Personalized story-viewing experiences on the Polariscope platform

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Abstract

Digital storytelling is increasingly used to enrich digital content, and personalization features may add significant value to the story-viewing experiences. This research focuses on enhancing digital storytelling using personalized filtering and recommendation methods to support the development of a media visualization mode integrated into the Polariscope platform, aimed at bringing people together by sharing and co-creating collective memories. These personalization features intend to enable more dynamic and immersive story-viewing experiences based on user preferences and customized parameters, such as time-based, context-based, media types, among others. A prototype of this solution was presented to a focus group of six participants to gather feedback and suggestions on the proposed solutions. The results highlighted a strong appeal for these features, with a preference for the summary mode visualization and for the filtering based on spare time and media type. Control was one of the most valued aspects among participants, who favored manual personalization over automatic personalization. These insights, along with additional suggestions such as filtering content by relevance, by geographic region, and incorporating voiceovers, will be integrated into the next iteration of the prototype, which will undergo field testing with end-users.

Keywords

Digital storytelling, Filtering, Personalization modes, Recommender systems.

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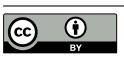

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1 Introduction

Digital Storytelling (DST) involves using digital resources and content to tell engaging, interactive stories across various platforms to pass information but also to establish an emotional connection with the audience, offering a deeper, personalized involvement [14]. Many platforms and institutions use this strategy to communicate more creatively and effectively, fostering empathetic discourse while improving personal and intercultural storytelling [5] [10]. The growing demand for engaging and intuitive digital experiences calls for personalized, interactive solutions that enhance user well-being [2] [8]. Additionally, studies highlight the decreasing attention span, emphasizing the need for short but efficient, rich digital content [7] [11]. This research is focused on Digital storytelling, specifically personalized viewing modes, by identifying solutions for Polariscope, a collaborative platform for storytelling around collective memories and cultural events. Various filtering and personalization options for the platform's Story page were discussed in a focus group. The aim was to explore how these modes could enhance user immersion and enrich story comprehension on the platform.

2 Personalizing the viewing experience

To enhance the efficiency of the digital storytelling strategy in Polariscope, a feature is being designed to enable immersive story viewing through a "Play mode" to display media content (images, videos, sounds and texts) in a more dynamic and engaging way. To accomplish this, personalized viewing modes were envisioned to optimize the narrative flow. Filtering and recommendation concepts were explored, drawing insights from their application on other platforms. Implementing these technologies, especially filtering and personalization, may positively impact the user experience, increasing engagement and loyalty to the platform [12].

2.1 Recommender systems

Recommendation Systems adapt content feeds based on user preferences, typically using algorithms and Artificial Intelligence (AI). In the case of hybrid systems, these allow some manual user configuration. To gather user feedback and suggestions that could enhance personalized viewing modes for the immersive Polariscope Story mode, different types of recommendations were identified: **User-defined recommendations** based on user preferences collected

through questionnaires (e.g., Pinterest, Blinklist); **Algorithmic and AI-supported recommendations** based on user behaviors (e.g., Facebook, Spotify, YouTube); **Contextual recommendations** based on the user's current context (e.g., location, weather, time, themes, and seasons) [3]. While useful, these recommendation systems also present several challenges reported in literature, such as: **Filter Bubble**: limitations on content discovery by hiding information deemed irrelevant to the user [1]; **Privacy, Security, and Trust**: issues around data management and storage with potential for data leakage [3] [6]; **Lack of Transparency**: Hidden data management procedures [9] [13]; **Ineffectiveness of Recommendations**: Randomness due to insufficient user data [1] [15]; **Lack of Control**: sense of being trapped by algorithms, with limited control on the recommendations [3] [9].

2.2 Filtering parameters

Filtering Systems adjust and present data according to the user's preferences and needs and offer practical ways to view content, such as sorting by type, summarizing feeds, or contextualizing content based on the user's environment. To offer a tailored viewing experience, [9] identified several types of filters: **Emotion-based filtering:** presents content based on emotional state, but effectiveness varies due to subjective perceptions; **Colour-based filtering:** which customizes content using colours (e.g., blue for calm, red for dynamic, as seen on YouTube); **Context-based filtering:** includes the time of day, thematic content (e.g., holiday music), and environmental factors (e.g., noisy surroundings) to adapt content accordingly; **Summary filtering:** offers condensed versions of the content for time-constrained users; **Interest-based filtering:** offers the ability to filter based on the media type, category, or complex personalized preferences [9]. Despite the wide range of personalization options, customization fatigue may occur when excessive filtering and personalization options are presented to users [16]. This can become overwhelming, particularly if the process of selecting filters is repetitive, leading to frustration and decreased user engagement [16].

2.3 A review of personalization uses

To highlight how personalization, through recommendation and filtering solutions, is applied in some of the most popular social media platforms, the benchmarking presented in Figure 1 was carried out by the research team. As shown in Figure 1, **AI-supported recommendations** based on user habits to promote retention and discovery are predominant in large-audience social platforms like **YouTube**, **Spotify** and **Facebook**. However, **YouTube** expands these features by adjusting the algorithms with **user-defined recommendations** based on Satisfaction Surveys (feedback gathered after videos) and Product Choice Surveys (collection of the user preferences for commercial purposes). In the case of **Blinklist**, an active learning platform, users complete a detailed questionnaire to personalize content based on their profile, personality, and patterns. The platform then creates a monthly reading plan and offers book recommendations for efficient learning. This learning platform also summarizes books into "blinks" consisting of short texts and audio versions. The **summary feature** is also adopted by **Smart News**, a news aggregation platform which offers a news summary feature

Filter/recommendation	Youtube	Spotify	Pinterest	Facebook	Blinklist	SmartNews
User-defined recommendations	✓	✗	✓	✗	✓	✗
Algorithmic and AI-supported recommendations	✓	✓	✗	✓	✗	✗
Contextual recommendations	✗	~	✗	✗	✗	✗
Emotion-based filtering	~	✓	✗	✗	~	✗
Colour-based filtering	✓	✗	✗	✗	✗	✗
Context-based filtering	✗	✓	✗	✗	✗	✗
Summary filtering	✗	✗	✗	✗	✓	✓
Interest-based filtering	~	✗	✓	✗	✓	✗
Media Type	✗	✗	✗	✓	✗	✗

Figure 1: Benchmarking of personalization features in social media platforms and applications.

for quick content consumption. **Interest-based filters** are another method to meet the users' needs by allowing to choose relevant topics that enhance the discover of new content. This feature is available in **Blinklist** and in the mood board application **Pinterest**, which allows ideas to be organized across topics using "pins". The users' mood is also a relevant criterion for personalisation with its different approaches, namely **colour-based filtering**, like in the **YouTube** feature that allows users to select a colour to shape the shown content to match their mood, and **Spotify**, which generates tailored playlists based on **emotional states**. **Context-based** playlists are also a strong strategy used by **Spotify** to adapt its music recommendations to specific consumption environments (e.g., daily activities, gym, or thematic contexts like holidays).

Based on the state of the art, the team built a mobile based prototype that integrated some of the highlighted afeatures, including the predefined modes, that included arranging and filtering the content based on criteria like: available time, by controlling the speed; length preference, providing summary versions including only a selection of media; and media type. Having built the prototype, the team conducted a user evaluation by means of a focus group to assess its acceptability and gather suggestions from potential users.

3 Methodology

As referred, some of the analyzed personalization features were selected, adapted to the prototype and presented for discussion in a focus group. The research questions posed to participants included how personalized viewing modes impact user engagement and content comprehension and which best suit the Polariscope Story viewing experience. The qualitative approach of focus groups was chosen as it enables quicker and more in-depth access to information through collective discussions [4].

3.1 Sample characterization and focus group setup

The focus group enrolled six participants (three female and three male), students in the field of Communication Sciences and Technologies and content creators. The session lasted approximately 45 minutes and aimed to collect feedback on the relevance of the proposed personalization features, determine the most desired viewing modes, and understand the user preferences regarding configuration and control. The session began with an introduction to the

concept of the Polariscope platform and the Story mode where the personalization features are integrated, followed by participants exploring the prototype on their own mobile devices. A discussion ensued, focusing on the role of personalization in digital storytelling and on which customization options were most valued and best suited for the Polariscope platform. The following section provides further information on the developed prototype.

3.2 The Story mode in the Polariscope prototype

The Polariscope platform promotes interaction and content contribution among users with a similar approach to social media applications but targeted to the area of cultural heritage and events. To this end, the platform is being designed as a collaborative storytelling community, supported by AI, to showcase and connect institutional collections with user-contributed content. AI is integrated into the system to identify correlations between media content shared in each thematic event (referred to as "Projects") by analyzing metadata such as descriptions, dates, locations, and keywords. This enables content recommendations based on various criteria, such as popularity, novelty, or thematic relevance. The metadata analysis also supports the creation of dynamic, AI-assisted story curations. Unlike traditional cultural heritage repositories, where specialists interact with AI through direct prompts or database queries, users on the Polariscope platform engage with AI indirectly. As an example, AI provides suggestions of relevant content for story creators to include into their stories. AI is also used to generate automation curations of content built into stories, which users can explore and/or build upon. Through this combination of human-driven and AI-driven curation, the platform aims to foster meaningful engagement and content creation around shared memories and experiences. By appealing to both experts and general audiences, Polariscope seeks to create an inclusive and dynamic space for cultural storytelling.

The platform is structured around Projects, each able to include multiple Stories. Each project provides visualizations of the media content shared in the project's open repository. The core of collaborative storytelling comes from the ability of users to share their own content and organize it into meaningful stories, as well as the ability to use content from other contributors (videos, images, sounds, and text) (Figure 2). The collaborative platform allows for different levels of participation, namelly project creators/owners, story editors and co-editors, content creators or simply viewers or lurkers, each playing a distinct role in the collaborative ecosystem (Figure 2). Project creators can invite other users and institutions to co-manage projects, fostering partnerships and collaboration. The platform encourages interaction and content sharing among all participants, with different user types contributing to a creative exchange of experiences and memories. The Story Page (Figure 3 and Figure 4) blends vertical scrolling for narrative text with horizontal sliders to showcase media content and community contributions. Users can scroll through community contributions horizontally and contribute with their perspectives by uploading content in dedicated banners. Another feature of the story is the "challenge" module, which includes interactive "calls to action" that encourage more focused user-generated responses. Hence, collaboration

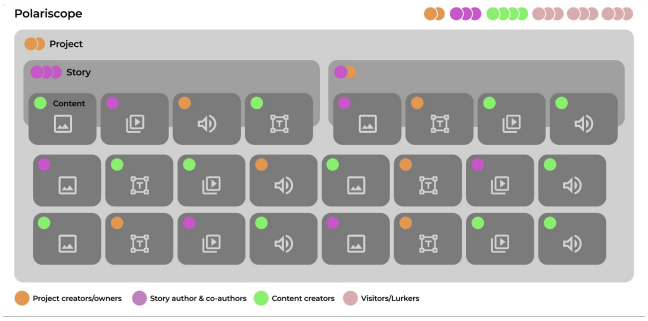

Figure 2: Polariscope platform ecosystem.

takes place not only during the story creation process through co-authorship but also during the viewing experience, where users can actively contribute to the challenges. This dual-layered approach to participation is designed to foster deeper engagement and continuous content sharing within the community. In complement

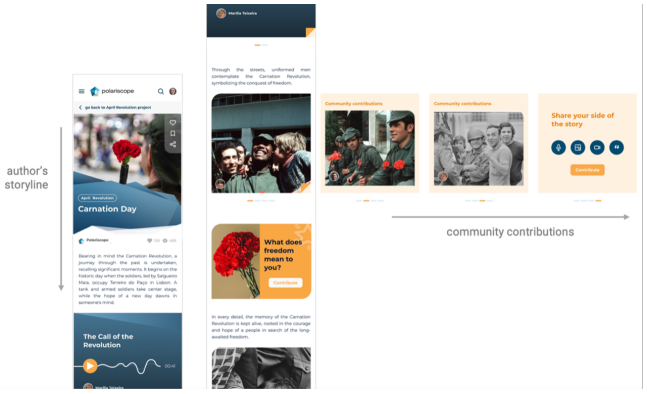

Figure 3: Story page structure and sliders to support collaborative storytelling.

Figure 4: Story page scrolling mode with "Play mode" menu options, including the settings wizard of the Hybrid mode (right).

to the scroll visualization of the stories, shown in Figure 3 and

Figure 4, an immersive visualization mode is being developed to offer a dynamic, scroll-free viewing experience, similar to Instagram stories, called "Play mode" (Figure 5). It adapts the content presentation according to user-selected filters (Figure 4) or behavior-driven automatic personalization. The proposed customization methods (Figure 4) include three modes: **Automatic** (AI algorithm based on user behaviour), **Manual** (selection and configuration), and **Hybrid** (filling a settings wizard to define the Speed, Media Type and the Context in a custom viewing mode – "My viewing mode", as shown in Figure 4 right side). In the Manual mode (Figure 4, third image), the **Default viewing modes** include various filtering options, like **Summary** (shorter format), **Media Type** (e.g., image, video), **Time-based** (e.g., predefined length according to users' available time), and **Context** (e.g., noisy, bright, etc.). This personalizing approach aims to provide a tailored and engaging content-viewing experience that adapts to the user's preferences and needs.

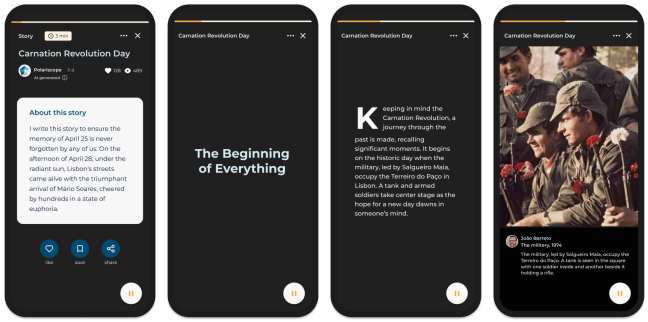

Figure 5: Story page "Play mode" (immersive presentation).

3.3 Results and discussion

After a brief contextualization of digital storytelling and personalized viewing modes, when asked about the factor that most impact user engagement and content comprehension, participants stated that dynamic narratives using AR and 3D objects significantly enhanced the story-viewing experience. Accessibility features like audio versions and voiceovers were also considered valuable. While personalization was seen as beneficial, the story's structure, content, and creativity remained the most important aspects.

Five out of six participants preferred having control over their viewing modes, favoring manual selection or a hybrid model over a fully automated AI-driven option. The hybrid approach would involve an initial wizard setup to define preferences for a customized viewing experience. Participants preferred defining these settings when entering a story's "Play mode" rather than setting them as a general configuration in their user profile, as a fixed configuration could feel restrictive. Instead of segmented selection menus, toggle buttons for dynamically adjusting multiple parameters were suggested. Regarding AI-driven automatic modes, participants were reluctant about its effectiveness, citing the need for vast data sources and the current inability of AI to match human curation.

The most suitable customization options (Figure 4) for the Polariscope platform, as identified by participants, were: **Media Type Filtering** (allows users to focus on visual elements instead of text-heavy content); **Time-Based Filtering** (prioritizes content based on available viewing time, which participants found particularly useful in fast-paced daily routines); **Summary Mode** (while algorithmic summaries were seen as potentially inaccurate, participants suggested that story authors should have the ability to curate their own summarized versions). The **Context Mode** was considered less effective, as constant reconfiguration could become time-consuming and overwhelming. Additional suggestions included: **Geographic Filtering** (selecting content based on specific locations); **Top 3 Highlights in Summary Mode** (a quick overview of key moments); **Voiceovers/Narration** (enhancing immersion and accessibility); **Speed control** (adjusting the presentation pace and duration); **Continuous Playback Mode** (seamlessly transitioning between recommended stories about the same subject within the same Project or not); **3D & Gamification Elements** (interactive quizzes and 3D models for education and engagement). Based on insights from the preliminary focus group, the following features are being developed to be integrated into the high-fidelity prototype of the platform:

· **Voice Narration:** Text-to-speech (TTS) features are being integrated into the platform using the browser's native voice support. This TTS solution was chosen for its offline capability, speed, and lack of usage limitations. Unlike online services like Google-supported ones, which require server communication and generate audio files, the native TTS offers real-time narration with mute/unmute controls for user comfort. This feature is aligned with the focus group feedback requesting optional narration across immersive viewing modes.

· **Content-Type Filtering:** An algorithm identifies the media types (images, videos, audio, text) presented in each story, allowing users to get immersive stories built on the media types chosen by the user. If a media type is underrepresented, the corresponding filter option will not appear.

· **Story Summary Mode:** Instead of AI-generated summaries (flagged by participants as undesired because it could distort the original story), authors will be able to create their own condensed versions by selecting up to half of the story's sections. This curated summary will be enabled in the story's "Play Mode", when available.

· **Playback Speed Control:** Similar to platforms like YouTube, the possibility of users controlling narration and content speed (e.g. 1x or 1.25x), as suggested by the focus group participants.

· **Hybrid Personalization Mode:** Since users rejected full AI-driven immersive modes, a wizard will guide them in selecting the most suitable options (e.g., narration preference, content type, pacing) to generate a personalized viewing mode.

· **Story Recommendations:** Aimed at enhancing the viewer experience by keeping the user in the immersive mode, the final slide of each story will provide suggestions of real-time story recommendations based on user behavior analysis, and algorithms powered by Recombee AI, the selected recommendation solution.

4 Final remarks and future work

Polariscope is a collaborative storytelling platform focused on collective memories that enables different levels of participation, namely for project creators, story editors and co-editors, and content creators. This study presents the initial stage of development of a media visualization module integrated into the Polariscope

platform to enhance immersion while viewing stories. Within the platform, stories are publications made by bits of text and media content that can be uploaded by the story author or shared by other contributors of a project. Each project aims to constitute a community that collects and shares users' records of cultural events and heritage experiences. Some stories may include challenges, which are special media sliders with specific calls to action. Any media chunk of a story can also receive contributions from any registered user, thus making stories by definition collaborative publications.

Immersion is a valuable dimension in a storytelling experience, as mentioned by the focus group participants. Therefore, a personalised visualisation mode is being developed to enhance the viewing experience of stories within the Polariscope platform. This study explores the most valued personalization strategies for digital storytelling viewing modes, with the goal of improving the user experience on the Polariscope platform. The research question includes identifying the personalized viewing modes that best align with the Polariscope Story Page and assessing its impact on user engagement and the storytelling experience through a focus group with potential users. The "Play" visualization feature for the Polariscope platform proposes immersive, scroll-free and personalized story viewing.

While acknowledging the limitations of the assessment due to the limited sample size (six participants), comprising students with technical backgrounds and content creators, insights gained at this early stage of conceptualisation and medium-fidelity prototyping provide valuable guidance for continuing the solution's development, particularly in identifying the most valued personalisation settings. The findings suggest that personalization is subordinate to structure, content and creativity in the context of storytelling. The focus group participants expressed a strong desire for the personalization features, with a preference for filtering by summary mode, time (duration) and media type. Configuration-wise, they preferred manual or hybrid personalization over AI-based automation, highlighting the need for control. Participants also suggested giving story authors control over curated summary versions, providing voice-over and adjusting the speed of the story presentation. These insights will be considered in the next iteration of the prototype, refining the platform's storytelling and personalisation features, which will be tested in the field with end-users.

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