

# Searchable multi-dimensional Data Lakes supporting Cognitive Film Production & Distribution for the Promotion of the European Cultural Heritage

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## List of definitions & abbreviations

Abbreviation	Description
3D	3 dimensional
AA	Automated Analysis
AI	Artificial Intelligence
App	Application
C	Constraints
D	Deliverable
DOP	Director of Photography
E	Ethical Requirements
EU	European Union
FR	Functional Requirement
G	Goals
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
L	Legal Requirements
NFR	Non-functional Requirement
R	Revision
TR	Technical Requirement
UI	User Interface
UWB	Ultra-Wideband
VR	Virtual Reality
WP	Work Package



## Executive Summary

This document presents the end-users needs and requirements collected, within T2.2, for the extraction of functional, technical and non-functional requirements for the SCENE platform. The primary objective of Task 2.2 is to effectively identify and document the key requirements for the diverse end-user groups involved in the SCENE platform. This task will:

- Engage a wide range of stakeholders including filmmakers, producers, the audience, actors, investors, and distribution entities.
- Identify the stakeholder's needs and capture their requirements for the SCENE platform
- Adopt a common structural representation to document these scenarios, enhancing clarity and usability for development teams.

This document describes the end-user needs and requirements gathered in T2.2 for the extraction of functional, technical, and non-functional requirements for the SCENE platform. This deliverable is the second edition of the requirement collection, with updated needs and requirements gathered from various sorts of stakeholders such as site managers, directors, distributors, and art directors. The document reports the requirements gathering process, which includes a combination of defined challenges, by the pilots and the developing team, and feedback collected through tailored questionnaires. Key findings from this data were used to identify user needs, preferences, and pain points. The analyses of survey results provided actionable recommendations for the developing teams to improve user experience and address specific challenges. The document categorizes requirements into functional, non-functional, and constraint-based specifications, ensuring that the project meets both practical and quality standards. Functional requirements outline the core actions the system must perform, while non-functional requirements address performance, usability, and scalability. Identified constraints reflect necessary limitations based on feasibility, resources, or contextual restrictions.

The technical requirements specify the essential system capabilities, ensuring compatibility with intended functionalities. The legal and ethical framework provides guidelines for privacy, data protection, and compliance, addressing key security considerations and regulations. Ethical requirements emphasize the importance of transparency and fairness in content distribution and management practices.

By focusing on detailed user requirements and incorporating a broad range of perspectives, Task 2.2 aims to ensure that the SCENE platform meets the practical needs of its end-users, facilitating usability, accessibility, and real-world applicability.

# 1 Introduction

## 1.1 Purpose, Context and Scope of the document

This document (D2.3) reports the user and technical requirements, the use cases and considerations for the SCENE platform and its components. More precisely, this deliverable identifies the conditions by conducting a requirements analysis of the different stakeholders. The term “requirements” refers to the collection of necessary qualities that define the system and its functioning. These prerequisites must be met in order for the system to function properly. The first stage in this process is to identify the stakeholders who will engage with the platform so that their needs may be understood and converted into actionable requirements.

This process helps the development of application scenarios that will be introduced in the SCENE platform. The scenarios that will be designed in the platform will then be tested by the different stakeholders selected. Inclusive process of engaging all stakeholders for requirements collection and tools validation was adopted, as presented in D2.1 – “SCENE use case definition & Application scenarios”. In this way, all identified target groups in the requirement and design process of the whole project, will satisfy their needs, and ensure the results in terms of usability and accessibility. It contains essential information, extracted via a requirement analysis process, necessary for the implementation of the SCENE platform. The requirements collected will guide the project’s implementation and the establishment of a common language between partners.

Production companies, location managers, and artistic directors have been interviewed in order to provide insight to the development team, allowing for a comprehensive view of users’ needs and real-world expectations, and in-depth comprehension of processes of the filming operations. Based on the feedback from the first-round end users, ADDMA, together with GOF, optimized the questions and the flow with each of the stakeholders separately, creating a new simplified approach and structure of the questionnaire. The second round of the questionnaire was shorter, used less technical language, had better phrased questions, and include structured paths based on the occupation status of each participant.

## 1.2 Relationship with other deliverables

This section presents the relationship between D2.3 deliverable with other deliverables of the SCENE project. Deliverable 2.3 is centrally positioned (Figure 1) and is influenced by several preceding deliverables. Initially, D2.1 will provide input to D2.3, as based on the participatory approach applied for the scenarios design and use cases definition for each pilot. This information will be used for the collection and analysis of the requirements for each tool and the SCENE platform. Also, D2.2 – “End-users needs and requirements.R1” is related to D2.3, as it is the first version of this deliverables, describing the first round of efforts conducted for the requirements collection. In addition, it is related with D2.7 – “SCENE Reference Architecture. R2”, presenting the specifications for the SCENE platform and its components. The deliverable 2.1 is also related with D2.3, because due to the participatory design method followed for the definition of scenarios and use cases, needs and requirements were also captured.

Regarding WP3, D2.3 is related with D3.3 “Media Asset Manager”, D3.4 - “3D models reconstruction methodology” of T3.4 and D3.5 – “Blockchain-based IPR preservation platform” of T3.5, presenting all the architecture and implementation of the corresponding components. The requirements collected during the requirements collection process, described in D2.2 and in D2.3, will be analysed and used for the specification extraction of these components.

The D2.2 is also related with D4.1 – “Location Scouting” related to T4.1, D4.2 – “AI-based Audience Preferences Scouting Tool” of T4.2, D4.3 – “Audience Building Tool” and T4.3, D4.4 – “Lighting & Audio Simulation tools” and T4.4, D4.5 – “Post-production Effects” of T4.5 and D4.6 – “Distribution Engine & Recommendation System” of T4.6. These deliverables, along with their corresponding tasks present the implementation and functionalities of the corresponding components of SCENE platform, whose requirements have been collected and presented in this deliverable.

The output of this deliverable influences subsequent deliverables, particularly within WP5, and more specifically D5.2 – “SCENE pilots setup & validation plan.R1” and D5.3 – “SCENE pilot trials & validation”.

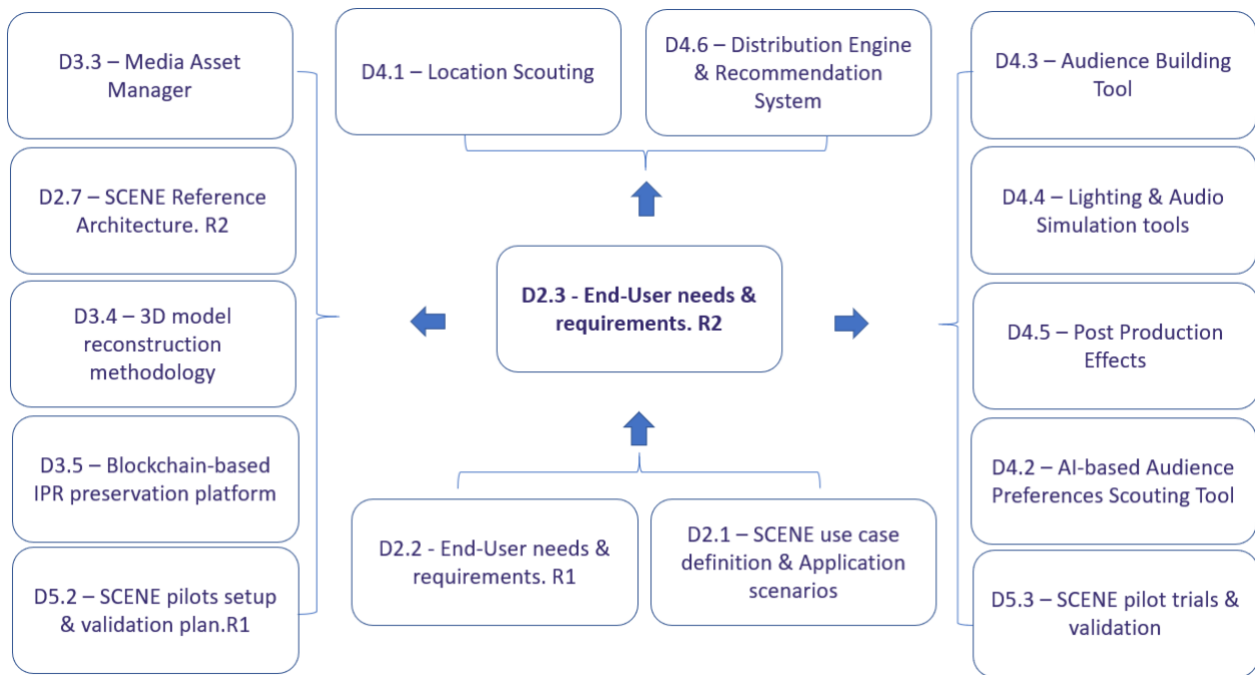


Figure 1: Relations of D2.3 with other deliverables

### 1.3 Updates since .R1

This section provides an overview of the advancements made in the collection and analysis of end-user requirements since the initial round documented in the deliverable D2.2 “End-User needs & requirements. R1”. Key updates include refining activities for gathering end-user input, incorporating detailed feedback from stakeholders, and expanding the scope of functional and non-functional requirements based on new insights.

During the first phase (D2.2), initial requirements were collected through a multi-stage process involving interviews, workshops, and iterative rounds of questionnaires targeted at a diverse group of stakeholders. The process began with stakeholder identification, focusing on key roles in the film industry, including location managers, producers, art directors, editors, and distributors. The aim was to capture a comprehensive range of requirements across pre-production, production, post-production, and distribution phases. These initial interactions highlighted critical needs, including improved search capabilities, location data management, and enhanced coordination tools for various users. Challenges specific to roles—such as the accessibility of cultural sites for location scouts and logistical support for managing legal documentation—were documented, forming a baseline for core requirements related to location scouting, simulation tools, and audience engagement.



In the second round (D2.3), these requirements were refined and validated through a revised approach to data collection, featuring two distinct versions of the questionnaire. This adjustment aimed to better capture the nuanced needs of different stakeholders by offering tailored pathways based on the respondent's role. One version was simplified for general end-users, while a second version used more technical language and specific questions for professionals with specialized needs. The language, structure, and flow of both questionnaires were optimized based on feedback from the initial round, resulting in improved clarity and response rates.

These refinements allowed D2.3 to capture a more comprehensive and precise set of requirements. For example, location scouts expressed interest in advanced filtering features to support searches by historical and logistical criteria, while art directors emphasized the importance of collaborative visualization tools to align artistic elements with project goals. The second round of questionnaires and targeted interviews thus enabled a deeper understanding of user needs across roles, ensuring that the SCENE platform will support both practical and creative requirements across the film production lifecycle

## 1.4 Structure of the deliverable

This deliverable is structured and organized as follows. Section 1 provides the scope of this deliverable in detail, its relation with other deliverables and a brief description of the deliverable's structure. Section 2 introduces the requirements collected for the SCENE platform, analysing also the project's goals and users' questionnaires collected for the requirement identification process. Section 3 presents the extracted requirements, functional, non-functional and constraints set, as extracted from the questionnaires. Section 4 presents the technical and legal assessment, as they have been delivered by the requirements collection process. Finally, section 5 is a conclusion, presenting the outcomes of the requirement collection process and the next steps of the project.

## 2 Requirements' collection

The process of gathering requirements entails acquiring essential information from diverse sources, including questionnaires and interviews. Initially, the focus is on extracting requirements for the system that define its targets and purpose. These goals are documented in the project materials such as dissemination and communication leaflets, which serves as a thorough and peer-reviewed source, forming the foundational basis for identifying these high-level goals.

Following this, the process shifts towards extracting more detailed functional and non-functional requirements and recognizing constraints. These requirements emerge from refining and breaking down the initially identified project goals through an iterative process, involving questions such as "how?" until requirements are specified at their most detailed level. In contrast, constraints represent factors that hinder the fulfilment of requirements.

To refine goals and gather requirements, two rounds of questionnaires were utilized in the form of online surveys. The goals extracted were based on the GA and the requirements collected from the SCENE platform's stakeholders. The first round of questionnaires aimed to gather initial insights and baseline information necessary for understanding end-user needs and requirements (D2.2) as well as the level of fairness in working conditions and the impact on Social Sciences and Humanities (SSH) aspects described in D2.3. The second round of questionnaires was designed to delve deeper into the findings from the first round, validating initial insights, and refining the requirements. Additionally, user stories were captured in order to



ensure a more comprehensive understanding of requirements, taking into account perspectives beyond the initial conceptualization of the project.

This section presents the requirements collection methods and the results.

## 2.1 User stories and challenges definition

This section presents the user stories collected during requirements collection process, and captures the roles and challenges encountered in the film and production industry. Additionally, it showcases how the SCENE platform can be utilised by all these different stakeholders in order to enhance their jobs.

For the collection of user stories, interviews with film makers and related stakeholders have been organized. As the film officer of the city of Athens, ADDMA had direct collaboration with audio-visual stakeholders on a daily basis to collect user-stories for location manager, art director, editor, director, director of photography, audio engineer, producer and distributor. These stories highlight their point of view, how they intend to use the SCENE platform as well as the challenges they face during different stages of filming. The content of the user stories highlights how each stakeholder would use the SCENE platform to enhance their workflow and ensure a streamlined production process. Also, it presents a narrative that weaves together the perspectives of various stakeholders with the practical challenges they face. By addressing these specific challenges through tailored tools and features, the SCENE platform can significantly enhance the workflow and productivity of each stakeholder group, leading to more efficient and successful productions, solutions given by the creation of SCENE platform and thereby presenting a complete picture of the industry's inner workings.

### 1. Location scouters

**User Story:** As a Location Scouter, I need to find and manage potential filming locations efficiently so that I can ensure they meet the film's requirements and coordinate bookings seamlessly.

This user story has been collected from the discussion with location scouters and location managers. After the presentation of the scope of the Location scouting tool, they indicated that they would like the platform to provide features for:

- **Search:** search for locations based on specific criteria like geographical area, setting type (urban, rural, historical), and logistical considerations (accessibility, permits required).
- **Details and comparisons:** View detailed information about each location, including photos, dimensions, available amenities, and past usage reports.
- **Coordination:** Schedule and manage site visits, liaise with property owners, and handle booking logistics through the platform's integrated calendar and communication tools.
- **Search and retrieve information for location managers.**

They also mentioned the following challenges of the platform:

- **Finding suitable locations:** Identifying locations that meet specific creative and logistical requirements can be time-consuming.
- **Coordination:** Managing site visits, negotiations, and bookings with property owners.
- **Documentation:** Handling permits and legal paperwork.

In addition, they highlighted that SCENE platform would help in:

- **Advanced search filters:** Streamlined search tools to find locations based on precise criteria.
- **Centralized communication:** Integrated messaging and scheduling tools to coordinate with property owners and team members.



- **Document management:** Digital storage for permits, contracts, and other essential documents, ensuring easy access and organization.

## 2. Art Director

**User story:** As an Art Director, I need to visualize and plan the artistic elements of the scenes to ensure they align with the director's vision and the overall aesthetic of the project.

This user story has been collected by the discussion with art directors. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Visualization tools:** Utilize the platform's tools to create mood boards, colour palettes, and set design mock-ups.
- **Collaboration:** Share concepts and designs with the director, producers, and other team members for feedback and approvals.
- **Multimedia quality assessment:** access automatically the quality of the uploaded multimedia.
- **Resource management:** Track and manage props, costumes, and set pieces through an integrated inventory system.

They also mentioned the following challenges of the platform:

- **Visual consistency:** Ensuring the visual elements align with the director's vision and overall aesthetic.
- **Resource management:** Keeping track of props, costumes, and set pieces.
- **Feedback loop:** Gathering and implementing feedback from multiple stakeholders.

In addition, they highlighted that SCENE platform would help in:

- **Visualization tools:** Mood boards, colour palettes, and set design mock-ups to help visualize and plan artistic elements.
- **Inventory system:** Tools to track and manage props, costumes, and set pieces.
- **Collaboration features:** Platforms for sharing designs and receiving feedback in real-time.

## 3. Editor

**User story:** As an Editor, I need to access and organize footage and other media assets efficiently so that I can create a coherent and polished final product.

This user story has been collected by the discussion with film editors. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Media access:** Use the platform to download and organize raw footage, audio tracks, and visual effects assets.
- **Metadata:** Utilize metadata tagging for easy retrieval and sorting of clips.
- **Collaboration:** Share drafts with the director and producers, gather feedback, and implement revisions collaboratively.

They also mentioned the following challenges of the platform:

- **Organization:** Managing large volumes of footage and other media assets.
- **Efficiency:** Quickly accessing and retrieving specific clips or assets.
- **Collaboration:** Coordinating with directors and producers to incorporate feedback.

In addition, they highlighted that SCENE platform would help in:

- **Metadata tagging:** Advanced tagging systems for easy sorting and retrieval of media.
- **Centralized media access:** All footage and assets stored in one place, accessible from anywhere.
- **Real-Time collaboration:** Tools for sharing drafts and incorporating feedback seamlessly.



#### 4. Director

**User story:** As a Director, I need to oversee the creative and operational aspects of the production to ensure the final product aligns with my vision.

This user story has been collected by the discussion with film directors. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Planning:** Use the platform to develop and refine the shooting schedule, storyboard, and shot list.
- **Communication:** Coordinate with the cast and crew, providing updates and receiving progress reports.
- **Review:** Access dailies and rough cuts, provide feedback, and approve final edits.

They also mentioned the following challenges of the platform:

- **Vision execution:** Ensuring that all aspects of the production align with their creative vision.
- **Communication:** Coordinating effectively with the entire cast and crew.
- **Time management:** Keeping the production on schedule.

In addition, they highlighted that SCENE platform would help in:

- **Integrated planning tools:** Features for developing and refining shooting schedules, storyboards, and shot lists.
- **Centralized communication:** Platforms for coordinating with the team, providing updates, and receiving reports.
- **Review and feedback tools:** Access to dailies and rough cuts for providing timely feedback.

#### 5. Director of Photography (DoP)

**User story:** As a Director of Photography, I need to plan and execute the visual aspects of the film to achieve the desired look and feel.

This user story has been collected by the discussion with directors of photography. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Location scouting:** Work with the location manager to evaluate potential filming sites for lighting and camera setup considerations.
- **Equipment planning:** Use the platform to plan and manage camera equipment, lenses, and lighting setups.
- **Daily coordination:** Access shot lists and scene breakdowns to ensure each shoot is prepared and executed smoothly.

They also mentioned the following challenges of the platform:

- **Visual planning:** Ensuring that the visual elements match the director's vision and the script's requirements.
- **Equipment management:** Handling the logistics of camera and lighting setups.
- **Scene preparation:** Preparing for each shoot day with the necessary equipment and information.

In addition, they highlighted that SCENE platform would help in:

- **Location evaluation tools:** Features for assessing potential filming sites for lighting and camera setup.
- **Equipment management:** Tools for planning and managing camera equipment, lenses, and lighting setups.
- **Scene breakdown:** Access to shot lists and scene details to ensure preparedness for each shoot.

#### 6. Audio Engineer



**User story:** As an Audio Engineer, I need to capture, edit, and mix audio to ensure high-quality sound for the production.

This user story has been collected by the discussion with audio engineers. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Recording management:** Coordinate with the production team to schedule and manage audio recording sessions.
- **Asset organization:** Organize and manage audio files, sound effects, and music tracks within the platform.
- **Post-Production:** Collaborate with the editor and director to synchronize audio with video, mix soundtracks, and ensure audio quality.

They also mentioned the following challenges of the platform:

- **Sound quality:** Ensuring high-quality audio capture and mixing.
- **Synchronization:** Synchronizing audio with video accurately.
- **Resource management:** Organizing and managing a vast array of audio files.

In addition, they highlighted that SCENE platform would help in:

- **Audio management tools:** Features for organizing and managing audio files, sound effects, and music tracks.
- **Synchronization tools:** Tools to help synchronize audio with video seamlessly.
- **Collaboration platforms:** Tools for working with editors and directors to ensure audio quality meets the project's standards.

## 7. Producer

**User story:** As a Producer, I need to manage the production's budget, schedule, and resources to ensure the project is completed on time and within budget.

This user story has been collected by the discussion with film producers. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Budget tracking:** Use the platform's financial tools to monitor expenses, approve expenditures, and manage the overall budget.
- **Scheduling:** Develop and adjust the production schedule, ensuring all departments are aligned.
- **Reporting:** Generate and review progress reports, ensuring the project stays on track.

They also mentioned the following challenges of the platform:

- **Budget management:** Keeping the production within the budget.
- **Scheduling:** Developing and maintaining a realistic and effective production schedule.
- **Resource allocation:** Ensuring resources are allocated efficiently across departments.

In addition, they highlighted that SCENE platform would help in:

- **Budget tracking tools:** Features for monitoring expenses and managing the overall budget.
- **Scheduling tools:** Integrated scheduling tools to develop and adjust the production schedule.
- **Progress reports:** Tools for generating and reviewing progress reports to keep the project on track.

## 8. Distributor

**User story:** As a Distributor, I need to access and review the final product and its promotional materials to develop an effective distribution strategy.



This user story has been collected by the discussion with distributors. After the presentation of the SCENE platform's functionalities, they indicated that they would like the platform to provide features for:

- **Content review:** View the final cut of the production, trailers, and promotional materials.
- **Marketing coordination:** Collaborate with the marketing team to plan and execute promotional campaigns.
- **Distribution planning:** Use the platform to manage distribution logistics, including release schedules and platform agreements.

They also mentioned the following challenges of the platform:

- **Content review:** Accessing and reviewing final products and promotional materials.
- **Marketing coordination:** Planning and executing effective marketing campaigns.
- **Logistic management:** Handling the distribution logistics efficiently.

In addition, they highlighted that SCENE platform would help in:

- **Centralized content access:** Easy access to the final cut, trailers, and promotional materials.
- **Marketing tools:** Platforms to coordinate with the marketing team and plan promotional campaigns.
- **Distribution planning:** Tools to manage distribution logistics, including release schedules and platform agreements.

## 2.2 Users' questionnaires

To capture user requirements, and identify the stakeholders who will engage with the platform, so that their needs may be understood and converted into actionable requirements, we opted for a qualitative inquiry approach, utilizing questionnaires. Questionnaires were selected due to their flexibility, allowing for various types of questions. They are easy to distribute, collect, and digitize, which is particularly crucial for a cross-country project, while also offering the advantage of providing valuable and in-depth insights.

As described in D2.2, two rounds of questionnaires have been implemented and distributed to film making stakeholders, including location scouters, visual effects and audio engineers, producers and distributors. The first round of user requirements collected has been described in detail in D2.2, while this deliverable presents the results of the second round of the requirements elicitation process. In terms of methodology, the user stories and feedback gathered from the first round of the questionnaire were crucial in order to facilitate discussions on the key areas of interest and the specific information needed from the survey.

The second round of requirements collection was performed to collect additional requirements. The questionnaire for this round has been redesigned, and the approach followed included the design of two distinct questionnaires, distributed to different stakeholders, where each one included specific question related to the stakeholders' jobs. More specifically, the first questionnaire was related to location managers, audio engineers, producers, editors and art directors<sup>1</sup>, while the second one was referred to distributors<sup>2</sup>.

In the development of the second version of the user's questionnaires, all SCENE partners were involved to include various backgrounds and disciplines in the co-creation of the survey. By including the perspectives of end-users, researchers, and industry experts, the design process aimed to enhance the relevance and effectiveness of the questions. Participants were invited to suggest questions and topics they deemed important, which were then refined and incorporated into the questionnaire by ADDMA and GOF. More specifically, multiple feedback was requested on the clarity, relevance, and comprehensiveness of the

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<sup>1</sup> <https://ec.europa.eu/eusurvey/runner/TheSceneProjectSurvey2024>

<sup>2</sup> [https://ec.europa.eu/eusurvey/runner/SCENE\\_Distributors2024](https://ec.europa.eu/eusurvey/runner/SCENE_Distributors2024)



questions. Based on that, revisions were made to ensure the final questionnaire was both user-friendly and aligned with the project's objectives. Also, ADDMA created a new simplified approach and structure of the questionnaire, using shorter, less technical language, better-phrased and tailor-made questions based on the occupation status of the end-user.

The survey became public on the EU Survey platform on April 26th 2024. The EU Survey platform was chosen for its robust features and compliance with data protection regulations. The platform facilitated the distribution, collection, and analysis of the survey data efficiently. As far as the design and the distribution are concerned, the questionnaire was designed using the EU Survey platform's intuitive interface, allowing for various question types, including multiple-choice, open-ended, and Likert scale questions. The survey was made accessible online, ensuring easy participation from respondents across different regions and sectors. Additionally, the platform ensured that all responses were securely stored and anonymized, protecting the participants' privacy in compliance with GDPR requirements. Consent forms were included at the beginning of the survey, informing participants about the use of their data and ensuring transparency.

When it comes to data collection, the questions of the survey included a mix of multiple-choice, ranking, and Likert-scale questions to capture quantitative data. Open-ended questions were minimized. The topics covered the occupation status, years of expertise, company size, involvement in film-making phases, location data access, challenges in location scouting, audience engagement, use of technology, and environmental sustainability.

The first questionnaire (Annex I), which concerns most of stakeholders, includes seven parts; however, not all parts are open to all respondents. The first part – "Occupation Status" & Part G – "Personal Info" aimed to gather demographic data and initial responses to identify trends and categorize users. The focus here was on understanding the respondents' roles in the film industry, such as whether they are filmmakers, producers, editors, or involved in other capacities. This information helps in segmenting the survey responses and tailoring insights based on different user groups.

The second part (Part B – "Locations") aimed to capture the geographical aspects related to filmmaking. It covers questions about preferred filming locations, challenges faced in various locations, and logistical considerations. By capturing this data, the project can address location-specific needs and provide solutions that enhance the filming process in diverse environments.

The third part C – "Audience/Distribution" includes questions that were designed to explore the respondents' target audiences and distribution channels. It aims to gather insights on how filmmakers reach their audiences, the effectiveness of different distribution methods, and any challenges they encounter. This helps in identifying trends in audience engagement and distribution strategies.

The fourth part (Part D – "Audio & Lighting Simulations") focused on the technical aspects of filmmaking, specifically audio and lighting. Respondents are asked about their experiences with audio and lighting simulations, the tools they use, and the challenges they face. Understanding these needs helps in developing better simulation tools and resources that improve the quality of film production.

Part E – "Security & Privacy" included critical concerns in the filmmaking process, particularly in the digital age. This part addresses issues related to data protection, intellectual property rights, and privacy during the various stages of filmmaking, from pre-production to post-production. By identifying these concerns, the project can propose measures to enhance security and privacy for filmmakers. Finally, Part F – "End-Users" included information about the general perception of the end-user for the SCENE platform, regardless of the user's role.



The second questionnaire (Annex II) is addressed to directors and includes fourteen (14) questions. The focus in this questionnaire was on understanding the processes that distributors follow and identify how the SCENE platform could be leveraged by these stakeholders. The questions also included single and multi-selection, and two of them were open ended, capturing information of the most important distribution processes.

## 2.3 Questionnaire distribution

For the requirements' collection process, both questionnaires were distributed in three events:

- (a) The workshop co-organised by SCENE, CRESCINE, and REBOOT projects in Cannes
- (b) Via emails to contacts of SCENE's partners & public film offices
- (c) Two workshops organised by ADDMA

Detailed information about each event is presented below.

- (a) The workshop co-organised by SCENE, CRESCINE, and REBOOT projects in Cannes

The questionnaire was distributed to the participants of the workshop organised by SCENE, CRESCINE, and REBOOT projects in Cannes, in May of 2024. The scope of the workshop was to present to the participants the REBOOT and SCENE initiatives, discuss about the tools implemented by each project, and then focus on the use of generative AI in the film making industry. Apart from this information, during the workshop the risks of using Generative AI in film making were discussed, and issues about the intellectual property of the content created using generative AI were raised.

The workshop participants saw the presentation of the SCENE project and its tools and had the chance to discuss about the challenges and requirements they have about the tools on the SCENE platform. After the discussion, the links of the online questionnaires were distributed to them in order to fill it in.

- (b) Via emails to contacts of SCENE's partners & public film offices

The questionnaire was also distributed via email to contacts of SCENE partners, contacts collected from dissemination events, and the public film offices of the consortium members (i.e., Spain, Italy, Greece, Cyprus, Germany). This method was chosen for its efficiency and ability to target specific groups effectively. It was also sent to a common contact list from all SCENE partners and encouraged to be promoted from each and every one of us in their country.

Customized emails were sent to various stakeholder groups, including filmmakers, distributors, and researchers, using the contact lists developed during the stakeholder workshops and previous engagements. Each email included a personalized message, highlighting the importance of their participation and providing a direct link to the survey. Finally, follow-up emails and reminders were sent to those who had not yet responded, ensuring higher participation rates. These reminders were scheduled at regular intervals to encourage timely responses without overwhelming the recipients.

- (c) Two workshops organised by ADDMA

The first workshop organised by ADDMA took place on the 15th and 16th of November 2023, gathering approximately 50 professionals from Greece and abroad (including Europe and Canada). These professionals represented a broad spectrum of roles in the audio-visual, creative, and film industries, including scriptwriters, directors, producers, and sales agents. Held at the Athens Megaro Athinon and the Stratos Vassilikos Athens Hotel, this event was instrumental in co-creating and mapping key requirements from a wide range of potential end-users.

The workshop was designed to foster an open dialogue among participants, enabling collaborative identification and mapping of requirements across all stages of the film production pipeline. This approach



went beyond traditional desk research, engaging key stakeholders in active discussions to ensure a more holistic and industry-grounded understanding of end-user needs. Notably, significant stakeholders who focus on content for younger audiences—such as children and teenagers—were also involved, providing valuable insights into the specific requirements for producing content that resonates with these younger demographics.

By involving professionals experienced in catering to younger viewers, the workshop addressed challenges and expectations involved in creating engaging, age-appropriate content for children and teenagers. This collaborative process ensured that the SCENE project is well-equipped to meet the diverse needs of all audience segments.

Furthermore, towards this direction, the Athens Film Office, under the auspices of ADDMA, co-created a workshop called “Owl Screenwriting Workshop and Industry Days”<sup>3</sup> with the participation of around 50 professionals from Greece and abroad (Europe & Canada), including scriptwriters, directors, producers, sales agents, and others active on the field of audio-visual/creative/film industry. The “Owl Screenwriting Workshop and Industry Days” took place successfully on the 3rd and 4th of October 2024 in Athens. For the first time, the event featured The Owl Industry Days (October 3-4), which included presentations, discussions, and panels focused on Greek fiction productions. Hosted at the St. George Lycabettus Lifestyle Hotel, the event facilitated over 200 B2B meetings between Greek audio-visual professionals and representatives from both Greek and international studios and production companies, fostering valuable collaborations.

This event was utilised to co-create and communicate, as well as map the key requirements from a broad range of potential end-users. This approach was followed beyond the typical desk-research effort done, in order to have a holistic and collaborative approach with the thematic industry. The participants -being key stakeholders- assisted in the process of open dialogue, identification and mapping of requirements in all stages of production.

The workshop and industry days attracted notable stakeholders, including representatives from production companies, government officials, and international film experts such as HELLENIC FILM & AUDIOVISUAL CENTER CREATIVE GREECE, BOAT ROCKER, TRUE NORTH, COSMOTE TV, FILM IN CYPRUS, TANWEER, FOSS ARGONAUTS. This diverse group fostered a rich networking environment, allowing professionals to exchange ideas, share experiences, and explore future collaborations.

At the end of the workshop, Mr. Stathis Kalogeropoulos from ADDMA, presented the SCENE EU Project. He highlighted its pivotal role in supporting the audio-visual industry by fostering collaboration and generating opportunities for creative professionals across Europe. He highlighted the project's connection to enhancing cultural output and economic development within the European audio-visual market. A key aspect of his presentation was the emphasis on gathering insights from end-users. Furthermore, he stressed the importance of industry feedback in shaping future strategies and initiatives. Participants were encouraged to complete a questionnaire, accessible via QR codes displayed during the event, to provide their valuable input during the coffee break.

## 2.4 Questionnaire’s results

This section presents the results of the requirements collected from the aforementioned events, including the key findings and the recommendations proposed by the stakeholders.

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<sup>3</sup> <https://theowl.afo.events/>

The total number of the participants in both questionnaires was 73. The questionnaires were answered by producers (26.42%) and directors (24.53%), indicating a high level of input from those involved in the strategic and creative aspects of filmmaking. The rest of the participants were audio engineers (13.21%) and location managers (11.32%), emphasizing the technical and logistical focus of the survey respondents. The majority of respondents have more than 5 years of experience (64.15%), showing that seasoned professionals are primarily providing insights, while 28.3% of the participants have 1-5 years of experience, which also constitutes a considerable segment, ensuring a blend of perspectives from both mid-level and experienced professionals. Users answered the corresponding questions based on the role of each user defined in the first question of the questionnaires.

### 2.4.1 General stakeholder’s questionnaire

Within the first part of the general stakeholder’s questionnaire, a question about the company size was included. The results showed that Self-employed/Freelancers (52.83%) form the largest group of the respondents, indicating a significant representation from independent professionals. Also, small companies (2-10 employees) employees participated in the questionnaire by 30.19%.

This part also asked the users about the filmmaking phases that they participate in (Figure 2). The objective of this question was to identify the number of people that participate in each film making phase, to capture which aspects of the filmmaking process respondents are engaged in allows for the analysis of trends, challenges, and practices within specific departments. The majority of the respondents indicated that the highest involvement was in production and pre-production phases.

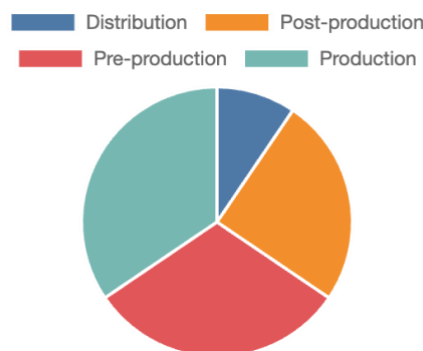


Figure 2: Engagement of participants in the filmmaking process.

- Part B: Locations

The second part, refers to location scouters and managers requesting information for location data access and its challenges. It reveals that 64.15% of respondents relied on shared folders to manually search for locations and data about each location, indicating a common but labor-intensive method of gathering information. The rest 35.85% of respondents mentioned that they use a dedicated tool for the location scouting process. Key sources for location data included general web pages, used by 49.06% of participants, and image databases, utilized by 47.17%. However, the most significant challenge in location scouting was finding suitable locations, which received an average difficulty score of 2.83, highlighting the complexities faced by professionals in identifying ideal spots for their projects.

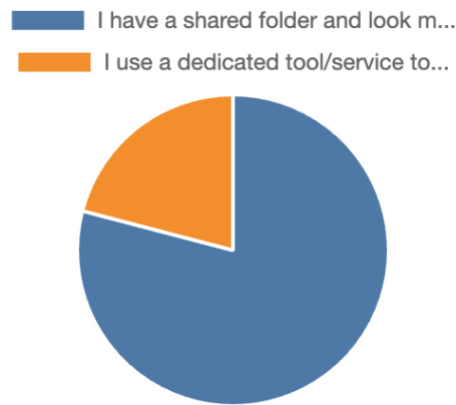


Figure 3: Location Data Access and Challenges

For the location scouting, several challenges have been presented with manual methods for accessing locations for filmmaking, which contributes to inefficiencies in the process. The most challenging task for location scouters is not only finding the location appropriate sites but also the complexities of negotiating permits, both of which can significantly slow down production timelines and add to the logistical strain of securing ideal shooting environments.

The respondents were also asked about the types of attributes (labels, tags) they are typically missing when searching for locations, in order to capture any gap in the tagging and search process for a location. The missing tags identified were the following:

- Eligibility criteria and application process for financial rebates
- Color palette of the location, condition and maintenance of the site
- Filming restrictions such as noise, time of day, use of drones
- Road conditions and parking availability and accessibility for large equipment and crew
- Natural light availability at different times of the day, shade and shadow patterns, artificial lighting infrastructure
- Ease of access for cast and crew
- Availability of nearby facilities (restrooms, changing areas, holding areas)
- Safety and security of the location, impact on the local community and potential for disturbances
- Permit requirements and process, local filming regulations and restrictions, costs associated with permits and location fees, contact information for local authorities and property owners
- Dimensions and layout (e.g., room sizes, ceiling heights), detailed floor plans or blueprints, presence of key features (e.g., staircases, large windows)
- Aesthetic details such as:
  - Architectural style (e.g., Victorian, modern, industrial)
  - Interior design elements (e.g., color schemes, furniture style, decor)
  - Exterior features (e.g., facades, landscaping, signage)
  - Historical authenticity and period details"
- Location ownership details, availability, price
- Year of build for man-made structures
- Accommodation facilities, how commutable the location is, tech services at the location (electricity, water etc.)
- Photos taken for filming purposes

Also, mainly narrative attributes include how well the location can support character interactions and movements, as well as its potential for unique camera angles/compositions that enhance storytelling. Furthermore, logistical information such as accessibility (road access, proximity to airports, public transport), availability of parking for crew and equipment and power supply and availability of utilities is also important. The next question captures the sources used for location scouting. Most users answered that they collect information from social media platforms (Figure 4).

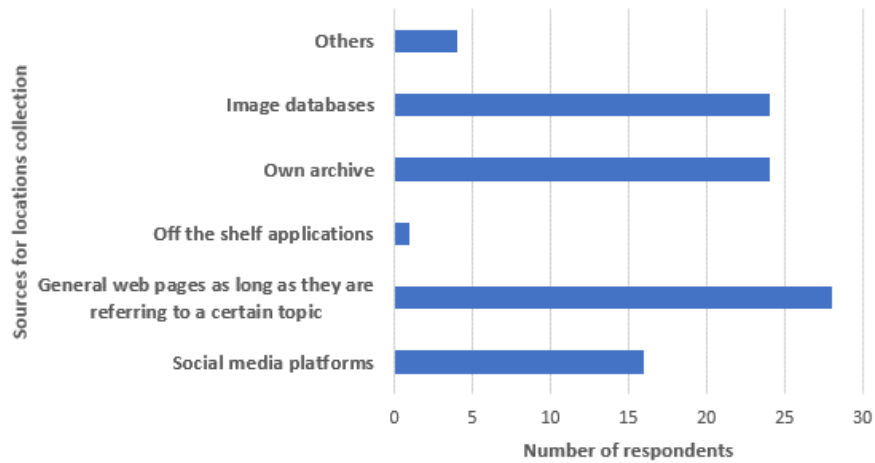


Figure 4: Sources used for locations collection

Social media plays a crucial role in audience engagement, with Facebook and Instagram emerging as the primary platforms used by industry professionals to connect with their audiences. Despite the importance of these channels, a significant number of respondents indicated that they are not currently utilizing online distribution platforms. This gap suggests an opportunity for broader adoption of digital distribution methods to enhance reach and accessibility in the evolving media landscape.

The biggest challenges faced during the location scouting process were also captured by the questionnaire. The scope of this question was to collect the specific needs that the location scouters have and try to address it via the SCENE platform. As visualised in Figure 5, the most important challenge that location scouters face is to find suitable locations at first, and then to collect logistics and accessibility information about the selected locations. In a third place comes the request for budget constraints and at last the negotiation permits and permissions to shoot in a specific location.

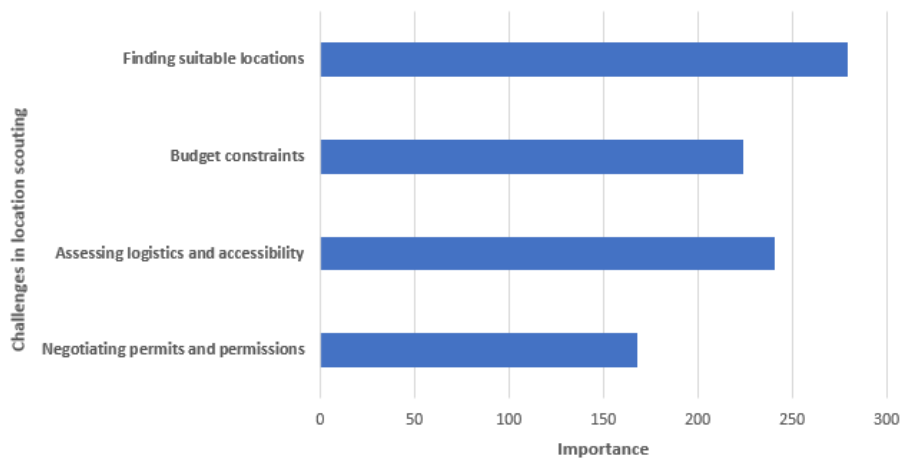


Figure 5: Challenges in location scouting

- Part C: Audience / Distribution

Audience engagement and market research efforts are often hindered by limited marketing budgets and the challenge of effectively reaching target audiences. These constraints make it difficult for businesses to optimize their outreach strategies. Additionally, many still rely on traditional methods such as surveys and market research reports to analyze audience preferences and behaviors, which, while useful, can lack the immediacy and depth needed for more dynamic market environments.

The third part, refers to audience engagement and its challenges, collecting information about activities currently used for audience engagement and preferences collection (Figure 6). According to the collected information, most respondents collect information from market research reports, and available surveys and questions that they either organize or find published. A smaller number of participants select to analyze social media and organize focus groups. These types of information collection were mentioned as time consuming and knowledge demanding, since they do not have access to trustworthy tools that could provide such kind of analysis.

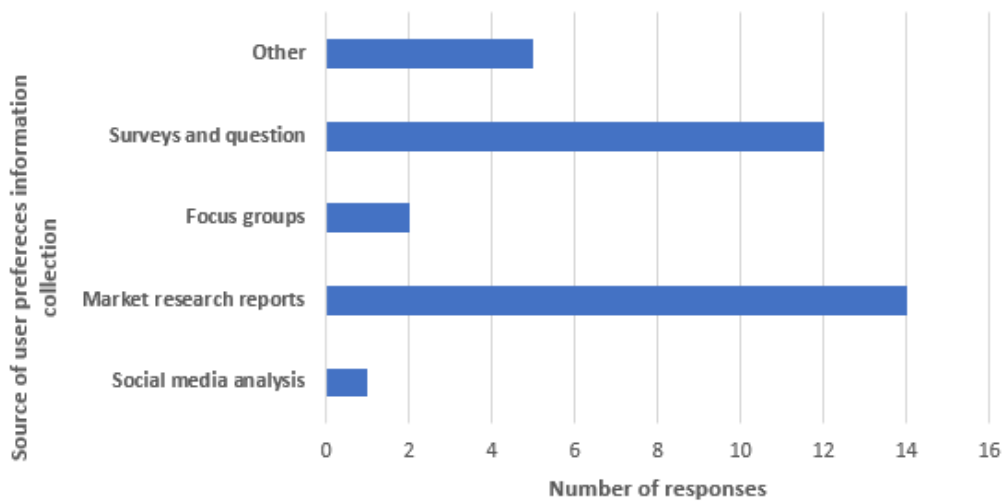


Figure 6: Source of user preferences information collection

A second question on this part included the criteria selected for the audience selection part (Figure 7). According to the majority of respondents, they choose their audience first by looking at demographics (such as age, gender, and geography), then by genre preferences, and finally by looking at their social media presence. Given the abilities and resources needed to complete this activity, these responses in connection to the previously listed instances explain why there are fewer people who are chosen for social media presence.

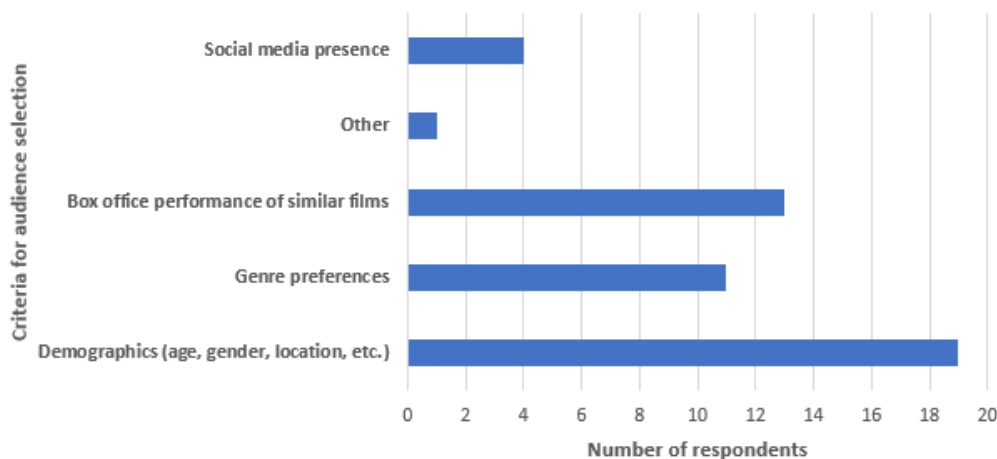


Figure 7: Criteria for audience selection

The next question refers to the challenges faced when it comes to audience engagement and retention (Figure 8). Audience engagement efforts are often constrained by limited marketing budgets, a challenge faced by 32.08% of respondents. To gather insights on audience preferences, professionals primarily rely on traditional methods, with 20.75% using surveys and 24.53% turning to market research reports. In selecting target audiences, demographics (32.08%) and the box office performance of similar films (22.64%) were the main criteria, reflecting the industry's reliance on established data to inform marketing and distribution strategies. The respondents mentioned as a bigger challenge the limited marketing budget, while in a second position they highlighted the lack of audience feedback and data, provided by social media, or on the marketing campaigns organised. This question is important because it captures the challenges currently faced, that could be addressed by the implementation and use of the Audience Building tool of the SCENE project.

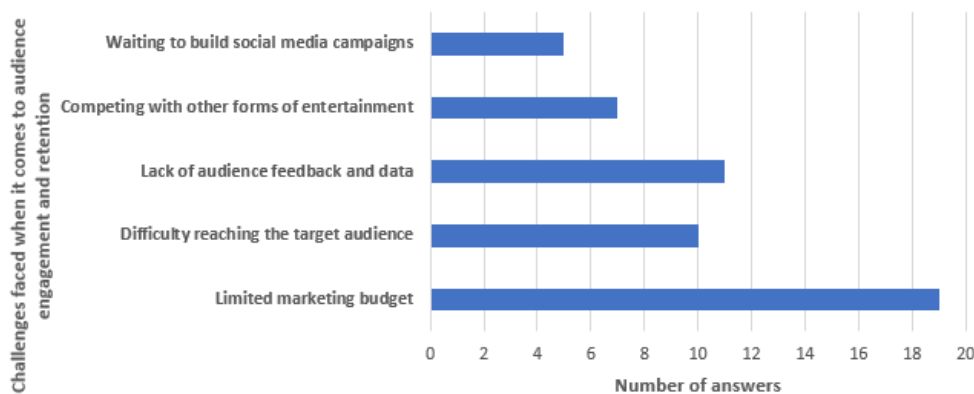


Figure 8: Challenges faced when it comes to audience engagement and retention

For the creation of audience campaigns, respondents mentioned that they use mostly Facebook and Instagram social media platforms, and also YouTube. The scope of these campaigns is to engage audiences and collect feedback about the movies, videos, and audio-visual material prepared related to a movie or a clip. From the collected information from these platforms, the respondents mention that they determine audience trends (i.e., interest in topics or themes) for future productions mostly from market and research studies, and from news and magazines. The important fact on this answer is that there were respondents who answered that they make their own assumptions from the feedback collected and analyse based on their assumptions this feedback. In terms of social media and distribution strategies, Facebook (24.53%) and Instagram (20.75%) were the leading platforms used for audience building. However, when it comes to online distribution, only 15.09% of respondents utilized digital platforms to distribute their content. Notably, a significant portion (56.6%) did not provide a response, suggesting a potential gap or hesitation in adopting online distribution channels more widely within the industry.

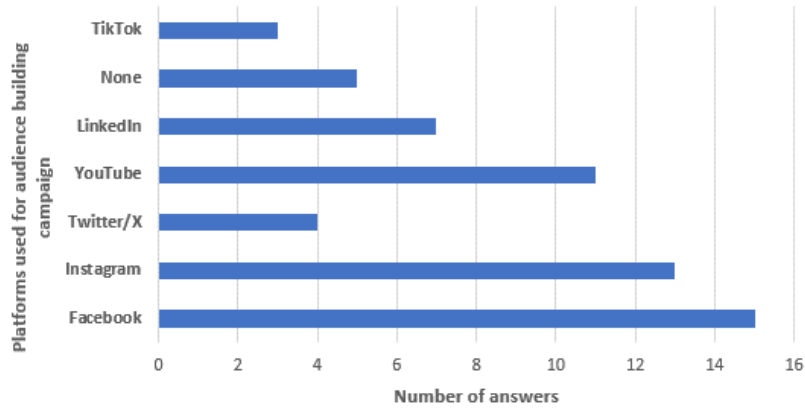


Figure 9: Platforms used for audience building campaign

- Part D: Audio & Lighting simulation

Film industry professionals are increasingly open to adopting new technologies, particularly tools that enhance location scouting and enable real-time simulation of filming conditions. These innovations offer the potential to streamline workflows and improve decision-making on set. Additionally, there is a strong demand for integrated databases and AI-powered audience analysis tools, which can provide deeper insights and improve the accuracy of market research, helping filmmakers better understand and engage with their audiences.

The fourth part refers to audio-visual experts and art directors, including questions about the current actions applied for the collection of information about the acoustics and lighting conditions of a location. Most respondents (Figure 10) said that they visit the location to make sure the acoustics are adequate. In order to assess lighting conditions, the 42% of respondents also look at pictures of the area taken at various times. The 46% of individuals come to the location at different times of day to learn more about the natural light. Five respondents, however, stated that they do not have a way to check the lighting and acoustics before filming, while an equal number stated that they use pre-existing software or tools for this purpose. Merely the 12% of participants indicated that they listened to tapes as part of their assessment procedure. Based on these findings, there is a need to allow audio simulation and lighting conditions evaluation without having to travel to the area to test it.

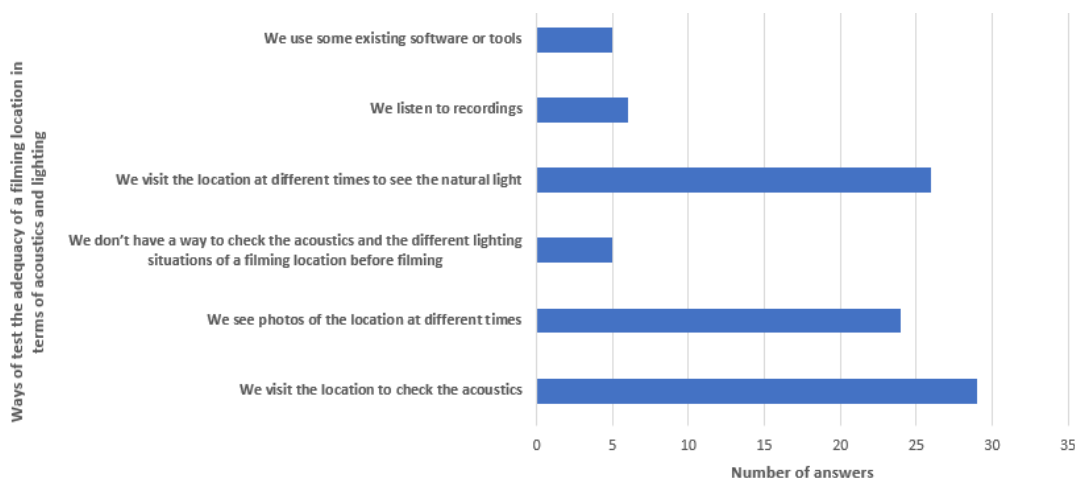


Figure 10: Ways of test the adequacy of a filming location in terms of acoustics and lighting

The next question on this part, referred to the kind of functionality that would be useful in terms of tools for remotely checking the acoustics and lighting. Participants who responded the question highlighted the option to see images or videos of sites under different lighting situations as the most popular feature. This was

closely followed by 20% of the votes in favor of seeing metrics or graphs representing a location's acoustic qualities. Furthermore, 18% of the people found it useful to listen to sample recordings from certain places. Other recommendations included the ability to change settings and lighting conditions (13%) and the possibility to upload own recordings for sound simulations (9%). Fewer participants expressed interest in functionalities such as changing the placements of sound sources.

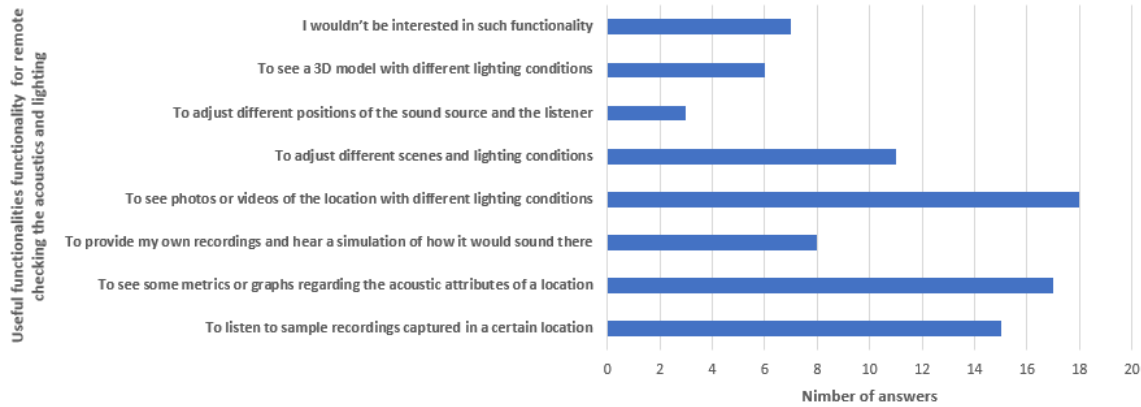


Figure 11: Useful functionality of tools for remotely checking the acoustics and lighting

The results of the next question of this part on selecting post-production visual effects reveal a diverse range of approaches among respondents. The 39% of the answers mentioned that they utilize tools within their editing suites, such as Adobe After Effects and Avid Plug-Ins, to handle visual effects like colour grading and denoising. Additionally, the 19% of the answers indicated that they select from multiple external companies for these services, while the 15% rely on a fixed external company. Some organizations maintain various effects libraries in-house, with the 12% reporting this practice. Finally, the 15% of the answers mentioned that they purchase specific tools as needed, highlighting a flexible approach to managing post-production visual effects.

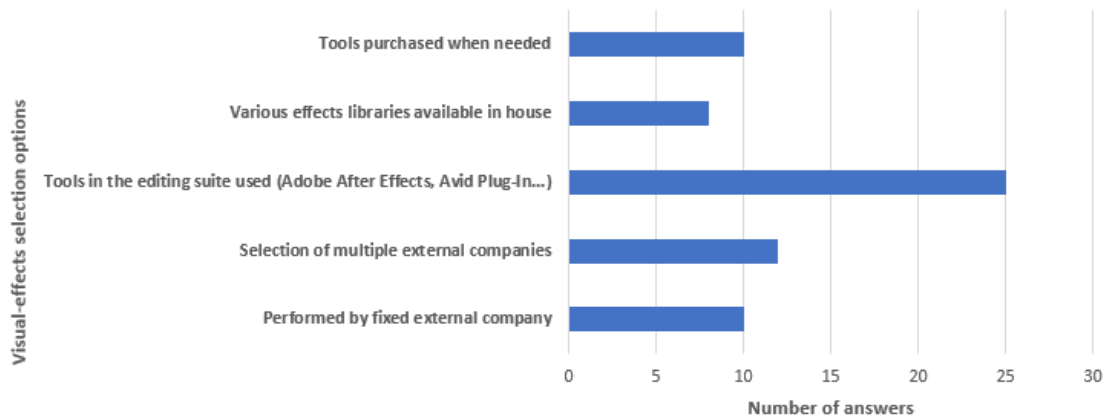


Figure 12: Visual-effects selection options

- Part E: Security & Privacy

The fourth part, refers to the security and privacy issues that might be faced within the filmmaking production pipeline. The majority of the respondents mentioned that they face frequently IPR issues in film production projects (Figure 13). They indicated the categories of rights that they encode or want to encode in a license agreement with a consumer, highlighting several key priorities among respondents. The most commonly identified category was intellectual property rights, with the 38% of the answers emphasizing its importance. This was closely followed by film production rights and distribution rights, each receiving 24% of the answers.

Additionally, the 21% of the answers noted the significance of including royalties and revenue streams in the agreement. Overall, these findings suggest a strong focus on protecting intellectual property while ensuring proper distribution and revenue management in license agreements.

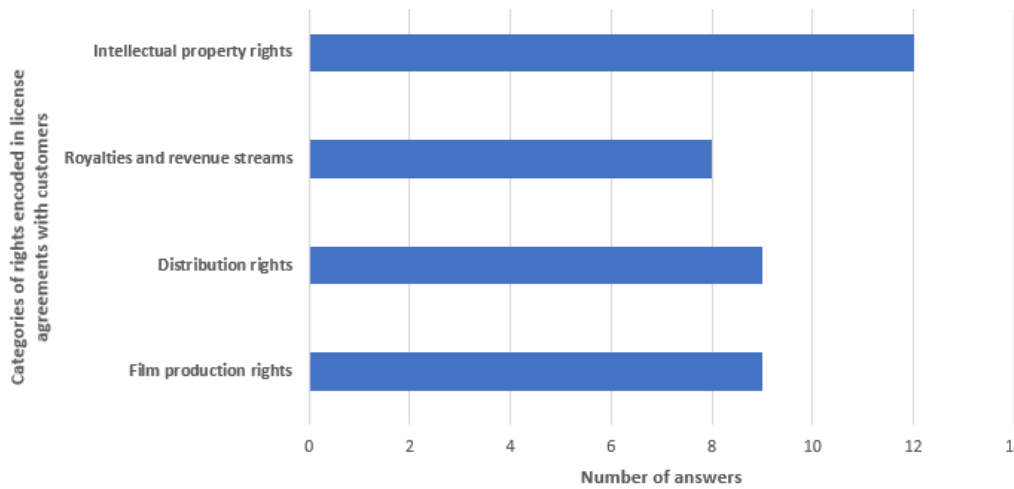


Figure 13: Categories of rights encoded in license agreements with customers

When managing the licensing and auditability of multimedia content during distribution, our current practices involve a combination of methods. Stakeholders mentioned that they heavily rely on contracts and legal agreements (59%), ensuring that all licensing terms are clearly defined and legally binding (Figure 14). Additionally, they utilize manual documentation and tracking (27%) to keep detailed records of content usage and licensing status. While they have considered implementing digital asset management systems (14%) for enhanced efficiency, their focus remains on solid contractual frameworks and thorough manual oversight to maintain compliance and accountability throughout the distribution process.

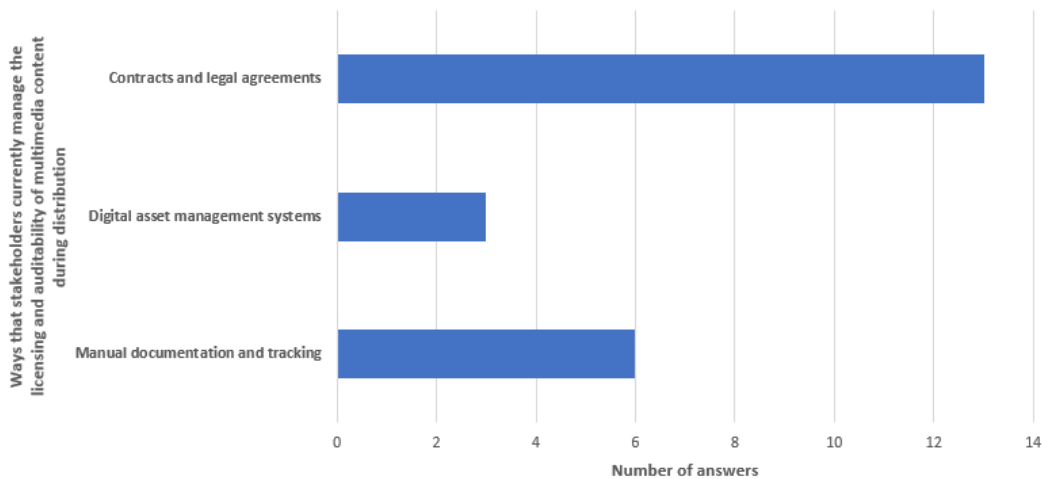


Figure 14: Ways that stakeholders currently manage the licensing and auditability of multimedia content during distribution

In terms of automation for managing licensing and auditability, stakeholders mentioned that they primarily utilize templates (56%) to streamline the documentation process, allowing for quicker and more consistent handling of licensing agreements. While they have explored the potential of specific platforms (6%) to further enhance automation, their reliance on lawyers (37%) remains crucial for ensuring that all legal aspects are properly addressed. This combination of automated templates and legal expertise helps them maintain compliance while optimizing efficiency in our content distribution processes.



In response to the question about using a platform that automates the licensing process through secure blockchain technology, the feedback is predominantly positive, with the 62% of answers indicating they would embrace such a system. This interest reflects a strong desire for improved security and transparency in licensing agreements, which could significantly streamline operations. Conversely, the 5% of the answers were about reservations, possibly due to concerns about technology integration or the complexities involved. As this marks the conclusion of our questionnaire, it's clear that there is a notable enthusiasm for innovative solutions in the realm of content management and licensing.

- Part F: End-users

The final part aimed to collect the respondents' opinion on the SCENE platform, as presented within the workshops and the dissemination video distributed via email to all of them. From their responses it can be concluded that the use of technology and digital tools is gaining traction, with 57% of respondents expressing openness to exploring new innovations. Among the most desired features for the SCENE platform, 60% highlighted the need for an integrated location scouting database, while 43% were interested in real-time light and audio simulation tools. These tools offer the potential to streamline production workflows and improve planning accuracy, reflecting the growing demand for tech solutions that enhance the efficiency and creativity of filmmaking.

The surveys highlight a strong need for more efficient and technologically advanced tools in the film industry, particularly for location scouting and audience engagement. There is also a growing awareness and demand for environmentally sustainable practices. Future development of the SCENE platform should prioritize these areas to meet the identified needs and improve overall efficiency and sustainability in film production.

## 2.4.2 Directors' questionnaire

The second questionnaire distributed to the directors' gathered responses from a variety of entities, including 3 from channel operators, 9 from distribution companies, 1 from a governmental body, and 1 from a film festival. Geographically, the majority of responses originated from Greece (9), followed by Spain (2), Italy (2), and the U.K. (1). This diverse range of stakeholders and countries provides a comprehensive overview of the current landscape in cinema distribution, highlighting both regional engagement and the variety of entities involved in the sector.

In response to the question regarding how stakeholders gather information about audience preferences for film projects, a variety of methods were highlighted. The most commonly utilized approach was market research reports, with 9 respondents indicating their reliance on this resource for in-depth analysis. Surveys and questionnaires were also significant, with 5 stakeholders employing them to gather direct feedback. Additionally, 4 respondents mentioned social media analysis as a valuable tool for understanding audience sentiments and trends. Finally, 2 stakeholders reported using focus groups to gain qualitative insights into viewer preferences.

In addressing the criteria for selecting a target audience for films, respondents emphasized several key factors that guide their decision-making process. Notably, box office performance of similar films was the most cited criterion. Demographics, including age, gender, and location, were also important, as indicated the 63% of the answers who utilize this data to tailor their films effectively. Genre preferences emerged as a significant factor as well, with the 24% of the answers acknowledging its impact on targeting strategies. Additionally, the 13% of the answers highlighted the relevance of social media presence in identifying and engaging potential audiences. The variety of criteria mentioned reflects a comprehensive approach to



audience selection, demonstrating a commitment to aligning film projects with viewer expectations and market trends.

The responses to the question regarding challenges in audience engagement and retention reveal several significant obstacles faced by stakeholders in the cinema distribution sector. A predominant concern is the limited marketing budget, highlighted by the 41% of the answers, which restricts their ability to effectively promote films and engage audiences. Additionally, the 24% of the answers noted the challenge of competing with other forms of entertainment, emphasizing the need for innovative strategies to capture audience interest. Difficulty in reaching the target audience was mentioned by the 13% of the answers, indicating a gap in effective communication channels. Another 19% of the answers expressed concerns about the lack of audience feedback and data, which hinders their understanding of viewer preferences. Lastly, the 3% of the answers presented the challenge of waiting to build social media campaigns as a barrier to timely engagement. This range of challenges underscores the complexities of audience engagement and retention in today's competitive landscape, highlighting the need for creative solutions and targeted strategies.

In response to the question about the use of social media platforms for audience-building campaigns, stakeholders provided a variety of insights into their strategies. A significant number, the 34% of the answers, rely on general information sources such as news and magazines to inform their audience-building efforts. Instagram and YouTube emerged as popular platforms, each cited by 23% of the answers, reflecting their visual and engaging nature in reaching potential viewers. Twitter/X was mentioned by the 14% of the answers, showcasing its role in real-time engagement and communication. Additionally, 11% of the given answers indicated using LinkedIn, primarily for professional networking, while the 7% noted TikTok's emerging relevance, despite its lower usage. Interestingly, 11% of the given answers stated they do not utilize any social media platforms for these campaigns. This diverse array of responses illustrates a thoughtful approach to audience building, highlighting the importance of leveraging multiple channels to effectively engage with different segments of the audience.

The responses to the question about determining audience trends for future productions reveal a well-rounded approach to understanding viewer interests. The most frequently cited method, employed by 11 stakeholders, is market and research studies, indicating a strong reliance on data-driven insights to inform production decisions. Additionally, 7 respondents utilize general information sources such as news and magazines, further enriching their understanding of current topics and themes. Individual trendsetters, influencers, and market leaders were recognized by 5 stakeholders as valuable sources for gauging emerging interests, while 4 respondents noted the importance of feedback from current audiences in shaping future projects. A small number, 2, mentioned relying on their own assumptions, and 1 respondent expressed a disinterest in catering to trends altogether. This diverse range of methodologies highlights a thoughtful and proactive approach to trend analysis, showcasing a commitment to aligning future productions with the evolving interests of the audience.

The responses to the question about the importance of reviews in the decision to distribute a film reveal a nuanced perspective among stakeholders. The ratings ranged from 1 to 5, with several respondents indicating strong reliance on reviews, as evidenced by the presence of 5/5 ratings from two participants and multiple 4/5 ratings. However, there were also lower ratings, including 1/5 and 2/5 from some stakeholders, suggesting that while reviews are a significant factor for many, others may prioritize different elements in their distribution decisions. This varied response underscores the complexity of the decision-making process in film distribution, highlighting that reviews are an influential, yet not universally decisive, factor. The diverse viewpoints collected demonstrate the importance of understanding the multifaceted nature of audience reception and critical feedback, providing valuable insights for future strategies in film distribution.



The responses to the question about the importance of ratings in the decision to distribute a film demonstrate a varied perspective among stakeholders. Ratings were rated on a scale from 1 to 5, with several participants assigning high scores, including multiple 5/5 and 4/5 ratings, indicating a strong appreciation for ratings as a key factor in their decision-making process. However, lower scores such as 1/5 and 2/5 from some respondents suggest that not all stakeholders view ratings as critical to their distribution choices. The presence of several 3/5 ratings highlights a moderate level of importance assigned to ratings by many. This diverse array of responses reflects the complexity of the film distribution landscape, where ratings serve as a valuable indicator of potential audience interest, but are weighed alongside other considerations. The insights gathered underscore the significance of ratings in the distribution decision-making process while also acknowledging the varied approaches stakeholders take in evaluating film projects.

The responses to the question regarding the importance of social media buzz in the decision to distribute a film indicate a strong recognition of its impact among stakeholders. The ratings predominantly fall between 4/5 and 5/5, with multiple respondents assigning the highest scores, suggesting that social media buzz is viewed as a critical factor in gauging audience interest and potential engagement. The presence of a few 3/5 and 2/5 ratings reflects some variability in perception, but the overall trend emphasizes the significance of social media in shaping distribution strategies. This consistent feedback underscores the role of social media as a powerful tool for building anticipation and connecting with audiences, highlighting its relevance in today's film distribution landscape. The insights collected showcase an awareness of the dynamic nature of audience engagement and the importance of leveraging social media platforms to enhance the visibility and appeal of film projects.

The responses to the question about the use of online platforms for distribution reveal a clear trend among stakeholders, with a predominant majority indicating a lack of utilization. Out of the 14 responses, only 3 participants affirmed the use of online distribution platforms, while 11 reported that they do not employ these channels. This significant skew suggests that traditional distribution methods may still dominate the current landscape, highlighting potential barriers or hesitations regarding online platforms among many stakeholders. However, the affirmative responses indicate that some entities are exploring or already leveraging digital distribution avenues, reflecting a growing recognition of its potential benefits. This information underscores the need for further exploration of online distribution strategies, as the industry evolves, and provides valuable insights into the distribution preferences and practices currently in place.

The responses to the question regarding factors influencing the audience's decision to watch a film in theaters versus on streaming platforms highlight a complex interplay of preferences and circumstances. Several stakeholders emphasized the importance of the cinematic experience, noting that theaters offer an immersive atmosphere with superior audio-visual quality that enhances blockbuster films and visually stunning narratives. In contrast, the convenience and accessibility of streaming platforms emerged as significant advantages, particularly for audiences with busy lifestyles or those seeking to enjoy films at home. Cost considerations also played a vital role, with many recognizing that streaming subscriptions often provide a more economical option than purchasing individual theater tickets. Additionally, factors such as marketing strategies, exclusive releases, and the type of film were mentioned, indicating that big-budget films tend to drive theater attendance while more intimate genres might be better suited for home viewing. The social aspects of movie-going and the influence of word-of-mouth and critical reception further illustrate how various elements shape viewer choices. Overall, this comprehensive collection of insights underscores the multifaceted nature of audience decision-making in today's evolving film landscape, providing valuable guidance for future distribution strategies.



The responses to the question about openness to adopting new technologies and digital tools reflect a generally positive attitude among stakeholders in the industry. A notable number of participants expressed a strong willingness to embrace innovation, with multiple respondents indicating they are "very open" and actively seeking innovative solutions. This proactive stance suggests a recognition of the importance of technology in enhancing operations and improving audience engagement. Additionally, several respondents categorized themselves as "open," indicating a readiness to explore new possibilities, while a few adopted a more cautious approach, expressing neutrality that hinges on the specific benefits and costs associated with new technologies. This diversity of perspectives highlights a healthy balance between enthusiasm for innovation and a prudent assessment of its potential impact. Overall, the insights collected underscore a collective recognition of the value of technology in the film industry, paving the way for future advancements and improved practices.

### 2.4.3 Recommendations

Recommendations on the SCENE platform's functionality and its tools were also collected during the requirements' collection events mentioned above. These recommendations have been collected, analysed and categorised per tool, and presented below.

#### 1. Enhancement of Location Scouting Tools:

- Develop and integrate a comprehensive location scouting database within the SCENE platform, that allows for easy access to location data and facilitates the sharing of information among team members.
- Incorporate features for real-time lighting and audio simulation to address the challenges in assessing logistics and suitability of locations remotely.

#### 2. Streamlined Audience Analysis:

- Implement AI-powered tools for audience analysis and targeting, that should be able to provide insights based on demographics, genre preferences, and social media trends.
- Develop features that enable automated collection and analysis of audience feedback, enhancing data-driven decision-making.

#### 3. Support for Marketing and Engagement:

- Create modules that assist with the creation and management of social media campaigns, addressing the challenge of limited marketing budgets and audience engagement.
- Include tools that track audience engagement metrics across different platforms (Facebook, Instagram, YouTube) to optimize marketing strategies.

#### 4. Adoption of New Technologies:

- Provide training and resources to encourage the adoption of new technologies. Highlight the specific benefits and cost-effectiveness of the tools provided by SCENE.
- Develop case studies and success stories to demonstrate the impact of these technologies on film production processes.

#### 5. Environmental Sustainability Features:

- Incorporate eco-friendly functionalities within the SCENE platform, such as carbon footprint calculators and recommendations for sustainable practices.
- Partner with environmental organizations to provide certifications or endorsements for productions that meet certain sustainability criteria.

**6. Online Distribution Support:**

- Develop features that support online distribution, including secure digital asset management and licensing tools.
- Explore blockchain-based solutions for intellectual property rights protection to address concerns about IPR.

**7. Comprehensive Training and Support:**

- Offer comprehensive training and support to ensure users can effectively utilize all aspects of the SCENE platform.
- Provide resources and tutorials that guide users through new functionalities and best practices for integrating these tools into their workflows.

### 3 Extracted Requirements

The requirements, as these were extracted from the user questionnaires, the workshop, the grant agreement and the rest project documentation are presented in the following sections.

#### 3.1 Functional Requirements

Functional requirements describe what a system should do, detailing the specific tasks, functions, or operations it must perform to meet the needs of its users or stakeholders. These requirements focus on the system's functionality, such as processing data, interacting with users, or integrating with other systems. For example, in a banking system, functional requirements might include features like user authentication, account balance retrieval, and fund transfers. They are typically documented in clear, measurable terms to guide the development team in building the system.

During a system’s implementation, functional requirements serve as a blueprint for developers, helping them to understand what needs to be built and ensuring that the system aligns with user expectations. They are used to create detailed technical designs, guide coding and testing activities, and evaluate whether the final product meets the expected outcomes. By providing a structured framework for both development and validation, functional requirements ensure that the system delivers the necessary features and functionality to fulfill its intended purpose.

From the requirements collected and analysed in section 2, the following table has been resulted.

*Table 1: The identified functional requirements*

ID	Title	Description
FR1	Location database	The system should have a database with locations and related information that could be easily accessed to its end users.
FR2	Search functionality	The system should support data holistic search, allowing the user to search information from several fields.
FR3	3D model interaction	The system must provide Real-time and fast interaction with the 3D model.
FR4	Allow the addition of multiple tags	Location information should be tagged.
FR5	Automatic metadata extraction	The system must automatically extract metadata for the available multimedia, aiming to optimize the search process.

FR6	Personalised recommendations	The system must be able to provide recommendations to the end-users based on their preferences.
FR7	Provide lighting simulation options	The system should provide lighting simulation options based on parameters as the hour of the day, the weather, etc.
FR8	Associating Multimedia with Metadata	The system must be capable of supporting the association of stored files with structured metadata information.
FR9	Provide lighting simulation options	The system should provide lighting simulation options based on parameters as the hour of the day, the weather, etc.
FR10	Video collections for Video Producers	The system must implement features that allow Video Producers to create and manage video collections for efficient organization.
FR11	Location Management	The system must have a form that allows the location managers to add, edit and delete information about specific locations.
FR12	Interactive Lighting Adjustment	The system must offer interactive controls, such as sliders and input boxes, within the user interface for users to adjust and modify the lighting conditions of the given scenes.
FR13	Holistic Film-making Management and storage	The system must include a mechanism for storing information for the whole film-making process.
FR14	Licence templates management for End-users	The system must implement a functionality for End-users to retrieve license templates and check availability for video purchase. Furthermore, it must allow the End-users to store purchased licenses in the system.
FR15	Video recommendation to end-users	The system must provide a recommendation system that will suggest video to end-users based on their demographics, viewing history and user preferences.
FR16	Disseminate videos and campaigns in social media platforms	The system should be able to disseminate campaigns for audience engagement to the social media platforms. The scope will be feedback collection as mentioned in the requirements.
FR17	Data Visualization for Insightful Trend Interpretation	The system must include data visualization tools to present trend insights and audience behaviour in a clear, understandable format, aiding decision-makers in strategy development and content planning.
FR18	Real-Time Analysis and Trend Reporting	The system must provide real-time analysis of current viewing patterns and generate reports on emerging trends, helping strategists and content creators to stay updated with audience preferences..
FR19	Audience Segmentation and Persona Creation	The system must segment audiences and create viewer personas based on anonymized viewer information, grouping viewers with similar viewing behaviours and preferences for more accurate trend analysis.
FR20	Audience engagement	The system must support the creation, organization, and modification (editing and deletion) of targeted campaigns to engage specific audiences.
FR21	Audience Feedback and Preference Analysis	The platform must serve as a central management system, primarily focused on aggregating and analysing audience feedback and preferences. This includes the capability to

		collect data from social media platforms, thereby enabling a comprehensive understanding of audience interactions and responses to campaigns.
FR22	Multimedia assessment	The platform must assess the quality of various media materials and quantify their quality levels.
FR23	Integrated Audience Data Analysis and Visualization	The system must analyse collected feedback and information, using natural language processing for metadata and statistical extraction, and provide a visualization view for the interpreted data.
FR24	Common User Interface	The system must provide a common cross-platform UI where a user could access all the collected information.
FR25	Audience User Profile	The system must support the development of personal collections for storing the searched and selected data resulted from the collected data analysis.
FR26	Decentralised, secure, and legally binding licensing agreements	The system must provide producers and consumers with a feature to create decentralized, secure, and legally-binding licensing agreements.
FR27	Licensing agreements terms customisation	The system must allow producers to specify and customize terms and conditions within the agreements via a Dashboard.
FR28	Licensing agreements actions	The system must provide producers and consumers a dashboard that will allow to perform a set of actions to their licensing agreements, to preview them and to view their current status.
FR29	Digital Signing of Licensing agreements	The system should integrate with a mechanism that will allow the digital signing of Ricardian Contracts for both producers and consumers.
FR30	Trend Prediction through Content and Interaction Analysis	The system must analyse media content and audience interaction data to predict trends, ensuring that these predictions are based on both the content viewed and how audiences engage with it.
FR31	Adding acoustic models	The system must allow users to provide source files for the modelling of new locations.
FR32	Personalization of audio sources	The system must allow the user to upload their own audio files for the audio simulation.
FR33	Audio scene configuration	The system must allow the configuration of the audio scene (type, number of sources).
FR34	Intuitive User Interface for Lighting Control	The system's user interface should be user-friendly and intuitive, featuring an easily navigable layout with accessible controls for lighting adjustments. Interactive elements like buttons and sliders should provide immediate feedback to user actions.
FR35	Real-Time Feedback on Lighting Changes	The system must utilize efficient rendering techniques to provide smooth, real-time feedback to users on changes made to the lighting conditions.
FR36	Distribution Platform Matching for Movies	The system must recommend suitable distribution platforms for movies based on attributes and platform analytics.
FR37	Audience Profile Visualization for Film-makers	The system must provide visual profiles of target audiences to assist film-makers in decision-making.

<b>FR38</b>	Resource management	The system must collect and store all information captured, e.g., images, videos, 3D scenes, visual effects, and allow its end users to access this information and use them.
<b>FR39</b>	Information sharing among different stakeholders	The system should provide the ability of sharing drafts of multimedia, or information among stakeholders, gather feedback, and implement revisions collaboratively.

### 3.2 Non-functional Requirements

Non-functional requirements (NFRs) describe how a system should perform rather than what it should do. They define qualities like performance, security, scalability, usability, and reliability. Unlike functional requirements, which specify features or tasks, NFRs set standards or constraints for the system's overall behavior and user experience. For instance, an e-commerce platform may have non-functional requirements such as a page load time of less than two seconds, or the ability to handle 10,000 simultaneous users.

During system implementation, non-functional requirements guide architectural decisions, technology choices, and performance tuning. They ensure that the system not only functions correctly but also meet critical performance and quality benchmarks. NFRs help teams plan for infrastructure needs, optimize user experience, and mitigate risks like security breaches or system downtime. They are typically tested through methods like performance testing, stress testing, and security audits to confirm the system meets the desired standards.

From the requirements collected and analysed in section 2, the following table has been resulted.

*Table 2: The identified non-functional requirements*

ID	Title	Description	Why (↑)	How (↓)	Constraints
<b>NFR1</b>	Scalability	The ability of a system to scale, in the sense that it can expand the endpoints connected to it.	G1		C4, C5
<b>NFR2</b>	Web-based access	The system must be easily assessable through web, and not be demanding in terms of skills and knowledge to access.	FR1	FR3	C2, C3
<b>NFR3</b>	Replicability	The degree to which a system can be replicated by others and thus serve as an effective prototype.			C4, C5, C13
<b>NFR4</b>	Usability	The degree to which a system is easy to use by all its users with the minimum overhead.			C3
<b>NFR5</b>	Compatibility	The ability of a system to support multiple platforms-desktop, tablets, mobile phones, or other devices.	FR3	FR2	
<b>NFR6</b>	Security	Refers to the system's capability to protect sensitive information from unauthorized access, breaches, and other security threats.			
<b>NFR7</b>	Responsiveness	Expresses the ability of the solution to perform its functionality in a reasonable amount of time (e.g., Low latency, quick search)			

<b>NFR8</b>	System Integration and Interoperability	Ensure robust and flexible integration capabilities across diverse systems to facilitate seamless data exchange and operational coordination.		FR8	
<b>NFR9</b>	Maintainability	This refers to the ease with which the system can be updated, modified, and maintained over time, ensuring its long-term effectiveness and adaptability to changing requirements.			
<b>NFR10</b>	Accessibility	The degree to which the system is accessible to all users, including those with disabilities, complying with relevant accessibility standards and guidelines.			
<b>NFR11</b>	Data Processing Efficiency	The system's ability to efficiently manage, process, and retrieve large sets of diverse data (images, audio, video, text, etc.) with minimal latency.		FR8	
<b>NFR12</b>	Seamless Data Access Across Operational Stages	The system must allow stakeholders from any stage of the film-making process to search and access data and metadata generated from another stage and stakeholder.	G1, G5	FR13, FR25	
<b>NFR13</b>	Performance	The system's ability to deliver consistent and stable performance, particularly in processing large volumes of data and handling complex operations with minimal delays		FR13	C2, C5, C7, C12, C13
<b>NFR14</b>	Intellectual Property Rights Compliance	The system's adherence to intellectual property laws, ensuring the protection and proper use of copyrighted materials and content			

### 3.3 Constraints

Constraints are limitations or restrictions that must be adhered to during the development and implementation of a system. They can involve technical, budgetary, legal, or organizational factors that influence how the system is designed and built. Common examples of constraints include limited hardware capabilities, development deadlines, budget restrictions, or regulatory requirements. For instance, a project may need to be completed using a specific programming language, within a set budget, or comply with data privacy laws like GDPR.

During a system’s implementation, constraints play a critical role in shaping decisions related to architecture, technology choices, and resource allocation. Developers and project managers must ensure that the system meets all functional and non-functional requirements while staying within the defined constraints. These limitations can impact trade-offs between features, performance, and cost, requiring careful prioritization and planning. By clearly identifying constraints early on, teams can avoid costly rework and ensure that the system is delivered on time and within scope.

From the requirements collected and analyzed in section 2, the following table has been resulted.

*Table 3: The identified system constraints*

ID	Title	Description	Affects (↓)
C1	Lack of streaming platform data	The streaming platforms might provide little to no data regarding user preferences about movies.	G12, FR6, FR36
C2	Lack of compatible VR HW	Users may experience challenges if their hardware is not capable of rendering the 3D model smoothly, leading to lag or reduced frame rates.	G3, FR1
C3	Need for audio playback equipment	A minimum setup (e.g., headphones) is needed to experience the audio simulation	G3, G15
C4	Presence of noise during the recording phase	The contributors need to access the locations in time slots where there is not a lot of external noise	G15
C5	Audio Simulation Accuracy	The accuracy of audio simulations may be constrained by the limitations in current audio processing and simulation technologies.	FR33
C6	Data Privacy Compliance	Compliance with prevailing data protection and privacy laws, such as GDPR and CCPA, is mandatory for all user data management. However, the dynamic nature of these regulations, coupled with the possibility of location-specific legal requirements, could pose challenges. These evolving legal frameworks might restrict access to essential data, potentially impacting the performance or functionality of certain technologies.	G12, G14, G17, FR24, FR26, FR27, FR28, FR29, FR32, FR36
C7	Storage Capacity	The system must have sufficient storage capacity to handle high-resolution textures, detailed 3D objects, multimedia and extensive metadata	G4, FR2
C8	Need for recording equipment	The users need some equipment to contribute source files for the modelling of new locations	G15, FR31
C9	User Interface Adaptability	The system's user interface needs to adapt to different screen sizes and resolutions, which can be a constraint in providing a consistent user experience across devices.	FR12, FR34
C10	Non-Deterministic Algorithm Outcomes	The variability in outcomes from non-deterministic NLP algorithms may limit the system's replicability, as reproducing the exact conditions and results of the original system setup could be challenging. This includes variations in model training, data processing, and interpretation of natural language inputs, which can lead to different outcomes even under similar conditions.	G12, FR36
C11	Lighting Simulation Accuracy	The accuracy of lighting simulations may be constrained by the limitations in current computer vision and simulation technologies	G3, G4, G16, FR12
C12	Audio Simulation Accuracy	The accuracy of audio simulations may be constrained by the limitations in current audio processing and simulation technologies	G15

### 3.4 Project Goals

The goals of the project, as these were extracted from the grant agreement and also from the interviews set with the stakeholders, are presented in Table 4. Each of the project’s goals is related to certain requirements, functional (“How” column) and non-functional (“Why” column), and the constraints set (“Constraints” column).

Table 4: Project Goals

ID	Title	Description	Why (↑)	How (↓)	Constraints
G1	Interoperable Architecture	The architecture should allow different components in different systems to connect seamlessly with each other, in a service-oriented protocol, providing scalability.	NFR1, NFR8	FR8,FR9, FR13, FR24	
G2	Promote Europe’s Cultural Heritage	The system has to adopt technologies that can assist in promoting Europe’s both tangible & intangible Cultural Heritage.		FR1, FR27	
G3	Early evaluation of filming conditions	Need to allow to simulate the lighting and acoustic conditions of a cultural site.		FR1, FR12, FR34, FR35	C2, C11, C3,
G4	High-Precision and realistic digital surrogates/models	3D models of cultural sites can both assist in promoting Europe’s cultural heritage and being the means for early evaluation of filming conditions.	G2	FR1, FR11, FR12, FR34, FR35	C4, C7, C14
G5	Integration of different technologies	Open-source tools, standards and common ICT protocols will be used to ensure interoperability and efficient integration among the solutions, to achieve the modernization and increase the competitiveness of the European film-making industry.	NFR8	FR8, FR11, FR13, FR24	
G6	Obtain full access to the field site	Bring on board and build trust with demonstration ecosystems.	FR39		
G7	Maintaining privacy and confidentiality	Ensuring General Data Protection Regulation (GDPR) compliance and follow GDPR restrictions, considering privacy and (cyber) security.	NFR6, NFR14, NFR15,	FR8	
G8	Scalable and replicable solution	Apply dedicated tools and methodologies to evaluate and enhance the scalability and replicability of all tools.	NFR1	FR11	
G9	Location Scouting	It should have a system that will both assist location scouters and enrich the 3D cultural models with regional aware information.	G2 G4	FR9, FR11	
G10	Quality metrics	The project aims to produce quality metrics and media-related KPIs for post-production effects.		FR47	
G11	SCENE-O ontology, capturing the entities of film-making industry	Creation of a new as-agnostic and as-scalable-as-possible ontology building on top of baseline film related ontologies.		FR2	

<b>G12</b>	Recommendation System	The system should be supported by a recommendation algorithm, taking into account users' past behaviour and film's properties.		FR9, FR9, FR11, FR15, FR36	C1, C6, C13
<b>G13</b>	Blockchain in IPR management	The system can support smart contracts and develop an efficient system enriched with Ricardian Contracts to produce legal documents understandable to humans.		FR14, FR26, FR27, FR28, FR29, FR32	
<b>G14</b>	Distribution technologies	The system should support secure and controlled distribution of media files to propose the audience that the film makers should target at.		FR11, FR14, FR26, FR27, FR28, FR29	C6
<b>G15</b>	Acoustic modelling	Modelling acoustic data combining both approaches (geometrical modelling and blind estimation) in an information fusion schema.		FR31, FR32, FR33	C12, C8, C4, C18
<b>G16</b>	Relighting Technologies	Implement technologies to provide efficient AI solutions, utilizing neural renderers for manipulating the lighting conditions of EU cultural heritage locations.	FR12	FR34, FR35	C14
<b>G17</b>	Media Asset Manager	This tool will incorporate format agnostic content to create collections and bundles, and support different types of content licensing and monetization, among other functionalities.	FR14, FR39, FR38	FR9, FR11, FR12, FR26, FR27, FR28, FR29	C6
<b>G18</b>	Data Lakes	Create a common data lake used as a repository of the raw information required by all tools.	FR38	FR13, FR2	
<b>G19</b>	Ontology alignment	Automatic ontology alignment tool will facilitate the knowledge integration into a holistic and single-point knowledge graph.		FR2	
<b>G20</b>	Post-production and playout tools	These tools aim to enable interactive enrichment of newly produced and heritage digital visual media.		FR48	
<b>G21</b>	Post-production effects	These effects aim to improve the aesthetic and artistic aspects of a movie's content.	FR48		
<b>G22</b>	Audience preferences scouting	This tool aims to predict trends based on audience viewing behaviour and the interaction with the presented content.	FR30	FR21, FR16, FR17, FR18, FR19	
<b>G23</b>	Audience building tool	This tool aims to engage audiences, understand the impact of a new production and facilitate the attraction of funding for the production.	FR37	FR20, FR21, FR23, FR24	
<b>G24</b>	Media Quality Assessment and Metrics Generation	The system must assess the quality of various media materials, including images, 3D models, videos, and sound, and generate key performance indicators	FR22	FR22	

		(KPIs) and quality metrics to quantify their quality levels.			
<b>G25</b>	Post-Production Effects Library Development	The system must develop and maintain an information library that classifies and categorizes a wide range of post-production effects from various vendors, including stock visual effects (VFX), audio effects, editing tool plugins, and colour grading maps.	FR38	FR2, NFR10, NFR12, FR24	

## 4 Technical and legal requirements

This section presents the updated technical and legal requirements resulted from the requirements collection process.

### 4.1 Technical requirements

From a technical standpoint, the technical requirements detail the specific needs of the various tools or subsystems within the SCENE platform to meet the criteria outlined in Section 2. Each partner responsible for creating or developing a tool or subsystem formulates these requirements. This process involves reviewing the general requirements and use cases, and then establishing precise technical specifications, such as ensuring real-time data synchronization or necessitating a stable internet connection. Detailed information about the technical requirements defined for each tool, are available in D2.5.

*Table 5 List of SCENE technical requirements*

ID	Title	Description	Why (↑)	How (↓)
<b>TR1</b>	Machine Learning computing capabilities	The main microcontroller will be capable of implementing machine-learning models.	FR3	FR2
<b>TR2</b>	Internet connection	Since the audio output will be served, a stable internet connection is required.	FR33	
<b>TR3</b>	Audio playback	To experience the audio simulated output requires, the use of headphones is suggested. Users can also experience it through a pair of stereo speakers. The use of built-in speakers of laptops and smartphones cannot provide satisfactory results.	FR33	
<b>TR4</b>	Recording equipment	The contributors who want to provide source files for the modelling of a new location need some recording equipment. Two different cases are addressed a) the use of a low-budget portable digital recorder that supports ambisonics b) the use of conventional microphones for monophonic recording.	FR31	
<b>TR5</b>	User Interface (UI) and Navigation	The system should have a user-friendly interface that facilitates efficient navigation and easy access to modelling tools. Besides this, the system should also facilitate smooth and intuitive controls for navigating through	FR3	

		the 3D environment, including zoom, pan, and rotate functionalities.		
TR6	Tracking Infrastructure	The Actors Tracking solution requires a deployment of an infrastructure composed of fixed UWB devices (called anchors), Gateways (GWs) and a localisation manager.	FR7, NFR16	
TR7	Data type storage and Management	The system must be capable of storing and managing (insert, delete, update) various types of data (images, audio, video, 3D objects, text, multimedia).	FR2, FR6, FR11, FR15, FR16, FR18, FR19, FR24, FR26, FR37, FR38, FR39, FR42, FR54 FR56	FR19
TR8	Open Architecture	Allow for an open architecture, which can be used by other initiatives and projects.	NFR4	NFR3
TR9	Associating Multimedia with Metadata	The system must be capable of supporting the association of stored files with structured metadata information.	G11, G5, G1, FR5, FR6, FR15, FR17, FR20, FR26, FR50, NFR11, NFR8	FR25
TR10	Web-based Connection API	The system must utilize APIs that would allow connection of different components through the internet and ensure interoperability.	G1	
TR11	Information retrieval from metadata	The system must provide retrieval mechanisms that allows to search multimedia with keywords, filters and free text from the metadata.	G4, G5, G8 G9, G12, G14, G17, FR19	FR25 FR29
TR12	Holistic Film-making Management and storage	The system must implement a datalake that will be able to support the data management and storage of the data generated in each process in the filmmaking.	G1, G5, G18, NFR10 NFR11 NFR13 FR12	FR17
TR13	Seamless Data Access Across Operational Stages	The system must allow stakeholders from any stage of the film-making process to search and access data and metadata generated from another stage and stakeholder.	G1, G5	FR19, FR25
TR14	Dynamic Knowledge Graph Construction	The system must support operations (add/remove/update) that allow the creation of knowledge graphs from a pool of ontologies.	FR17	FR25
TR15	End-user (Audience) Interaction	The system must enable end users (the audience) to view available campaigns, participate by providing comments, and express their preferences, thereby facilitating interactive user engagement.	G22, G23	FR34, FR35, FR38

TR16	Common User Interface	<p>The system must provide a common cross-platform UI that will integrate the sub-UIs of each component and will allow all the relevant stakeholders to access the functionalities of the system from a single point of access.</p>	<p>G1, G5, NFR2, NFR4, NFR5, NFR6, NFR8, NFR10, FR1, FR3, FR4, FR5, FR9, FR16, FR18, FR23, FR24, FR31, FR32, FR33, FR34, FR35, FR36, FR39, FR40, FR41, FR42, FR45, FR47, FR48, FR49, FR50, FR54, FR57, FR58, FR59, FR63, FR66, FR67</p>
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## 4.2 Legal & ethical requirements

The project's legal and ethical requirements are distinct from its other requirements because they apply to the entire SCENE platform, forming a foundational base relevant to all its aspects. These requirements also influence the final development of the SCENE platform, as the technical aspects must adhere to relevant laws. Furthermore, given their unique importance, these requirements will lead to specific use cases, ensuring a more secure implementation for all stakeholders and their data. Additional details about the legal and ethical requirements identified are available in D7.2 and D1.3.

### 4.2.1 Security requirements: Privacy and Data Protection

This section provides an overview of the Privacy and Data Protection framework to be used in SCENE. The project involves the collection of personal data, in different countries of the European Union such as Greece, Cyprus and Italy, where the pilot sites are located. Moreover, although being under the same European regulation, the national laws of EU member states might have differences. Therefore, a close follow up of data protection requirements in each pilot site will be carried out.

The collection, processing and transmission of personal data must be analysed under the principles of the GDPR (General Data Protection Regulation, EU Regulation 2026/679) and especially the respective national laws. Any additional regulations at European or national level that are not in the GDPR and apply to Data Protection or any other sensitive information have to be also taken into account.

#### 4.2.1.1 EU Legislation and regulation

On 15 December 2015, the European Parliament, the Council and the Commission reached agreement on the new data protection rules, establishing a modern and harmonised data protection framework across the EU: The **General Data Protection Regulation**<sup>4</sup>. The Regulation is an essential step to strengthen citizens' fundamental rights in the digital age and facilitate business by simplifying rules for companies in the Digital Single Market. It aims to eliminate existing fragmentation and burdens, leading to savings for businesses. The

<sup>4</sup> [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_15\\_6321](https://ec.europa.eu/commission/presscorner/detail/en/ip_15_6321)



final text was formally adopted by the European Parliament and Council at the beginning 2016. Therefore, the rules became applicable two years later. As a Regulation and not a Directive, it had immediate effect on all EU Member States after the transition period and did not require any enabling legislation to be passed by governments. The Commission should work closely with Member State Data protection authorities to ensure a uniform application of the new rules. The Regulation updated and replaced the current Data protection rules that were based on the 1995 Data Protection Directive.

The GDPR strengthens the existing rights and empowers individuals with more control over their personal data. Most notably, these include:

- Easier access to your own data: individuals has more information on how their data is processed and this information should be available in a clear and understandable way.
- A right to data portability: it is now easier to transfer your personal data between service providers.
- A clarified "right to be forgotten": when you no longer want your data to be processed and if there are no legitimate grounds for retaining it, the data will be deleted.
- The right to know when your data has been hacked: companies and organisations must notify the national supervisory authority of serious data breaches as soon as possible so that users can take appropriate measures.

By unifying Europe's rules on data protection, lawmakers create business opportunities and encourage innovation though:

- One continent, one law: The regulation establishes one single set of rules which makes it simpler and cheaper for companies to do business in the EU.
- One-stop-shop: businesses only have to deal with one single supervisory authority.
- European rules on European soil: companies based outside of Europe have to apply the same rules when offering services in the EU.
- Risk-based approach: the rules avoid a burdensome one-size-fits-all obligation and rather tailor them to the respective risks.
- Rules fit for innovation: the regulation guarantees that data protection safeguards are built into products and services from the earliest stage of development (Data protection by design). Privacy-friendly techniques such as pseudonymisation are encouraged, to reap the benefits of big data innovation while protecting privacy.

#### 4.2.1.2 *The new Artificial Intelligence Act*

On December 2023, Parliament and Council negotiators reached a provisional agreement on the Artificial Intelligence Act<sup>5</sup>. The main goal is to ensure that AI systems are developed and used in a secure, ethical and responsible way, accomplishing the fundamental rights of EU citizens while, at the same time, promote innovation. Therefore 3 main aspects are targeted:

- *Ensuring AI security*: security requirements for AI systems in terms of robustness, reliability and resilience to cyber-attacks.
- *Protect fundamental rights*: AI systems are not allowed if vulnerate fundamental rights, such as privacy, freedom of speech and discrimination. The new law establishes a framework based on risk, so that the higher the risks the stricter the requirements for AI systems, which intends to promote robust, secure and ethical AI systems.

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<sup>5</sup> <https://www.europarl.europa.eu/news/en/press-room/20240308IPR19015/artificial-intelligence-act-meps-adopt-landmark-law>



- *Promote responsibility and transparency*: transparent requirements for AI systems, so that users can be informed about how the system work and how their data are used. This measure intends to help promoting citizen's confidence on AI.

The AI Act has set out clear definitions for the different actors involved in AI: providers, deployers, importers, distributors, and product manufacturers. Moreover, the AI Act also applies to providers and users of AI systems located outside of the EU, if output produced by the system is intended to be used in the EU.

In terms of structure, there is a General Body at EU level composed of member states as well as of Commission members. Furthermore, EU member States must designate one (or more) national authorities in charge of supervising the implementation of the regulation.

The impact on global competitiveness is still unclear. AI systems not aligned with the AI Act would be implemented in other areas of the world. Depending on whether the non-EU countries join a similar initiative/regulation to promote 'fair play' and fundamental rights, the AI innovation in Europe might be severely affected.

In terms of labour market, it is also unclear and sometimes contradictory. From an optimistic perspective, AI is able to create new job positions in areas such as development, data management, engineering and cybersecurity. It can also help automatizing routinary tasks, allowing the workforce to focus more on creative and strategic tasks. According to a McKinsey study, AI can create between 10 to 15 million new job positions in the EU by 2030<sup>6</sup>. On the other side, from a pessimistic perspective, AI can generate job loss in areas such as production, customer service, logistics and administration. In summary, the impact of AI on Europe is complex and would not only depend on EU regulation and national legislation, but also on how companies and workers (employees) adapt to this working environment.

The new Law establishes a series of requirements for AI systems which represent a serious risk for the fundamental rights, such as those used for decision making that have legal or significant effects on the users. There are 4 main categories:

- **Unacceptable risk** (prohibited): The Act prohibits AI models posing an unacceptable risk (e.g., the use of real-time remote biometric identification in public spaces or social scoring systems).
- **High risk** (conformity assessment): The Act allows high-risk models but must comply with various requirements and undergo a conformity assessment, which should be completed before the model is released on the market. The models need to be registered in an EU database. Some requirements refer to an appropriate risk management system, logging capabilities and human responsible to oversee the process. Data governance should be applied to the data used for training, testing and validation. Other features include mechanisms to ensure the cyber security, robustness and fairness of the model. Some examples of this category encompass AI for critical infrastructures, hiring processes, employee ratings, automated insurance claims, etc.
- **Limited risk** (transparency): The Act requires transparency for these models (e.g., a user must be informed whether they are interacting with a human or an AI system). A typical example is represented by current chat bots.
- **Minimal risk** (code of conduct): The remaining models are considered of minimal or no risk by the Act; here the implementation of a Code of Conduct around ethical AI is recommended.

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[https://www.mckinsey.de/~media/mckinsey/locations/europe%20and%20middle%20east/deutschland/news/presse/2024/2024%20-%2005%20-%2023%20mgi%20genai%20future%20of%20work/mgi%20report\\_a-new-future-of-work-the-race-to-deploy-ai.pdf](https://www.mckinsey.de/~media/mckinsey/locations/europe%20and%20middle%20east/deutschland/news/presse/2024/2024%20-%2005%20-%2023%20mgi%20genai%20future%20of%20work/mgi%20report_a-new-future-of-work-the-race-to-deploy-ai.pdf)

According to this categorization, the AI systems that will be developed in SCENE fall under the limited or minimal risk categories. The general-purpose AI (GPAI) models have basically to adhere to transparency requirements, which includes:

- Providing technical documentation
- Comply with EU copyright law
- Disseminate detailed summaries about the content used for training

In terms of timing, the AI Act is still provisional and is expected to be fully applicable by 2026. Some intermediate steps are envisioned, and the SCENE partners will follow this transition to accommodate their developments to the new Law, if needed.

## 4.2.2 Legal Requirements

The legal requirements that are required to be captured and considered during the implementation of the SCENE platform are presented in Table 6. Additional information about these requirements is presented also in D1.3 – “Data Management Plan & Regulatory, Social, Gender (GEP) & Ethical Issues.R1” and D7.2 – “AI – OEI – Requirement No. 2”.

*Table 6: List of Legal requirements*

ID	Title	Description
L1	GDPR - Privacy by design principle: Proactive not Reactive - Preventative not Remedial	The system must incorporate all means that are necessary to prevent privacy or security breaches from occurring. This design anticipates and prevents invasive events before they happen. In this context, the system should incorporate a variety of measures to effectively check the validity of all information inputs and all actions.
L2	Obtain Data Subject consent	The system should have the means to obtain Data Subject consent. This includes but not limited to an information sheet and a consent form to be displayed with a "tick box" to confirm that "I have read and fully understood the SCENE platform and I agree to abide by the principles described there" or an equivalent phrasing.
L3	Encryption of personal data	The system must encrypt all personal data by default using standardized encryption mechanisms with securely managed encryption keys.
L4	Expiry date of personal data	The system must associate an expiry date to all collected personal data.
L5	Deletion of expired personal data	The system shall delete (in an unrecoverable way) all the collected personal data after they expire.
L6	Provide a readable, understandable and easily accessible privacy policy for the users.	Users should be informed on the privacy policy of SCENE.
L7	Terms of use	The system must provide its terms of use.
L8	View of collected personal data	The system must provide the ability (direct or indirect) to the Data Subject to view what personal data have been collected.
L9	Correction of collected personal data	The system must provide the ability (direct or indirect) to the Data Subject to make corrections to personal data that have been collected.
L10	Provide a single point of contact for the users	Users need contact data to address their requests.

### 4.2.3 Ethical requirements

The ethical requirements that are required to be captured and considered during the implementation of the SCENE platform are presented in Table 7.

*Table 7 List of Ethical requirements*

ID	Title	Description
E1	Information on consent source	The system should provide information on how it gained consent for data preservation and sharing.
E2	Information on end user identity protection	The system should provide information to the end users on how their identity is protected.
E3	Information on secure handling of sensitive data	The system should describe how sensitive data will be handled to ensure they are stored and transferred securely.
E5	Compliance of SCENE Artificial Intelligence to the general ethical principles	The Artificial Intelligence components of SCENE must comply with the general ethical principles, based on the European Group on Ethics in Science and New Technologies. These include the following: non violate human dignity, respect of human autonomy, compliance to human rights and universal values, contribution to fairness, equal opportunities and solidarity, respect the outcome of democratic decision making, AI pursuant to the principles of the rule of law, guarantee the safety and integrity of users, compliance to the laws and regulations on data protection and privacy, prevention of harmful impact on the environment.
E6	Easy to understand user interfaces	The system should offer an easy-to-understand user interface. The app(s) should allow for information to be provided in a plain/easy-to-understand language.
E7	Gamification based on non-personal data.	Gamification should be related to the collection and processing of non-personal data only. The SCENE gamification tools should avoid asking or encourage persons to share their personal data, since this it could be considered as a non-ethical/dark pattern.
E8	Management of notifications and warnings.	The system should provide the end users with a configuration panel to allow them to decide how often they will receive notifications and the type of notifications. Similar functionality should be provided for the warnings.

## 5 Conclusions

The deliverable 2.3 – “End-User needs & requirements R2”, is part of task T2.2 – “End-User needs & requirements”, and presents the process and the results for extracting the SCENE platform’s requirements, the users’ requirements and the general SCENES system’s technical and legal requirements. Through the multiple stages of the requirements elicitation process, we were able to dig deeper into the project’s real goal and potential. To this end, the project goals and constraints were identified. Moreover, the requirements were categorized in functional, non-functional, technical, legal and ethical requirements and needs. For the last part, the consortium identified the project's stakeholders. This provided a better insight on the technical and business aspects of the project, which resulted to the definition of the different use cases that will be implemented in each pilot of the project.

All the above served to elaborate on the SCENE system’s functionalities (use cases) and the reasons behind them (requirements). The project’s target seems to be aligned with the audio-visual sector’s needs. SCENE



platform's requirements were compiled so that they can achieve this overarching goal and potentially bring real change. The outcomes of this deliverable will guide the rest of the process in order to ensure alignment with the project's goal and the users' requirements. Given the complexity and breadth of the proposed functionalities, it is essential to prioritize these requirements effectively. By establishing clear priorities, stakeholders can focus on the most critical features that will deliver maximum value while ensuring a more manageable implementation process. This strategic approach not only enhances the likelihood of successful deployment but also allows for iterative development, enabling adjustments based on user feedback and evolving needs.

The validation of the collected requirements will be achieved through the pilot execution and the collection of pilot feedback. By incorporating representative usage test scenarios, stakeholders can effectively assess the practical applicability of the SCENE platform's functionalities during pilots. The pilot strategy designed in T5.1 and T5.2, along with the feedback collection methods drafted, aiming to collect valuable feedback during the pilots, and to evaluate the level of satisfaction with the requirements that have been derived and noted in this deliverable.

Furthermore, refocus of efforts should be applied in task T4.6 toward alternative distribution strategies for independent filmmakers highlights an important consideration in today's film landscape. By exploring innovative distribution methods tailored for independent creators, the project can better serve this segment of the industry, ultimately fostering a more inclusive and diverse film ecosystem. This dual focus on validation and tailored distribution strategies will contribute significantly to the project's overall success and relevance.



# Annex I – End-User Needs & Requirements Questionnaire

## Part A: Occupation

- 1) **Occupation Status (Single Selection)**
  - Location Manager
  - Art Director
  - Editor
  - Director
  - Director of Photography
  - Audio Engineer
  - Producer
  
- 2) **Years of expertise in the film industry (Single Selection)**
  - Less than 1 year
  - 1 - 5 years
  - More than 5 years
  
- 3) **Size of the company (Single Selection)**
  - Small (1 - 10 employees)
  - Medium (11 - 50 employees)
  - Large (51 - 200 employees)
  - Very Large (200+ employees)
  - Self-employed / Freelancer
  
- 4) **In which phase(s) of the film-making process are you involved?**
  - Small (1 - 10 employees)
  - Medium (11 - 50 employees)
  - Large (51 - 200 employees)

## Part B: Locations

- 5) **How do you access the location data? (Single Selection)**
  - I have a shared folder and look manually for each item through my personal or my company’s archive
  - I use a dedicated tool/service to search for specific data (e.g., search engine, application etc.)
  
- 6) **What types of attributes (labels, tags) are you typically missing when searching for locations? (Open end question)**
  
- 7) **Select the initial sources from which location data are collected (multi selection)**
  - Social media platforms
  - General web pages as long as they are referring to a certain topic
  - Image databases
  - Off the shelf applications
  - Own archive
  - Others
  
- 8) **What are the biggest challenges you face during the location scouting process? (Ordering question)**
  - Assessing logistics and accessibility
  - Budget constraints
  - Finding suitable locations



- Negotiating permits and permissions

### **Part C: Audience / Distribution**

**10) How do you currently gather information about audience preferences for film projects in order to build your target audience? (multi Selection)**

- Surveys and question
- Social media analysis
- Market research reports
- Focus groups
- Other

**11) What criteria do you consider when selecting a target audience for your films? (multi Selection)**

- Demographics (age, gender, location, etc.)
- Genre preferences
- Social media presence
- Box office performance of similar films
- Other

**12) What challenges do you face when it comes to audience engagement and retention? (multi Selection)**

- Limited marketing budget
- Difficulty reaching the target audience
- Competing with other forms of entertainment
- Lack of audience feedback and data
- Waiting to build social media campaigns
- N/A

**13) Do you usually use any of the social media platforms for your audience building campaign? (multi Selection)**

- Facebook
- Instagram
- Twitter/X
- YouTube
- LinkedIn
- TikTok
- None

**14) How do you determine audience trends (i.e., interest in topics or themes) for future productions? (multi Selection)**

- General information sources (news, magazines)
- Market and research studies
- Individual trendsetters / influencers / market leaders
- Feedback from current audiences
- Own assumptions
- Not interested in or catering to trends
- Other

**15) Do you use online platforms for distribution? (Single Selection)**

- Yes
- No

### **Part D: Audio & Lighting Simulations**



**16) How to do you test the adequacy or predict the characteristics of a filming location in terms of acoustics and lighting in your current workflow? (multi Selection)**

- We visit the location to check the acoustics
- We visit the location at different times to see the natural light
- We see photos of the location at different times
- We use some existing software or tools
- We listen to recordings
- We don't have a way to check the acoustics and the different lighting situations of a filming location before filming
- We use some existing software or tools

**17) What kind of functionality would be useful in terms of tools for remotely checking the acoustics and lighting of a filming location: (multi Selection)**

- To listen to sample recordings captured in a certain location
- To see some metrics or graphs regarding the acoustic attributes of a location
- To provide my own recordings and hear a simulation of how it would sound there
- To see photos or videos of the location with different lighting conditions
- To adjust different scenes and lighting conditions
- To adjust different positions of the sound source and the listener
- To see a 3D model with different lighting conditions
- I wouldn't be interested in such functionality

**18) How do you select post-production visual effects (color grading, text inserts, denoising)? (multi Selection)**

- Performed by fixed external company
- Selection of multiple external companies
- Tools in the editing suite used (Adobe After Effects, Avid Plug-In...)
- Various effects libraries available in house
- Tools purchased when needed

**Part E: Security & Privacy**

**19) Have you encountered any issues related to intellectual property rights (IPR) protection in your film projects? (Single Selection)**

- Yes, frequently
- Occasionally
- Rarely
- No

**20) What categories of rights would you encode in a license agreement with a consumer? (multi Selection)**

- Film production rights
- Distribution rights
- Royalties and revenue streams
- Intellectual property rights

**21) Is it possible to have multiple different distributions right for the same content? (Open ended question)**

**22) How do you currently manage the licensing and auditability of multimedia content during distribution? (multi Selection)**

- Manual documentation and tracking



- Digital asset management systems
- Contracts and legal agreements

**23) Do you have a way to automate it? (Single Selection)**

- Templates
- Platforms
- Lawyers

**24) Would you use the platform that automated the licensing process through secure licensing (block chain)? (Single Selection)**

- Yes
- No

**25) In which of the production phases you would like to have extensive support from automations/AI tools? (multi Selection)**

- Pre-production
- Production
- Post-production
- Distribution
- Other
- Not applicable

**Part F: End-Users**

**26) How open are you or your organization to adopting new technologies and digital tools? (Single Selection)**

- Very open, actively seeking innovative solutions
- Open, willing to explore new possibilities
- Neutral, depends on the specific benefits and costs
- Reluctant, prefer traditional methods and tools

**27) Are there any specific tools or features you would like to see in a platform like SCENE? (multi Selection)**

- Integrated location scouting database
- AI-powered audience analysis and targeting
- Real-time light and audio simulation tools
- Blockchain-based IPR protection and licensing control
- Advanced distribution engine for audience identification
- Personalized film recommender system
- Accurate tracking of actors' locations on stage enabling the possibility to activate microphones, sound-, and lighting effects, at the precise moment required

**28) Who in your opinion is expected to use the SCENE platform (as end-user)? (multi Selection)**

- Location Scouters
- Film Offices
- Set designers
- Directors
- Production Company
- Artistic Director
- Film-maker
- Producer
- Investor
- Distributor
- Others



**Part G: Personal Info**

**29) Gender (Single Selection)**

- Male
- Female
- Gender - Variant
- Prefer not to say

**30) Would you like to stay updated with our latest news by subscribing to our Network of Interest? (Single Selection)**

- Yes
- No



## Annex II – Distributors Needs & Requirements Questionnaire

**1) What type of distributor are you? (Single Selection)**

- Channel
- Platform
- Governmental Body
- Distribution Company
- Other (Please Specify)

**2) Country you are based in: (Open end question)**

**3) How do you currently gather information about audience preferences for film projects in order to build your target audience? (multi Selection)**

- Surveys and question
- Social media analysis
- Market research reports
- Focus groups
- Other (Please Specify)

**4) What criteria do you consider when selecting a target audience for your films? (multi Selection)**

- Demographics (age, gender, location, etc.)
- Genre preferences
- Social media presence
- Box office performance of similar films
- Other (Please Specify)

**5) What challenges do you face when it comes to audience engagement and retention? (multi Selection)**

- Limited marketing budget
- Difficulty reaching the target audience
- Competing with other forms of entertainment
- Lack of audience feedback and data
- Waiting to build social media campaigns
- N/A

**6) Do you use any of the social media platforms for your audience building campaign? (multi Selection)**

- General information sources (news, magazines)
- Instagram
- Twitter/X
- YouTube
- LinkedIn
- TikTok
- None

**7) How do you assess the potential success of a film before deciding to distribute/fund it? (Open end question)**



**8) How do you determine audience trends (i.e., interest in topics or themes) for future productions? (multi selection)**

- General information sources (news, magazines)
- Market and research studies
- Individual trendsetters/influencers/market leaders
- Feedback from current audiences
- Own assumptions
- Not interested in or catering to trends
- N/A

**9) Which factors influence the audience's decision to watch a film in theaters versus on a streaming platform, based on your opinion? (Open end question)**

**10) How important are the following in your decision to distribute a film? (multi Selection)**

- Reviews
- Ratings
- Social Media Buzz

**11) Do you use online platforms for distribution? (multi Selection)**

- Yes
- No

**12) How open are you or your organization to adopting new technologies and digital tools? (multi Selection)**

- Very open, actively seeking innovative solutions
- Open, willing to explore new possibilities
- Neutral, depends on the specific benefits and costs
- Reluctant, prefer traditional methods and tools

**13) Who in your opinion is expected to use the SCENE platform? (multi Selection)**

- Location Scouters
- Film Offices
- Set designers
- Directors
- Production Company
- Artistic Director
- Film-maker
- Producer
- N/A

**14) Would you like to stay updated with our latest news by subscribing to our Network of Interest? (Single Selection)**

- Yes
- No