The Co-Creation Space: An Online Safe Space for Community Opera Creation

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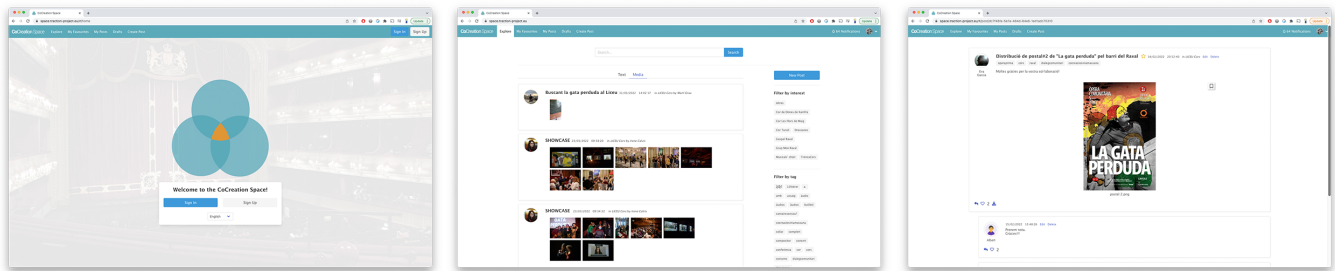Delft, The Netherlands
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Figure 1: Screenshots of 1) the main landing page, 2) the explore page for discovering posts 3) an image post with comments

ABSTRACT

This work presents the Co-Creation Space, a multilingual platform for professional and community artists to 1) generate raw artistic ideas, and 2) discuss and reflect on the shared meaning of those ideas. The paper describes the architecture and the technology behind the platform, and how it was used to facilitate the communication process during several user trials. By supporting ideation sessions around media items guided by a facilitator and allowing users to express themselves and be part of the creation of an artistic product, participants were enabled to access new cultural spaces and be part of the creative process.

CCS CONCEPTS

• **Human-centered computing** → *Collaborative and social computing systems and tools.*

KEYWORDS

Opera, Toolkit, Web application, Social interaction, Media sharing

1 INTRODUCTION

Widespread access to the internet, and the ubiquitous availability of mobile devices has empowered community artists to create media together with professionals [1, 6–8]. This process of co-creation allows disparate communities to shape and share their own narratives [4, 5, 9], empowering them to build confidence, silence self-criticism [3], and have an ongoing voice [2, 3, 10, 11].

Figure 2 outlines the steps in such a co-creation process [4]. First, raw ideas are shared in a digital safe space, giving users an equal voice. Then, participants discuss and reflect on commenting and sharing their own media. Next, selected artists synthesize high-level artistic patterns from the media and conversations. Finally, professional and non-professional artists create artistic output together based on these patterns.

In this paper, we present a web-based platform called *The Co-Creation Space*, developed in the EU-funded project TRACTION, an online safe-space that supports non-professional community collaboration with professional artists. During the demo, conference participants will be able to interact with the platform the way

project trial participants did. Using the tool, professional and non-professionals artists can co-create opera experiences by sharing, discussing and reflecting on different types of media, including images, audio, and text fragments. The goal of the platform within the project is to provide a technological means of supporting the process of community opera creation and make European culture more accessible and inclusive [4].

2 POSITIONING THE PLATFORM

The Co-Creation Space positions itself at the intersection of online media storage, editing, and sharing tools. The tool serves the co-creation process by incorporating media storage, similar to the functionality of tools like Google Drive and iCloud, and media sharing, such as Facebook and Instagram. The goal of the tool is also to support basic media editing functionality, incorporating some functionality of products like the Adobe Suite with online whiteboards tools like Miro. The goal of the Co-Creation Space is to bridge the gap between professional and non-professional co-creators by supporting self-reflection, peer support and group discussion around media.

Current tools do not support these dynamics for several reasons: platforms may focus on one type of media, such as images in the case of Instagram or short videos in the case of Tik Tok. Such platforms also focus on individuals sharing content with the broad public, offering no or very little opportunity for co-creation within private groups. The media storage sector on the other hand, tends to be completely private, offering file storage to individuals and providing limited means for collaboration around media. Our tool sits at the intersection of these use cases, providing space for storage and playback of media of various types, while enabling the sharing, discussion and editing of said stored media among private groups of users.

In order to use the platform, users sign up with a username and e-mail address and join private groups, each of which is moderated by a facilitator, who is most often a professional artist, who guides participants through the co-creation process. All content submitted to a group on the web platform is private to that group, so users feel comfortable sharing their raw media and ideas. Communication within a group is centered around posts, which represent the main unit of interaction. Posts created by users can have multiple media items of different types attached to them and other users can reply to posts with media items of their own. Based on findings from our user-centered process, special care was been taken to make the platform accessible to users speaking different languages, and possessing different levels of technology experience and mobility, and using different laptop and mobile devices. This was achieved by enabling the interface to be translated into different languages, enabling auto-translation of uploaded spoken word into different languages, following UI accessibility standards, and by making sure the application behaves responsively when viewed on mobile devices.

3 FEATURES & ARCHITECTURE

The result of the user-centred design process is an interactive web application taking advantage of latest web technologies to facilitate media sharing and playback. In terms of application architecture, the platform is designed as a conventional three-tiered web application comprised of a browser-based front-end, which makes heavy use of JavaScript for interactivity, a web back-end responsible for user management, routing and interaction with data storage and a relational database system, which provides persistent data storage. Moreover, the platform makes extensive use of cloud services for more complex tasks. *Amazon Web Services* (AWS) was chosen in this case to provide some of these features. These include storage of media assets, video/audio transcoding, audio transcription and real-time translation of content as well as content distribution over a wide geographical area. Also the server hosting the back-end code and the relational database are provided by AWS.

The platform natively supports the following types of media: 1) video, 2) audio, 3) images and 4) PDF. In order to ensure video and audio items can be played back on the greatest share of end devices as well as on lower-capacity Internet connections, each video or audio track is encoded using both DASH and HLS. Users always have the option to directly download the original, unprocessed files as well. Figure 3 illustrates the pipeline that is set into motion whenever a user uploads a video or audio item while creating a new post. First, the file is stored in S3, a key-value based file system offered by AWS. At this point, the system concurrently starts a transcoding job for both DASH and HLS as well as a transcription job for the audio track. References to the resulting manifest files are stored into the application's database once complete. The transcription job first attempts to detect which language is spoken in the media item, if any. Then, speech recognition is performed and the resulting text is also stored in the database and can then be used to render subtitles. Optionally, the text is also translated into a variety of languages, specific to the co-creation group's needs. These translations can then be used as subtitles and captions for videos or audio items.

Depending on the size of the uploaded media item, these processes take some time to complete. The processes run asynchronously so the user can continue browsing the site after submitting the post. Once complete, the system will add the new post to the *Explore* section of the site, as shown in the second image of Figure 1, where it can be discovered and commented on by other users. This section of the platform also gives the user the ability to search for posts using string queries or filter them by tags or topics.

Moreover, to give users more ways of interacting with video or audio, comments can be added directly to an item's timeline. Alternatively, a user can quickly react to a moment in the video/audio stream by hitting one of the emoji buttons below the timeline. The selected emoji is then added to the current moment in the timeline and becomes visible to other users as an animation of the selected emoji during subsequent playback, as seen in the first image of Figure 4.

When uploading images, users can sketch on top of them or highlight certain portions of them in order to point out important areas or add quick notes. This is to aid users in communicating their ideas more clearly when uploading images, as can be seen in the second image in Figure 4.

The professional artists facilitating the co-creation groups specifically requested native support for PDF documents. This is especially useful for sharing sheet music. A facilitator might create a post containing a piece of music and add the associated sheet music for it. Then users can browse the sheet music, download it and practice
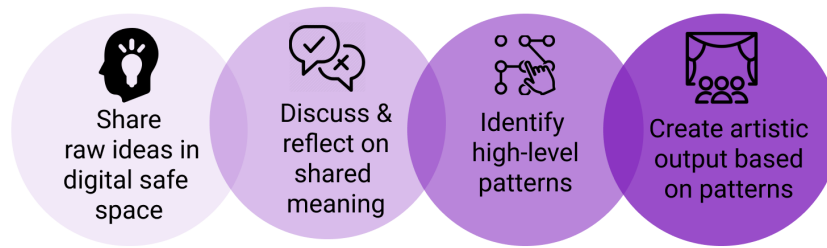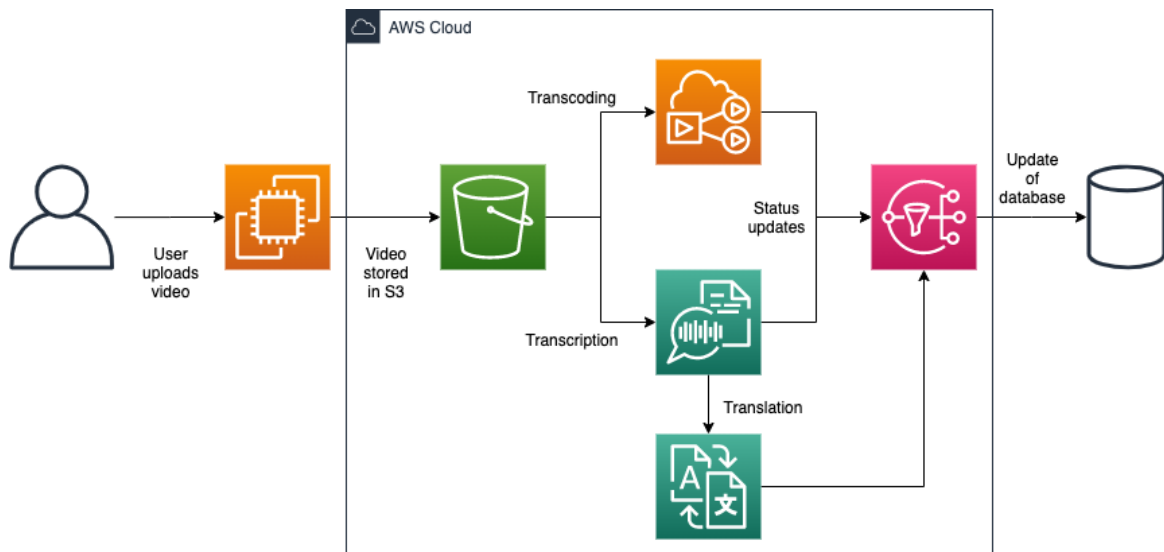
Figure 2: Steps in the co-creation cycle

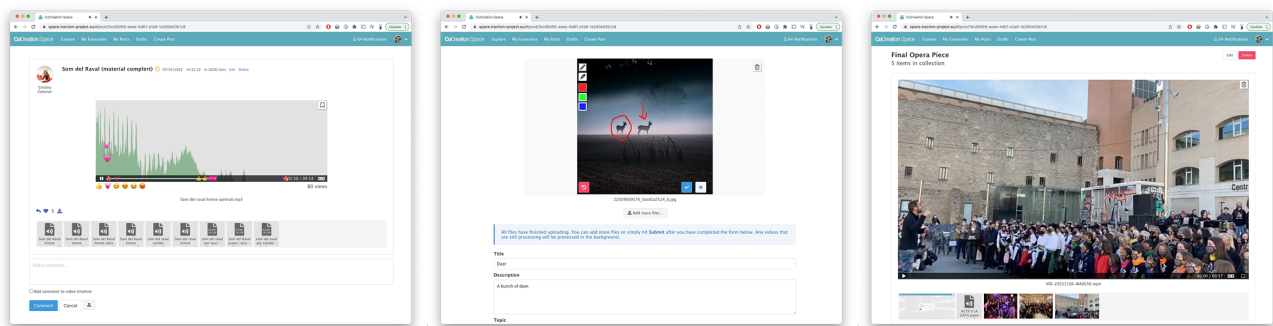Figure 3: Architecture of the media processing pipeline

Figure 4: Screenshots of the platform showing 1) audio player with emoji reactions, 2) image with user-drawn annotations, 3) a user's private media collection.

along with the audio track playing in the background. Another feature especially useful to facilitators is the ability to add individual media items from arbitrary posts to private collections, as seen in the third image of Figure 4. This feature enables the facilitator to create collections of their favourite user submissions. Later they can share the contents of a collection as a regular post, providing a

convenient means of creating a snapshot of the co-creation process at a moment in time.

4 CONCLUSION

In this paper, we described a platform designed to support and facilitate communication between professional artists and marginalised communities in the context of opera. The platform provides users

with a safe-space enabled by private groups which allows them to express themselves through the sharing and discussion of media. Each group is moderated by a professional artist acting as facilitator and guiding the creation process on the platform. The platform gives users ways to discussions, reflections, and to form patterns about media during the creative process.

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