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From storytelling to scrollytelling – modern digital publications that strengthen and develop the data literacy of our users

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Neuchâtel, 2023

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1 INTRODUCTION

In recent years, digital publications have emerged as a key component of the dissemination strategy of statistical institutions, gradually replacing traditional print publications. The term "digital publications" in this context refers to dynamic, screen-optimized documents that allow interactive engagement with the reader, as opposed to static PDF files that are primarily intended for passive consumption. This evolution has coincided with a resurgence of storytelling techniques within digital publications. Storytelling, a timeless method of conveying information, has long been a feature of public statistics, manifested in publications enriched with graphs, maps and infographics. This practice can be traced back to the historical statistical yearbooks that catered to an inquisitive bourgeois readership in the 19th century.

Although well-intentioned, the combination of storytelling and digital publishing has sometimes had unintended outcomes. Despite their digital format, certain digital publications, imitate the complexity and prolonged reading times linked to traditional 20th century scientific statistical publications. These contemporary web-based publications, with their convoluted nested structures and footnotes, may overwhelm readers with information and hinder their ability to rapidly locate the answers they need. Readers may also experience psychological distress, as they may miss relevant information while engaging.

Scrollytelling, an emerging technology that combines the concepts of storytelling and scrolling, can overcome this mismatch. It utilizes a straightforward, recognizable gesture: scrolling up or down a webpage. As the user progresses through the material, the visual narrative unfolds dynamically, enriching the narrative experience. This approach provides readers with a feeling of control over the content, enabling them to interact with the material naturally and effectively. However, it is necessary to reduce the volume and complexity of content to ensure user-friendly consumption.

The purpose of this paper is to investigate three Scrollytellings produced by the Federal Statistical Office (FSO) over recent years, assessing the methods and tactics employed to create mod-

ern, captivating and reader-friendly publications. Technical, design, and UX choices will be considered for each case. The assessment of the three scrollytellings will be conducted through a reader's user journey. A concise evaluation of the use of scrollytelling for statistical dissemination will be provided at the end. Furthermore, a list of potential future trends that the FSO may introduce or consider for the next scrollytellings will be presented.

2   NATURE OF SCROLLYTELLING

The New York Times' notable example of scrollytelling, "Snow Fall", played a significant role in shaping this narrative and visual technique.

The expansion of Scrollytelling in recent years can be attributed to several factors:

1. Technological advances: the development of advanced web technologies has made it possible to create richer and more interactive experiences directly in the browser, facilitating the creation of complex stories with multimedia elements.

2. Changes in content consumption patterns: with the increasing use of mobile and touchscreen devices, the vertical scrolling format seamlessly adapts to user interaction behavior on these platforms.

3. Engagement needs: capturing user attention in the digital age has become more challenging due to information overload. Scrollytelling provides a form of presentation that keeps users engaged and encourages reading and interaction through a continuous flow.

4. Visual and interactive impact: stories created using Scrollytelling often include eye-catching visuals, interactive visualizations and smooth transitions. These elements contribute to an engaging and memorable experience.

For these reasons, over the last few years, the technique of scrollytelling has become an increasingly important channel for spreading of statistical data at the FSO. A growing number of traditional digital publications are being converted into scrolling format, confirming that the technique works.

3 THREE EXEMPLES OF SCROLLYTELLING AT THE FSO

The three FSO publications using the scrollytelling technique that we will evaluate are: "**Die Schweiz (er)zählen**" (only available in German and French), "**Statistics counts**" and "**Mobility and Transport Microcensus 2021**".

In all three projects, priority has been given to ensuring full responsiveness, enabling seamless user interaction across a range of devices and screen sizes. Additionally, we have prioritized cross-browser compatibility for consistent performance across multiple browsing platforms.

Strict adherence to Swiss accessibility standards characterizes scrollytelling, ensuring a smooth experience for all users. Simultaneously, integrating on-site SEO best practices enhances discoverability and visibility of projects in the digital environment.

3.1 Die Schweiz (er)zählen

https://www.census1850.bfs.admin.ch

"Die Schweiz (er)zählen" presents historical census data from 1850 onwards and sheds light on the following thematic areas: Gender and Age, Foreign Population, Religious Landscape, and Language. Images, graphics, and maps vividly and dynamically illustrate the population's development in Switzerland from 1850 to the present day.

Image 1

This Scrollytelling experience commences with a panoramic establishing shot (Image 1: 1), akin to the opening scene of a movie, capturing the broader landscape in a single frame. Accompanying this visual is the title that provides the initial context for the upcoming narrative,

offering a backdrop for the project at hand. Additionally, there is a "Call to Action" that serves as a usability aid, guiding users on how to navigate through the content. The combination of these three initial elements serves to provide context, pique curiosity, and encourage the reader to delve into the content.

As users scroll down the homepage, they encounter an introductory text (Image 1: 2) and four distinct narrative threads, each centered around a different theme (Image 1: 3, 4). These themes delve into the historical journey of the Swiss people, the evolving trends in religion, and the development of the diverse languages spoken in Switzerland. The preview of the themes is composed from a photo gallery, title and description of the theme. All these elements help to give orientation, context and curiosity to the reader.

Notably, this structure employs a random-access approach, granting users the freedom to choose the sequence in which they explore the stories.

Regardless of their chosen order, a consistent visual framework is maintained throughout the entire scrollytelling. This consistent visual theme aids users in maintaining their bearings as they navigate the content.

Upon entering a selected story, the narrative generally follows a linear progression. The cover of the story has the same design structure as the cover of the homepage (Image 2: 1). As users scroll through the story's content, simple but engaging animated transitions guide them from one scene to the next.
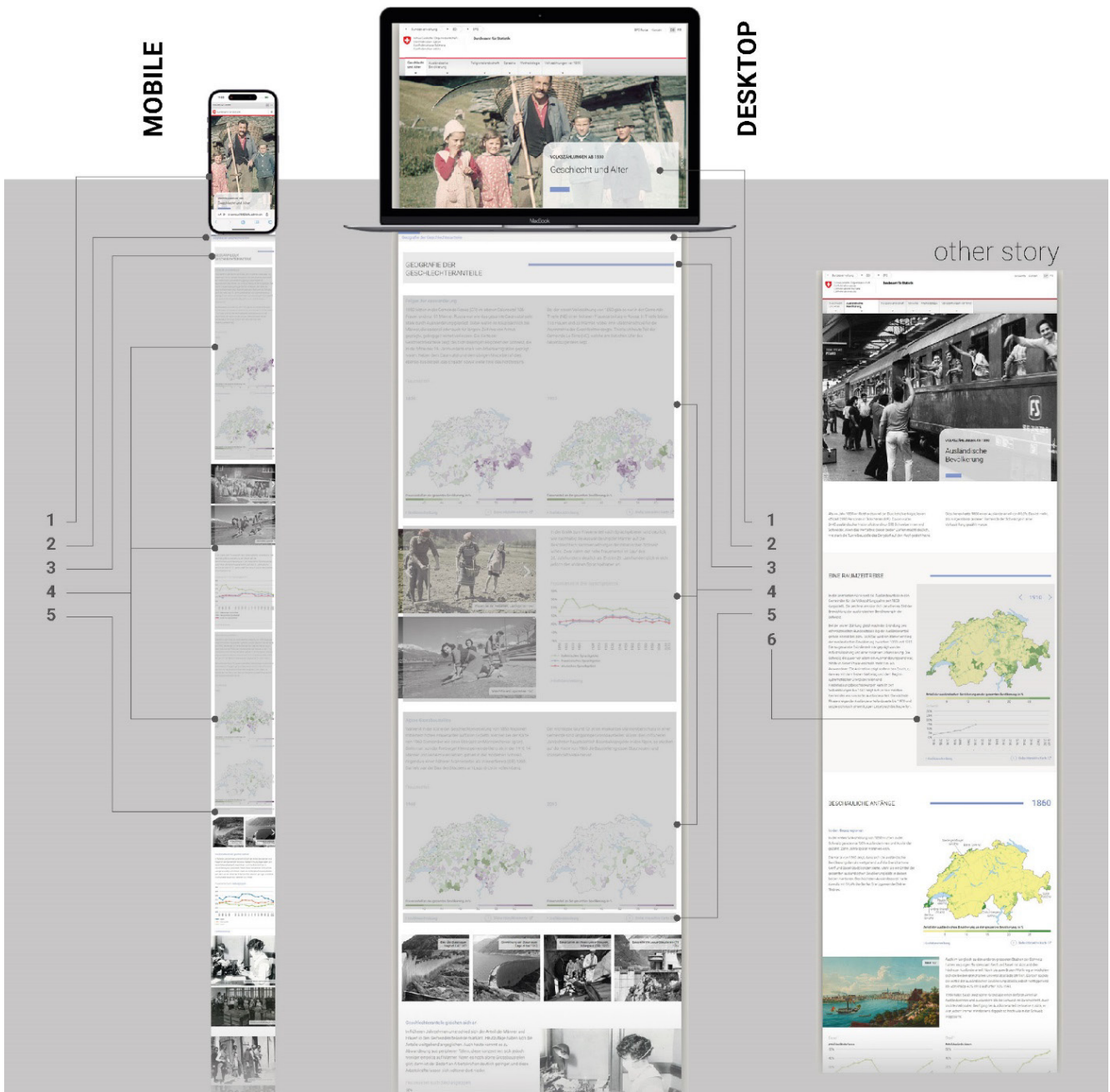
Image 2

Concurrently, a blue progress bar (Image 2: 2) situated at the top of the display serves as a navigational aid, showing users their current position within the story and providing an indication of its overall length. An indication of the chapters of the story (Image 2: 2) is also always visible and changes automatically as the user scrolls to maintain context and orientation.

As each story comes to an end, a module highlights additional stories. This serves to captivate readers, enticing them to seamlessly continue their exploration of the website with just a simple click within reach.

Communication within the scrollytelling largely relies on impactful headlines (Image 2: 3), hierarchical order, and informative texts well-structured. These textual elements are complemented by photos and compelling visual representations of statistical data in SVG format, presented in the form of graphics or thematic maps (Image 2: 4, 5). Within these maps, data is effectively highlighted through commonly used techniques such as color variation, motion effects, transparency adjustments, and contouring (Image 2: 6).

This project posed the challenge of presenting a substantial amount of documentation and content. The number of stories and the type of content was not defined at the beginning of the work for external reasons. For the design and development team, an important concern was to create a solution that not only performed well but also remained consistently captivating to readers, all while adhering to tight timelines and regardless of the final number of stories to be realized. To tackle this, our strategy involved crafting a predefined number of easily adaptable and reusable sections (blocks) that could be seamlessly integrated across all stories, in different order or with little adaptations. This streamlined the production process and, importantly, ensured that each story felt unique, distinct and engaging while maintaining design consistency. By relying on a set of predefined standard modules, we managed to simplify the intricacies of design and development. This approach not only enhanced scalability and future management but also enabled us to maintain effortlessly a cohesive visual identity.

Technology used: HTML, CSS, JS Libraries (GSAP, ScrollMagic).

3.2 Statistics counts
https://statistik-zaehlt.ch

The "Statistics counts" scrollytelling highlights the importance of statistics for all stakeholders in society and covers visualizations and facts regarding all the statistical topics.
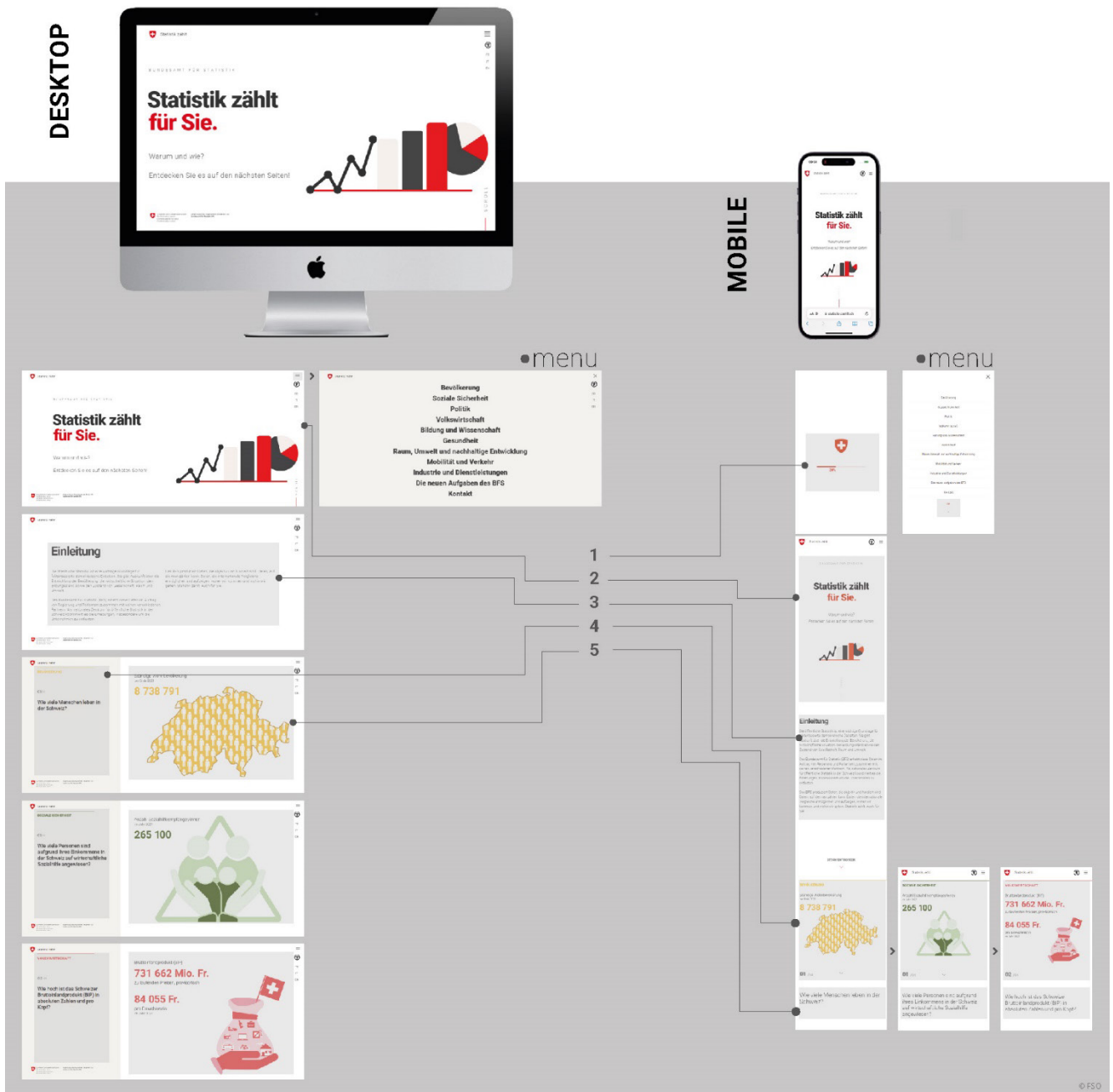

Image 3

This Scrollytelling experience takes a unique approach that is finely tailored to elevate user engagement. Unlike the previous case, this narrative is presented as a singular, continuous story, employing step-by-step scrolling for desktop users and linear vertical scroll for those on mobile devices. Leveraging step-based scrolling offers a heightened sense of stability and precise control over elements, contributing to a more immersive, focused and interactive user journey.

As in the previous project, the initial page presents important key components: a captivating title, a contextual description, a call to action, and a cover image (Image 3: 2). To optimize the user experience and facilitate navigation across all ten themes, we have implemented a menu (Image 3: menu). This menu allows users to effortlessly navigate between different statistical topics, enhancing their exploration.

The distinct color palette aligned with the FSO's guideline fosters a sense of orientation and a meaningful context for the information presented.

Each theme is thoughtfully structured across four sections, each showcasing data and pertinent statistics. Furthermore, the theme layout introduces a dual-part structure. On desktop, the layout is vertically split into two columns: the left column (Image 3: 4) presents a thought-provoking question that piques the reader's curiosity, while the right column (Image 3: 5) showcases the accompanying answer with statistical data, complemented by a bespoke illustration. This layout ensures a harmonious balance between narrative and data representation. A paging information is given to know in which section of the theme the user is. The themes name and color is always

visible to maintain the context. The last page of a theme offers a link to get more statistic data on our principal website.

For the mobile interface, the layout takes a horizontal orientation. The upper portion of the slide features an animated illustration seamlessly integrated with the statistical data. This animation initiates upon entry and remains fixed as the user scrolls. In the lower portion, the textual content elegantly scrolls from the bottom upwards, gradually fading behind the animated illustration.

Image 4

To improve the modernity of the design we have introduced vector illustrations with advanced animations. These animations are powered by Lottie, an open-source animation file format that is tiny, high-quality, scriptable, interactive, and can be manipulated at runtime.

An innovative inclusion within this venture is the introduction of an initial loader for the mobile version (Image 3: 1). Configured to appear only when needed, this loader ensures that readers are kept engaged during short loading intervals, pre-empting any initial white page experience.

In this instance as well, we have embraced a modular approach. From a technical standpoint, there are merely two distinct page types alongside the cover. This decision has once again streamlined development timelines, while concurrently simplifying content management and future updates.

A special section is dedicated to accessibility.

Technology used: WordPress, SliderRevolution, Lotties.

3.3 Mobility and Transport Microcensus 2021
https://www.mobilitaetsverhalten.bfs.admin.ch

This scrollytelling shows the main results of the "Mobility and Transport Microcensus 2021", the largest national-level survey about travel behavior.
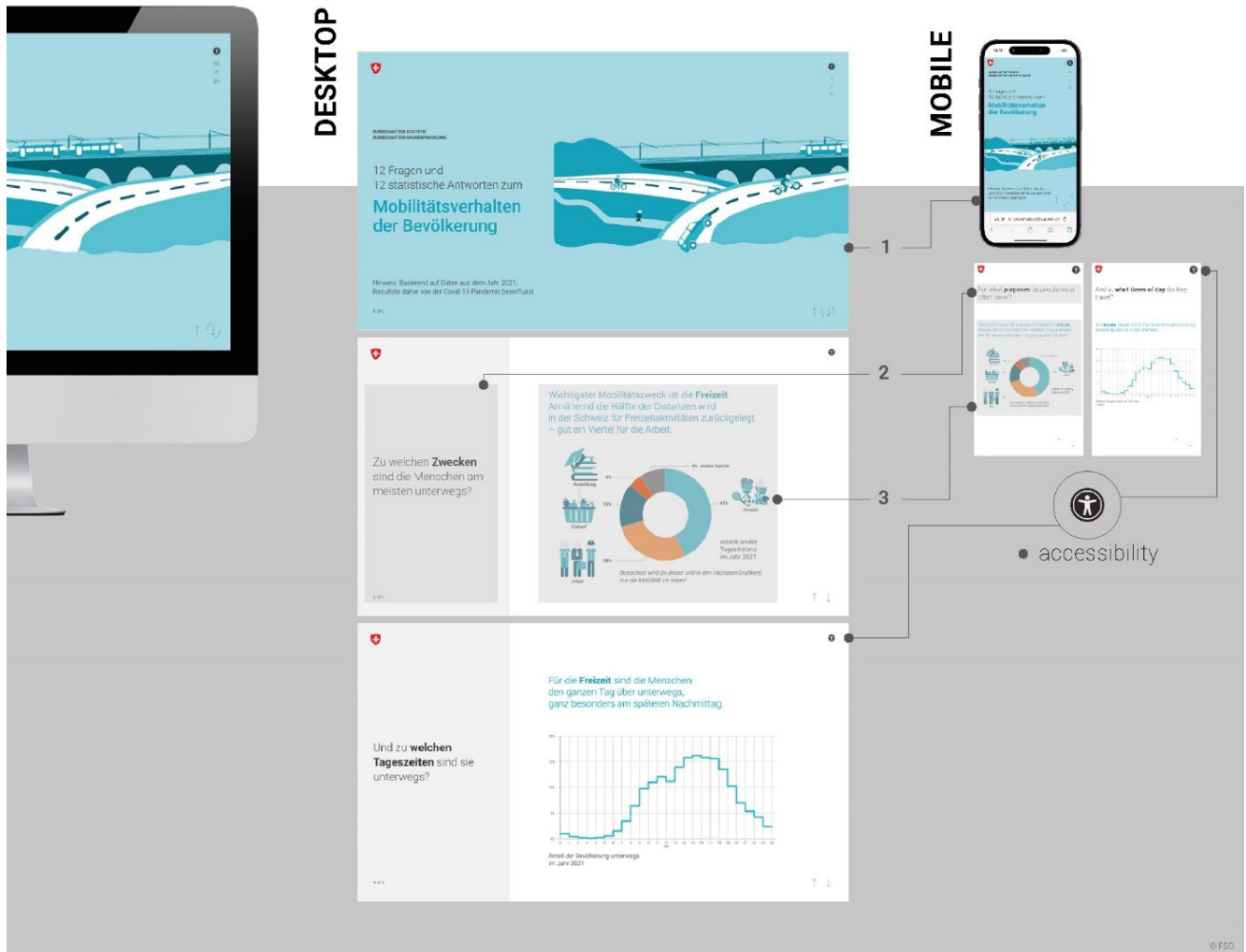

Image 5

In this Scrollytelling the narrative is presented employing the stepper method. Unlike the first two projects, here the creator of the textual and statistical content was part of the project from the beginning. This pivotal collaboration acted as a game-changer, facilitating the seamless

alignment of content with the Scrollytelling format, thereby significantly enhancing user experience and storytelling efficacy.

The first page contains the same key elements also used in previous projects (Image 5: 1). In this case, we have enhanced the main illustration by creating an endless animation (Image 6).

Image 6

The exploration continues in ten sections with a two-column layout. For the desktop version: on the left, the questions, which appear as the first element and stimulate the reader (image 5: 2); on the right, the illustrated and animated answers with statistical data (Image 5: 3). For the mobile version: questions at the top and answers at the bottom. The illustration has a square format to fit all screens perfectly, avoiding the creation of different format for each device.
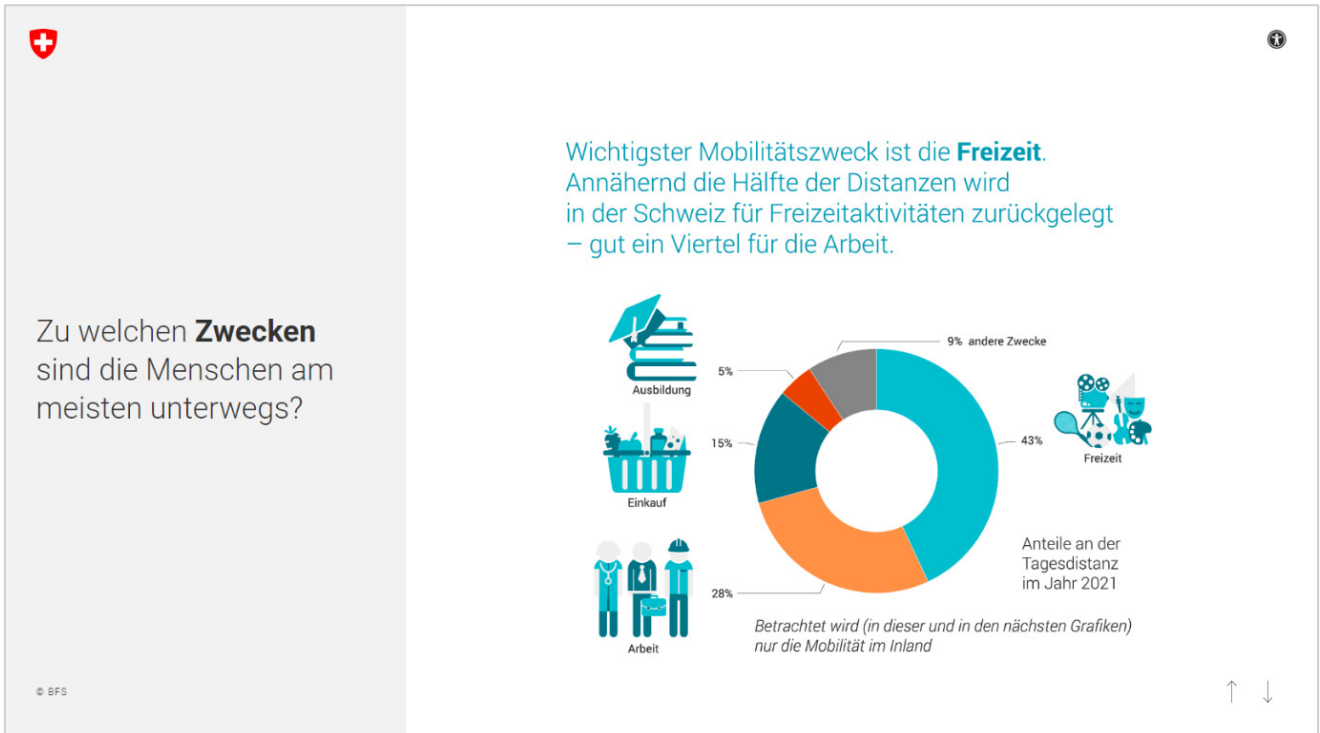
The final section gives further information about the topic and the explication of the microcensus.

Accessibility is ensured with a separate section accessible via the AX icon (Image 5: accessibility).

Technology used: WordPress, SliderRevolution, Lotties.

4   OBSERVED OUTCOMES

From our personal experience at the FSO, we have concluded that the use of scrollytelling to publish statistical data is a good technique for the following main reasons:

1. context and narrative: scrollytelling enables the contextualization of data within a broader story. The data becomes part of a narrative that elucidates the reasons behind the numbers and trends, thereby rendering the information more comprehensible and memorable;

2. interactivity: interactive visualizations built into a scrollytelling allow users to explore the data at their own pace. They can select parameters, filter information and gain deeper understanding;

3. emotional engagement: scrollytelling has the potential to create deeper connections between users and data, as it can evoke empathy and engagement through storytelling and engaging visuals;

4. gradual progression: because scrollytelling takes users step-by-step through a story, data can be presented progressively, making complex concepts easier to understand without overwhelming users with too much information at once.

Further confirmation of the effectiveness of scrollytellings can be found in the results on social media. For example, the latest scrollytelling "Mobility and Transport Microcensus 2021", published on 04/06/2023, produced the following results on LinkedIn:

Out of a total of 439 posts on the official FSO channel from 22/08/2022 to 22/08/2023 (last 365 days), the post announcing the publication of the scrollytelling "Mobility and Transport Microcensus 2021" ranked second in terms of impressions, seventh in terms of clicks, first in terms of reposts, second in terms of likes and with an engagement rate of 5.79% (LinkedIn post: https://www.linkedin.com/posts/bfs-ofs_mobilit%C3%A4tsverhalten-der-bev%C3%B6lkerung-im-jahr-activity-7049755104144486402-Ev9K/).

5 FUTURE

Inspired by the positive response to the realized scrollytellings, the FSO will expand its production. One idea is to create a dedicated scrollytelling for each statistical theme.

By applying lessons learned from the past 2 years, we will develop standardized processes and techniques that speed up scrollytelling production whilst ensuring engagement, accessibility, and impact. In the future, we intend to enhance dynamic features, such as improved interactive graphics and immersive 3D elements.

Scrollytelling is undergoing transformative changes that offer interesting potential for its future. This evolution is characterized by several significant advancements and developing trends:

- Augmented Reality (AR) and Virtual Reality (VR) Integration: scrollytelling is incorporating AR and VR technologies to deliver immersive and interactive experiences. AR overlays digital elements onto the real world, enhancing visual appeal. VR transports users to virtual realms, enabling deep engagement. These technologies hold the potential to revolutionize scrollytelling by crafting more captivating and lifelike encounters.

- 360-Degree Storytelling: the integration of 360-degree visuals and videos enriches scrollytelling by enabling users to explore scenes from various angles, fostering a heightened sense of immersion. By incorporating these elements, creators transport users to different locations, encouraging interaction as they scroll.

- Interactive Narratives with User Choices: interactive narratives are becoming a cornerstone of scrollytelling experiences, offering users the ability to make choices and shape story trajectories. This participatory approach enhances engagement and invites users to explore multiple paths, fostering repeated visits.

- Artificial Intelligence (AI) and Personalization: AI technologies are gaining popularity in scrollytelling, allowing for personalized experiences based on user preferences, behavior, and demographics. AI algorithms analyze user data to adapt narrative content, visuals, and interactive elements, resulting in tailored and relevant encounters for each user.

- Open Free exploration: an additional emerging trend is the concept of open free exploration, where users have the freedom to explore content at their own pace and direction. This empowers users to delve deeper into the narrative, enhancing engagement and allowing for a more personalized experience.

6   CONCLUSION

The adoption of scrollytelling as a dissemination strategy for statistical data by the Swiss Federal Statistical Office (FSO) has proven to be a successful and innovative approach. Through the analysis of three scrollytelling projects, namely "Die Schweiz (er)zählen", "Statistics counts" and "Mobility and Transport Microcensus 2021" it is evident that scrollytelling offers several advantages for presenting complex statistical information in a modern, engaging, and accessible manner.

Scrollytelling effectively leverages the synergy between storytelling and scrolling, resulting in a dynamic narrative experience. By seamlessly blending context, narrative, and interactive visualizations, scrollytelling contextualizes data, enhances interactivity, fosters emotional engagement, and facilitates gradual progression through complex concepts. The technique not only overcomes the limitations of traditional publications but also aligns with contemporary digital consumption patterns and the demand for engaging content presentation.

The success of these scrollytelling projects can be attributed to several key factors. The integration of multimedia elements, such as captivating images, graphics, and maps, enriches the storytelling experience. User-centered design principles ensure responsiveness and cross-browser compatibility, catering to diverse devices and screen sizes. Furthermore, a focus on accessibility standards ensures inclusivity for all users, enhancing the overall user experience.

The Swiss Federal Statistical Office's commitment to refining the scrollytelling approach is evident in its intention to expand production, standardize processes, and incorporate advanced features. The incorporation of augmented reality (AR) and virtual reality (VR) technologies, 360-

degree storytelling, interactive narratives with user choices, artificial intelligence (AI) personalization, and open free exploration highlights the evolving nature of scrollytelling. These emerging trends promise to elevate engagement and immersion, providing users with tailored and captivating experiences.

As scrollytelling continues to evolve, it remains an evolving medium that bridges data communication with compelling storytelling. By embracing technological advancements and embracing innovative approaches, the Swiss Federal Statistical Office and other institutions can continue to captivate audiences and deliver insights effectively. Ultimately, scrollytelling stands as a testament to the ever-expanding potential of digital storytelling in the realm of statistical dissemination.

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