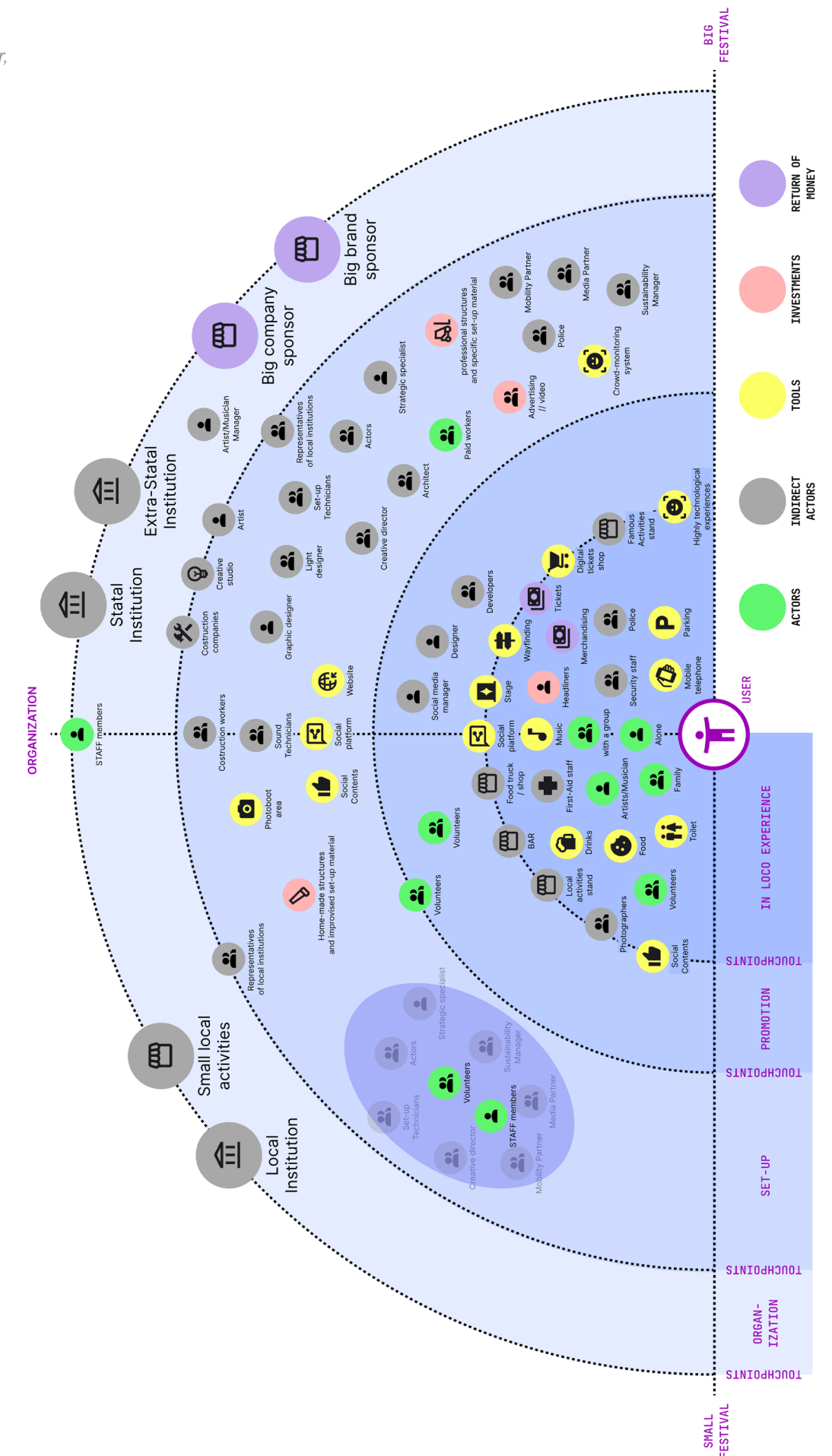
By contrast, larger festivals with greater budgets have the capacity to invest in specialized staff and additional levels of experience, such as interactive installations, branded experiences, and activities outside of music. This is one of the reasons why smaller festivals have difficulty introducing innovative audience engagement systems, despite the interest and potential. The mapping of the festival ecosystem highlighted the complexity of these dynamics and identified where viable, low-impact, and scalable interaction solutions could be applied, particularly in smaller festivals with a strong audience connection.

4.5 What others do

As a part of the Discover phase, the scope of research was expanded from the festival context to the studios, artists, and designers working at the intersection of music, stage visuals, and real-time interaction. The criteria for selection were based on the identification of internationally and nationally recognized players in the domains of stage visual design and interaction design, specifically those who have worked on responsive systems in live, high-density performance environments.

A majority of these studios and designers were found through the research of their completed projects. The procedure involved

Figure 33
Ecosystem map showing the stakeholder, tools and investments involved in the organization and execution of a festival



finding the repeated names in the context of large-scale live productions, audiovisual performances, touring concerts, and large-scale events, specifically those in which the technology plays an active role in mediating the relationship between the performer and the audience. These were selected as they work in environments that are structurally similar to festivals: temporary, spatially complex, and emotionally charged settings in which attention, collective presence, and sensory intensity are central. Instead of the traditional stage design or visual elements, these studios consider visuals, data, and interaction as an active part of the experience, often responding in real time to sound, movement, or the presence of the audience.

Moment Factory

Moment Factory is internationally recognized for designing large-scale multimedia environments that integrate light, video, sound, architecture, and spatial storytelling. Among their projects, Aura at the Notre-Dame Basilica of Montréal represents a particularly relevant case for this research.

Aura is an immersive multimedia experience permanently installed inside the basilica. The project transforms the architectural space into a responsive audiovisual environment through projection mapping, synchronized lighting systems, and spatialized sound design. Rather than relying on direct user input, the experience is structured as a choreographed real-time dialogue between music, light, and architectural surfaces. The audience is not required to interact explicitly; instead, the system amplifies emotional intensity through dynamic visual modulation synchronized with sound crescendos and spatial transitions.

This project is relevant to the present thesis because it demonstrates how real-time visual systems can enhance collective immersion without necessitating active device-based participation. The engagement mechanism is environmental rather than individual, suggesting that audience presence can be reinforced through atmospheric responsiveness rather than through personal interfaces.

Rhizomatiks

Rhizomatiks operates at the intersection of art, technology, and performance, with a strong research-driven approach to motion tracking, data visualization, robotics, and real-time systems. A particularly relevant project for this thesis is Reframe, developed in collaboration with the Japanese pop group Perfume under the direction of Daito Manabe.



Figure 34
Moment factory logo, Source: momentfactory.com

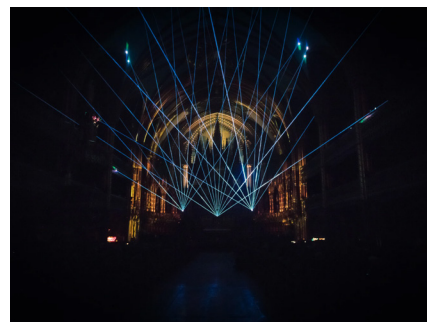


Figure 35
Photo inside the Basilica, Aura, Luminous experience in the heart of Notre-Dame Basilica, Montreal 2017, Source:momentfactory.com

Figure 36
Rhizomatiks logo, Source: rhizomatiks.com

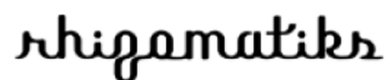


Figure 37
Photo of the stage during Perfume exhibition, Reframe tour, Source: Youtube

In Reframe, choreography, sound, and computational systems are tightly synchronized through motion tracking technologies and spatial data processing. The performers' movements are captured and translated into dynamic visual outputs, creating a continuous feedback loop between body, algorithm, and projection. Rather than functioning as decorative stage visuals, the digital layer becomes structurally embedded in the performance logic: light, graphics, and spatial transformations respond precisely to timing, gesture, and rhythm.

The relevance of this project lies in its integration of data as an active performative medium. Sensors and real-time computation do not merely enhance spectacle; they redefine the relationship between physical presence and digital representation. The boundary between performer and technological system becomes thin, generating an audiovisual environment in which data is treated as material rather than overlay.

For this research, Rhizomatiks demonstrates how real-time systems can be embedded into the core dramaturgy of a live event, suggesting that interaction does not necessarily require explicit audience input but can emerge from the translation of embodied movement into shared spatial experience.

Sensory Studio

Sensory Studio operates within the fields of music, fashion, and cultural events, with a particular focus on audio-reactive and light-based environments. A representative example of their work can be found in their nightclub and festival installations, where sound is translated into dynamic lighting systems and spatial atmospheres.

In these projects, real-time audio data is processed to modulate light intensity, color transitions, and environmental effects in direct relation to the music being played. Rather than functioning as a dominant visual spectacle, the system enhances the atmosphere in a subtle and integrated manner. The technological layer does not compete with the performance but amplifies its emotional tone, reinforcing immersion. However, this very sense of heightened atmosphere and visual harmony often encourages audience members to take out their smartphones to record the interplay between light and sound. The immersive quality of the installation, while designed to deepen presence, paradoxically becomes visually captivating in a way that stimulates documentation, revealing once again the ambivalent relationship between spectacle, memory, and mediation.

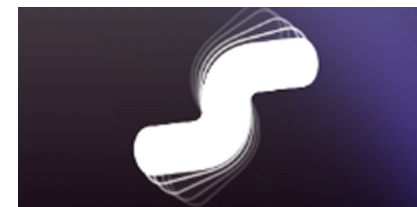


Figure 38
Sensory studio logo, Source: sensorystudio.co

Figure 39
Photo of the stage during a set at Blanche, London, Source: sensorystudio.co





Figure 40
Pico Global logo, Source: pico.com



Figure 41
People watching the visual from projection mapping inside a big tent in Coachella, Source: pico-plus.com



Figure 42
teamlab logo, Source: teamlab.art

PICO

PICO developed the activation HP at Coachella, a project that exemplifies the concept of “festivalisation” of branding through immersive experience design. Created in partnership with the music duo ODESZA during the Coachella Valley Music and Arts Festival, the installation transformed HP’s sponsorship into a multi-sensory experiential environment known as the Antarctic Dome.

The project combined experiential strategy, immersive production, and sustainability storytelling to create a branded space that functioned as a temporary narrative environment within the festival. Rather than presenting the brand through traditional advertising formats, the activation embedded HP’s environmental positioning into a spatial and atmospheric experience, engaging over 80,000 attendees. The installation received industry recognition for its ability to merge creativity, technology, and large-scale event production.

Although not explicitly framed as an interaction design project, this case is relevant to the present research because it demonstrates how festivals increasingly operate as experiential ecosystems in which brands, storytelling, and immersive environments converge. The notion of “festivalisation” highlights how the logic of the festival extends beyond music into layered experiential narratives, reinforcing the idea that contemporary live events are hybrid systems where technology, space, and audience engagement intersect.

teamLab

teamLab is an interdisciplinary collective internationally recognized for its immersive digital environments that respond to movement, presence, and collective behavior. Among its projects, A Table Where Little People Live represents a particularly relevant reference for this research.

In this installation, a digital miniature world is projected onto a table surface. Small animated characters (“little people”) move and interact within the projected environment, and their behavior changes dynamically in response to the presence and actions of visitors. When participants place their hands or objects on the table, the characters react by climbing, jumping, or avoiding obstacles, effectively transforming the audience into an active spatial agent. The system translates physical gestures into immediate visual feedback, creating a direct relationship between body, space, and digital narrative. Unlike purely spectacle-driven immersive environments, this project emphasizes micro-interactions

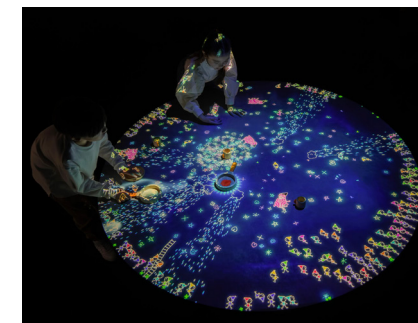


Figure 43
Two kids interacting with the table, A Table where Little People Live, 2013, Source: teamlab.art



Figure 44
Refik Anadol, Source: UNESCO



Figure 45
Photo of the performance of Visions of America: Amériques, Los Angeles, US 11 June 2014, Source: refikanadol.com

and collective participation: the experience evolves through the simultaneous presence of multiple users, whose actions influence one another. The installation therefore exemplifies a space–people interaction model in which the audience becomes the primary input shaping the environment in real time.

This case is particularly significant for the present thesis because it demonstrates how interaction design can foster engagement without relying on personal devices. Instead, shared physical space becomes the interface, and collective behavior becomes the engine of the experience.

Refik Anadol

Refik Anadol is a media artist internationally recognized for his research in data painting and AI-generated audiovisual environments. A significant example of this approach is Visions of America: Amériques, an immersive installation presented at Walt Disney Concert Hall in collaboration with the Los Angeles Philharmonic.

In this project, Anadol transformed archival materials and musical compositions into large-scale data-driven visualizations projected onto the architectural surfaces of the concert hall. Using machine learning algorithms and computational data processing, historical and sonic datasets were translated into fluid, continuously evolving visual landscapes. The façade of the building became a living canvas where sound, memory, and artificial intelligence converged in real time.

Central to Anadol’s practice is the concept of “data painting,” understood as the use of data not as analytical information but as artistic material. Rather than visualizing data for interpretation, the project renders invisible processes, such as sound structures and archival memory, into sensorial and atmospheric experiences. Technology here functions not merely as a tool, but as a medium capable of amplifying presence and emotional resonance without requiring explicit audience interaction.

This work is particularly relevant to the present thesis because it demonstrates how data can be transformed into a collective experiential layer within a live cultural context. Even in the absence of direct interaction, the system enhances immersion and reinforces the shared intensity of the event, suggesting alternative ways in which computational systems can contribute to engagement beyond screen-based participation.



Figure 46
Jacopo Ricci, Source: thevision.com,
Credit: Enrico Rassu



Figure 47
Kvant laser on a stage during Fedez
live show, Source: plsn.com

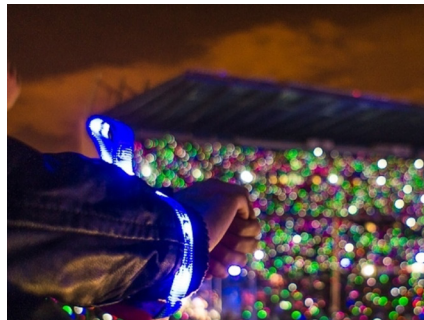


Figure 48
LED wristbands used during a concert,
Credit: Carlos RM (CC) 2012.

Jacopo Ricci

Jacopo Ricci is an Italian lighting designer known for his work in large-scale live music productions, including collaborations with famous artists. As highlighted in professional industry coverage, Ricci's approach combines scenographic lighting design, dynamic programming, and synchronized visual effects to create visually impactful stage environments.

His work is characterized by a strong emphasis on rhythm, intensity, and spatial composition. Lighting is treated not merely as functional illumination but as an expressive layer capable of shaping perception, reinforcing musical dynamics, and structuring the audience's visual focus. Through the coordinated use of moving heads, LED architectures, and time-coded sequences, Ricci constructs immersive atmospheres that amplify the performative energy of the show.

Although his projects are not centered on interactive systems in the strict sense, they represent a relevant aesthetic reference for this research. The visual and light effects he develops demonstrate how stage design can significantly influence emotional engagement and collective immersion. In this context, Ricci's work is considered less as a model of interaction design and more as an example of how strong visual dramaturgy can intensify presence and attention within live events.

Coldplay concerts

Finally, a good example of the successful engagement of the audience in live music is offered by the concerts of Coldplay, in which the audience is given LED wristbands that light up in time with the music. These wristbands turn the audience into an active part of the performance, allowing for massive light shows that change over the course of the concert. Instead of being passive witnesses, the audience becomes an element of the scenography of the concert, collectively contributing to its visual identity. This approach offers a moment of shared experience, encouraging people to be in the moment because the experience cannot be replicated by a screen. By making the audience visible and integral to the performance, the example of Coldplay offers a powerful reference for the design of engagement that enhances, rather than detracts from, the live experience.

4.6 Key Insights from the Discover Phase

The Discover phase enabled the recognition of a number of recurring insights that were uncovered through quantitative mapping, interviews, ecosystem analysis, and case study analysis. These insights define the problem space and directly relate to the Define phase of the project.

Music is the key value of festivals in Italy.

Music, and more specifically the lineup and the artists, is the main driver for the vast majority of the analyzed festivals. Irrespective of the size and type, music is the key value that everything else revolves around. Other experiences are considered secondary or optional, especially in the case of small/medium-sized festivals.

Digital distraction is a growing and widely recognized issue.

The widespread presence of smartphones in live events has become a structural factor in contemporary festivals. This phenomenon is increasingly being denounced not only by artists, who have expressed their discontent or have organized "no phone shows," but also by the audience themselves. Interviews and public debates show a collective ambivalence: the audience is aware that the constant filming of the event has a negative effect on immersion and collective energy, and some people have confessed to regretting their use of the phone after the event, when they realized that they remembered less or felt less immersed. This is proof that digital distraction is not only a problem imposed by technology, but also a problem perceived by those who practice it.

Small-medium festivals operate under strong organizational constraints.

In small- medium sized festivals, the organizational structure is usually slim and highly interdependent. Key members and volunteers often have multiple roles in logistics, sponsorship, security, communication, and artist relations. The multitasking strategy is not only a preference but a necessity of the organizational structure, which is forced by budget constraints, volunteer-driven management, and limited operational margins. Although there may be clearly delineated roles, there may be overlap in responsibilities, and the decision-making framework remains centralized in a small circle. This leads to a lack of opportunity for incorporating expert professionals in user

experience, interaction design, or experimental audience engagement. Innovation, if it happens, has to come from within the same organizational framework and not from additional professional staff.

The integration of interactive experiences is challenging on a small scale.

There is certainly interest in audience engagement and innovation, but small to medium-sized festivals often find it difficult to implement interactive systems due to cost, complexity, and management overheads. Interaction, in such cases, is either restricted to passive visual components or is not included at all. These observations together point to a distinct opportunity space: the need for light, scalable, and low-cost interaction systems that can facilitate audience engagement without adding organizational complexity. This understanding forms the basis for the Define phase, where user needs, design goals, and the problem statement of the project are defined.

05 Define

5.1 Methodology Process

The Define phase marks an important shift from research to design. Having investigated the festival landscape, key scenarios, and gathered both quantitative and qualitative data, this chapter explores the process of making sense of complexity and turning observations into design imperatives.

During this stage, the results of the research are distilled into personas, user needs, and opportunity areas. The aim is to shift from the observations made during the Discover stage to a more systematic understanding of who the design is for, what their essential needs and contradictions are, and where there is potential for effective intervention.

Personas are a design tool that encapsulates the behaviors, motivations, and attitudes that have been identified through research interviews and analysis. They are not idealized versions of users, but rather a reflection of actual patterns that emerge from the research, particularly with regard to attention, engagement, and technology use at festivals.

On the basis of these personas, key user needs are identified, focusing on the points of engagement, distraction, and collective

experience that occur during festivals. These needs are directly related to the development of the project concept, which seeks to resolve the conflict between presence and digital mediation without imposing limiting solutions.

This chapter thus establishes a clear link between research findings and design intentions, providing the basis for the development of an interactive system that addresses real constraints, real users, and real festival contexts.

5.2 Who are the users?

The definition of the user of this project requires a clarification of roles and perspectives. The system is designed in the context of a festival, but it does not refer to a specific type of user in a traditional way. Rather, it refers to different levels of the festival system.

From a strategic point of view, the client of this project is the festival itself. The festival is the one that adopts and integrates the system into its framework. The system is designed as a tool that can be used to improve the overall experience and the identity of the festival without adding high costs and infrastructure.

The direct users of the system are the members of the audience. They are the ones who trigger the interaction through their behavior and presence during the festival. The system is designed to be perceived and interpreted by the audience in real time, making them the central actors of the interaction.

Artists also have an indirect but relevant role. They are not the main users, but they are influenced by the results of the system, since more attention, presence, and collective participation can affect the mood of the event and the quality of the live experience.

For this reason, the project has a user-centered approach, which is focused on the audience, but it is also mindful of the needs and limitations of festivals and artists. This is a crucial aspect, since the system has to be desirable and significant for the audience, acceptable and useful for the artists, and possible for the festival organizers. This is reflected in the definition of personas and user needs in the next sections.

5.3 Who are the festival-Goers?

To gain insight into the variety of users participating in the current festival scene, the study has identified six macro-categories of festivals, each linked to specific audience profiles, behavior, and expectations. This research integrates industry insights, cultural analysis, and market knowledge, creating a basis for the definition of user needs and design opportunities.



Figure 49
Artist POV,
photo during a
performance at
the OMI festival,
Reggio Emilia,
2023, Source:
Instagram

Urban Megafestival

» Primary target audience: 18-34 years

Urban megafestivals cater to a young and extremely connected crowd, mostly consisting of university students and young professionals living in urban environments. According to industry insights, this audience demonstrates extremely high smartphone usage rates during concerts, often recording and sharing the experience in real-time.

These users can be characterized as “experience seekers.” They are attracted to large headliners, large-scale production, and spectacular staging. Music tourism is a key factor, with around 24% of tickets for large festivals being sold to out-of-region visitors, which clearly indicates a strong connection between festivals and tourism.

Nature & Escapism

» Primary target audience: 20-40 years

This category appeals to viewers interested in experiential and

contemplative content, sometimes in a natural or hard-to-reach setting. The audience is highly sensitive to sustainability, nature, and eco-friendliness.

Music tastes tend towards non-commercial electronic, ambient, or experimental music, and engagement can be a ritualistic and social activity. The audience tends to include solo travelers as well as close-knit groups of friends. Compared to other categories, these users are more likely to pay for add-ons related to experiential activities like camping, wellness, and workshops.

Heritage & Classical

» Primary target audience: 40-75 years

Festivals in this genre tend to attract a slightly older audience with a high level of education and cultural awareness. The attendance at festivals is driven by a combination of musical and cultural heritage values of the performance spaces, such as theaters, opera houses, and heritage sites.

Cultural tourism is a major driver, and this audience is more likely to pay a premium for the experience, including seating and performance. The engagement is more listening and less digitally mediated.

Cultural Hybrid

» Main target: 20–55 years (mixed audience)

Cultural hybrid festivals are events that appeal to a mixed audience who are driven by content and values rather than celebrity acts. The programming may include talks, debates, activism, world music, and interdisciplinary performances.

The target audience for cultural hybrid festivals includes students, families, and cultural practitioners who are drawn to the high level of accessibility of these events, which are free or low-cost.

Micro & Community Festivals

» Main target: 16–35 years, predominantly local or regional

Micro and community festivals have a strong local identity and emotional loyalty. The audience is usually made up of fans of indie, folk, and emerging music cultures, with a strong interest in volunteering, local food, crafts, and circular economy practices.

Although the spending power is lower, the engagement and sense of belonging are very high. Micro and community festivals tend to operate on word-of-mouth and a long-term relationship with their audience.

Crossmedia & Digital

» Main target: 20–40 years

This category appeals to digitally curious audiences with hybrid cultural practices, mixing interests in electronic music, contemporary art, gaming, and interactive installations. Motivation is closely tied to innovation, experimentation, and technology-mediated experiences.

These users demonstrate a high level of social sharing and are highly receptive to interactive and media-rich spaces. Festivals in this category can be considered laboratories for new forms of audiovisual and interactive expression.

This categorization illustrates the non-homogeneous nature of festival audiences in Italy. Each category has distinct approaches to technology, participation, and engagement. It is crucial to recognize these differences to design interaction systems that are context-aware, scalable, and user-expectation-congruent, which will be the foundation for the personas and user needs.

5.4 User interview

In addition to the quantitative analysis and audience profiling, a set of qualitative interviews was carried out among friends and acquaintances who are regulars at music festivals, concerts, and club nights. While the sample is small, the interviewees were chosen for their regular attendance at live music events and their experience with different types of festivals.

Before each interview, the participants were told about the purpose of the research and asked to sign a consent form, as is standard in UX research. This helped ensure that they were fully informed about the use of the data, anonymity, and voluntary participation.

The interviews were designed to investigate behaviors, feelings, and attitudes in live music events, paying particular attention to the connection between audience engagement and smartphone use. The questions were framed to promote reflection rather than binary responses, giving the interviewees the chance to talk about their personal habits, immersion experiences, and sources of distraction (see appendix for all questions).

One of the main themes that emerged in the interviews was digital distraction. The participants were asked how and why they use their phones during performances, whether they think the use of

phones is an enhancement or a diminishment of the experience, and how they feel about filming, photographing, or using social media during live experiences. Special attention was paid to the conflict between the impulse to record the experience and the impulse to be present and emotionally engaged.

Before delving into the specific results of the interviews, it is necessary to explain the structure of the interview and the reasoning behind the choice of questions. The interview guide was created to investigate user behavior, emotional engagement, and attention dynamics in live music events, specifically focusing on the phenomenon of digital distraction.

The first series of questions was about festival-going habits and preferences, seeking to situate each participant within the larger festival context. It is essential to understand the frequency of festival attendance and the nature of the events that users choose to attend in order to establish patterns of scale, genre, and level of production that directly affect audience behavior and expectations. A second set of questions explored what constitutes a meaningful or memorable live experience. These questions aimed to uncover qualitative values like emotional engagement, collective atmosphere, audio quality, and artist presence, moving beyond purely technical aspects. Some questions were specifically designed to explore the use of smartphones during live events, asking participants about their usage habits and motivations. Instead of viewing phone use as a problem in itself, the questions aimed to uncover underlying motivations like memory creation, song identification, sharing, or habit. Follow-up questions probed participants about their own perceptions of phone use, exploring potential contradictions between their behavior and attitudes. Other questions explored distraction and immersion, asking participants to describe moments of complete engagement as well as aspects that disrupt their engagement with the live event. This enabled the study to uncover both technological and non-technological sources of distraction, such as crowd dynamics, physical environment, and other contextual factors. Finally, the interview covered participation and interaction, as well as areas of possible improvement in the festival experience. These areas were intended to reveal hidden needs and opportunities, particularly in relation to alternative methods of participation that could decrease the dependence on smartphones without introducing restrictions.

In conclusion, the structure of the interview was designed to be open-ended and reflective, as is common in UX qualitative research. The aim was not to confirm hypotheses but to provide insights that could inform the development of personas, user

needs, and the design concept.

» **Riccardo M.** (26), bar manager living in Copenhagen, is a typical example of a regular festival-goer at large rap and electronic music events with a strong emphasis on production quality and atmosphere. He goes to festivals two to three times a year, both in Italy and internationally, and considers high-quality sound systems, visual aspects, and artist performance essential factors for a positive live experience.

Riccardo talks about a very high and conscious use of the smartphone during concerts, especially for video recording, photography, and sharing experiences. For him, the smartphone is a tool for memory capture and preservation, enabling him to live again the experience afterwards. At the same time, he is very much aware of the ambivalence of this practice. Video recording does not completely impair immersion—he remembers moments of strong engagement during large concerts—but often causes unintended distractions. The presence of the smartphone in his hands sometimes causes him to answer messages or access social media out of habit, provoking brief but perceptible mental distractions from the performance.

This ambivalence is even more apparent in his thoughts on the attitude of artists towards the use of phones. Riccardo is aware that many artists do not like to see phones in the audience, which causes him to restrict recording to very short intervals. However, he still recognizes that filming slightly causes him to feel as though he is pulled out of the live experience. His desire to engage more actively is heightened by the presence of strong collective energy, facilitated by artist interaction, synchronized visuals, lights, and sound.

Riccardo has also been exposed to interactive elements such as responsive wristbands and immersive stage designs, which he feels strongly heighten engagement and make the experience feel more deliberate and “designed.” When asked what would encourage him to use his phone less, he points to the importance of unique, temporary, and visually overwhelming moments, as well as alternative methods of preserving memories that do not involve personal recording. In the end, he points to a critical area of improvement in how festivals facilitate remembering and re-living experiences for the audience, implying a need for systems that extend beyond individual videos.

» **Samuele Z.** (24), private investigator, represents the audience that is very much attuned to electronic and rap music festivals. He is a festival-goer several times a year, including large festivals

like Decibel Open Air, Frauenfeld, Kappa FuturFestival, and Elrow, as well as smaller techno festivals. According to Samuele, the decision to attend a festival is mainly based on the music and the location.

A good live experience, according to him, is one where he can let himself go in the music through dancing, without having to think much about it or being distracted. Sound systems, crowd energy, and unique settings are key factors. Although Samuele uses his smartphone quite frequently during concerts, he does so in a selective and deliberate manner. He records short videos or songs he likes the most, mostly to recall the experience or save the song.

Samuele talks about times of deep immersion, when music, lights, and crowd alignment are in a continuous flow, such as during a late-night techno performance at Decibel, where he stopped checking his phone altogether and danced for a long time without realizing the passage of time. For him, the biggest distraction is not technology but the lack of collective participation. When people around him stop dancing, start talking loudly, and become less engaged, the collective energy dissipates, and it becomes more difficult to maintain a connection with the performance.

His experience with phone use is also ambivalent. While he admits that smartphones can be a distraction from enjoyment, he also remembers times when he wanted to save a song but decided not to take out his phone in order to keep his hands free to engage with dancing. Participation, for Samuele, is driven by strong rhythmic continuity, good flow from the DJ or artist, and collective engagement from people in the crowd.

The interactive elements that he has experienced are primarily visual installations and stage designs, which enhance immersion but are relatively passive in terms of interaction. When asked what would encourage him to use his phone less, Samuele clearly identifies the need for alternative ways to save or recall music while being physically engaged. As a possible improvement, he identifies the significance of sustaining energy throughout the performance, avoiding points where the audience tends to drift away or resort to their phones because of a lack of engagement.

» **Alessio M.** (23), student in Pharmaceutical Sciences, has an audience profile that highly values artistic presence and collective participation over technological mediation. Alessio goes to large international or urban festivals two to three times a year, as well as concerts by large artists, and makes these choices based on the strength of the lineup.

Alessio's criteria for a live concert to be meaningful are when the artist is fully present and the audience is one collective unit. Emotional energy is more important than visual or production values. This is also evident in his use of technology, as he uses his smartphone very little at concerts, perhaps taking a quick photo or video, but for the most part keeping his phone in his pocket.

He talks about moments of full immersion as those in which distractions are completely absent, such as during the Kanye West concert when the lights went down and everyone sang together. In such cases, the feeling of belonging and collective attention becomes paramount to the experience. However, Alessio also points out physical and environmental aspects as sources of distraction. His shorter stature compared to most people around him often obstructs his view of the stage, thus reducing his engagement with the performer. Moreover, the prevalence of mobile phones among other people, especially when these are backlit, is a source of visual distractions that further impair immersion.

When Alessio reflects on his own use of the phone, he recognizes that documenting experiences clouds his recollection of them, thus reaffirming his preference for direct immersion. Engagement with the performance, according to Alessio, is encouraged by the artist's direct engagement with the audience and collective audience response.

His experience with interactive components at festivals has been limited to ambient elements such as light responding to sound, which he finds to be atmospheric but not necessarily engaging. Since he already keeps his phone usage to a minimum, Alessio would reduce it further only if there were specific event-related motivations or restrictions, such as specific points in time where his attendance is specifically appreciated or restrictions against using the phone. One area where he could improve is crowd management, particularly around the entry and exit points, and making better use of downtime.

» **Laura L.** (25), university student in cultural heritage. She states that she goes to about two to three concerts per year. The most recent festival she attended was the I-Days in Milan.

When asked what makes a live concert meaningful or memorable, Laura points out the importance of interaction between the artist and the audience. This includes moments of verbal communication between songs, jokes, and other forms of

communication that are not necessarily formal. These aspects of the concert create what she terms an "almost intimate" setting, even in large concert halls. The sense of relational intimacy is clearly an important factor in the memorability of the experience.

Her experience with smartphone use during concerts shows an internal conflict. She recognizes that she wishes to have the "strength" to resist using her smartphone, but that she feels the urge to record almost every song when she is at a concert of her favorite artist. When the artist is liked but not loved, she usually prefers to take pictures rather than videos. Notice, however, that she underlines the fact that smartphone use is strictly linked to the event. She does not use the smartphone for messaging or phone calls during concerts. This indicates that the smartphone is used as a tool for preserving memories rather than as a means for external distraction.

One of the most immersive experiences was described during the Machine Gun Kelly concert at Unipol Arena in Bologna on February 15, 2026, when the artist declared that he would sing a song live for the first time. Laura felt as if she were living through an experience that was both unique and irrevocable.

Despite her strong emotional engagement, she finds compulsive photo and video recording to be her main source of distraction. She admits freely that smartphone use has, at times, diminished her enjoyment of the live experience. Nevertheless, she rationalizes her behavior by pointing out the significance of being able to relive some moments in the days that follow the event. Revisiting the event serves to compensate for the partial distraction experienced during the live event.

Active participation, as identified by Laura, occurs spontaneously, especially when she is watching a performance of her favorite artist. In these instances, she finds it impossible not to sing, move, or otherwise participate. As for the interactive aspects, she talks about collective actions organized through fan pages, such as the phone flashlight action during certain songs. She views these events in a positive light, as efforts to differentiate certain dates of the tour and establish collective memories, even within the organized framework of large-scale tours. This bottom-up interaction seems significant in that it enhances collective identity.

In response to what could decrease her phone use during concerts, Laura gives a straightforward answer: having access to the official complete recording of that particular date of the tour. The assurance of being able to relive the experience later would

diminish the need to document it herself. She also adds that this would not only decrease the number of raised phones but also improve visibility for shorter audience members, including herself.

Summary

The interviews have revealed that the phenomenon of smartphone use is rarely experienced as a purely negative or purely positive phenomenon. Rather, it is a habitual and ambivalent phenomenon. The phone is used to keep memories, identify songs, record special moments, and stretch the event beyond its temporal limits. At the same time, it can interrupt attention, shatter immersion, and decrease the sense of the shared collective aspect of the performance. In some instances, the subjects have only later understood that the use of the phone had momentarily separated them from the live experience.

The smartphone is both a tool of distraction and a tool of emotional preservation. The need to record performances, especially when they are perceived as unique and unrepeatable, is driven by the fear of losing access to the experience in the future. In this respect, the use of the phone is not an expression of indifference but a strategy of meaning preservation. The issue, therefore, is not the presence of technology but the absence of alternative systems that could ensure memory without undermining presence.

The interviews also showed that the meaningfulness of a performance is often a matter of relational closeness, perceived uniqueness, and collective coordination. Spontaneous interactions between the artist and the audience, as well as crowd behavior, were found to be very memorable. This indicates that immersion is enhanced when the participants feel that they are part of a collective experience that is unique in time.

The findings overall gave a deeper insight into the motivations, contradictions, and subtle needs of the audience, which are not always apparent from the quantitative data alone. These findings helped to inform the development of personas and user needs, and reinforced a central thesis argument: that design interventions should not seek to ban technology, but rather reposition it. The aim is to develop systems that support memory, promote embodied experience, and enhance collective awareness, making self-documentation unnecessary by making presence itself more valuable than its documentation.

5.5 User needs

Analysis of the user interviews has resulted in the establishment of four primary user needs, which define the experience of live music audiences. These needs are realized in a variety of behaviors and attitudes towards technology.

Desire to be fully present in the live experience

The users are very keen on experiencing complete immersion in the live event, where the focus is on the performance, the artist, and the audience. Being “inside” the live experience has been identified as a crucial indicator of a successful live experience. Anything that distracts the user, such as smartphones, divided attention, or external interruptions, is seen as an impediment to this experience of being fully present. The users are not necessarily against technology but are looking for experiences that can facilitate their attention and involvement.

Need to preserve and recall the experience

On the other hand, the users also show a need to preserve the memory of the experience. Smartphones are used as a means to record videos, photos, or particular songs that help the users recall the experience later. But this process is also often cited as conflicting with immersion, thereby creating a tension between remembering and immersing oneself in the experience. This need underlines the importance of finding alternative methods to preserve memories without necessarily needing constant smartphone usage during performances.

Need for collective engagement and peer energy

The quality of the experience is also affected by the presence of others. The users show greater engagement when the presence of others is actively engaged in the experience, such as dancing, reacting, and sharing attention towards the performance. The collective energy of others multiplies individual engagement, and passive audiences decrease immersion.

5.6 Personas

Personas are a fundamental tool in interaction design, which are used to identify the most important user types based on real behavior, goals, and motivations. According to Cooper et al. in the book *About Face*⁽⁶⁾: *The Essentials of Interaction Design*, personas are not generic user types but design targets that help to keep the user perspective in the center of the design process.

⁽⁶⁾ (Cooper, A., Reimann, R., Cronin, D., & Noessel, C. (2014). *About Face: The Essentials of Interaction Design*. John Wiley & Sons.)

In this context, personas can be divided into different types based on their relationship with the system and the design goals.

» **Primary personas** are the most important users for whom the system is explicitly designed. Their goals and needs have the highest priority, and design decisions should never compromise the user experience for other types of users. In this project, the primary persona is the festival audience member, who is the direct user that experiences, activates, and perceives the interactive system during live performances.

» **Secondary personas** are those users who use the system but whose needs can be met without conflicting with the primary persona. The goals of secondary personas are significant but secondary. In the context of the project, artists or organizers of the festival could be secondary personas because they impact and are impacted by the system but do not directly use the system in the same experiential manner as the audience.

» **Supplementary personas** are those who are occasional or indirect users of the system. They may use the system in a peripheral or limited manner and usually have the same needs as primary or secondary personas. For instance, technical personnel, volunteers, or partners could be supplementary personas because their use of the system is functional rather than experiential.

» Finally, **anti-personas** are used to clearly define who the system is not intended for. Their purpose is to prevent the project from expanding in the wrong direction and to avoid design choices that conflict with its main objectives. In this case, an anti-persona could be someone who attends festivals mainly to consume content passively or to constantly create social media content during performances. Their goals do not align with the project's intention, which is to encourage presence, shared attention, and collective engagement rather than continuous digital mediation.

» **Primary Personas: Festival Attende:**

Profile

Marco goes to music festivals as a result of the lineup quality and experience. He is drawn to the shared energy, physical participation in the form of dancing and crowd movement, and the immersive audiovisual experience. For Marco, the value of a live experience is the sense of being completely within the moment. Nevertheless, he finds himself constantly torn between



Figure 50
Sketch of a man representing the Festival attendee

the need to document the experience and the need to stay within the experience.

Behaviours

Marco is a selective but regular smartphone user during performances. He records videos or songs in order to remember them later or to capture significant moments. Nevertheless, he finds himself reflecting on the experience and realizing that the use of his smartphone has distanced him from the experience. He enjoys the immersive aspects of the experience, including synchronized lighting, large-scale visuals, reactive stages, and audience-based interactions such as light wristbands. His level of engagement is highly dependent on the presence of the surrounding audience, as participation is contagious, and audience movement enhances his engagement.

Needs and Motivations

- » To be fully engaged in the live experience without cognitive interruptions
- » To retain and recall memories without the need for constant video recording
- » To be part of a collective experience rather than a passive observer
- » To recognize the festival as a participatory experience, not just a consumption experience
- » To sustain emotional and physical energy during transitions and waiting periods between artists

Pain Points

- » Digital distraction from habitual smartphone checking
- » The conflict between documenting an experience and being fully engaged in it
- » Passive or disengaged crowds that detract from collective immersion experiences
- » Lack of engagement during waiting periods and artist transitions
- » Limited alternatives to personal videos as memory artifacts

In addition to defining personas to represent end users, this project extends the persona methodology to include key stakeholders who influence the system's feasibility and strategic direction. While the primary persona represents the experiential perspective of the audience, the project also acknowledges that interactive systems within festival environments operate inside a broader ecosystem shaped by organizational and artistic actors. For this reason, secondary personas are introduced to represent these stakeholder roles, not as generic institutional entities, but as goal-directed subjects with specific operational pressures,

expectations, and success criteria. This approach ensures that the proposed system is not designed exclusively around user desirability, but also considers viability and integrity within the live event context.

» Secondary Personas 1: Festival Organizer

Profile

Giovanni is the president and coordinator of a non-profit cultural association that organizes an annual provincial music festival. The organization is composed of a small core team with clearly distributed responsibilities, supported by additional volunteers during the event days. He, as president and coordinator, carries greater legal and strategic responsibility. His work involves, ensuring safety compliance, managing institutional relationships, and overseeing the overall coherence of the event. The festival operates with limited financial margins. Being a free-entry event, its sustainability relies heavily on sponsorship agreements and food & beverage revenue. Giovanni approaches innovation pragmatically: new ideas are welcome, but only if they are economically sustainable, logistically manageable, and aligned with the festival's identity.

Goals

- » Guarantee operational reliability: Ensure that every essential element (stage, bar, safety systems) functions without failure.
- » Maintain financial sustainability: Balance fixed costs with sponsorship income and food & beverage revenue.
- » Deliver a positive audience experience: Optimize services so that even with limited infrastructure, the overall perception remains high-quality.
- » Enhance reputation and growth potential: Build credibility year after year without compromising stability.

Pain points

- » Zero margin for error, a single malfunction can compromise the entire experience.
- » Budget rigidity: High fixed costs
- » Weather dependency
- » Artist booking frustration: Desired artists are sometimes unaffordable once core operational costs are covered.

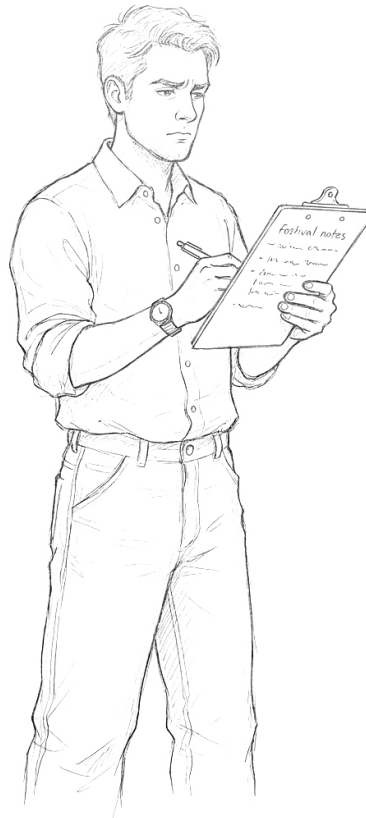


Figure 51
Sketch of a man representing the
Festival organizer



Figure 52
Sketch of a man representing the
Emerging artist

» Secondary Personas 2: Emerging Artist

Profile

Luca is an emerging artist who has recently released his first successful tracks and is beginning to build a recognizable presence, especially within his local region. Streaming platforms are gradually expanding his audience, and he is now performing in small festivals and medium-sized venues as part of his first semi-structured tour. His long-term ambition is to become a widely recognized artist, but, his deeper aspiration is to create what he considers the “best live show in the world.” For Luca, the live dimension is not secondary to recorded music. He invests significant attention in stage presence, emotional build-up, and audience interaction.

At the same time, as an emerging performer, he is still refining his ability to manage crowd dynamics. He is highly sensitive to fluctuations in attention and perceives moments when audience engagement decreases. He is also aware of how smartphones shape the atmosphere of his performances.

Goals

- » Build a strong artistic identity through live performance
- » Create memorable and emotionally intense moments
- » Grow his fanbase
- » Gain visibility and documentation: Benefit from photos and videos shared by fans to increase reach and online presence.

Pain points

- » Attention drops during performance: He sometimes perceives moments where audience focus decreases, especially between songs or during slower transitions.
- » Smartphone mediation during emotional peaks: During the most intimate or intense parts of the show, he notices many phones raised, which can dilute the sense of shared presence.
- » Ambivalence toward documentation: While he appreciates being photographed and shared online, since it contributes to his growth, he also feels that excessive filming can reduce emotional reciprocity.

5.7 Key Insights from the Define Phase

The Define stage integrated the findings of the qualitative and quantitative research into a body of key insights that directly influenced the conceptual approach of the project. These insights identify the structural conflicts inherent in the contemporary festival experience and point to clear design opportunities.

There is an increasing need for guided attention during live events.

The interviews, case studies, and artist statements have identified a common concern regarding the fragmented attention span created by habitual smartphone use. Although the audience is aware that the constant recording of the event detracts from immersion, they are unable to resist the urge to record voluntarily. This indicates a need for a system that does not ban technology but instead directs attention in a subtle and deliberate manner, encouraging presence and focus during critical moments of the performance.

Audiences experience a persistent tension between presence and memory.

Attendees want to remember and re-experience the event, but the act of filming themselves gets in the way of their ability to be fully immersed in the experience. This is a problem that keeps popping up: they film because they want to remember the experience, but then they feel as though the act of filming has diminished their ability to remember the experience emotionally. This shows that there is a need for a different method of memory preservation.

Small–medium festivals require lightweight, scalable, and sustainable solutions.

In contrast to large-scale events, small to medium-sized festivals are constrained by tight budgets and organizational resources. There is also a lot of overlap in roles, limited technical capabilities, and most of the effort is put into logistics. Any other interactive system that is to be introduced in such an environment should be easy to set up, cost-effective, and able to withstand the complexities of operations.

Collective engagement amplifies individual immersion.

Research has shown that immersion is not only an individual

phenomenon but also a collective one. Audience participation is a phenomenon that is highly affected by peer participation. When the audience is actively participating, moving, and reacting together, individual participation is increased. However, passive audiences can easily destroy immersion. This is an important aspect that highlights the need to design interactions that are collective in nature.

5.8 Problem definition

In the Discover phase, the research inquiry broadened to encompass the Italian festival scene, audience behaviors, organizational limitations, and interaction models in the entertainment sector. Through quantitative mapping, qualitative interviews, and reference analysis, patterns, conflicts, and unmet needs emerged regarding live music experiences.

The Define phase condensed this complexity into a more defined focus, integrating findings on user behaviors, motivations, and pain points. Specifically, the study pointed out an increasing gap between the need for presence in live events and the pervasive, often unconscious, use of smartphones that disrupts attention and fosters passive engagement.

The intersection of these findings pointed to a core design problem: how to facilitate attention, participation, and collective engagement without resorting to limiting or distracting design solutions. Instead of simply removing technology from the equation, the project aims to reimagine its role in a more thoughtful and experience-centered manner.

From this, the following design question was developed:

How might we reduce digital distraction and passive behavior in live events without compromising enjoyment and instead improve actual audience engagement?

However, from a UX design perspective, it became necessary to move beyond a surface-level framing of the issue. Rather than simply defining the challenge as one of reduction or limitation, the objective was to go deeper into the underlying dynamics shaping audience behavior.

This shift allowed the research to reconsider the initial assumption: digital distraction is not merely a matter of individual self-discipline, but often an indicator of insufficient engagement.

Instead of asking how to suppress phone use, the focus turned toward understanding what conditions might make people genuinely want to remain present.

The reframed insight can be summarized as follows:

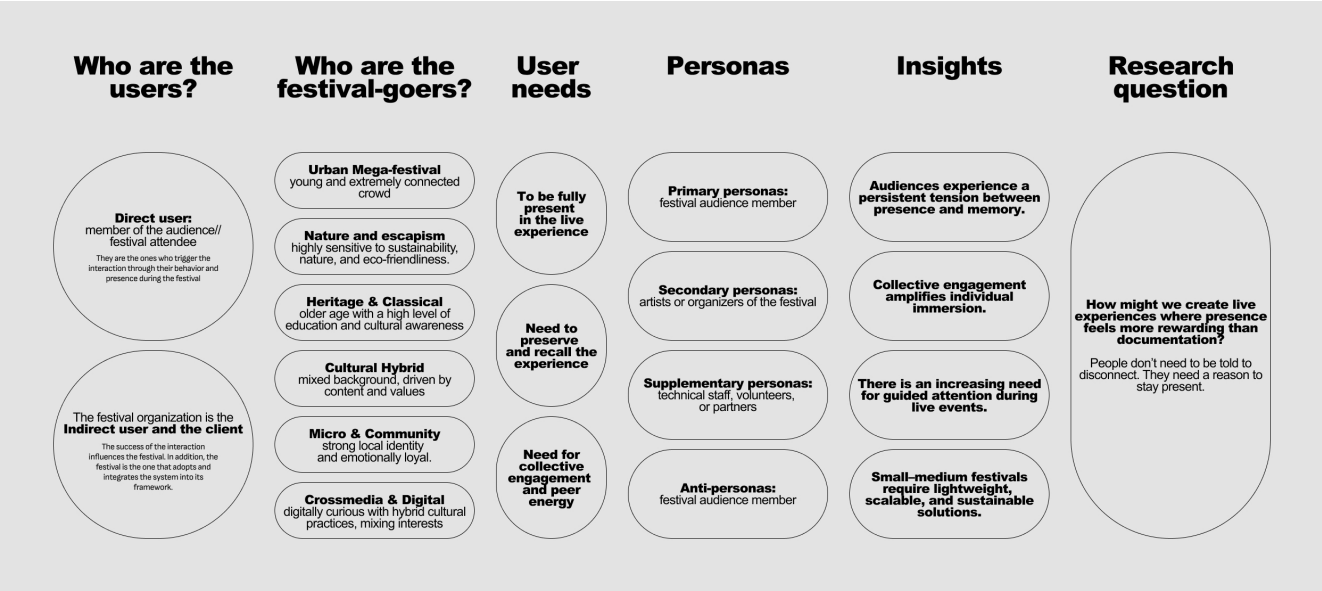
People don't need to be told to disconnect. They need a reason to stay present.

Consequently, the research question evolved into a more constructive and experience-driven formulation:

How might we create live experiences where presence feels more rewarding than documentation?

This reframed problem definition situates the project within an experiential design paradigm. Instead of being the opposite of smartphone use, the goal is now the establishment of a set of conditions in which embodied engagement, collective energy, and real-time immersion create more value than mediated recording. The project seeks, therefore, not the removal of devices but the redesign of the incentive structure of attention.

Figure 53
Diagram to summarize chapter 5



06 Develop

6.1 Methodology Process

The methodology adopted in this chapter builds directly upon the insights gathered in the previous phases of research. Rather

than introducing new exploratory tools, this stage focuses on translating the identified findings into actionable design directions. The process began with the synthesis of key insights emerging from the contextual analysis, stakeholder mapping, interviews, and ecosystem evaluation. These insights were reformulated into a set of project guidelines and constraints, ensuring coherence with the theoretical framework and empirical observations developed throughout the thesis.

From these directions, two distinct conceptual proposals were developed. Each concept represents a different strategic response to the central research question, addressing audience engagement from complementary perspectives: one oriented toward technological mediation and behavioral awareness, the other toward collective activation and embodied participation.

For both concepts, a detailed scenario of use was constructed in order to contextualize their application within a realistic festival environment. This scenario-based reasoning allowed for the evaluation of feasibility, user experience implications, and alignment with the structural limitations of small and medium-scale festivals. A comparative reflection was then conducted to identify the respective strengths and weaknesses of each concept, highlighting trade-offs in terms of scalability, technical complexity, emotional impact, and integration within existing festival ecosystems.

Nota

Finally, preliminary considerations regarding privacy and data management were outlined for both proposals. Given that the subsequent chapter will address the potential implementation of the concepts, it was necessary at this stage to anticipate ethical implications, especially in relation to audience monitoring, data collection, and technological transparency. This methodological progression ensures that the conceptual development remains grounded in research while preparing the foundation for practical application.

6.2 From Insights to design directions

The study has uncovered a number of recurring tensions in the modern festival experience. On the one hand, there is a clear need to be immersed in the experience, to be fully present in the live event. On the other hand, there is a tendency to use the smartphone to record memories, even if this sometimes impacts immersion levels. This is a reflection of the need for the user to

be able to recall the experience.

The importance of peer engagement and the impact of crowd dynamics was also revealed in the interviews. Audience members reported that their level of engagement was significantly impacted by the crowd dynamics, with engagement being a contagious process that is dependent on shared emotional intensity. This has implications for understanding the nature of the live experience, which is not simply an individual process but a collective one.

However, the landscape analysis of small to medium-sized festivals has also shown that there are structural constraints in place, including budget constraints, overlapping roles, and a lack of access to complex technology.

Based on these findings, four key design principles guided the development of the project concepts:

Encourage physical participation

Derived from the user need to feel immersed and physically engaged, this principle responds to participants' desire to dance, move, and experience performances through embodied presence rather than passive observation.

Design for collective feedback

Grounded in the insight that engagement is socially contagious, this direction aims to amplify shared energy and make collective behavior visible and meaningful.

Avoid punitive systems

The reframed problem definition emphasized that users do not need to be disciplined or restricted. Instead, they need rewarding conditions for presence. Therefore, the concepts avoid moralizing or explicitly prohibiting smartphone use, focusing instead on incentive-based engagement.

Be lightweight and scalable for small festivals

In response to organizational and economic constraints identified in the landscape analysis, the solutions are conceived as adaptable systems that do not require extensive infrastructure or large technical teams.

These principles formed a structured framework within which alternative design concepts were developed and assessed. The next sections describe the two main directions pursued during the Develop phase and how each addresses the research findings.

6.3 Concept exploration

According to the definition of the key design principles, the Develop phase moved into a phase of structured concept exploration. Instead of focusing on one solution, two different but well-connected design concepts were developed. Both concepts address the same research question: "How might we create live experiences where presence feels more rewarding than documentation?" but from different philosophies of interaction.

6.3.1 Concept A: Smartphone object detection

Figure 54
Concept A, The original image of the massive attack performance has been modified for research purposes.



The first concept examines the theme of making collective behavior visible in the performance space. The concept is founded on the assumption that attention and distraction are invisible at the individual level but become significant when reflected at the collective level.

This approach examines the possibility of a live performance incorporating a feedback system that reflects the aggregated behavior of the audience in real time. Instead of commanding and controlling, the system provides a dynamic that connects audience behavior to the shared visual space.

This concept thoroughly engages with the themes of collective feedback and not-so-much-punitive intervention and is technically very light and flexible with the existing festival infrastructure.

6.3.2 Concept B: Collective Dancehall

Figure 55
Concept B, Interactive Shadow Art, Source: www.klmultimedia.com



The second concept is based on a generative and embodied approach to the issue. Rather than reflecting distraction, it aims to enhance the physical presence and movement in the crowd. This approach explores the possibilities of using the audience's physical engagement, such as dancing, movement, and spatial rhythm, to influence the performance space. The aim is not to resist digital behavior but to enhance physical participation.

The logic of this approach is generative. Presence is made rewarding because it visibly changes the space. This concept is very much in line with the principles of promoting physical participation and scalable structure appropriate for small festivals. Although both concepts function within the same framework

of research, they symbolize two different design attitudes that complement each other. The first design attitude resonates with behavior to raise awareness, while the second design attitude magnifies participation to raise immersion.

Both concepts symbolize an intentional investigation of alternative approaches to digital distraction, not through limitation but through design.

6.4 Concept definition

6.4.1 Concept A: Scenario of use

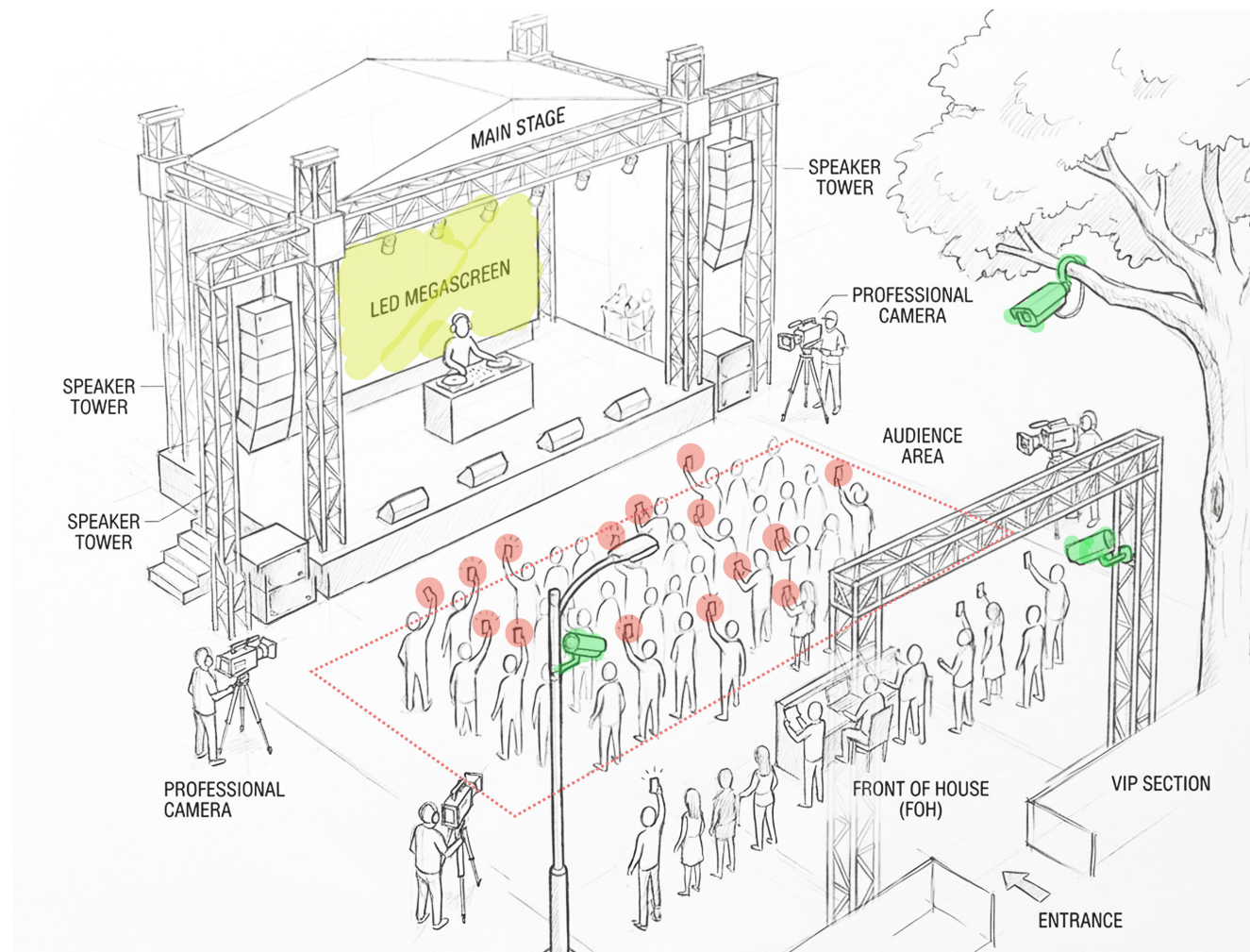


Figure 56
Sketch showing the system of Concept A in a festival scenario

Consider a late-night concert at a small to medium-sized music festival. The headlining act takes the stage, and the energy shifts. As the first famous song starts, several fans in the crowd reflexively bring out their smartphones to record the performance. From the point of view of each individual, this action seems innocuous and almost instinctual. In the midst of the crowded room, lit screens are normalized and do not tend to cause a

disturbance. But as more and more phones are raised, a subtle change happens to the visuals on the main stage.

A layer begins to obstruct the projected images. The actual visuals are still visible, but pieces of them are scattered across the screen, as if partially hidden. The distortion increases in proportion to the number of phones in use. The music is not interrupted; the show itself is not stopped. But the visual experience becomes increasingly less immersive.

Slowly, the audience members recognize the correlation between elevated phones and visual distraction. The connection is not made through words; it is a collective realization. As some members of the audience lower their phones, the visual component diminishes. The stage becomes clearer.

In this situation, the audience recognizes that its collective activity directly impacts the experience. The performance space reacts not to the individual, but to the collective presence.

The system does not demand disconnection. Rather, it creates a clear correlation between distraction and immersion.

6.4.2 Concept A: Strength and Weakness

One of the main advantages of this concept is based on its reflexive nature. This concept does not impose limitations or disable devices; instead, it makes behavior visible. By making visible what is normally invisible, the system instills awareness on a collective level. This directly corresponds to the reframed research question: presence becomes rewarding because it makes visible the enhancement of the performance environment.

The concept also supports the idea that live events are a form of co-created experiences. The audience is no longer a passive receiver of content but an active participant in the environment. This supports the user need for collective engagement and energy identified in the research phase.

From an organizational perspective, the intervention can be implemented within the existing stage visual systems without changing the fundamental structure of the festival. Additionally, the interaction is still indirect and anonymous. It is based on aggregated patterns of behavior rather than specific individuals, keeping a level of abstraction.

Although this concept is coherent in its own right, this direction introduces a number of critical considerations.

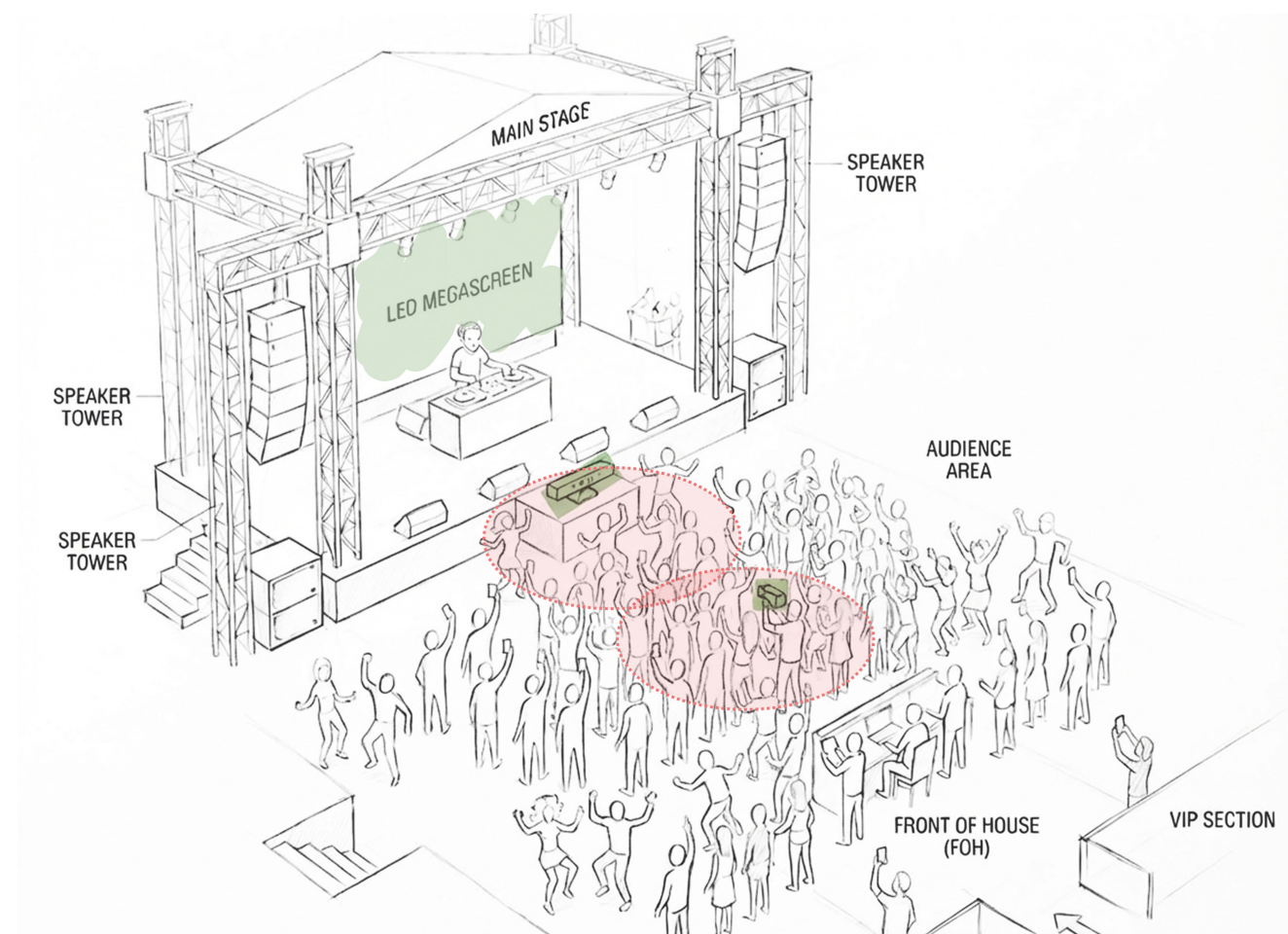
First, even in the absence of the recording and storage of personal data, the mere presence of a detection system may raise feelings of being monitored. Trust from the audience would largely rely on the transparency of the system.

Secondly, there is a fine line between reflection and punishment. If the visual interference is perceived as too disruptive or punitive, the system may result in frustration rather than engagement. The aesthetic integration with the artistic direction of the performance would, therefore, be crucial. The feedback should be perceived as being an integral part of the experience rather than being imposed from the outside.

Lastly, the success of the concept would largely rely on the recognition of the cause-and-effect relationship by the collective. If the relationship between behavior and visual change is too subtle, it may not be recognized. If it is too obvious, it may be perceived as didactic.

Figure 57
Sketch showing
the system of
Concept B in a
festival scenario

6.4.3 Concept B: Scenario of use



Consider an early evening show at a small to medium-sized festival. The mood is being generated, but the audience energy is still not consistent. Some audience members are dancing fervently, some are standing still, and most are switching between watching the stage and checking their phones for a brief moment. In front of the audience, as an integral part of the visual system on the stage or as a visible interactive element close to the audience, a collective visual layer begins to react to the movement. As audience members begin to dance, their silhouettes are converted into abstract shapes projected onto the stage visuals. These shapes are not realistic depictions but abstract, anonymous movement traces.

As movement escalates, the visual environment becomes more complex and dynamic. Colors increase, shapes proliferate, and the projection becomes more intricate. When the audience is static, the visual environment also becomes more austere.

The audience slowly realizes that their bodily engagement affects the mood of the performance. Dancing is no longer just a manifestation of joy; it becomes a tangible input into the joint aesthetic process of the performance. People start to perceive themselves not as individuals in a sea of faces but as part of a larger living entity.

In this case, engagement is presented not as a mitigation of distraction but as an amplification of participation. The system does not respond to what is being avoided but to what is being encouraged: movement, dancing, and co-creation.

6.4.4 Concept B: Strength and Weakness

The key strength of this concept is its positive approach. It is not a reflection of negative behavior but is a reward for active participation. This strategy directly responds to the user need for collective participation and energy, which was discovered in the research phase. It again validates the notion of immersion as a result of bodily engagement and social feedback.

This strategy differs from Concept A in that it does not pertain to digital distraction in any direct manner. It does not track device use or respond to a lack of attention. Rather, it provides an alternative source of attention that naturally competes with smartphone use. Being present becomes desirable as a result of participation, which yields tangible results.

From an experiential perspective, this concept positively engages the body, which validates the importance of bodily interaction in a live setting, as discovered in the research phase. It also validates the design principle of not using punitive systems. The system is designed as a reward mechanism: more movement equals more expressive visuals.

Regarding privacy, the abstraction of the participants to silhouettes makes it much harder to identify them. With proper implementation, the system functions without storing any personal information and without creating identifiable images. This makes it easier to convey the message of transparency and to place the installation as more of a playful addition than a surveillance system.

Moreover, the idea might promote a better emotional connection between the participants. Watching the collective movement be translated into a common image strengthens the sense of unity, turning the audience into a visible community.

However, despite its rich experience, Concept B brings about a set of new issues.

First, it demands a more visible technological infrastructure in the physical environment of the festival. Sensors or cameras need to be placed close enough to record the movement properly.

Secondly, the system relies rather heavily on the responsiveness of the crowd. Without an active or committed audience, the interaction may have difficulty activating. Unlike Concept A, which responds to existing behavior (phone use), this concept calls for a change in engagement behavior.

There is also the potential for the visual element to be either too prominent or too subtle. If too prominent, it could detract from the performance itself. If too subtle, it could lack the motivation necessary for participation.

Finally, although the use of silhouettes helps to reduce identifiability, the presence of visible sensors or cameras could potentially raise privacy issues if not handled properly.

6.5 Privacy considerations

As both of the proposed concepts are based on camera technology, which is used in a public setting, privacy and

ethical issues are a core design consideration. Right from the conceptualization phase, both designs have been developed on a set of non-negotiable guidelines: no facial recognition, no identity recognition, no data storage, and no audio recording.

The aim is not to track people but to facilitate mass interaction. This means that the design will only be for real-time visual processing, with no archives or personal profiles being created.

6.5.1 Concept A

In Concept A, the system is able to capture visual input from a fixed overhead camera. However, what is technically processed is not the identity or image of the individuals but the detection of bright light sources via threshold recognition. The system is able to identify light sources in the form of rectangular luminous patterns, which are typical of smartphone screens.

There are several safeguards in place in this approach. First, the resolution of the image is set to prevent any readable information from being obtained from the screens. Messages, images, or personal information on the devices are not readable. Second, the system only uses real-time processing and does not record any footage. Third, the logic of detection is not based on the analysis of biometric or personal information.

However, despite these measures, there are still potential risks involved. There might be false positives in threshold-based detection, where other bright light sources are mistakenly identified as smartphones. Furthermore, even if the system is not conducting surveillance from a technical perspective, the presence of a camera pointed at the audience might still create a surveillance effect. The audience might feel uncomfortable if the purpose and operation of the system are not properly communicated.

6.5.2 Concept B

Concept B preserves a different set of information. The system only records silhouettes and depth information. The subjects are represented as abstracted visual representations, without any identifiable information. There is no processing of facial information or personal characteristics.

The privacy mechanisms in this concept are mainly based on abstraction. The visual representation does not create realistic images but rather abstracted silhouettes, which make the subjects unrecognizable. Additionally, the physical location of

the camera can be made visible and explicitly stated, which further emphasizes the importance of transparency and informed participation. The visibility of the technological presence in the space can help alleviate the ambiguity that is often associated with hidden sensors.

Some risks still exist in this concept. Since the system is physically closer to the subjects, there may be concerns regarding spatial intrusion. Although there is no identifiable information being recorded, the feeling of being recorded from a close distance can still cause discomfort. As with Concept A, there is a need for communication and explicit indication of the purpose of the system to ensure ethical acceptability.

In sum, both approaches seek to transform camera-based interaction from surveillance to collective augmentation. However, ethical design is not solely dependent on technological protection but also on transparency. In the context of a festival, where the audience is not necessarily expecting interactive sensing systems, the onus is on making the technological mediation visible and voluntary.

07 Deliver

7.1 Methodology Process

After the Develop phase, which produced two alternative concepts based on user needs and key insights, the following step in the UX process is to test and validate their potential.

Although both concepts answer the same reframed research question — “How might we create live experiences where presence feels more rewarding than documentation?”— they represent two different logics of interaction. Because of this, it is not possible to choose one path over the other solely on the basis of theoretical consistency and design intent. This choice needs to be validated.

In a research-based UX paradigm, the Deliver phase is more than just implementation; it is the process of decreasing uncertainty. This is where the prototypes become instruments of research. They enable the designer to test how a given audience might respond to the proposed systems, how the interaction is understood within the given context, and whether the desired behavioral outcomes (more presence, collective engagement,

less passive phone use) are actually achieved.

Chapter 7 marks the shift from design exploration to evidence-based decision-making, which is a crucial step in developing a promising concept into a feasible intervention.

7.2 Interaction Model

In order to compare the two concepts in a structured and transparent manner, it is necessary to define their respective interaction models. At this stage of the research, these models should be understood as design hypotheses rather than empirically validated systems. They represent conceptual frameworks and are intended to clarify the behavioral logic underlying each proposal. Although both concepts operate within the same festival context, they articulate different hypothetical feedback dynamics between audience behavior, technological mediation, and visual output. Concept A is based on a corrective and subtractive loop, where the system reacts to specific behaviors by limiting or modifying visual stimuli. Concept B, conversely, follows an amplificatory and generative logic, where collective participation becomes the input that progressively enhances the audiovisual environment.

These models therefore function as analytical tools to evaluate potential implications, rather than definitive descriptions of tested interaction systems.

7.2.1 Concept A

» Phase 1 - Passive Behavior

The interaction in Concept A starts with a pre-existing condition: passive smartphone use during a live performance. The audience is engaged in habitual activities such as video recording, photo taking, or checking their phones. This is the initial state of the system.

» Phase 2 - System detection

An overhead camera is scanning the audience continuously. Using brightness threshold recognition, the system detects rectangular light sources illuminated, corresponding to smartphone screens. It is essential to note that the system does not detect people but light intensity patterns.

» Phase 3 - Visual Consequences

These illuminated regions are cropped and projected in real time onto the main stage visuals. The projection does not interrupt

the performance but gradually covers parts of the visual display, creating an interference effect. The more smartphone screens are detected, the more the visuals on the stage are fragmented or obscured.

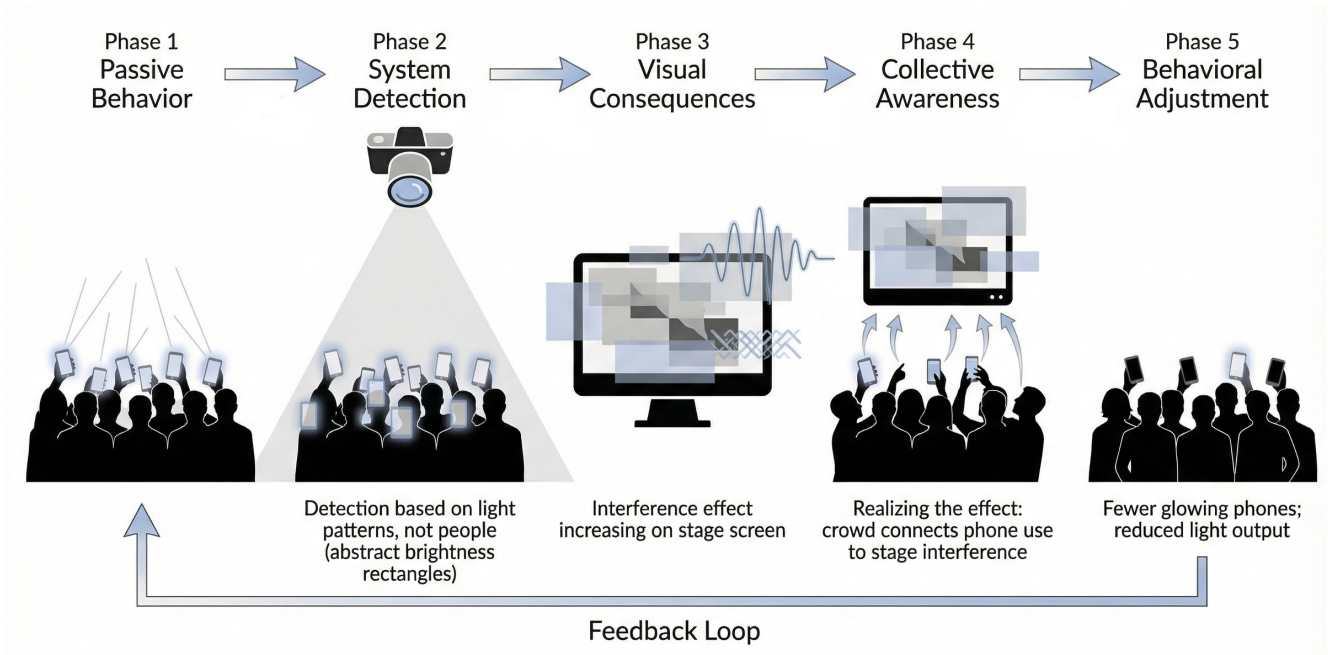
» **Phase 4 - Collective awareness**

This leads to a moment of collective awareness. The crowd starts to realize that their individual actions are collectively leading to a common visual outcome. The weakening of the visuals is now a visible sign of the collective distraction.

» **Phase 5 - Behavioral Adjustment**

If the use of smartphones goes down, the overlays decrease accordingly. Consequently, the visuals on stage become clear and meaningful again. Immersion increases. The system therefore creates a feedback loop where the adjustment of behavior comes from the collective visual consequence and not from a prohibition.

Figure 58
Sketch showing the Interaction model
of Concept A



7.2.2 Concept B

Concept B is organized around another starting point. Instead of responding to passive behavior, it addresses active engagement of the body.

» **Phase 1 - Kinect capture**

The Kinect sensor records body movement and depth within a predetermined spatial area. It does not analyze identity but rather

at the level of intensity of movement, spatial density, and group rhythm. Movement information is abstracted into parameters such as speed, amplitude, and distribution.

» **Phase 2 - Visual feedback**

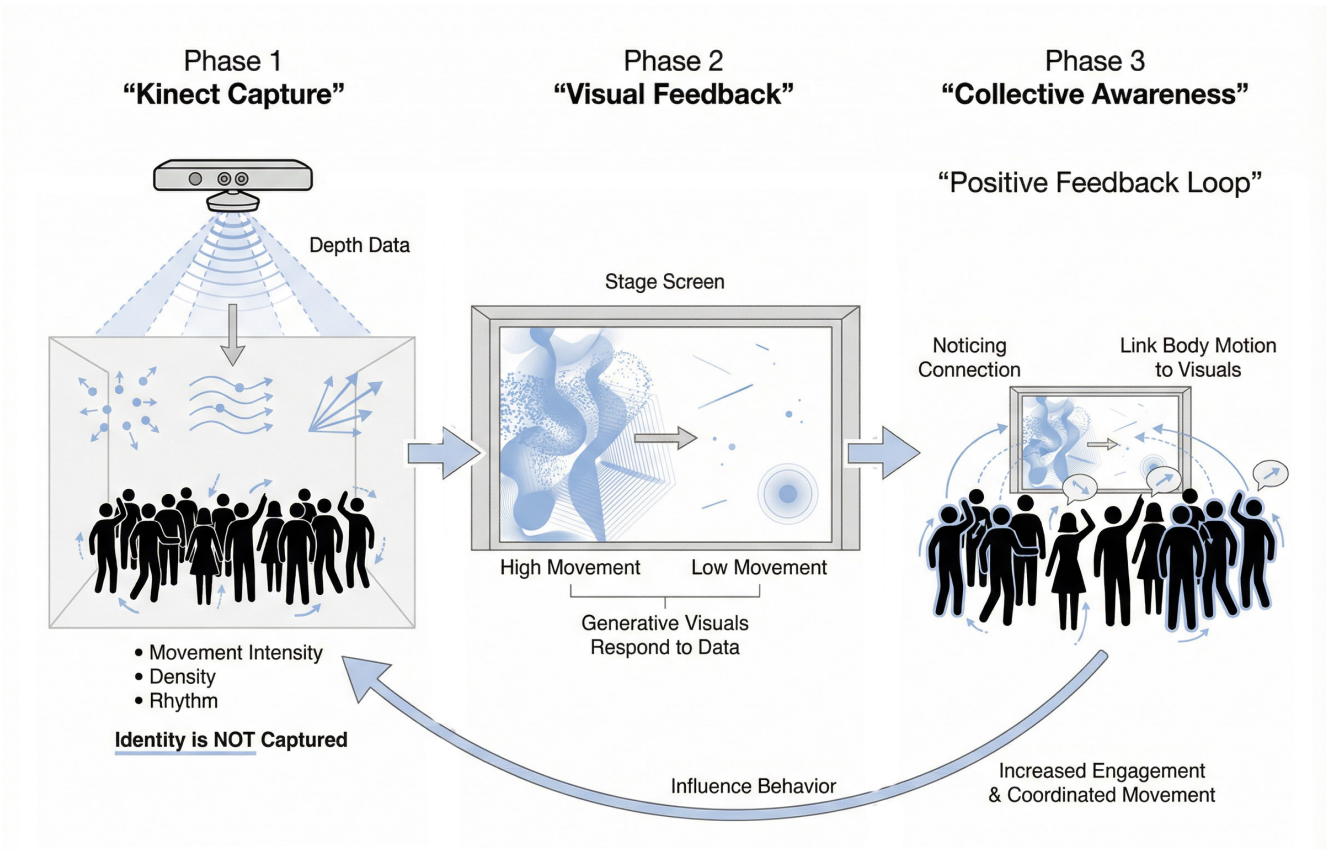
This information is translated into generative visuals projected on stage. The visual space is responsive to the energy of the crowd. More movement translates to more dynamic, complex, or expansive visual compositions. Stillness, on the other hand, translates to minimal or muted visual activity.

» **Phase 3 - Collective awareness**

As the participants realize that their dancing and movement patterns have a direct effect on the visuals on the stage, collective awareness is achieved. The audience realizes that the system is not only reactive but also collaborative.

An amplification loop is then created. The more people move, the more complex the visuals become. The more complex visuals, the more people participate, and so on. The system acts as a positive feedback system, rewarding the presence of people rather than correcting their distraction.

Figure 59
Sketch showing the Interaction model
of Concept B



7.3 System architecture

7.3.1 Concept A

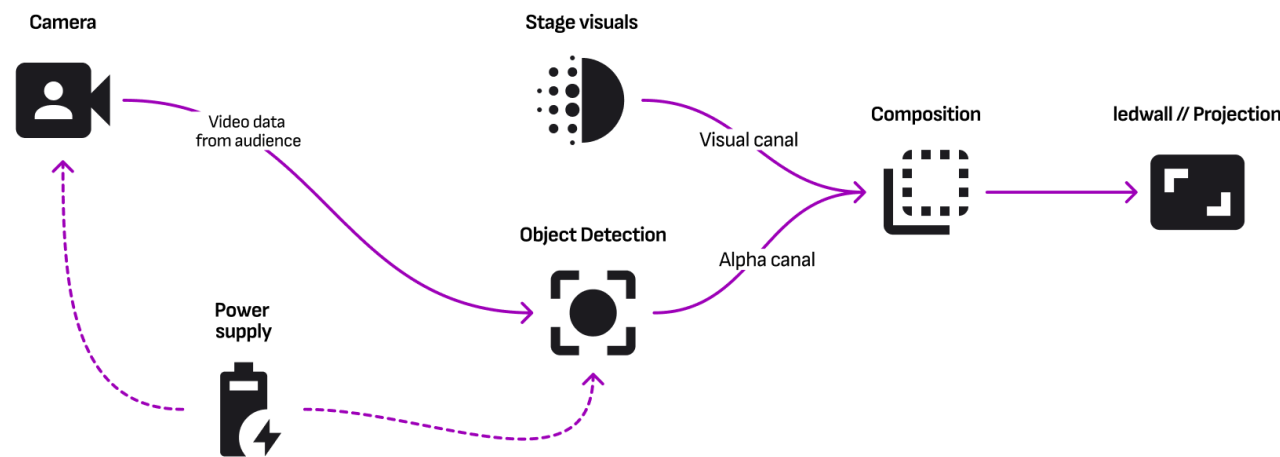


Figure 60
Sketch showing the System
architecture of Concept A

The system architecture of Concept A is intended to maintain a technically light approach while integrating well with the existing visual system of a festival stage.

The configuration begins with a fixed camera placed above and slightly at the back of the audience, facing the audience instead of the festival stage. The camera is placed high enough for the system to capture the illuminated screens of raised smartphones without focusing on recognizable facial details. The camera signal is then transmitted in real-time to a dedicated computer processing the visual signal.

In the processing unit, object detection is achieved by brightness threshold recognition. The algorithm identifies areas of high-intensity light sources that match the typical brightness and dimensions of smartphone screens. The identified areas then go through a cleaning and filtering process to eliminate visual noise and false positives. The system does not provide detailed image capture; instead, it provides simplified cropped images of the identified light sources.

The processed result is then transmitted to the visual control system of the festival stage. By means of a live compositing process, the processed elements are overlaid onto the main stage visuals shown on the large LED screen. The overlay process is dynamic; its density and intensity are proportional to the number of detected screens.

Notably, the system is real-time. There is no footage recorded, and there is no visual data archived. The processing loop is a transient process: capture, detection, abstraction, overlay, and reset.

From a structural perspective, the system can be analyzed as comprising four interrelated modules:

- » Input Layer — Overhead camera capturing luminous crowd activity.
- » Power and Connectivity Layer — Direct electrical supply and wired connection to the processing unit.
- » Processing Layer — Real-time threshold detection and visual filtering.
- » Output Layer — Dynamic compositing integrated into the stage visual system.

This modular setup ensures that the system is still flexible. It can be easily incorporated into a festival setting without having to make extensive changes to the stage design. Since it is a visual overlay and not an autonomous system, it benefits from the existing projection or LED screen environment.

The system architecture is an embodiment of the scalability design principle, as discussed in the previous chapters. Since it does not have complex hardware and does not incorporate extensive sensor networks, it is still viable in the economic and logistical realities of small to medium-sized festivals.

7.3.2 Concept B

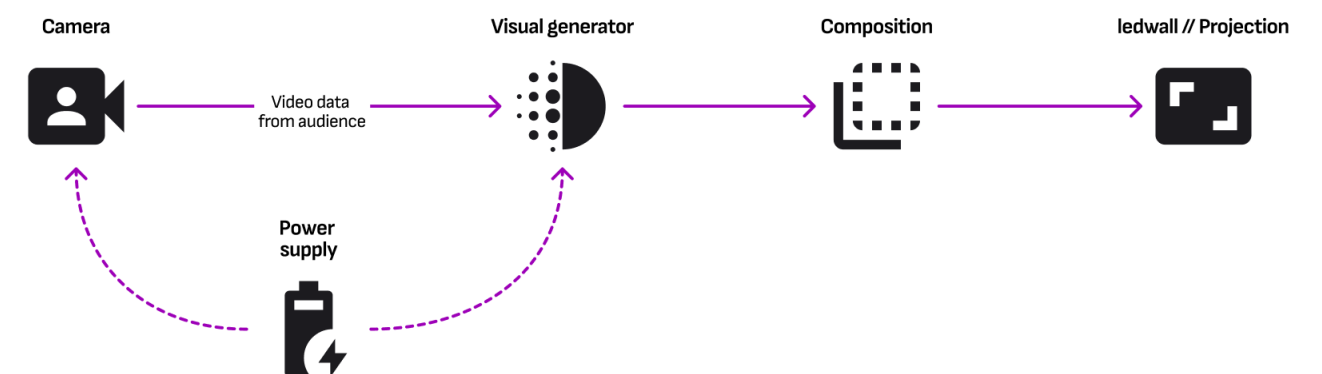


Figure 61
Sketch showing the System
architecture of Concept B

The system architecture of Concept B is organized around a depth-sensing camera (Kinect) intended to detect the collective body motion of the audience in a specific spatial area.

The Kinect sensor is placed at the front or near the audience, facing the participants. Unlike a conventional RGB camera, the Kinect sensor records both visual silhouettes and depth data, allowing the system to analyze spatial distribution, motion density, and body dynamics without processing recognizable

facial expressions.

Because of its hardware needs, the Kinect sensor needs to be connected to a dedicated computer for processing the data as well as a direct power source, as it cannot be used independently. This adds another layer of infrastructure to the system, as in Concept A, but with more complex cable management needs in the festival setting.

The live video feed is sent to the processing computer, where the motion input is converted into visual variables. The system processes variables such as motion amplitude, velocity, body density in the frame, and overall spatial rhythm. These variables are then used to drive a generative visual engine.

The produced visuals are then transmitted from the computer to the main display system, either an LED screen or a projection surface, where they are merged into the stage environment. The projection is in real time, allowing immediate feedback between movement and visual response.

Like Concept A, the system does not store data. The interaction loop is based on a transient processing model: capture, abstraction, transformation, projection, and reset. The system can be defined as consisting of four interrelated components:

- » Sensing Layer — Kinect device capturing depth and motion data.
- » Power and Connectivity Layer — Direct electrical supply and wired connection to the processing unit.
- » Processing Layer — Real-time motion analysis and generative visual translation.
- » Output Layer — Projection or LED display integrated with stage visuals.

In contrast to ConceptA, this design presents a more overtly visible technological presence in the audience space. Nevertheless, it enables a more nuanced interpretation of bodily movement and spatial dynamics.

In terms of scalability, although still possible for small to medium-sized festivals, this system requires more meticulous spatial planning and technological implementation. Its value lies in its ability to interpret collective bodily engagement with dynamic visual representation, underscoring the embodied and participatory aspect of the live event.

7.4 How it works

7.4.1 Concept A

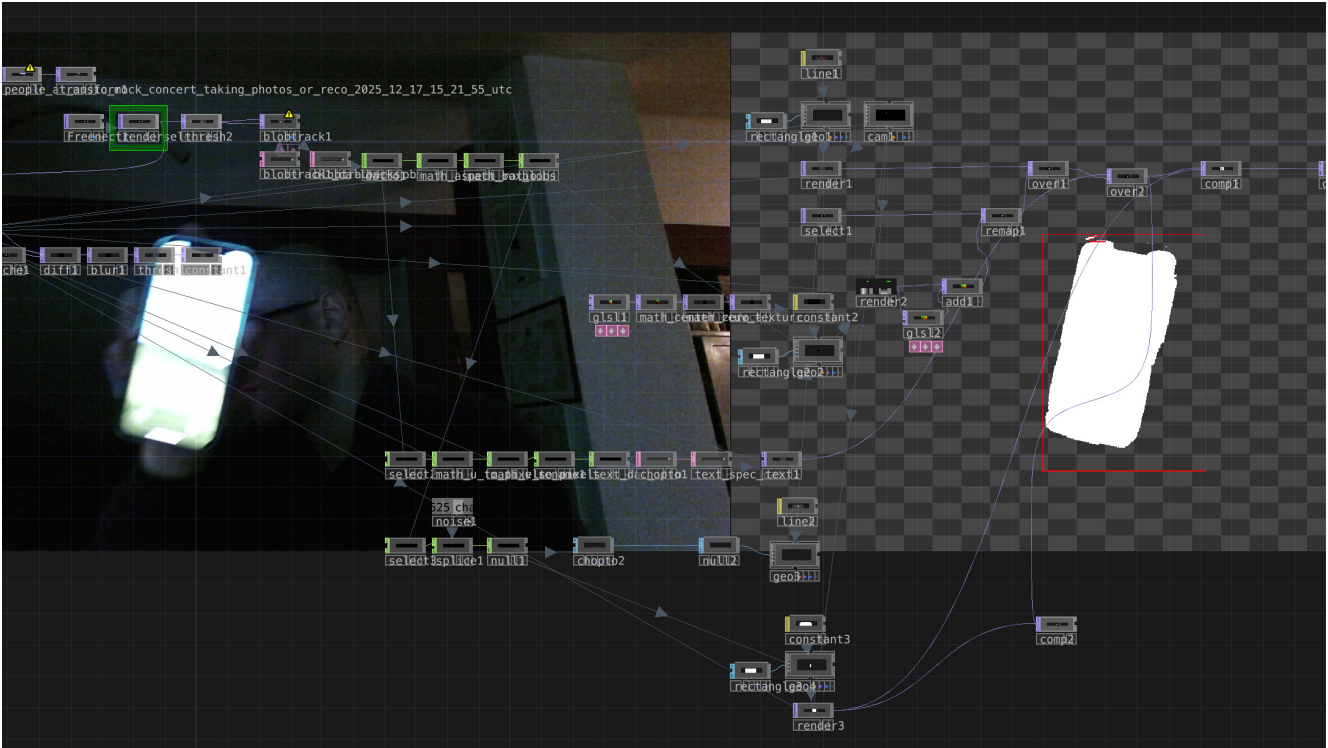
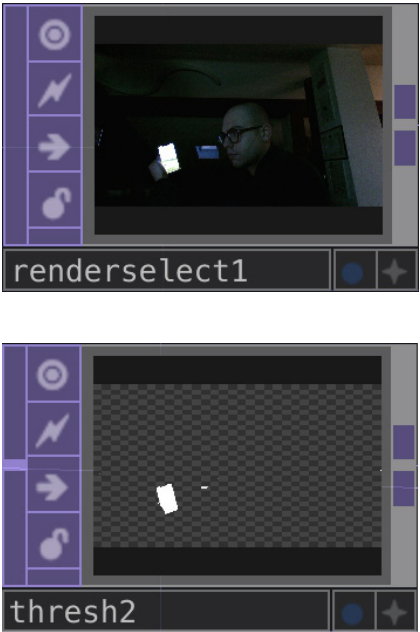


Figure 62
Screenshot of touchdesigner network
of the prototype of Concept A

The object detection algorithm developed for Concept A was built using TouchDesigner, a visual programming environment that uses nodes to create real-time interactive installations and live visual processing.

Figure 63 to 68
Knots of the touchdesigner network of
Concept A



The object detection algorithm is based on luminance thresholding and blob tracking, and not machine learning or AI-based object recognition. This was a deliberate design choice: it is transparent, deterministic, and computationally efficient, as per the constraints outlined earlier.

The processing pipeline unfolds as follows:

First, the live video stream from the overhead camera is imported into TouchDesigner via a Video Device In operator. As the smartphone screens are modeled as high-intensity light sources in a darker crowd setting, a brightness threshold is applied using a Level or Threshold operator. This operator is used to create a binary mask of the image, where pixels above a certain luminance value are set to white, and the rest are set to black.

The threshold value is set through empirical testing to separate the light sources from the stage lighting or reflective surfaces. However, due to the dynamic nature of festival lighting, a stable



threshold value is difficult to achieve.

After the binary mask is created, a Blob Track TOP operator is employed to identify areas of white that are connected. These areas are then considered to be possible smartphone screens. The blob tracking system is able to retrieve information about the position of the area (X/Y coordinates), the size of the area, and the bounding box size of the area.

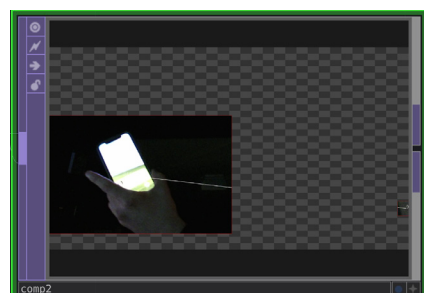
A technical limitation was identified during the development process. The free version of TouchDesigner only allows for two tracked objects at any given time. This makes it difficult to achieve the collective logic of the system, which would be to identify multiple screens at the same time. In order to overcome this limitation during the development stage, the test environment was set up to simulate controlled conditions with a limited number of active devices.

Once identified, the bounding box corresponding to each blob is used to extract the respective area from the original video stream. The extracted areas are then processed to refine edges and eliminate noise. The processed fragments are then texture-mapped and sent to a compositing network.

To facilitate the overlaying of the stage visuals, each extracted area is provided with an alpha channel. The alpha channel enables the fragments to be overlaid on the main visual output without fully obscuring it. With the Composite TOP operator, the screen fragments are composited over the main visual stream in real time.

The intensity and number of overlays can be proportionally related to the number and size of the detected blobs. In this manner, the system expresses the collective smartphone use as visual interference without modifying the underlying content. Crucially, the whole process is a transient loop, where the input is recorded, processed, and displayed in real time, without storing any frames. After a frame is processed and displayed, it is deleted.

From a computational standpoint, the process is also relatively lightweight, using image processing techniques such as thresholding and contour tracking, as opposed to deep learning models. This is important for the aim of building a system that could plausibly work within the technical infrastructure of small to medium-sized festivals.



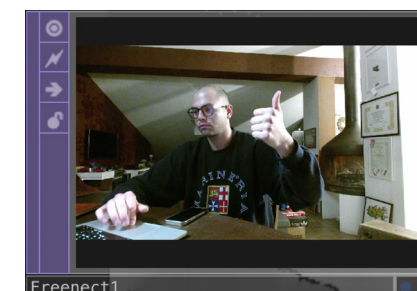
7.4.2 Concept B



Figure 69
Screenshot of touchdesigner network of the prototype of Concept B

Concept B focuses on translating collective bodily presence into a temporally displaced visual field. The system begins with the Kinect depth sensor, which captures real-time spatial data of the audience area in front of the stage. Unlike RGB cameras, the Kinect provides depth information, allowing the system to detect bodies based on distance rather than color or texture.

Figure 70 to 72
Knots of the touchdesigner network of Concept B



The incoming depth stream is processed inside TouchDesigner. A threshold operation is applied to isolate the relevant depth range corresponding to the audience, effectively separating bodies from the background environment. This step produces a high-contrast silhouette mask that represents the collective presence of people in space.

The silhouette is then cleaned to reduce noise and unwanted artifacts. Basic filtering operations are used to smooth irregular edges and eliminate minor depth inconsistencies. The objective at this stage is not to obtain precise anatomical tracking, but rather to create a stable and readable representation of mass and movement.

A time displacement operator is then applied. Rather than displaying movement as immediate feedback, the system introduces temporal delay and accumulation. As bodies move, their spatial data is slightly offset over time, generating trails



and layered echoes of motion. This creates a dynamic visual effect in which collective movement leaves a residual trace in space, transforming instantaneous gestures into fluid temporal compositions.

The final output consists of this displaced silhouette projected as an abstract visualization of collective motion. No data is stored at any point in the process.

7.5 Prototype Constraints

Although both Concept A and Concept B were developed at the level of interaction model and system architecture, only Concept B was implemented and tested in practice. This decision was not conceptual but technical.

Concept A relies on consistent and reliable real-time body detection in order to function meaningfully. The corrective logic of the system depends on the accurate tracking of multiple individuals simultaneously. However, within the constraints of the TouchDesigner non-commercial (free) license, the Blob Track operator is limited to tracking only two blobs at a time. This limitation significantly compromises the validity of the detection mechanism in a festival-like scenario, where the system is intended to respond to collective behavior rather than to one or two isolated bodies.

Because the core logic of Concept A depends on scalable multi-user detection, testing it under these constraints would have produced misleading or non-representative results. The interaction would not reflect the intended collective dynamic, and therefore any evaluation would lack methodological consistency with the research objectives.

For this reason, Concept A remains a viable and theoretically coherent design direction, but it is not empirically validated within this thesis. Concept B, by contrast, does not depend on individual blob tracking but instead processes depth data and collective motion fields. This made it technically feasible to prototype and test within the available software limitations.

The following section therefore presents the testing framework applied exclusively to Concept B.

7.6 Prototyping Strategy

In most UX projects, prototyping involves the creation of simplified interfaces or simulated interaction flows. However, in this project, the nature of the proposed systems required a different approach. Both concepts were conceived as environmental and collective interaction systems rather than interface-based products. There are no buttons, menus, or direct interaction points. Interaction is passively derived from audience behavior within a live setting. For this reason, prototyping did not consist of wireframes or speculative visual mock-ups, but of building functional real-time systems capable of processing live input and producing immediate visual output.

Originally, the intention was to prototype both Concept A and Concept B in order to compare their behavioral and perceptual impact. However, due to technical constraints described in the previous section, only Concept B was fully implemented and tested. Concept A remains at the level of interaction model and system architecture, but was not validated through practical experimentation.

The prototype of Concept B was developed in a smaller environment rather than in a real festival context. Crowd density, lighting variability, and environmental unpredictability were active but at a smaller scale. The objective of the prototyping phase was not to achieve production-level refinement, but to validate three core aspects:

- » technical feasibility of real-time depth processing
- » perceptual clarity of the visual feedback mechanism
- » potential behavioral response generated by collective motion translation.

7.6.1 Prototype set-up

Figure 73
Kinect position during the test



The Kinect sensor was placed facing the audience area at about upper-body height, enabling it to record both silhouette and depth information in a specified interaction area. As required by the sensor, the Kinect sensor was connected to a separate power source as well as to the processing computer via a cable. Unlike a standard RGB camera, the Kinect 360 v1 sensor is not capable of operating solely via a USB connection and thus requires a constant supply of external power while in operation.



Figure 74 to 76
Photos of the Microclub party, with the prototype of concept B in use

The output signal from the computer was transmitted through HDMI to a projector that was positioned above the area. The images were projected onto a designated area, mimicking the incorporation of the generated images in a stage setting. The computer was still connected to a power source throughout the demonstration.

7.7 Testing Framework

The first testing phase was carried out during the private event called Microclub Apartment, organized by Microclub. The event was held in a top-floor apartment in the city center of Reggio Emilia, and it was organized as a carefully curated and invitation-only event.

Thanks to a professional connection with the organizers, it was possible to test the prototype in a situation of full operational autonomy during the event. This represented a very interesting opportunity to test the system in a real social context, even if on a smaller scale compared to a public festival.

7.7.1 Ethical and privacy framework

Since the event was private and only allowed access after the selection of participants, all participants received a detailed invitation message before the event. The message contained information about the location, house rules, and details about the presence of an interactive camera-based system, which was developed for a master's thesis project.

Participants were explicitly informed that:

- » A camera would be present as part of an interactive visual system.
- » Photos and videos would be taken during the event for documentation purposes.
- » All collected content would be used exclusively for research.
- » Any recognizable faces appearing in documentation would be obscured.

Attendance at the event implied acceptance of these conditions. This communication ensured transparency and informed consent.

Importantly, this enhancement does not alter the privacy logic of the system. As in the previous iteration, only depth data is processed, and no RGB or identifiable visual information is captured or stored. The particle layer further distances the final output from any literal representation of bodies, reinforcing abstraction as both an aesthetic and ethical choice.

From a conceptual standpoint, the improved prototype strengthens Concept B's role as an embodied spatial amplifier. Collective motion is no longer simply displaced in time, but expanded into a generative field that visually materializes kinetic intensity. The system thus evolves from a proof of technical feasibility into a more articulated proposal for a scalable festival installation.

7.9 Focus group evaluation

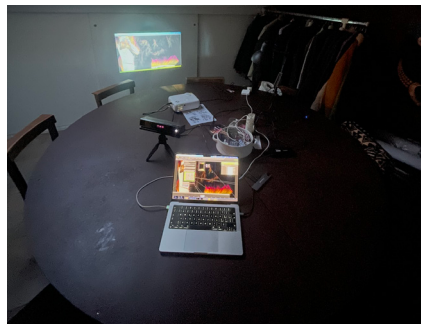


Figure 80
New prototype set-up of Concept B for the Focus group evaluation

In order to evaluate whether the proposed system effectively addresses its primary objective, improve audience engagement by minimizing digital distraction during live performances, a small-scale focus group session was conducted. The aim was not to statistically validate the system, but to qualitatively explore its perceived impact on presence, engagement, and smartphone usage behavior within a festival-like context.

The session was structured as a moderated group discussion. Participants gathered in the same space where the improved prototype of Concept B was installed and running in the background. The Kinect-based system was actively capturing and generating visuals in real time, creating a semi-immersive environment. Music was played at a moderate volume: loud enough to simulate a live atmosphere, yet low enough to allow verbal exchange. This configuration allowed participants to simultaneously experience the system and reflect on it, bridging observation and discussion.

At the beginning of the session, the research objectives were clearly explained. Participants were informed that the focus of the discussion was to evaluate whether the system could realistically reduce smartphone usage by encouraging embodied and collective engagement. Each question was first posed individually, allowing every participant to respond, and was then opened to spontaneous group discussion in order to encourage natural exchanges and critical reflections.

The focus group consisted of six participants, all regular festival-

goers familiar with live music environments. Most participants are personal acquaintances of the researcher. Alessio M. and Samuele Z. had previously been interviewed during the research phase and were therefore already familiar with the conceptual direction of the project. Luca C., an additional participant, had been present during the Microclub testing session and had directly observed an earlier version of the prototype in action.

This proximity to the researcher and prior exposure to the project introduces potential bias, which is acknowledged as a methodological limitation. Participants may have been more receptive to the concept due to familiarity, prior discussion, or social dynamics. However, their consistent attendance at festivals and direct experience with live performance contexts make them relevant evaluators in relation to the project's objectives.

All participants were informed about the purpose of the session and the academic context of the research. Participation was voluntary, and feedback was collected with audio recording. No personal identifying information is disclosed in the documentation of the results.

The discussion was structured around three core questions designed to assess whether the system could realistically reduce smartphone usage by increasing embodied and collective engagement:

If you were at a festival where the stage visuals were generated in real time by the audience's collective movement, would you feel more motivated to stay physically engaged? Why?

Purpose: To understand whether the system creates intrinsic motivation for embodied participation as an alternative to passive recording.

Would this type of system make you feel more part of a collective experience, or would it remain secondary to the artist's performance?

Purpose: To assess whether the installation is perceived as meaningful or merely decorative.

In your opinion, does this solution reduce digital distraction by replacing it with something more engaging, or does it simply introduce another visual stimulus?

Purpose: To critically test whether the project fulfills its stated intention or risks reinforcing spectacle-driven recording behavior.

Through this structured discussion, the objective was to gather reflective insights on the perceived validity of Concept B as a strategy for reducing digital distraction without imposing restrictions, but instead by fostering collective embodied engagement.

08 Results

8.1 User test result

The user test was conducted during a Microclub event through a shadowing approach. Rather than directing participants or providing explicit instructions, the system was installed in the venue and observed in a natural setting while attendees interacted with it spontaneously. The objective was to evaluate real behavioral responses to the prototype in a live music environment.

Figure 81 to 85
Photos of the Microclub party, with the prototype of concept B in use



Initial Curiosity and Exploration

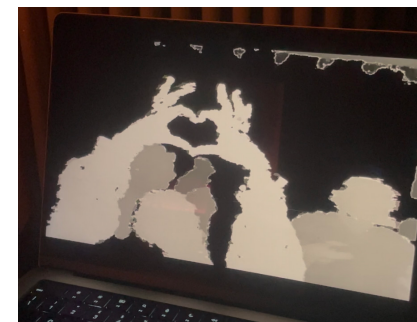
At the beginning of the event, when the system became visible, attendees showed clear signs of curiosity. Several individuals looked directly at the Kinect sensor and the projector, attempting to understand how the system worked. Some participants waved their hands or stepped in and out of the tracking area to test whether their presence affected the visuals.

This exploratory phase is typical of first contact with interactive systems and indicates that the feedback loop between body movement and visual output was perceptible and understandable without explanation.

Shift from Observation to Participation

Once the music volume increased and the event atmosphere intensified, behavior shifted significantly. Rather than simply observing the installation, multiple participants intentionally positioned themselves directly in front of the Kinect camera. This behavior suggests that the interactive zone was recognized as a performative space.

Participants were not passively standing in the projection area; they were deliberately choosing to dance within the tracked zone.



The interactive field became a temporary micro-stage within the larger event environment.

Smartphone Behavior

One of the most significant observations concerns smartphone usage. Individuals positioned inside the Kinect capture area were not holding their phones while dancing. When someone took out their phone, they tended to step out of the tracked zone.

This behavioral pattern suggests a spatial separation between embodied participation and digital mediation. The interactive area appeared to encourage physical engagement over documentation. The necessity of using both hands and full-body movement to influence the visuals may have implicitly discouraged simultaneous phone use.

Although this does not prove a direct causal relationship, it indicates that the system may create conditions that reduce phone usage by demanding physical presence.

Expressive Appropriation

A particularly meaningful moment occurred when one participant moved to the center of the tracked area and began performing choreographed hand movements synchronized with the music. She appeared to intentionally explore the visual response of the system, treating the projection as a responsive partner.

This episode highlights an important qualitative insight: the system did not merely produce reactive visuals; it invited performative experimentation. The participant shifted from being an audience member to becoming an active visual contributor.

From a UX perspective, this indicates successful affordance communication: the system's behavior was legible enough to invite intentional manipulation without instruction.

Emergent Micro-Collectivity

Another relevant observation was the formation of small clusters of people around the tracked area. When one person engaged with the system, others briefly gathered to watch or join. This created short-lived collective dynamics centered around embodied interaction rather than screen-based mediation.

The shadowing session revealed three core outcomes:

- » The interaction logic was immediately understandable without explanation.

- » The tracked zone encouraged embodied participation.
- » Phone usage appeared spatially incompatible with active engagement in the system.

While the test was conducted on a small scale and within controlled constraints, the observed behaviors support the hypothesis that generative, movement-based visual systems may foster physical presence and temporarily reduce digital distraction, not by prohibition, but by offering a compelling alternative mode of engagement.

8.2 Focus group result

The focus group involved six participants: Alessio M., Samuele Z., Luca C., Luca M., Laura L., and Andrea B. Each participant answered the three structured questions (see appendix for the questions) individually before engaging in an open discussion. This structure allowed both personal positioning and collective reflection to emerge.

Individual Responses

Question 1 received unanimous agreement. All participants stated that, in principle, a stage visual system generated by collective movement would motivate them to remain physically engaged. The primary reason cited was that the system provides an additional reason to move and participate, making physical presence feel more meaningful.

Question 2 produced more varied responses. Four participants felt that the system would enhance the sense of collective experience, while two believed it would remain secondary to the artist's performance. This indicates that while the system strengthens group awareness, it does not necessarily override the centrality of the performer.

Question 3 revealed the greatest divergence. Four participants felt that the system does not directly reduce digital distraction but instead introduces another visual stimulus. Two participants believed it could meaningfully reduce phone use by offering a more engaging alternative.

Emergent Themes from Group Discussion

After the structured responses, an open discussion developed. Several recurring themes emerged:

» Increased Immersion and Collective Energy

Participants broadly agreed that the system enhances immersion

and reinforces the perception of being part of a shared experience. The real-time visual feedback was described as something that:

- » Encourages people to dance more.
- » Stimulates peer energy.
- » Creates a sense of visibility and shared contribution.

The possibility of being represented on the large screen was identified as a motivating factor. Participants suggested that people may feel encouraged to “perform” within the interactive zone, transforming passive spectators into active contributors.

» Reduction of Passivity

There was consensus that the system reduces passivity. It provides an explicit incentive to remain active during the live performance. Rather than simply watching the artist, participants are given an additional layer of engagement.

However, reducing passivity does not automatically equate to eliminating phone use.

» Ambivalence Regarding Smartphone Use

The most debated issue concerned digital distraction.

Two contrasting interpretations emerged:

» Stimulus Replacement:

Some participants argued that the system might paradoxically encourage phone use, as people may want to record the visually compelling effect generated by the interaction.

» Embodied Engagement:

Others argued that when physically inside the tracked area, they would not use their phone. Being captured by the system creates a performative situation that encourages movement rather than documentation. Phone use, in this view, would occur primarily outside the camera's field.

Interestingly, this aligns with the shadowing observations during the Microclub test, where individuals inside the tracked area were rarely holding smartphones. A recurring statement during the discussion was that “inside the camera area, I wouldn't use my phone, I would move.” However, several participants admitted they might still take out their phone when not being visually represented.

Interpretation

The focus group results suggest that the system is perceived as:

- » Increasing immersion.
- » Strengthening collective awareness.
- » Encouraging active participation.

However, its capacity to reduce digital distraction appears conditional rather than absolute. The system may not eliminate smartphone use, but it may spatially and behaviorally displace it, shifting attention toward embodied engagement when participants are directly involved.

The findings reinforce the idea that the project does not operate as a prohibitive mechanism, but rather as a behavioral alternative. Instead of restricting smartphone use directly, the system introduces an embodied and collectively rewarding mode of engagement that reconfigures attention dynamics within the live environment.

From a UX perspective, this indicates that the system's success in minimizing distraction depends on the intensity of engagement it generates. The stronger the embodied and collective reward, the less attractive the phone becomes, at least temporarily.

8.3 Impact and Future development

The combined results of the Microclub field test and the focus group evaluation allow for a structured reflection on the research question guiding this thesis:

How might we create live experiences where presence feels more rewarding than documentation?

The findings do not provide a binary answer. Instead, they offer insight into complex behavioral dynamics that highlight the benefits and limitations of the proposed method

8.3.1 Consolidated Insights

Embodied Feedback as Behavioral Incentive

Both observational data and participant feedback indicate that real-time generative visuals driven by collective movement significantly increase embodied participation. The system successfully reconfigures a portion of the audience from passive spectators into active contributors.

This suggests that environmental feedback loops can operate as non-coercive behavioral incentives. Rather than prohibiting smartphone use, the system increases the perceived value of

physical engagement.

Spatial Redistribution of Attention

A particularly relevant outcome concerns the spatial dynamics of smartphone use. During the Microclub test, participants inside the tracked area were rarely holding phones. When phones were used, individuals often moved outside the capture zone.

The focus group discussion reinforced this pattern conceptually: participants stated that active involvement within the system would make phone usage behaviorally inconsistent.

This indicates that digital distraction may not be eliminated, but spatially redistributed. The system generates a localized zone in which embodied engagement and phone use become functionally incompatible.

In relation to the research question, this demonstrates that distraction can be mitigated not through universal restriction, but through the creation of high-engagement micro-environments.

Engagement Does Not Automatically Neutralize Documentation

However, the third focus group question exposed a critical limitation. The majority of participants expressed doubt that the system alone is sufficient to reduce smartphone usage overall. Some even suggested that visually compelling generative outputs might increase the desire to document.

This highlights an important theoretical distinction:

Reducing passivity is not equivalent to Reducing digital mediation.

While the system increases embodied activation, it does not structurally counteract the impulse to record. Therefore, in its current form, the project functions as an engagement amplifier, but not yet as a fully articulated distraction mitigation mechanism.

8.3.2 Design opportunities

The evaluation phases made one aspect particularly clear: the system works as an engagement catalyst, but not yet as a fully articulated distraction regulator.

During both the Microclub test and the focus group discussion, participants consistently described the installation as immersive, energizing, and capable of strengthening collective presence. Movement became intentional. Participation became visible. The

audience was no longer only observing the performance, but contributing to the visual atmosphere of the event.

However, when the discussion shifted toward digital distraction, the picture became more nuanced. While the system clearly competes with smartphone use by offering a compelling embodied alternative, it does not inherently prevent documentation. In some cases, the aesthetic quality of the visuals might even encourage recording.

This tension reveals an important design opportunity.

If embodied interaction is capable of attracting attention, perhaps it can also regulate it, not through restriction, but through calibrated feedback. The next logical evolution of the project would therefore involve integrating the corrective dimension explored in Concept A with the generative logic of Concept B.

In practical terms, this could mean embedding object detection within the interactive area in order to recognize when a participant is holding a smartphone. Rather than blocking behavior, the system would respond adaptively: when a device is detected within the tracked zone, the intensity, density, or responsiveness of the generative visuals could gradually decrease. When participants are fully engaged with their bodies, the system would amplify their presence.

The objective would not be punitive, nor moralistic. Instead, the system would recalibrate incentives inside a clearly defined spatial field. Outside the interactive zone, participants would remain free to behave as they wish. Inside it, the environment would transparently communicate which behaviors strengthen the collective experience.

8.3.3 Final considerations

More broadly, this direction reinforces a central finding of the research: digital distraction in live events is unlikely to be meaningfully addressed through prohibition alone. Phone bans may remove devices, but they do not generate presence. Presence emerges when the environment becomes perceptually and socially rewarding.

The project demonstrates that environmental interaction systems can increase collective awareness, that spatially bounded interactive zones can temporarily reduce smartphone use, and that embodied participation can compete with digital mediation.

Yet it also shows that attraction alone is not sufficient. To fully align with the research objective, the interaction logic must embed behavioral contingencies within the feedback structure itself.

For this reason, the hybrid integration of corrective and generative mechanisms represents not a radical redesign, but a natural progression. It is the step that brings the system closer to operationalizing its ambition: not eliminating smartphones, but reshaping the ecology of attention in live performance environments.

09 Conclusion

This thesis began with a question about engaging audience in live music contexts, but it gradually evolved into something broader: a reflection on how interaction design can shape the way we experience presence, collectivity, and attention.

Throughout this project, technology was never treated as the problem. Nor was it treated as the solution in itself. Instead, it emerged as a material: something that can either fragment attention or orchestrate it. What makes the difference is not the hardware, nor the software, but the way interaction is conceived. In this space, the role of the UX designer becomes increasingly significant.

The UX designer operates as a mediator between technological systems and human experience. In a world where computational systems are becoming ubiquitous, invisible, and deeply embedded in everyday life, someone must shape how these systems are perceived, felt, and integrated into social environments. The designer becomes an interpreter, translating technical potential into meaningful human interaction.

In live events, as explored in this thesis, the challenge is not to remove technology but to reorient it. Not to silence devices, but to design environments that make embodied presence more compelling than digital mediation. This requires a sensitivity that is both technical and human: understanding sensors and data flows on one side, and collective emotion, social behavior, and attention dynamics on the other.

In this sense, the UX designer is not merely a problem-solver.

They are cultural actors.

This role can be compared to the transformation that took place in modern and contemporary art, when artistic practice moved beyond technical skills. The decisive change was not in the tools themselves, but in the perspective applied to them. By reframing context and intention, artists altered the meaning of their work, demonstrating that values emerge from interpretation as much as from execution.

Similarly, interactive systems today are technically accessible. Sensors, tutorials, etc... These tools are increasingly democratized. In theory, anyone can assemble them. But the significance of the experience does not lie in the technological components themselves. It lies in the conceptual framing: in how interaction is positioned, what behaviors it encourages, what values it reinforces.

The difference is not in the system. It is in the perspective through which the system is designed.

Just as modern art invites viewers to reconsider what an object or a painting could mean, interaction design invites audiences to reconsider how technology participates in collective life. A smartphone can fragment attention, or it can become irrelevant within a more compelling shared experience. A projection can be spectacle, or it can be a mirror of collective energy.

This thesis does not claim to have solved digital distraction. Rather, it proposes a shift in perspective: attention in live contexts is not something to control, but something to choreograph. Technology is not an enemy of presence; it is a medium through which presence can be amplified or diminished.

The future relevance of UX design lies precisely here: in its capacity to frame interaction as a cultural act. As systems become more intelligent, responsive, and autonomous, the need for designers who understand both computational logic and human sensitivity will only increase.

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Appendix

» **Samuele Ligabue, Correggio Music Festival member (cap. 4.3) interview transcription:**

“How is the organizational team structured? Do people have clearly defined roles, or does it often happen that one person covers multiple responsibilities?”

“It is a non-profit association composed of seven members: one president, two vice-presidents, and the remaining members are volunteers. They often collaborate with friends or additional volunteers who are not formally part of the organization. Although the president carries greater responsibility, by mutual agreement they consider themselves all equally responsible for the organization of the festival. Each member has clearly defined tasks and is responsible for a specific macro-area. Two members are in charge of logistics and fundraising (therefore sponsors), and they frequently collaborate with a member responsible for communication, both print and digital, including coordination with sponsors. Sponsors are divided according to their investment tier, which determines the type and location of brand presence within the festival area. Two other members manage the food and beverage sector, overseeing logistics, supplier relationships, and the overall food offering of the festival. These same two individuals are also responsible for safety-related matters, including permits, operational works, and compliance with safety protocols. One member is responsible for managing and training volunteers during the festival days. Another oversees all bureaucratic and financial aspects, handling accounting and fund management—similar to an internal accountant. A final member manages relationships with artists’ managers and negotiates potential bookings for the line-up.”

“In your opinion, what is the main difficulty in managing a small–medium-sized festival compared to a very large one?”

“The main difference between small–medium and large festivals is that smaller events must focus intensely on the limited elements they offer, with virtually zero margin for error. Unlike large festivals, which may have multiple food areas, several stages, and numerous bars, a small festival cannot afford for its only stage or only bar to malfunction, as this would compromise the entire event. All services must therefore be optimized to ensure an overall positive experience. Larger festivals, by offering more variety, inherently have a greater margin for error and a higher probability that the overall experience remains positive even if something is not perfect. Another key difference concerns sponsorship. Large and well-established festivals attract major sponsors simply by virtue of their name and visibility, as brands have a clear economic interest in positioning themselves within high-density audience environments. There is often competition among brands to secure a presence within such events. A primary distinction must also be made between free-entry festivals and ticketed festivals. Ticketed festivals can rely not only on initial investments but also on revenue from ticket sales. In the case of Correggio

Music Festival, which has free entry, economic return depends almost entirely on food and beverage sales. However, adverse weather conditions can drastically reduce this income.”

“How does the budget influence the festival’s design, artistic, and organizational choices? Are there recurring compromises?”

“Budget strongly influences festival organization, especially because certain costs cannot be reduced, such as safety measures, stage rental, site rental, and sponsor-related constraints. Based on preliminary financial calculations, organizers determine the minimum budget required to make the event feasible. Only after this assessment do they allocate the remaining budget to artists for the line-up. This can be frustrating, as from a cultural perspective the artists are arguably the most important component of the festival. Consequently, the available budget significantly shapes the artistic proposal, and it often happens that a desired artist cannot be booked because their fee exceeds the remaining budget.”

» **List of Question asked for the interview (cap 5.4):**

How often do you attend music festivals, and what kind do you usually go to?

What makes a live performance feel meaningful or memorable to you?

During concerts, how do you usually use your phone?

Can you describe a moment when you felt fully immersed in a live performance?

What typically distracts you during a concert?

Have you ever felt that using your phone reduced your enjoyment of the live experience?

What motivates you to participate actively rather than just watch a performance?

Have you ever experienced interactive elements at a festival? How did they affect your engagement?

What would encourage you to use your phone less during a live show?

If you could improve one aspect of the festival experience, what would it be?

» **Riccardo M. interview trascription:**

“I attend music festivals at least two or three times per year. I mostly choose large rap or electronic music festivals, both in Italy and abroad. I am drawn to events known for their strong production, impressive visual setups, and high-quality sound

systems. The atmosphere and the reputation of the festival are very important to me when deciding where to go.

For me, a meaningful live performance combines several elements: the energy and skill of the artist on stage, powerful and immersive sound systems, and synchronized visuals and lighting. When these factors align, I feel completely absorbed in the moment and emotionally connected to the performance.

I use my phone extensively, primarily to record short videos, take photos, or occasionally share moments online. I see my smartphone as a tool to capture memories and preserve the experience so I can relive it later. At the same time, I am very conscious of how this usage can interrupt my focus; sometimes I find myself checking messages or social media out of habit, which briefly distracts me from the performance.

One vivid example is at Frauenfeld during a headliner set. The bass was overwhelming, the crowd moved together in rhythm, and the visuals were perfectly synchronized with the music. Even though I recorded parts of it on my phone, I felt completely present and emotionally absorbed in the collective experience.

My own phone can be a distraction, as well as the habitual use of devices by people around me. Occasionally, the surrounding audience checking their phones or talking can break the collective energy, making it harder to stay immersed in the music.

Yes. I try to film only short clips, but I am aware that even brief phone use slightly pulls me out of the experience. Many artists are not fond of phones in the audience, which also influences how I manage my recording.

Active participation is inspired by the presence of collective energy. When the artist interacts with the crowd, and when visuals, lights, and sound are synchronized in a way that invites movement, I feel compelled to engage physically and emotionally rather than merely observing.

Yes. I have experienced responsive wristbands and immersive stage designs. These elements significantly heightened my engagement and made the experience feel more “designed” and intentional, reinforcing my sense of presence and collective participation.

I would be encouraged to put my phone down if the experience itself offered unique, temporary, and visually overwhelming moments. Alternative ways to preserve memories, other than recording on my personal device, would also help me stay more present.

I think festivals could better facilitate the remembering and reliving of experiences without relying solely on personal recordings. Systems that allow attendees to revisit moments collectively or through curated audiovisual content would enhance the overall experience and reduce the need for constant phone use.”

» **Samuele Z. interview transcription:**

“I attend several festivals every year, usually three to five depending on the season and the line-ups. I mainly go to electronic and rap festivals. Some of the major ones I’ve attended include Decibel Open Air, Frauenfeld, Kappa FuturFestival, and Elrow, but I also enjoy smaller techno-focused festivals. My decision to attend is primarily driven by the line-up and the location. If the artists I follow are performing and the setting is appealing—whether industrial, open-air, or surrounded by nature—I’m very likely to go.

A live performance becomes meaningful when I can fully let go and immerse myself in the music. I don’t want to overthink; I want to feel absorbed by the rhythm. Strong sound systems are fundamental, especially for electronic music. The energy of the crowd is equally important: when people are dancing and reacting together, the experience becomes collective rather than individual. Unique or well-designed locations also make a big difference in how memorable the event feels.

I use my phone quite frequently, but in a selective way. I usually record short clips of songs I particularly like, mainly to remember the moment or to save the track. I don’t constantly keep my phone in my hand, but I do take it out intentionally at specific moments. For me, it’s less about sharing on social media and more about personal memory.

I remember a late-night techno set at Decibel Open Air where I completely lost track of time. The DJ maintained a consistent, hypnotic flow, and the lights were synchronized in a way that enhanced the rhythm. At some point, I stopped checking my phone entirely and just danced continuously. I didn’t even realize how much time had passed. That kind of uninterrupted flow is what I look for in a festival.

The main distraction for me is not technology itself but the behavior of the crowd. When people around me stop dancing, start talking loudly, or seem disengaged, it affects the overall energy. The collective atmosphere weakens, and it becomes harder to stay connected to the performance.

Yes, sometimes. There have been moments when I wanted to record a song but realized that taking out my phone would interrupt my physical involvement. In those cases, I’ve chosen not to use it so I could keep dancing freely. I’m aware that even short recordings can slightly break immersion.

Strong rhythmic continuity and a good flow from the DJ are key. When the transitions are smooth and the energy builds progressively, it naturally pushes me to engage physically. Collective participation also motivates me—when everyone is moving together, it feels almost automatic to join in rather than just observe.

I’ve experienced immersive stage designs and visually striking installations. They enhanced the atmosphere and made the environment feel more engaging, but the interaction was mostly passive. They contributed to immersion, yet they didn’t require direct participation from me beyond being present in the space.

If there were alternative ways to save or recall a track without physically using my

phone, that would help. For example, systems that allow you to access setlists afterward or automatically identify songs could reduce the need to record videos. Anything that lets me stay physically engaged while still preserving the memory would be beneficial.

I would focus on maintaining a consistent level of energy throughout the performance. When there are drops in intensity or long pauses, people tend to drift away mentally and reach for their phones. Sustaining flow and collective engagement is crucial to prevent that disengagement.”

» **Alessio M. Interview transcription:**

I usually attend two or three festivals per year, mostly large international festivals or major urban events. I also go to concerts of well-known artists when the opportunity arises. My choice is mainly influenced by the strength of the lineup. If the artists performing are meaningful to me, I am willing to travel and invest time and money to attend.

For me, what truly makes a performance meaningful is the artist’s presence and authenticity. I value emotional intensity more than technological production or elaborate visuals. When the artist is fully engaged and the audience responds as one collective body, the experience becomes powerful. I am more interested in the emotional connection than in scenography or technical spectacle.

I use my phone very little. Occasionally, I might take a quick photo or record a short video, but most of the time my phone stays in my pocket. I prefer experiencing the moment directly rather than through a screen. I feel that excessive documentation interrupts the emotional continuity of the experience.

One moment that stands out was during a Kanye West concert. When the lights dimmed and the entire crowd began singing together, it felt as though everyone was synchronized emotionally. There were no visible distractions, and the collective attention was entirely focused on the music. In that moment, the sense of belonging and shared energy was overwhelming.

Distractions can be both environmental and social. One practical issue for me is my height; being shorter than many people around me sometimes obstructs my view of the stage, which reduces my connection to the performer. Additionally, the brightness of other people’s phone screens can be visually distracting, especially in darker moments of the show.

Yes. I have noticed that when I document too much, my memory of the event feels less vivid. It is as if recording replaces remembering. This realization reinforces my preference to remain immersed rather than mediated by a device.

Active participation is encouraged when the artist directly interacts with the audience and when the crowd responds collectively. Singing together, moving in unison, or sharing a moment of silence creates a sense of unity that naturally pushes me to engage rather than passively observe.

I have experienced ambient interactive elements, such as lighting systems reacting to sound. While I find them atmospheric and aesthetically pleasing, they do not significantly alter my level of engagement. They contribute to the mood, but they are not central to my experience.

Since I already limit my phone use, I would reduce it further only if there were specific motivations or structural elements within the event—such as moments designed to emphasize collective presence or even temporary restrictions on phone usage. Clear signals that a particular moment is meant to be fully experienced could reinforce this behavior.

I would improve crowd management, particularly at entry and exit points, where organization often feels chaotic. Additionally, I think downtime between performances could be better structured to maintain engagement and avoid dispersion of attention.

» **Laura L. Interview transcription:**

I usually attend two to three concerts or festivals per year. The most recent festival I went to was I-Days in Milan. I tend to choose events based on the artists performing, especially when they are artists I feel emotionally connected to.

For me, what makes a concert truly memorable is the interaction between the artist and the audience. I really value moments when the artist speaks between songs, makes jokes, shares personal thoughts, or communicates in a spontaneous way. Those moments create what I would describe as an “almost intimate” atmosphere, even in very large venues. It makes the experience feel relational rather than just performative.

I feel a strong internal conflict about using my phone. On one hand, I wish I had the strength to resist recording. On the other hand, when I attend a concert of my favorite artist, I feel the urge to record almost every song. If I like the artist but do not feel deeply attached, I tend to take pictures instead of videos. I want to clarify that I never use my phone for messaging or calls during concerts—it is always related to documenting the event itself. For me, it is a tool to preserve memories rather than a distraction connected to the outside world.

One of the most immersive experiences I remember was during the Machine Gun Kelly concert at Unipol Arena in Bologna on February 15, 2026. At one point, he announced that he would perform a song live for the first time. I felt like I was witnessing something unique and unrepeatably. That awareness made the moment feel extremely intense and emotionally charged.

My main distraction is my own compulsive need to record photos and videos. Even when I am emotionally involved, the act of documenting can partially pull me out of the moment.

Yes, definitely. I am aware that recording can reduce my immediate enjoyment.

However, I also justify this behavior by thinking about how meaningful it is to rewatch those moments in the days after the concert. Revisiting the videos helps me relive the experience, which in a way compensates for the partial distraction during the live event.

When I see my favorite artist perform, participation happens spontaneously. I find it impossible not to sing along, move, or express my emotions. It is not something I consciously decide—it just happens because of the emotional connection.

Yes, mainly through collective actions organized by fan pages, such as coordinated phone flashlight moments during specific songs. I see these initiatives positively because they differentiate certain tour dates and create shared memories. Even though they happen within large-scale, structured tours, they feel like bottom-up interactions that strengthen collective identity among fans.

If I had access to the official full recording of that specific concert date, I would feel less need to record it myself. Knowing that I could relive the entire performance later would reduce the urge to document everything personally.

Providing official recordings would not only reduce phone usage but also improve visibility, especially for shorter audience members like me. Fewer raised phones would make the experience more accessible and visually enjoyable for everyone.

» **Focus Group Interview summary (cap 7.9):**

Moderator:

“As I mentioned before, the goal of this discussion is to understand whether a system like this, where stage visuals are generated in real time by the audience’s collective movement, could actually reduce digital distraction at festivals. I’ll ask each of you three questions. Please answer individually first, then we’ll discuss together.”

Moderator:

“If you were at a festival where the stage visuals were generated in real time by the audience’s collective movement, would you feel more motivated to stay physically engaged rather than use your phone? Why?”

Yes, I think I would. If I know that what I’m doing physically has an effect on what’s happening visually, it changes my role. I’m not just watching anymore. It gives me a reason to move, to participate. That already makes it more interesting than standing still and maybe checking my phone.

Yes, definitely. For me it’s about having a purpose. If I’m contributing to the visuals, I feel more involved. It creates a direct link between my body and the performance environment. That makes staying engaged more meaningful than just documenting it.

Yes. Especially in electronic music contexts, where movement is already central. If

I see that the visuals react to us as a crowd, I’d be even more motivated to dance. It becomes a feedback loop, we move, the visuals change, we react again.

Yes, for sure. It gives you an extra layer of engagement. Instead of looking at your phone out of habit, you have something else capturing your attention — something you’re actively influencing.

Yes. I also think it introduces a playful dimension. You’d probably want to experiment, like, “what happens if I move more?” That curiosity alone keeps you physically present.

Yes. I think it makes you feel less anonymous. If your movement contributes to the stage visuals, you feel seen in some way. That motivates you to stay engaged instead of withdrawing into your phone.

Moderator:

“Would this type of system make you feel more part of a collective experience, or would it remain secondary to the artist’s performance?”

Yes, it would make me feel more part of a collective experience. Because it’s not about individual interaction — it’s about everyone together influencing the result. That creates a sense of shared presence.

For me, no — it would still remain secondary. The artist is the core of the experience. The system can enhance it, but it doesn’t replace that central emotional focus.

Yes, I think it reinforces collectivity. Especially if people around you realize that their movement matters. It shifts attention slightly from just watching the stage to being aware of the crowd.

Yes, absolutely. It strengthens the feeling that we’re part of something happening together in real time.

Yes. It doesn’t remove the artist from the center, but it adds a layer of collective participation. It feels more like a shared construction of the atmosphere.

I would say no, it remains secondary. The artist is still the emotional core. But it does enrich the atmosphere and maybe strengthens the sense of togetherness.

Moderator:

“In your opinion, does this solution reduce digital distraction by replacing it with something more engaging, or does it simply introduce another visual stimulus?”

No, I don’t think it automatically reduces digital distraction. It’s engaging, yes, but it might just be another visual element people want to capture.

No. I agree. It’s interesting, but that doesn’t necessarily mean people won’t use their phones. It depends on the person.

No, I don’t think it’s enough on its own. It encourages participation, but phones are

a habit. It might reduce it in the moment, but not eliminate it.

Yes, I think it can reduce distraction — at least when you're actively inside the interactive area. If you're part of it, you're less tempted to check your phone.

Yes. I see it as replacing passive scrolling with active engagement. It doesn't forbid phone use, but it competes with it.

No. I think some people might even take out their phones to record the effect, especially if it looks beautiful.

Moderator:

"Okay, let's discuss openly now. What do you think overall?"

I think one of the strongest aspects is immersion. When visuals react to movement, it feels more alive. It makes the space feel responsive.

Yes, and it increases energy. If someone starts moving more in front of the camera, others might follow. It becomes contagious.

Exactly. It creates peer stimulation. You don't want to be the only one standing still.

It makes you feel part of something shared. Not just watching the artist, but co-creating part of the atmosphere.

And it reduces passivity. It gives you a reason to stay" physically active instead of drifting.

Moderator:

"But does that translate into less phone use?"

I'm not sure. If the visuals are very impressive, people might want to record them.

Yes, that's true. It could actually motivate documentation.

But if you're inside the camera area, I don't think you'd use your phone. You'd want to move.

Yes. If I know I'm being tracked and my movement affects the visuals, I wouldn't stand there holding my phone. That would feel contradictory.

Maybe phone use shifts outside the interactive zone. Inside, you participate. Outside, maybe you document.

Yes, I agree. It doesn't remove phones, but it changes behavior in specific moments and area.

Inside the frame, I wouldn't use it. Outside, maybe I would.

Moderator: "

So the system doesn't prohibit phone use, it offers an alternative?"

Exactly. It competes with it.

And that might already be enough to reduce passive moments.

Even if it reduces phone use temporarily, during high-energy moments, that's already a positive outcome.

Interactive System for Collective Engagement in Live Music Events
Reframing Attention in Festival Environments