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The Potential of Locative Mobile Apps for Telling New Stories About Contested Cities

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Abstract: This article describes the design of a locative mobile phone app, Rijeka Fiume in Flux, for exploring the past of Rijeka, a city that was historically contested, first between Hungary and Croatia in the 19th century, and then between Italy and Yugoslavia in the 20th century. It evaluates how successfully it disrupts ethno-national narratives about the city's identity. Modelled on experiential learning and polyvocality, the app seeks to share historical knowledge from multiple perspectives with a broad audience, while also enabling users to explore the past based on their curiosity and experiences moving through the city, provoking engagement with the multifaceted stories of the city. Focus groups with students of different ages, place of residence, and language groups offers useful insights on the potential of such apps to tell new stories about contested heritage. One category of feedback concerns the appeal as well as drawbacks of technology, including the consequences of encountering technical malfunctions, and larger questions concerning the alienating effects of technology. The second concerns the challenges of attracting and maintaining the interest of the intended audience. The third concerns the effects of engaging with the contents of the app. Overall, the feedback confirms the potential of apps to disrupt and create new narratives, while also highlighting specific challenges that require targeted attention in order to develop effective apps.

Keywords: locative mobile apps; polyvocality; multivocality; contested heritage; experiential learning; narrative

Rijeka, also known by its Italian name Fiume, is one of a number of cities that share the misfortune of having been claimed by rival national projects – other well-known cases in Europe include Belfast, Nicosia, Strasbourg, and Wroclaw. Narrating the history of these cities is difficult – which story is historically more accurate? Exclusive narratives are, indeed, one way to assert claims to rightful ownership of the city, becoming weapons in the arsenal of nationalist competition. Alternatively, narrative can focus on conflict, acknowledging the existence of multiple communities, but also simultaneously promoting the idea of incompatible coexistence. For example, you can hire a cab driver with a past in the Belfast paramilitaries to drive you around the troubled neighborhoods. Ultimately, every narrative tells a story, and in the process, excludes others.[1]

The problem of narrating the history of a contested place has surfaced in recent years with vigor in the case of Rijeka. Toward the end of the First World War, both Italians and the movement to create a South Slavic state asserted rival claims on Habsburg Rijeka, in addition to an autonomist movement with Riccardo Zanella at its helm. The poet and adventurer Gabriele D'Annunzio famously occupied the city in 1919 on behalf of Italy, but without any mandate to do so, with the help of a group of soldiers and enthusiasts, in what came to be known as the *Impresa di Fiume* in Italian, or "Fiume affair" to an international public. D'Annunzio and his followers were expelled in 1920 after the signing of the Treaty of Rapallo, which established Rijeka as an independent state on the newly established border between Italy and the Kingdom of Serbs, Croats and Slovenes. The Free State was short lived – although the autonomist party came to power in October 1921, the Italian fascist state occupied the city shortly thereafter in March 1922, formally annexing it in 1924.

The Second World War, however, marked a dramatic reversal of this outcome. Following the occupation of the entire Northern Adriatic region by Nazi Germany following Italy's capitulation in 1943, the communist partisans under the leadership of Josip Broz Tito liberated the city and the adjoining Istrian peninsula in the spring of 1945. The 1947 peace treaty settled the question of Rijeka's belonging in Yugoslavia's favor. This did not however put an end to

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1 On the exclusionary effects of authorized heritage discourse and the potential of polyvocality/multivocality to reverse this, see Laurajane Smith, *The Uses of Heritage* (London: Routledge, 2006); Veysel Apaydin, *Narrating Heritage: Rights, Abuses and Cultural Resistance* (London: Bloomsbury Publishing, 2023); Christopher Whitehead, Tom Schofield, and Gönül Bozoğlu, *Plural Heritages and Community Co-production: Designing, Walking, and Remembering* (London: Routledge, 2021).

Italian-Yugoslav confrontations over the precise location of the new border between Italy and Yugoslavia, which had shifted westward to the other side of the Istrian peninsula near Trieste, which would only be provisionally settled in 1954. In the wake of the border change, hundreds of thousands of Italian speakers from the former Italian territories, including Rijeka, would move to Italy in what came to be known in Italy as the Istrian-Dalmatian exodus. Rijeka would remain part of Yugoslavia until Croatia's secession from the country in 1991.

This history of national contestation over the Northern Adriatic continues to haunt the region and resonate with Croats and Italians alike. Whereas the winning bid of the 2020 European capital of culture program adopted the slogan "port of diversity," the anniversary of the Fiume affair triggered a flurry of commemoration. In Italy, the rise of politicians riffing off irredentist discourse has resonated in some right-wing circles.[2] In parallel, the descendants of Italians who were forced or felt compelled to leave the city after the Second World War find community in social media sites that celebrate the true Italian-ness of the city. This nationalist discourse has, in turn, been met with resistance from Croats, who claim the city as their own.

Is it possible to disrupt these kinds of nationalist narratives, which define cities primarily through the lens of ethno-national identification, and in their place foster other, less exclusionary kinds of narratives, such as stories that center the diverse and overlapping ethno-linguistic and religious communities that have called the city home, or that focus on other cross-cutting themes, such as gender or architectural innovation? And what kind of tools can be harnessed to reach broad audiences in this endeavor? Mobile-phone based locative apps offer a different way of encountering the past than through the consumption of ready-made narratives – through engagement with maps, augmented reality, and flexible knowledge structures (such as databases that can be queried or explored in multiple ways). Some notable examples include Apeldoorn stories, berlinHistory, Cleveland historical, the apps produced as part of the Hidden City project, and the Visit Harvard app, which includes a walking tour on the Legacy of Slavery.[3]

The Rijeka in Flux project sought to harness this type of technology to disrupt entrenched narratives through experiential learning. By enabling users to explore knowledge about the city's past in a non-linear modality, as determined by one's movement through space and/or curiosity, the resulting app enables users to discover and assemble new narratives based on their experiences of encountering the city.

How successful is it in this endeavor? In answering this question, this article examines the implications of the Rijeka Fiume in Flux mobile phone app for the field of heritage studies, and for the development of mixed reality applications. As was argued more than a decade ago, mixed reality "has reached adolescence, and we need to look at how it is interacting with the world. We need to see where it is going and either do what we can to help it get there or do what we can to redirect it to more constructive goals."[4]

The following essay presents the objectives and design of Rijeka Fiume in Flux and discusses insights regarding user experiences that were collected in a series of focus groups, interviews, and classroom interactions with a variety of different audiences including high school students, university students, instructors, and a tour guide. I argue that while the technology itself is promising, capturing loyal users is a much more persistent challenge. While it is simple to attract users to try out the app one or two times, short-term use of the app may challenge or de-stabilize entrenched narratives, but it is unlikely to replace them with something new. At the same time, apps like this can be powerful tools for conveying the past to "naïve" audiences, who are not already captive to entrenched narratives, such as high-school students and tourists. Beyond their potential as stand-alone applications, they also have the potential to assist with and support other more traditional story-telling modalities, such as tour guides, in conveying alternative stories about the city's past. Technology enables innovative ways of interacting with the past *in situ*, but can also be alienating – by involving them in the creation of the app, target audiences can help to mitigate the alienating aspects of technology and foster greater interest and empathy.

1 Objectives

The motivation for designing the mobile phone app was threefold. We wanted to find an innovative vehicle to share the findings of researchers involved in the "Rijeka in Flux: Cities after Border Change" project with a broader audience

2 Irredentism is a political project and discourse with its origins in the 19th century, which was particularly prominent under fascism. It claims so-called "unredeemed" territories inhabited by Italian speakers on behalf of Italy.

3 On the Hidden City project, see Fabrizio Nevola, David Rosenthal, and Nicholas Terpstra, *Hidden Cities: Urban Space, Geolocated Apps and Public History in Early Modern Europe* (London: Routledge, 2022), https://apeldoornstories.nl/; https://berlinhistory.app/english/; https://clevelandhistorical.org/; https://www.harvard.edu/visit/tours/#app.

4 Evan Barba, Blair MacIntyre, and Elizabeth D. Mynatt, "Here We Are! Where Are We? Locating Mixed Reality in The Age of the Smartphone," *Proceedings of the IEEE* 100, no. 4 (2012): 929–36, 935.

than the typical consumers of scholarly publications. We also wanted to explore the value of experiential learning to enrich our understanding of the past, using deep maps and augmented reality. Finally, we wanted to democratize the learning process, by shifting away from a model in which experts produce narratives for knowledge consumers, to one in which participants are invited to take part in the interpretation of the past in collaboration with experts, ultimately developing their own narratives based on their interests and experiences, while also rooted in verifiable historical research.

Experiential learning, as theorized by David Kolb, posits that doing and feeling (active experimentation and concrete experience) are important foundations for learning, but that these actions are incomplete unless followed by watching and thinking (reflective observation and abstract conceptualization).[5] Engaging the bodily senses can help foster meaning-making by triggering an emotional response and sharpening interest and focus.[6] But, as Emilie Sitzia notes, narrative-making is also an essential step in meaning-making, because "human beings think in narratives and through narratives by using and understanding specific patterns, structures, motifs, etc."[7] Thus, both immersive and discursive practices are essential in experiential learning. In a similar vein, the Rijeka Fiume in Flux mobile phone app begins with the experience of moving through and sensing the city, supplementing and augmenting this experience with narrative fragments and additional visual sensory data that are intended to stimulate reflection and conceptualization.

Reflecting a constructivist approach to learning, the organization of information in the app is intentionally flexible, to free users to explore the content in an open-ended way. Constructivism holds that learners acquire knowledge through active engagement with the world.[8] The vehicle employed is the deep map in combination with embodied experience of the city. Deep mapping is a concept developed in the spatial humanities to move beyond Cartesian notions of space and imagine ways to visualize space in ways that integrate space, place, and time. David J. Bodenhamer, John Corrigan, and Trevor M. Harris have laid out an expansive and ambitious program for deep maps, which intersects in several ways with the goals and mechanisms of the Rijeka Fiume in Flux App:

> A deep map is a finely detailed, multimedia depiction of a place and the people, animals, and objects that exist within it and are thus inseparable from the contours and rhythms of everyday life. Deep maps are not confined to the tangible or material, but include the discursive and ideological dimensions of place, the dreams, hopes, and fears of residents – they are, in short, positioned between matter and meaning. […] The spatial considerations remain the same, which is to say that geographic location, boundary, and landscape remain crucial. What is added by these deep maps is a reflexivity that acknowledges how engaged human agents build spatially framed identities and aspirations out of imagination and memory and how the multiple perspectives constitute a spatial narrative that complements the prose narrative traditionally employed by humanists.[9]

Defining deep maps as "a new creative space that is visual, structurally open, genuinely multimedia and multilayered," they note that such maps "do not explicitly seek authority or objectivity but provoke negotiation between insiders and outsiders, experts and contributors, over what is represented and how. Framed as a conversation and not a statement, they are inherently unstable, continually unfolding and changing in response to new data, new perspectives, and new insights."[10] Deep maps privilege multivocality – the inclusion of many different voices reflecting different positions. Embracing multivocality involves rejecting the premise that there is a single story about any particular place or time – an assumption at the heart of exclusionary nationalist narratives, which silence alternative narratives.[11]

Integrating cartography, narrative, images, and audio-visual material, The Rijeka Fiume in Flux mobile phone application is a flexible platform that invites users to make sense of the city in collaboration with experts and with the city itself, ordering and re-ordering place-based narrative fragments into new narratives. Seeing the city as a storytelling medium, the app is based on the premise that, through the affordances of mobile locative technologies, "the audience helps create the narrative they experience and

5 David Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, NJ: Prentice Hall, 1984).

6 Philipp Schorch, "Cultural feelings and the making of meaning," *International Journal of Heritage Studies* 20, no. 1 (2014): 22–35.

7 Emilie Sitzia, "Narrative theories and learning in contemporary art museums: A theoretical exploration," *Stedelijk Studies* 4 (2016): 1–15, 4–5.

8 A good introduction to the topic is provided by George E. Hein, "The Challenge and Significance of Constructivism," *Hands On* (2001): 35–42. For a more detailed discussion, see id., Learning in the Museum (London: Routledge, 1998).

9 David J. Bodenhamer, John Corrigan, and Trevor M Harris, eds., *Deep Maps and Spatial Narratives* (Bloomington: Indiana University Press, 2015), 3.

10 Bodenhamer, Corrigan, and Harris, eds., *Deep Maps*, 4.

11 For a thoughtful exploration of the liberatory potential of multivocality from a postcolonial perspective, see César A. Cisneros-Puebla, "Multivocality as Practice of Critical Inquiry for Social Justice," *The Qualitative Report* 27, no. 8 (2022): 1529–46, https://doi.org/10.46743/2160-3715/2022.5507.

actually brings the story's discourse into being."[12] Embracing multivocality, it not only showcases the multiple voices of the researchers, but also of the multiple communities that have called Rijeka home.

Moreover, the app employs augmented reality to bring the past and the present of the city into an open-ended dialogue. Augmented reality or mixed reality can be defined broadly as the "technologies that [take] everyday objects and activities and enhance them in some way."[13] This includes a wide variety of tools, from the technologically simple to complex, such as audio-tours that can be initiated using QR codes and visualizations that enrich the ambient environment, for example, by superimposing virtual over a user's view of the physical world around them. Public historians and heritage scholars have noted the potential of augmented reality to make the past come alive.[14] Such tools are particularly valuable in cases of intangible heritage where the material evidence has disappeared or been destroyed, as is often the case with marginalized communities.[15] The function of augmented reality in the Rijeka Fiume in Flux app is therefore to create a bridge between embodied experience of the urban space, and historical narratives and artifacts, essentially turning the city into another layer of the deep map.

2 Application Design

The application was developed by a team of five researchers comprised of the University of British Columbia-based SpiceLab,[16] two historians, and an architectural historian who was also a graphic designer. All historians involved in the Rijeka in Flux project were included through multiple consultations at different stages of the app development, providing critiques and reflections on their experiences using the app that was then fed back into the design process.[17] It was launched in 2021, and continued to be actively maintained until April of 2024, reflecting its limited funding lifecycle. Due to changes in policies of the main app stores it is unfortunately no longer available for download. The end of the project however invites reflection.

The basic building block of the app is the "marker" – that is, a geo-located pin, color-coded for time period and with an icon identifying its type (Figure 1). When you click on the marker you access a card with content – primarily, a paragraph (generally between 250 and 300 words) describing the history of the site and its significance, and historic images (Figure 2). Some markers also have short videos with experts discussing their research in relation to the marker. Users can interact with the markers in three ways – they can see them located on a map; they can encounter them in augmented reality format by holding their phone up against the landscape, or they can see them in the format of a list.

The selection of the markers that were included in the app was a threefold process, based on the guiding principle of multivocality. First, historians working on the Rijeka in Flux project, who were exploring the transformation of the city in the 20th century, proposed and created markers that were relevant for their individual research projects. Some of the key research themes covered were: the history of socialism in Rijeka, sports and leisure in Rijeka, the history of the Italian and Croatian school networks, Rijeka's *lieux de mémoire*, erased monuments, Rijeka's rise as a socialist port, architectural innovation in the 20th century, the relationship of the Italian community with the Communist authorities, and migration in the city. The diversity of themes ensured that the app would offer a multitude of narratives about the city's past. Then, project members collectively debated what other markers should be included due to their general significance to the history of the city. Secondly, while project researchers took responsibility for researching and writing some of these markers, a few guest contributors were also included. Thirdly, subsequent to the completion of the first phase of the project, we opened up the possibility of

12 Jeff Richie, "The Affordances and Constraints of Mobile Locative Narratives," in *The Mobile Story. Narrative Practices with Mobile*, ed. Jason Farman (Oxon: Routledge, 2014), 53–67, 56–57.

13 Barba, MacIntyre, and Mynatt, "Here We Are," 930.

14 See for example, Mark Bugeja and Elaine Marie Grech, "Using Technology and Gamification as a Means of Enhancing Users' experience at Cultural Heritage sites," *Rediscovering Heritage through Technology: A Collection of Innovative Research Case Studies That Are Reworking The Way We Experience Heritage,* eds. Dylan Seychell and Alexei Dingli, (London: Springer, 2020): 69–89; Emily Esten, "Combining Values of Museums and Digital Culture in Digital Public History," *Handbook of Digital Public History,* eds. Serge Noiret, Mark Tebeau and Gerben Zaagsma (Berlin: De Geuyter, 2022): 107–19.

15 Jonathan Westin, Anna Foka, and Adam Chapman, "Humanising places: exposing histories of the disenfranchised through augmented reality," *International Journal of Heritage Studies* 24, no. 3 (2018): 283–86; Jonathan Amakawa and Jonathan Westin, "New Philadelphia: using augmented reality to interpret slavery and reconstruction era historical sites," *International Journal of Heritage Studies* 24, no. 3 (2018): 315–31.

16 The SpiceLab is led by geographer Jon Corbett, in collaboration with programmer Nick Blackwell.

17 Nataša Janković and Marco Abram assisted with the design of the app. Gruia Badescu, Vanni D'Alessio, Ivan Jeličić, Vjeran Pavlaković, and Francesca Rolandi also contributed to its design through their feedback. App content was contributed by the aforementioned project team members, along with students Oriane Edwards and Angelo Massaro as well as guest contributors. The author wishes to thank Nataša, Marco, Ivan, and Francesca for their feedback on a draft of this article.

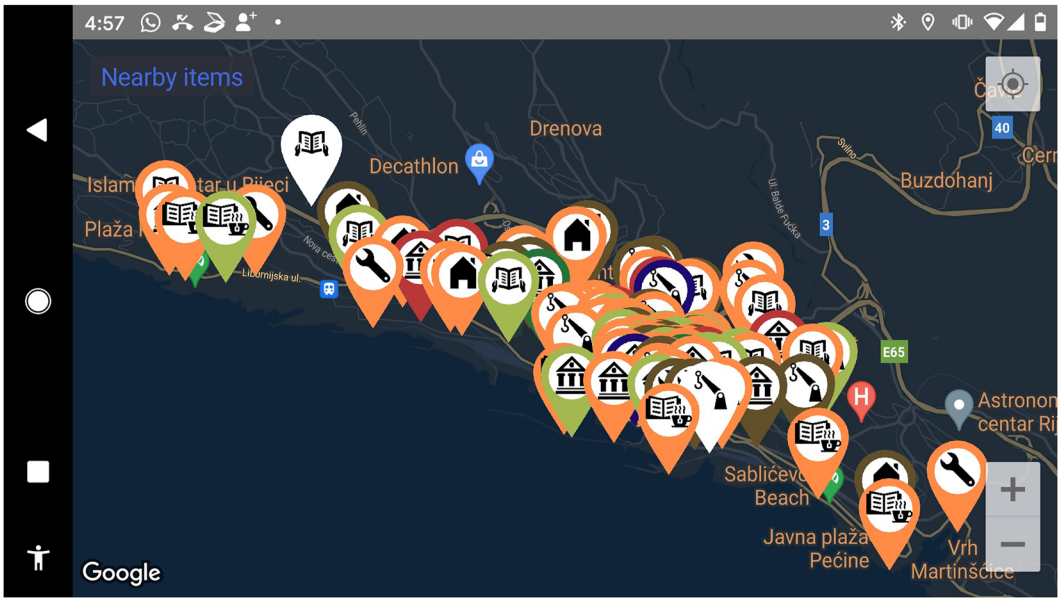

Figure 1: Map view of the Rijeka Fiume in Flux app, showing all the markers. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

collaborating with additional local experts to add in new markers.[18]

The decision to undertake co-creation with community partners was the product of an organic development, when the project was approached by activists who had designed a feminist walking tour for the Smoqua festival of queer and feminist culture. For these activists, the app offered both a repository for their work, which was of an ephemeral nature, as well as the possibility of reaching a broader audience. Adapting and including the texts in the walking tour to the app was clearly in line with the app's principle of multivocality. Including the feminist walking tour incorporated a new narrative – one in which women activists, architects, writers, and scholars played an important role in shaping the city. Not only are women largely absent or peripheral in nationalist narratives, but the contributions of these women provide an alternative to a narrative defined by conflict.

Following this fruitful experience, the project collaborated with the Jewish Community of Rijeka to create another set of five markers showcasing this community's rich history. In contrast to the previous collaboration, the process of developing these markers can more accurately be described as co-creation. The texts were authored by a member of the Jewish community, Rina Brumini, and edited and translated by project members. This process sometimes elicited disagreements and negotiations – for example, regarding the best way to approach markers related to the Holocaust. Whereas the project team had previously used stories about individuals as a means to bring history to life, it became clear that privileging the stories of only a few Shoah survivors was seen as overshadowing the lives of so many others whose stories would not be told. This process of co-creation revealed that aspects of the approach and design of the app sometimes needed to be modified to respect the values of community partners.

This was a worthwhile compromise, because it allowed us to include and make visible to a broader audience the stories of a community whose size and heritage was devastated during the Second World War. The stories of the Jewish community are an important chapter in the presentation of the city's multicultural past and present, which also includes other linguistic and confessional groups (Italian, Croatian, Hungarian, Serbian, Slovene, Muslim, and Istro-Romanian, to name a few that are highlighted in the app). Showcasing not only the cultural diversity of the city, but the intertwining of different communities through individual sites, is key to the app's approach to disrupting mono-national narratives.

18 Scholars of museum participatory practice have reflected extensively on the potential and practice of co-creation with community members, particularly with the intention of including marginalized voices. See for example: Pamela Barnes and Gayle McPherson, "Co-creating, Co-producing and Connecting: Museum Practice Today," *Curator: The Museum Journal* 62, no. 2 (2019): 257–67; David Allison, *Engaging Communities in Museums: Sharing Vision, Creation and Development* (Routledge, London: 2019); Kimberly Kasper and Russell G. Handsman, "Survivance Stories, Co-Creation, and a Participatory Model at the Mashantucket Pequot Museum and Research Center," *Advances in Archaeological Practice* 3, no. 3 (2015): 198–207.

The mobile phone app has many of the same features that you might expect in older technology, the guidebook: short descriptions and photographs of important sites, a map, suggested itineraries, and an index. What differentiates it from the guidebook is the level of flexibility that it offers to users in engaging with its contents through its filters, which has two consequences: it invites users to interact more freely with their environment, and it provides more opportunities to follow their own interests. The application allows users to engage with the application contents in multiple ways, ranging from the minimally curated – browsing a list of all markers, or following the inspiration of the moment – to the highly curated – taking a thematic guided tour (Figure 3).

Guided tours were thematic visits designed by app historians, who selected a series of interconnected markers to present particular perspectives on Rijeka's past. This includes, for example, places that have been physically erased or obscured (Hidden Rijeka); the architectural history of concrete in construction in Rijeka (Concrete Jungle); Rijeka's migration history (People on the Move); and the contrast between Rijeka's past as a place of intermixing cultures and as a borderland (Blended City, Divided City). The intention behind these tours, and others, is to give a starting point to app users who do not know where to start in exploring the city (Figure 4). While some of the tours explore *lieux de mémoire* connected with polarizing figures Josip Broz Tito,

Figure 2: Example of a card, which opens when you click on a marker. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

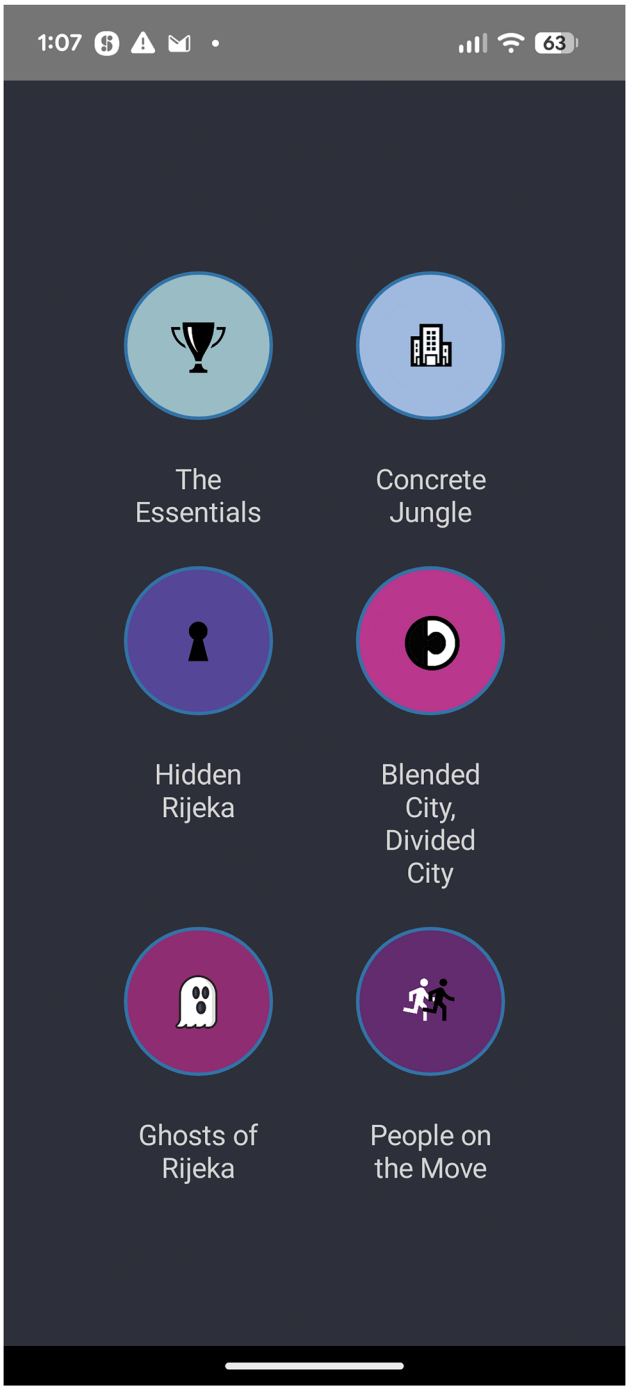

Figure 3: Thematic tour menu, illustrating the design concept of the app. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

the long-time leader of socialist Yugoslavia, or Gabriele d'Annunzio (Ghosts of Rijeka tour), as well as the legacies of particular linguistic communities, they do so without anchoring them in nationalist narratives.

The tours help to make visible histories that are now difficult to perceive in the urban space. "Blended city, divided city" enables participants to realize that, when they are walking along the Fiumara canal (or Mrtvi kanal), they are actually walking along the former border that separated two distinct municipalities in different states. The tour showcases sites that also speak to the interconnectedness of these two border spaces, conveying the tensions created by spatial proximity and political rivalry. This example highlights the potential of spatial thinking which the app enables for generating new insights.

Another tour focusing on migration titled "People on the move," challenges monoethnic narratives of ownership or victimization by situating them in a broader context. Where the "exodus" is usually framed as an exceptional event, and within the Italian cultural space, as a key reference point for understanding the present, the tour presents this episode alongside other stories of migration associated with the city, of other groups and from other periods. In this way it invites participants to consider the "exodus" through the lens of migration rather than national history.

On the other end of the curation spectrum, users can also choose to interact with the app in less pre-determined ways. They could, for example, call up a list of all the markers, and scroll down the list until they find one that intrigues them. Alternatively, the starting point could be spatial and experiential: users can let their wanderings through the city guide their encounter with the past. While all modes of interacting with the app encourage users to engage in experiential learning, the "near me" function explicitly encourages users to draw on their spatial and embodied experience of the city to inform their understanding of the past. By allowing walking to guide the encounter with the city, this particular modality encourages users to engage sensorially with their environment, responding to cues around them and making connections between the material and virtual cities, thereby producing a hybrid space.[19]

The map and augmented reality functions both allow users to identify nearby markers and locate other markers

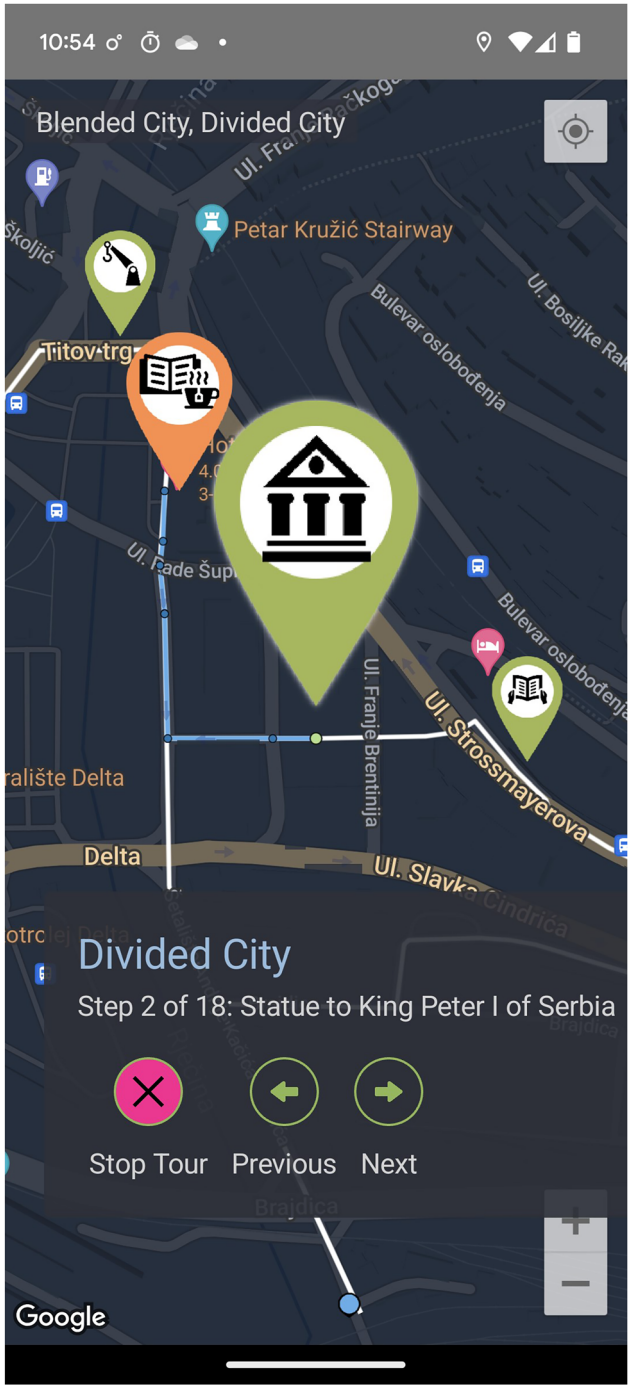

Figure 4: Thematic tour interface, featuring enhanced marker icons and suggested itinerary. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

in the vicinity that might interest them. In this manner, the user's encounter with the past is determined by the interaction between their body, their environment, and the cues that are provided by the app. We can imagine that a beautiful sunset, for example, might lead users to stay close to the shoreline, or conversely, to climb the stairs up to Trsat, the

19 On walking as a mode of spatial production, see David Rosenthal, "Revisioning the city: public history and locative digital media," 21–38, 25–26. On hybrid space, see Jo Morrison, "Heritage, digital placemaking and user experience: an industry perspective," 39–58, 41. Both chapters are in Fabrizio Nevola, David Rosenthal, and Nicholas Terpstra, eds., *Hidden Cities: Urban Space, Geolocated Apps and Public History in Early Modern Europe* (London and New York: Routledge, 2022).

hill and fortress overlooking the city, thereby influencing what stories they encounter – in the first case, a story about a growing and bustling port city, and in the other, a less coherent story combining the history of the border, the development of industry in the 19th century, and the eclectic military and spiritual history of a hilltop village. A stormy day, conversely, might persuade a walker to stay close to the city center, focusing discovery on the cultural and linguistic history of the city.

We can also imagine that the city itself might lead an explorer along a particular path, attracting them from the bustling Korzo pedestrian street, under the iconic bell tower – with its dramatic story of symbolic vandalism – to Kobler square, and piquing their curiosity onward through the warren of alleys in the old city. The city's vistas and the natural flow of its pathways might then weave particular stories, or alternatively, present specific paradoxes. A tourist walking along the Korzo would note the surprising proximity of the Filodrammatica theater and the Radio Rijeka building – notable as meeting places for the rival Croatian and Italian national movements during the First World War. What does it mean that such foes were gathering and making their plans in such close proximity on the main street? A flaneur walking along the Fiumara, formerly the border between Italy and Yugoslavia, might be drawn first to the Homeland War bridge and then to the Liberation monument on the Delta, and perhaps reflect both on the symbolic importance of the location, as well as on the clashing narratives about war and identity – the former celebrating the sacrifices of those who died for Croatia in its bid for independence in the 1990s, and the latter celebrating those of the victims of fascism and the victory of the Yugoslav partisans in the Second World War.

The above examples highlight how an itinerary through urban space, seemingly random, although potentially co-created by the user, the urban space, and the mobile phone app, can invite a stroller to assemble a narrative that connects different sites, each one with its own story. In addition to shaping narratives through itineraries, space can also contribute to the story experientially. This is particularly evident in the case of sites that have been materially erased, leading to an experience that can be described as a haunting, a liminal space where something that no longer exists is conjured back into existence.[20] A stroller seeking out the Old Great Synagogue, for instance, will be struck by its disappearance. The absence of this monumental building and its replacement by a mundane apartment building invites reflection – an effect already explored in depth by the artist Gunter Demnig and his Stolpersteine (or stumbling stones), marking the places of residence of victims of Nazi persecution.[21] App users may encounter the same experience when seeking out the Venetian Lion monument on the docks, or the two monuments to Yugoslav kings: what does it tell us, that these once important monuments have been obliterated? They might also encounter the faint presence of Partisan graffiti on ordinary residential building walls and marvel at the ghostly traces of the past. Less dramatic, but equally significant, is the recognition of transformation – for example, one might stand in a courtyard surrounded by the city museum, library, and cultural center, contemplate its past as a center of sugar and tobacco production, and later of motor and tractor manufacturing, and consider how the buildings themselves and the neighborhood they sit in have changed, and why.

There are other ways of structuring and interacting with app contents that do not use space as a departure point, although users can still use the app to locate these markers and orient themselves in space. The app also allows user to follow their curiosity, by looking at markers according to typology, time-period, or by searching for specific markers by title keyword using the "search" function (Figure 5). The typologies categorize the markers according to their use – that is, industry; infrastructure and government/military; culture and education; residential; public space and monuments; and leisure. The time periods refer to the different states that controlled the city at various times. This allows users to filter the markers according to their interests – say, the Second World War, or the socialist era. While not relying to the same extent on experiential learning, the search function meets another objective of the project – the democratization of knowledge – by allowing users to develop an understanding of the city's past that is articulated around personal thematic interests.

3 User Experience

Up to this point, we have presented our objectives, which are to disrupt entrenched narratives, democratize the process of interpreting the past, and to stimulate the exploration of new narratives through experiential knowledge. We then looked at how the design of the app goes about achieving

20 Tim Edensor has reflected on the effects of haunting: Tim Edensor, "Mundane hauntings: commuting through the phantasmagoric working-class spaces of Manchester, England," *Cultural Geographies* 15, no. 3 (2008): 313–33, https://doi-org.mu.idm.oclc.org/10.1177/1474474008091330.

21 Matthew Cook and Micheline van Riemsdijk, "Agents of memorialization: Gunter Demnig's Stolpersteine and the individual (re-) creation of a Holocaust landscape in Berlin," *Journal of Historical Geography* 43 (2014): 138–47.

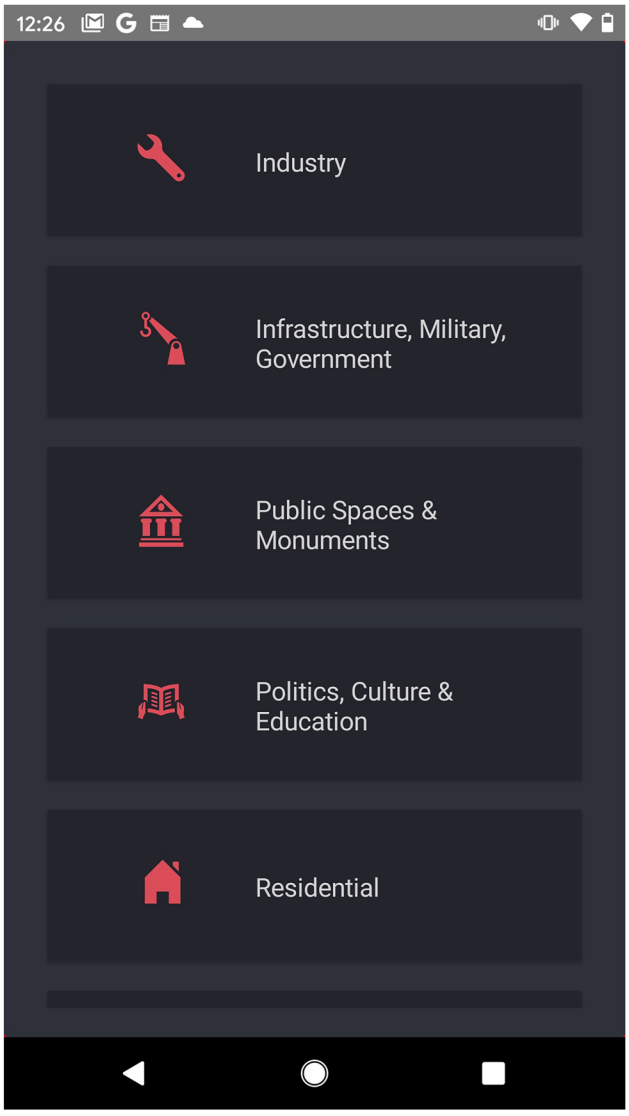

Figure 5: Menu allowing filtering by typology – also possible by time period and by author. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

those objectives along with some concrete examples of how the app might indeed meet those objectives.

We set out to assess whether users interacted with our app in the manner that we anticipated. In order to evaluate the impact of the app on users' perceptions of Rijeka's past, we organized a series of six focus groups with different audiences. The objectives were twofold: to evaluate the appeal of the app, and to explore its potential to disrupt entrenched narratives about Rijeka's past and generate narratives that reflect its complexity.[22]

3.1 Methodology

Given the limited time and financial resources at our disposal, we opted to concentrate on a specific segment of our target audience – that is, users between the ages of 15 and 30. This demographic was chosen because studies have suggested that young people are most likely to use mobile phone apps.[23] In addition, we were able to leverage project members' roles as instructors, and draw on our scholarly networks, to recruit student participants. Four classes were invited to participate for a single two-hour session. We recognize that our findings cannot be generalized to other potential users, such as older adults who might use the app for tourism, and that it would be equally valuable to collect data on such users (Table 1).

Two focus groups included Croatian-speaking university students located in Rijeka; a third, italophone high-school students from Rijeka; and a fourth, francophone university students based in Brussels, Belgium. In addition to these focus groups, additional feedback was collected during an informally organized guided tour led by the author with a visiting student from Germany at the University of Rijeka and a professional tour-guide. The format for each group was adapted to their positionality (Rijeka-based or outsiders) and location (physically in or outside of Rijeka).

In the case of the Croatia based high-school and university students, the following approach was used. After completing a questionnaire on their background and pre-existing beliefs about Rijeka's past, on-site groups were given three exercises to carry out: a way-finding task, where they needed to locate a marker on the app; an exploration task, where they were asked to walk from point A to B, and explore the markers they encountered along the way, and a fragment of a guided tour. After each exercise, their feedback was solicited using a "value walk" method (where participants physically situated themselves bodily on a spectrum to indicate how much or how little they agreed with a value statement). At the end of the focus group, two groups were asked to create a drawing representing Rijeka's past; this activity was cut from the third focus group due to reasons of time. All three groups also filled out a second

22 Additionally, for a subset of focus groups, we sought to evaluate to what extent the app, through augmented reality, was able to enrich the users' understanding of the past. Unfortunately, due to technical glitches with the augmented reality on some phones, we did not collect sufficient useable data to address this question.

23 On the propensity of youth to use educational or travel apps amongst youth, see for example Annika Hinze et al., "A Study of Mobile App Use for Teaching and Research in Higher Education," *Tech Know Learn* 28 (2023), 1271–99; Shifeng Wu et al., "Experience with Travel Mobile Apps and Travel Intentions –The Case of University Students in China," *Sustainability* 14, no. 19 (2022): 12603.

Table 1: Composition of focus groups.

Location	Language	Number of participants	Characteristics	Date and location
Rijeka, Croatia	Croatian	5	Masters in Translation Studies	15 October 2021, Trsat neighborhood, Rijeka
Rijeka, Croatia	Croatian	13	Cultural Studies Masters	13 October 2021, Rijeka city center
Rijeka, Croatia	Italian	7	Secondary school	14 October 2021, Rijeka city center
Brussels, Belgium	French and English	5	Masters of History	November 23, 2021, Brussels; October 3, 2022, Rijeka city center

questionnaire asking them to reflect on their experience using the app, and what they learned in the course of using it.

The focus group with Brussels-based students was formatted differently. The first occasion was a session with Masters-level students in which students were asked to share their impressions of the history of Rijeka using Mentimeter, an audience engagement tool, then follow a guided tour on the app remotely, and then once again share their impressions. The methodology of this session is described in greater detail later in this article. A subset of this group subsequently visited Rijeka, where they followed another guided tour, and provided additional feedback.

While the heterogeneity of the group size, diverse profiles of the participants, and differences in the format of the focus group preclude the testing of any hypotheses, they also generated diverse results that suggested preferences and outcomes specific to different audiences, while simultaneously outlining preferences and outcomes that were generalized.

4 The Appeal of the App

Ultimately, the potential of the app to challenge existing narratives about the past and promote narratives is dependent on whether it is appealing enough to attract and keep users. On the one hand, this relies on technical functionality and ease of use; on the other, it relates to whether or not the app is experientially rich and compelling.

The focus groups revealed that one major challenge for this or any mobile phone app is the multiplicity of factors that can lead to the malfunctioning of the app, ranging from complete incompatibility of a phone with the app, to the malfunctioning of an aspect of the app on particular phones, such as the images, or the geo-location functionality. The functionality of augmented reality on mobile phones was of varying quality and reliability depending on the phone. In addition to problems with individual phone models, the app needs to be regularly updated to keep up with software upgrades, periodically leading to malfunctioning. Compounding these issues, the project did not have the resources to ensure rapid and efficient technical support. In this respect, mobile phone platforms compare unfavorably with a much more simple and stable legacy media, the guidebook.

In the context of a focus group, the malfunctioning of the app on some participants' phones would inevitably lead to a marked negative assessment of the app by those who were unable to use the app, and it even colored the assessment of the group as a whole. Moreover, those experiencing technical malfunctioning, however minor (such as a missing "you are here" cursor on the map, geolocation lag, or augmented reality glitches) tended to offer lukewarm evaluation of the content of the app. This suggests that technical malfunctions are fundamentally alienating. In the words of one participant, "The concept is fun. The technology is maybe a bit too difficult, which leads to frustration."[24] While fundamentally agreeing with Brett Oppegaard and Dene Grigar's suggestion that it is not realistic to wait until technical glitches are fixed before embarking on the creation of locative mobile apps, heritage groups considering this path should consider whether they have sufficient resources to ensure sufficient technical reliability.[25]

As a proviso, a few participants expressed excitement at the augmented reality feature, in spite of having a mixed experience with its functionality. This may be because the augmented reality was recognized as innovative, or because it was seen as less essential to the basic functioning of the app. The augmented reality feature, was, however, not appealing to all participants. The limited appeal of augmented reality likely not only reflects individual failings of phone functionality, but also, more broadly, the technical and formal limitations of the "monocle" view in

24 Cultural studies focus group on October 13, 2021, in the Rijeka city center.

25 Brett Oppegaard and Dene Grigar, "The Interrelationships of Mobile Storytelling: Merging the Physical and the Digital at a National Historic Site," in *The Mobile Story. Narrative Practices with Locative Technologies*, ed. Jason Farman (Oxon: Routledge, 2014), 17–33, 21–22.

which virtual objects are overlaid over the phone's camera view.[26]

On the question of ease of use, the focus group provided rich feedback and suggestions for improvement. The two items which proved the most challenging were wayfinding and navigating between different modes. The app development team was able to implement some suggestions, such as improved flow and improved legibility of the guided tour map. Other valuable suggestions, such as adding an audio-reading option, could not be implemented due to limited funds or feasibility.

In addition to comments focused on technical malfunctions and usability, focus group participants contributed valuable insights into the overall utility of the technology as a tool for engaging with the past. Several commented that the app allowed them to engage with their environment effectively. One described the experience as "interactive rather than passive" and "immersive," while another expressed appreciation for the ability to "be in control" with the app facilitating exploration, rather than being dictated a set itinerary.[27] One participant appreciated that it allowed them to become aware of the rich and surprising history of buildings that they had passed by many times without noticing.[28] This was echoed by a tourist guide who, after a private introduction to the app, noted that "you can't see much just by looking at the city, compared to Split, Zagreb, Dubrovnik. With the app the city comes alive." Another participant commented that the app is a handy resource, concise and less bulky than a book. While this framed positively, the implication was that it lacked depth. Driving home the point, the participant called the app a starting point – anyone wanting to know more would have to turn to a book.[29]

Observation of the high school students as they used the app revealed unexpected ways of engaging with it. Most notably, students took screenshots of marker cards that they found interesting – even if the app offered a simple way of saving a selection of "favorite" markers. This suggests that these users integrated the app into their existing habits of engaging with digital content. High school students seemed to feel at ease in their interactions with the mobile phone app. This is noteworthy as several had noted that they have not read any history books. A medium like the app may therefore offer a more appealing way to learn about the past than paper-based media for certain audiences.

At least two university-level users, however, found that the app alienated them from their environment, rather than allowing them to engage with it: "We shouldn't be staring at a phone while we walk; we should be looking around."[30] Another participant found the app not only distracting from the city and its history, but even distorting: "The application seems to us to completely bypass the human aspect of the story and the city, we are in the city only in contact with buildings and the application (map). We only look up from the phone to see the buildings and vice versa, the history seems to be dulled by the app."[31]

These comments allude to what Jason Farman has called "the poverty of the screen" which actually hinders the creation of a hybrid material-virtual space by distracting users from their embodied experience. Some might argue that the problem is mediation through technology, and that public historians should in fact move attention away from phones and back to the body and the environment. Yet, Farman has persuasively argued in his edited volume *The Mobile Story* that mobile media storytelling projects demonstrate that "someone can be staring at a mobile device and be more deeply connected to the space and to others in that space than other people might perceive."[32]

Modifying the interface – that is, pursuing technological solutions – may help to address the feeling of alienation for the city. For example, audio- or video-clips narrated by current and past inhabitants might be able to restore the "human aspect" that was found lacking. However, as Steven High and others have pointed out, while urban audio-tours are meant to be immersive, they do not merge the surrounding environment and the recording into a single environment. Rather, they produce a liminal experience, where the user is simultaneously in two disconnected states.[33] Consequently, the real challenge is how to do so in a way that creates a productive tension – a dynamic and compelling dialogue between the urban space and the virtually-embedded narrative elements because, as Jeff Ritchie has pointed out, mobile apps require "really

26 Barba, MacIntyre, and Mynatt. "Here We Are," 933.

27 Cultural Studies focus group on October 13, 2021, in the Rijeka city center.

28 Cultural Studies focus group, October 13, 2021, in the Rijeka city center.

29 Translation studies focus group, October 15, 2021, in Trsat.

30 Translation studies focus group, October 15, 2021, in Trsat.

31 Université Libre de Bruxelles focus group on October 3, 2022, in the Rijeka city center (online survey).

32 Jason Farman, "Site-Specificity, Pervasive Computing, and the Reading Interface;" in *The Mobile Story*, 3–16, 6.

33 Steven High, "Embodied Ways of Listening: Oral History, Genocide, and the Audio Tour," *Anthropologica* 55, no. 1 (2013), 73–85, 75. On the many different ways of using audio tracks with locative mobile phone apps, see Rosenthal, "Revisioning the city," 24–25.

nontrivial effort" from their users.[34] Textual and audio-visual prompts that invite the user to engage physically and perhaps playfully with the urban space may be a productive way forward.[35]

Content-wise, while no information was specifically solicited on the texts, two participants expressed approval of these, which were judged to be "nicely summarized," as well as "nice and brief."[36] While some users were not particularly attracted to looking at the images provided for each marker, finding that "they don't add anything different," others found them rewarding.[37] One participant who strongly agreed to the statement that the images added to their experience explained that they "love to see old pictures," finding it "emotionally satisfying," whereas another noted that "it's cool to see something as it used to be, versus how it is now."[38] One user, who found the images to be "the strongest part of the app," said that they added authenticity.[39] These comments suggest that at least some users connect easily with visual sources, not only on an intellectual but also on an emotional level, and that interacting with such images provide a good entry point for engaging with the past.

Based on these results, we decided to probe into what content elements users choose to engage with in a survey completed by a group of visiting students from the Université Libre de Bruxelles who completed a self-guided tour. While the resulting responses were small in number, they provide valuable insights into users' behavior. For example, only four out of seven respondents read the guided tour description. While all users reported reading at least some part of the marker descriptions, only four out of seven read them entirely. Users' engagement with the images was even more selective, with only three looking at more than one image per marker, and four looking only at the main image. Five out of seven did not even read the captions to the images.[40]

While it might be tempting to ascribe this selectivity to the medium, which is often seen as encouraging "scrolling and swiping" rather than sustained engagement, it is worth noting that guide-book readers engage in similar behavior, skipping sections that do not interest them. These preliminary findings give us pause, for if our aspiration is to challenge users' preconceptions about the history of a place, it is less than ideal if users opt out of engaging with the content we offer. Yet, they also highlight a tension inherent in the premise of the app, and the constructivist approach to learning more broadly: that they simultaneously seek to challenge users and empower them to make their own choices about how to encounter the past.

Overall, without leaving us with definitive findings, the focus group feedback suggested a few interesting lines for further inquiry. The first is whether mobile phone apps, in spite of their potential, are the most effective tool for historians and cultural institutions to reach their audiences, given the high technical and financial threshold and the impact of technical problems. The second is the question of whether, technical problems aside, apps of this type stimulate meaningful engagement with the past through immersion and embodied experience, or whether they disable meaningful engagement by distracting users from the place they are visiting or by focusing attention only on the built environment. The third is the question of whether this app's approach to the co-creation of history works is suitable to realizing its objective of challenging pre-existing understanding of the past.

5 Diversifying Narratives About the past

Keeping in mind these observations about the limitation and paradoxes of the medium in general, and the specific platform we designed, how successful was the app in encouraging users to explore the many possible narratives about Rijeka's past, eschewing exclusionary ethno-national narratives?

The focus groups provide only partial insight into this question, as they were based on a short-term exposure to the app, raising the question of whether it is realistic to expect that it is possible to create a narrative of place, let alone change one's point of view, through such brief contact. Students clearly did learn new facts about the city in which they lived. They were able to list places and stories that were new to them, such as the plaque commemorating Marisa Madieri, an Italian author who wrote a memoir about her childhood in Rijeka and her experience of the "exodus," the mass departure of the local population from the city.

However, learning new facts about the city did not necessarily translate into adopting new narratives about the

34 Jeff Ritchie, "The Affordances and Constraints of Mobile Locative Narratives," in *The Mobile Story*, 53.

35 Oppegaard and Grigar, "The interrelationships of Mobile Storytelling," 25–26, 28; Richie, "The Affordances and Constraints of Mobile Locative Narratives," 53–67, 53.

36 Cultural Studies focus group, October 13, 2021, in the Rijeka city center and Translation studies focus group, October 15, 2021, in Trsat.

37 Translation studies focus group, October 15, 2021, in Trsat.

38 Translation studies focus group, October 15, 2021, in Trsat.

39 Translation studies focus group, October 15, 2021, in Trsat.

40 Université Libre de Bruxelles focus group on October 3, 2022, in Rijeka city center (online survey).

city as a whole. For one, students based at the University of Rijeka already tended to view Rijeka as a city with a multicultural past. Consequently, most participants did not feel like what they learned fundamentally changed or shaped their understanding of the city. This may have led to one user's remark that the app's main audience is tourists, rather than themselves.[41] Yet, the direction of causality remained unclear – did they see the app as being for tourists because it failed to challenge their pre-existing understanding sufficiently, or did they engage in a limited way with it because they perceived it as being directed at another audience?

The lone respondent who started out with an ethnonationally defined perspective on the city's heritage similarly did not change her mind about this overarching narrative, in spite of clearly enjoying using the app and learning many new things. For example, she noted that learning about the significant women from Rijeka highlighted in the Feminist Tour markers had added to her understanding of the city. This student expressed interest in using the app again, which we can interpret as indicating that she felt engaged by the app. At the same time, she mentioned she is training to become a tour guide – in her case, then, the student-tourist distinction was perhaps less relevant.

Collecting feedback from the students from the Université Libre de Bruxelles provided an opportunity to investigate what users who knew little about the city would get from a brief encounter with the app. Students in a Masters-level course had attended a lecture the previous week on the memory culture of Rijeka, and immediately prior to the focus group, were given a lecture on the creation of the mobile phone app that included a brief introduction to Rijeka's history from the 19th century to the present and its two main linguistic communities (Croatian and Italian). Following this, they were asked the following question using the Mentimeter word-cloud function: "which concepts or adjectives do you associate with Rijeka?" They were able to enter ten terms (Figure 6). They were then asked to follow the "People on the Move" tour, which deals with the city's history of migration. Afterwards, they were asked the same question (Figure 7). They were reminded that they could use the same terms as previously, but that they could also use new terms. Nineteen students participated in the first round, and fifteen in the second.

A comparison of the two-word clouds revealed quite a bit of similarity, reflecting the knowledge that students acquired previously in the lectures. Yet, there were some interesting, if subtle, shifts in the terms submitted. This included new terms suggesting a more complex reading of the city's ethnic makeup (Serb, Slovene) as well as new terms relating to the notion of communities. There was an increased number of words referring to the Second World War and to the Communist period. Additionally, new terms appeared that reflected a richer understanding of the city's past, beyond ethnic conflict – terms from the semantic field of the economy (industry, shipyard); culture (Madieri, literature, written press); and geographic features (river, hilly, canal de la mort). The second word cloud also included more analytical terminology (such as cultural separation, linguistic separation, and cultural policy.).

While the results of this simple experiment do not suggest that students adopted specific new narratives about the city of Rijeka after following the guided tour, it does suggest that, even with a remote and abbreviated exploration of a guided tour, the students' understanding of the past of the city deepened and became more multilayered. That is, it suggests that they acquired a more refined understanding of the phenomena initially identified (multiculturalism, multilingualism), and that they broadened their temporal, conceptual, and possibly, spatial (geographic and topographic) understanding of the city's past.

A few students from this class subsequently visited Rijeka on a field trip with their instructor, and took the "Blended City, Divided City" tour. Students were invited to provide anonymous feedback, eliciting seven responses. One detailed response suggests that the experience of the guided tour was successful in communicating a complex, multivocal narrative about the city's past:

> This visit sought to expose the palimpsest of influence and multiple occupations that the city has experienced. A pluralist but sometimes sensitive story, where facets of the city seek to diminish or even erase a previous facet. The statue of King Alexander I of Yugoslavia is a good example, Italian destruction, Yugoslav disinterest, part of the city's multiple history is found in this statue.[42]

While only a single response, this testimonial suggests that the app indeed has the capacity to stimulate the exploration of new narratives through experiential knowledge – one of its key objectives. The user noted the multiple overlapping layers of history in a single location. They also commented on the process of place-making, in which the traces of a community or regime's identity is either willfully erased, or else is eroded by time and neglect. They made the connection between these processes and the turbulent past of the city, changing hands on multiple occasion. While it is possible

41 Translation studies focus group, October 15, 2021, in Trsat.

42 Masters of History focus group (from Brussels), October 3, 2022, in the Rijeka city center.

Figure 6: Pre-test word cloud. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

Figure 7: Post-test word cloud. Credit: Brigitte Le Normand, Jon Corbett, and Nataša Janković.

that the student already had some knowledge of this history, they further observed that it was the app's ability to make the invisible visible that made it possible to tell and visualize this story. Thus, it would seem that using the app enabled the student to understand these processes more concretely and deeply.

6 Conclusion

In creating the Rijeka Fiume in Flux mobile phone app, we pursued three objectives: create an innovative, multivocal way to reach new audiences with our research, explore the potential of experiential learning for deepening our engagement with the history of a city, and empower users to discover and assemble new, evidence-based narratives about the history of the city. In this way, we hoped to disrupt entrenched exclusionary narratives about the history of a contested city. Through the app, users would be confronted with the stories of many different communities. Moreover, they would have the opportunity to ponder the everyday life proximity of these communities, as well as the ongoing and overlapping production and erasure of traces of different political projects and communities.

Reflecting back, we can make a number of observations regarding successes, opportunities and challenges. One of the lessons that we learned in the development of the app is that we could broaden our notion of expertise to include local expertise outside the academy – in this way, giving back to the community by providing it with a place to archive its knowledge and to share it with broader audiences. This in turn advanced our aim of democratizing the production of knowledge – in this case by focusing on knowledge-holders that are marginalized and under-resourced, rather than on users. While in our case this was a serendipitous development, including local expertise can and should be actively designed into the process.

Feedback collected in the focus groups demonstrated that the app has potential as a useful and appealing tool for communicating place-based historical knowledge. Users appreciated the interactive quality of the app as well as its convenience. They felt that it enhanced their ability to understand the city by revealing aspects of its past that were no longer visible. They were also intrigued by the augmented reality feature, although this was largely an appreciation for its potential.

One of the key challenges that emerged is securing user loyalty: getting users to keep using the app. This was due in part to technological challenges – users who became frustrated with functionality issues quickly gave up on using the app. Users' willingness to keep using the app also depended on how much they got out of it. Some users felt that there were limits to its ability to stimulate meaningful engagement with the city. While the app has as its key feature the ability to make the invisible (and sometimes obliterated) visible, and to help people to picture the city as it was in the past, users felt that it alienated them from their environs, as they tended to only pay attention to a screen instead of to the bustling city around them. Technology thus materialized as a problem – both when it worked well, and when it worked poorly. This raises the interesting question of whether technological improvements (resolving glitches, improving interfaces, adding an audio feature, etc.) might resolve users' frustrations – or whether there is an inherent limitation to technology's ability to mediate experiential learning. We should also not ignore the potential impact of the COVID-19 pandemic, which produced significant digital technology fatigue and potentially decreased the appeal of engaging with apps during leisure time.

Another problem in fostering user loyalty, one unrelated to technology, was the app's difficulty in connecting with its intended audience. Here too, the pandemic had a clear impact, as the app was launched early in 2021 and the border closures and lockdowns made it more difficult to promote the app to potential users, and reduced the number of tourists visiting the city. Additionally, focus group participants with some familiarity of the city were not convinced that they could gain something new from using the app. While this may be due to limitations in the design of the focus group, it does suggest a possible limitation to achieving our overall aim of disrupting entrenched narratives. This is not necessarily an intractable problem – it might be resolved by involving the target audience in the creation of the app. User testing should focus on better understanding what would entice locals to engage with such an app – ideally more than once; and what kinds of features, media, and content are successful in generating persistent interest and empathy.

Yet, the focus groups revealed that apps of this type have significant potential in fostering polyvocal understandings of contested cities amongst what we might call naïve users – that is, school-aged students who are starting to learn about the history of their home-city, and tourists. High school students found the format engaging, and tour guides appreciated its ability to make the city's rich heritage visible and accessible. These findings reinforce the need to clarify at the beginning of the design process the nature of the intended audience, and tailor the design and content to that audience.

The observations and feedback collected in these focus groups suggest two interesting paths for further inquiry. The first is whether it is possible to lessen the effect of alienation from the environment that a few users noted and create a productive dialogue between digital technology and the urban environment. The second is to consider how users with existing knowledge can be convinced that they might learn something new by engaging with a tool like this – and, more broadly, how the psychological barriers to changing your mind can be overcome.

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