



Storytelling in interactive Atlases – Challenges and Solutions

Final Presentation

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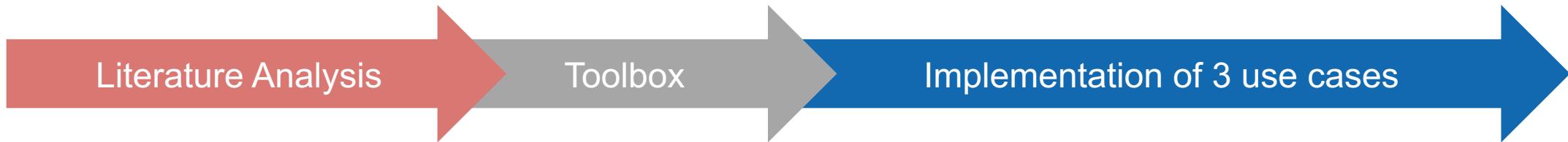
1. Introduction

„Visual storytelling gives cartography multiple ways to unite technology with praxis, product with process, and design with critique.“

„[...] storytelling can be an important tool with a strong impact on the cartographer’s design decisions and push cartographic conventions in new ways.“

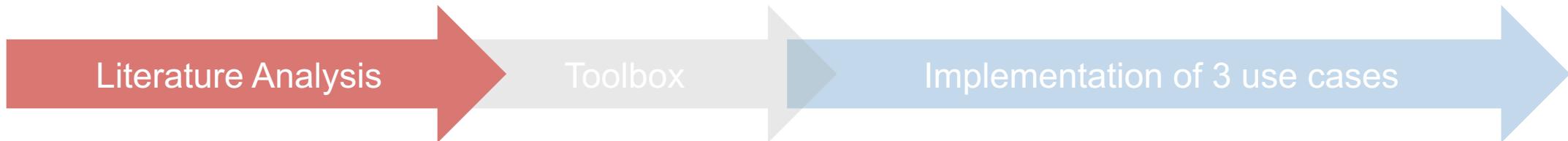
[Robert E. Roth (2020): Cartographic Design as Visual Storytelling: Synthesis and Review of Map-Based Narratives, Genres, and Tropes, The Cartographic Journal]

2. Overview: Structure & method



- *Provide **clear overview** over **existing techniques and concepts** of storytelling in the field of cartography*
- *Most important **concepts and techniques** to implement storytelling*
- *Implement **3 use cases** of storytelling in the **Atlas Cartography Environment***

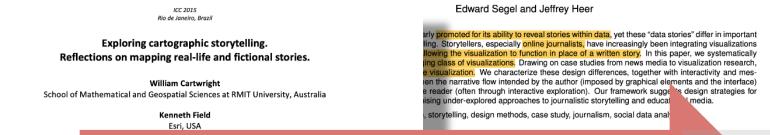
2. Overview: Structure & method



- *Provide **clear overview** over **existing techniques** and **concepts** of storytelling in the field of cartography*

2. Overview: Structure & method

Narrative Visualization: Telling Stories with Data



Abstract:

Conventionally, the map (usually made by the cartographer) shows the relative position of geographical elements. They do not illustrate the true nature of personal geographies, or 'a geography – personal geography'. Maps can show 'what is where', or 'where I am'; but they do not necessarily best represent personal geographies. Other map-like 'or map-like' embedded artefacts that are not maps might be better tools to communicate aspects of a personal geography. Our research is focused on seeking alternative approaches to 'mapping'.

From a cartographic perspective, this research and development of prototypes resulted in the assembly of geo-placed information from archives, public on-line resources, official documents and literature to generate cartographic representations of a personal narrative – a true story of a personal geography – and a fictional story from literature. As in oral stories, the spatial narrative is told through the development of two prototypes that tell: (i) a true story (the personal geography), and (ii) the geo-placed elements of a book provided interesting challenges. The records from which the personal geography was built and the book used as a mapping/narrative example sometimes lacked precise geographical information or even ignored completely certain aspects of geography. Looking at the geography in literature, it is clear that the cartographer has to work hard to fit in the story, or they may be inferred implicitly. From the cartographer's perspective this demands a mapping which must work-around how sometimes the geography described in documentation or in the passages in a book must be represented.

Mapping oral stories

Oral stories and maps have had a long and intimate relationship over the centuries. Cartographers have historically used stories from travellers and explorers to "fill in the blanks on their maps" and to develop base maps (Cauvard, 2013, p. 136). Whilst maps were used to depict space, they also depict place. Adornments on maps, in the form of standard symbolisations and personal annotations, allowed for a personalisation of geographical information depiction, and they

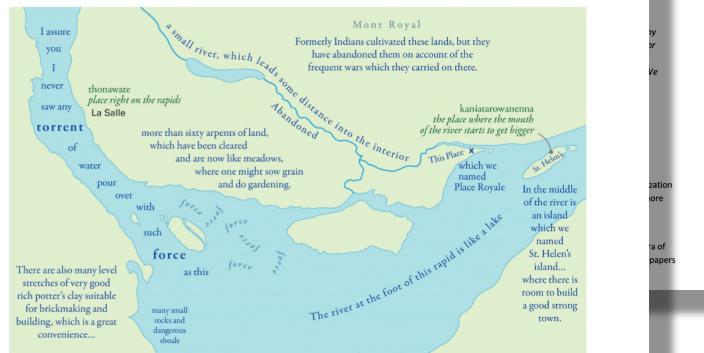


Figure 8. Voice as a visual storytelling trope. 'They Would Not Take Me There: People, Places, and Stories from Champlain's Travels in Canada, 1603–1016' published by the Society of Map Collectors (Central) (Pearce and Hermann, 2010) presents the expostions of Samuel de Champlain through what would become New French writings from his journals; the designers insert Champlain's voice into the map using typography (blue Garamond). Alongside Champlain's voice is an imagined Indigenous voice (green Garamond), 'adding' context to a landscape that Champlain often refers to as empty or barren (2010: 46). The designers' voice also is inserted into the map for narration and context (black Univers Light), resulting in a juxtaposition of different perspectives, time periods, and power structures.

visual story for greater engagement. The text also can vary in colour, size, style, etc., to represent different voices, distinguishing among designers, characters, and the audience (Figure 8). As described above, voice combined with focalization produces a unique vantage point, which, for spatial narratives, shifts the map scale and projection from a planimetric, north-up view to be grounded from 'somewhere' and 'someone' (Pearce, 2008). Dynamic techniques for voice draw from cinematic cartographies and include audio or audiovisual solutions common to the narrated animation and multimedia visual experience genres, respectively.

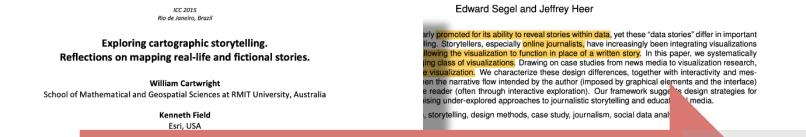
Literature Analysis

Toolbox

Implementation of 3 use cases

2. Overview: Structure & method

Narrative Visualization: Telling Stories with Data



Abstract:

Conventionally, the map (usually made by the cartographer) shows the relative position of geographical elements, but, whilst showing the correct position of geographical elements, they do not illustrate the true nature of personal geographies, or a 'geography of personal geographies'. Maps can show 'what is where', or 'where I am'; but they do not necessarily best represent personal geographies. Other map-like, or 'map-like', embedded artefacts that are not maps might be used to communicate aspects of a personal geography. Our research is focused on seeking alternative approaches to 'mapping'.

From a cartographic perspective, this research and design work places information from archives, public on-line sources, and geo-placed information from archives, public on-line sources, and geo-placed information from archives, public on-line sources, and generate cartographic representations of a personal geographical story from literature. As in other genres, development of a personal geography to tell a true story (the elements of a book build interesting challenges. The book built and the book used as a mapping/narrative example sometimes lacked precise geographical information or even ignored completely certain aspects of geography. Looking at the geography in literature, we can see that the cartographer's perspective on mapping personal geographies, or they may be inferred implicitly. From the cartographer's perspective this demands a mapping which must work-around how sometimes the geography described in documentation or in the passages in a book must be mapped.

Mapping oral stories

Oral stories and maps have had a long history. Oral stories have historically used stories from memory and to pass them down and to develop base maps (Caputo, 1991). Maps also depict place. Adornments on maps, in the form of standard symbionyms and personal annotations, allowed for a personalisation of geographical information depiction, and they

Literature Analysis

Potential

Storytelling has been promoted for its ability to reveal stories within data, yet these "data stories" differ in important ways from traditional journalism. Storytellers, especially online journalists, have increasingly been integrating visualizations, drawing the visualization to tell a story in a more dynamic way. In this paper, we present a typology of narrative visualization designs, drawn on case studies from mining them for insights into visualization research. We characterize these design differences, together with interactivity and measures the narrative provided by the author (implied by graphical elements and the interface) for telling the story. Our findings suggest new strategies for using under-explored approaches to journalistic storytelling and educational media.

ICZ 2012
Rio de Janeiro, Brazil

Exploring cartographic storytelling.
Reflections on mapping real-life and fictional stories.

Edward Segel and Jeffrey Heer

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Challenges

Narrativization

THE CARTOGRAPHIC JOURNAL 23

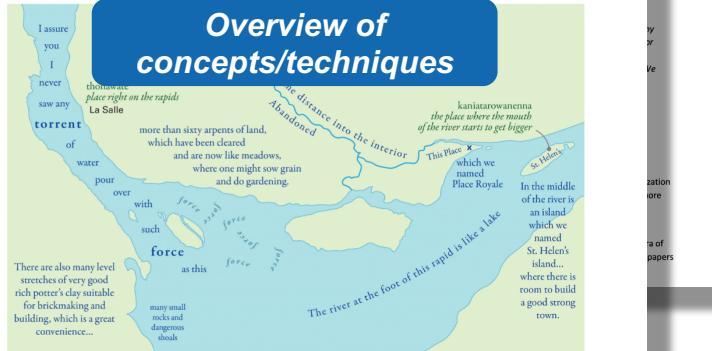


Figure 8. Voice as a visual storytelling trope. 'They Would Not Take Me There: People, Places, and Stories from Champlain's Travels in Canada, 1603–1016' published by the Society of Map Collectors (Central) (Pearce and Hermann, 2010) presents the explorations of Samuel de Champlain through what would become New France. Drawing from his journals, the designers insert Champlain's voice into the map using typography (blue Garamond). Alongside Champlain's voice is an imagined Indigenous voice (green Garamond), 'adding' context to a landscape that Champlain often refers to as empty or barren' (2010: 46). The designers' voice also is inserted into the map for narration and context (black Univers Light), resulting in a juxtaposition of different perspectives, time periods, and power structures.

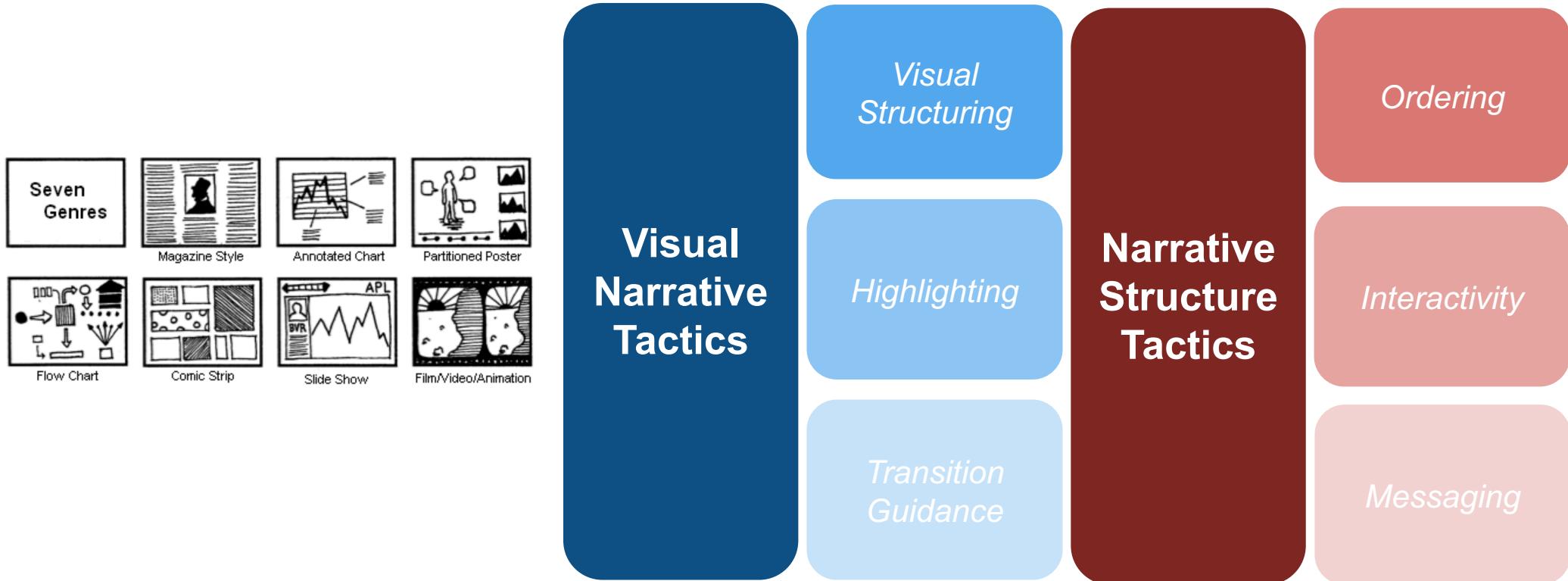
visual story for greater engagement. The text also can vary in colour, size, style, etc., to represent different voices, distinguishing among designers, characters, and the audience (Figure 8). As described above, voice combined with focalization produces a unique vantage point, which, for spatial narratives, shifts the map scale and projection from a planimetric, north-up view to be grounded from 'somewhere' and 'someone' (Pearce, 2008). Dynamic techniques for voice draw from cinematic cartographies and include audio or audiovisual solutions common to the narrated animation and multimedia visual experience genres, respectively.

Toolbox

Implementation of 3 use cases

Genres of Narrative Visualizations & Design Space Dimensions

By E. Segel; J. Heer, *Narrative Visualization: Telling Stories with Data*, 2010

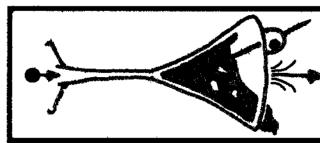


Author-Driven <-> Reader-Driven

By E. Segel; J. Heer, *Narrative Visualization: Telling Stories with Data*, 2010



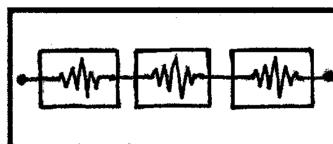
- Linear ordering of scenes
- Heavy messaging
- Less interactivity



Martini Glass Structure

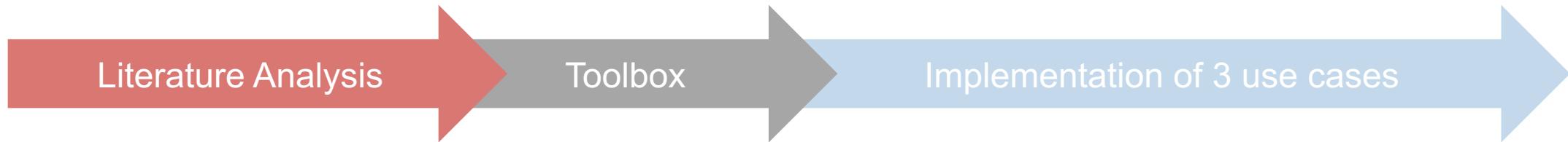
Reader-Driven

- No prescribed ordering of scenes
- No or light messaging
- Free interactivity

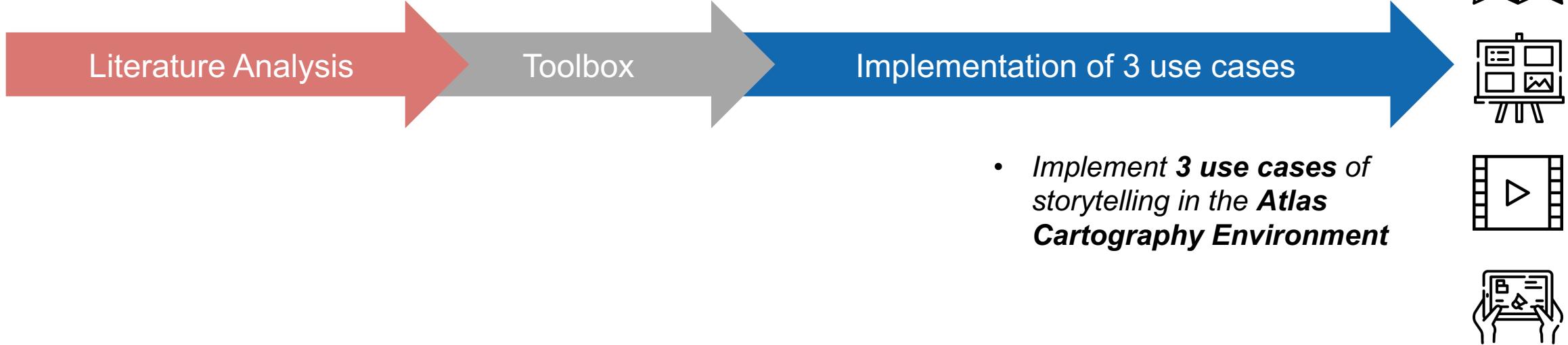


Interactive Slideshow Structure

2. Overview: Structure & method



2. Overview: Structure & method



3. Implementation

a) Presentation of use cases

<i>Use case</i>	<i>Title</i>	<i>Typ</i>	<i>Technical environment</i>

3. Implementation

a) Presentation of use cases

<i>Use case</i>	<i>Title</i>	<i>Typ</i>	<i>Technical environment</i>
1	<i>„Eintritte in den Bund“</i>	temporal	Web-map (Leaflet)

3. Implementation

a) Presentation of use cases

<i>Use case</i>	<i>Title</i>	<i>Typ</i>	<i>Technical environment</i>
1	<i>„Eintritte in den Bund“</i>	temporal	Web-map (Leaflet)
2	<i>„Schlachten Napoleon’s“</i>	spatial	Web-map (Leaflet)

3. Implementation

a) Presentation of use cases

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1	<i>„Eintritte in den Bund“</i>	temporal	Web-map (Leaflet)
2	<i>„Schlachten Napoleon’s“</i>	spatial	Web-map (Leaflet)
3	<i>“Zeitreise: Luftfahrt“</i>	thematic	Storyboard

3. Implementation

a) Presentation of use cases

<i>Use case</i>	<i>Title</i>	<i>Typ</i>	<i>Technical environment</i>
1*	<i>„Eintritte in den Bund“</i>	temporal	Web-map (Leaflet)
2*	<i>„Schlachten Napoleon’s“</i>	spatial	Web-map (Leaflet)
3*	<i>“Zeitreise: Luftfahrt“</i>	thematic	Storyboard

*One using **Author-Driven-Approach**, one using **Reader-Driven-Approach**

Use case 1, Author-Driven-Approach

Use Case 1a Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_1a/UseCase_1a.html

Eintritte in den Bund

The map illustrates the historical process of the Swiss Confederacy's formation through a series of gray shaded regions representing the territories of the member cantons at different points in time. The timeline starts with the first documented entry of a city into the confederation in 1291 (Schaffhausen) and continues through various stages of expansion, including the formation of the Zürich League in 1315, the formation of the Swiss Confederacy in 1351, and its peak during the Reformation Wars in 1513. The map also shows the final dissolution of the confederation in 1815.

Vor 1291:

Das Territorium der heutigen Schweiz durchlief eine ähnliche Entwicklung wie das übrige Europa. Die ersten Jahrhunderte waren geprägt von Migrationsbewegungen. Dies führte dazu, dass das Gebiet von verschiedenen Völkern besiedelt wurde. Mit der Herrschaft der Römer breitete sich auch das Christentum aus, die Kirche mit ihren Bistümern und Klöstern wurde zu einer wichtigen Landbesitzerin. Gleichzeitig vermehrten adlige Familien ihre Macht durch Eroberungen, Erbschaften und Heiratspolitik...

vor 1291 1291 1332 1351 1352 1353 1481 1501 1513 1803 1815 1979

Visual Narrative Tactics

Visual Structuring

Highlighting

Transition Guidance

Narrative Structure Tactics

Ordering

Interactivity

Messaging

Use case 1, Author-Driven-Approach

Use Case 1a Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_1a/UseCase_1a.html

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vor 1291 1291 1332 1351 1352 1353 1481 1501 1513 1803 1815 1979

Visual Narrative Tactics

Visual Structuring

- Establishing shot
- Consistent visual platform
- Timeline bar

Highlighting

- Color
- Transparency
- Contouring

Transition Guidance

- Animated transitions
- Camera motion

Use case 1, Author-Driven-Approach

Use Case 1a Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_1a/UseCase_1a.html

Eintritte in den Bund

The map illustrates the historical progression of Swiss cantons joining the Swiss Confederation. A grey shaded area represents the growing territory of the confederation, starting from the original three cities (Zürich, Uri, Schwyz) and expanding through various stages of entry. Labels indicate the date of each entry and the corresponding heraldic emblem. The map also shows major cities like Zurich, Bern, Geneva, and Chur, along with regional boundaries and place names.

Vor 1291:

Das Territorium der heutigen Schweiz durchlief eine ähnliche Entwicklung wie das übrige Europa. Die ersten Jahrhunderte waren geprägt von Migrationsbewegungen. Dies führte dazu, dass das Gebiet von verschiedenen Völkern besiedelt wurde. Mit der Herrschaft der Römer breitete sich auch das Christentum aus, die Kirche mit ihren Bistümern und Klöstern wurde zu einer wichtigen Landbesitzerin. Gleichzeitig vermehrten adlige Familien ihre Macht durch Eroberungen, Erbschaften und Heiratspolitik...

vor 1291	1291	1332	1351	1352	1353	1481	1501	1513	1803	1815	1979

Narrative Structure Tactics

Ordering

- Linear

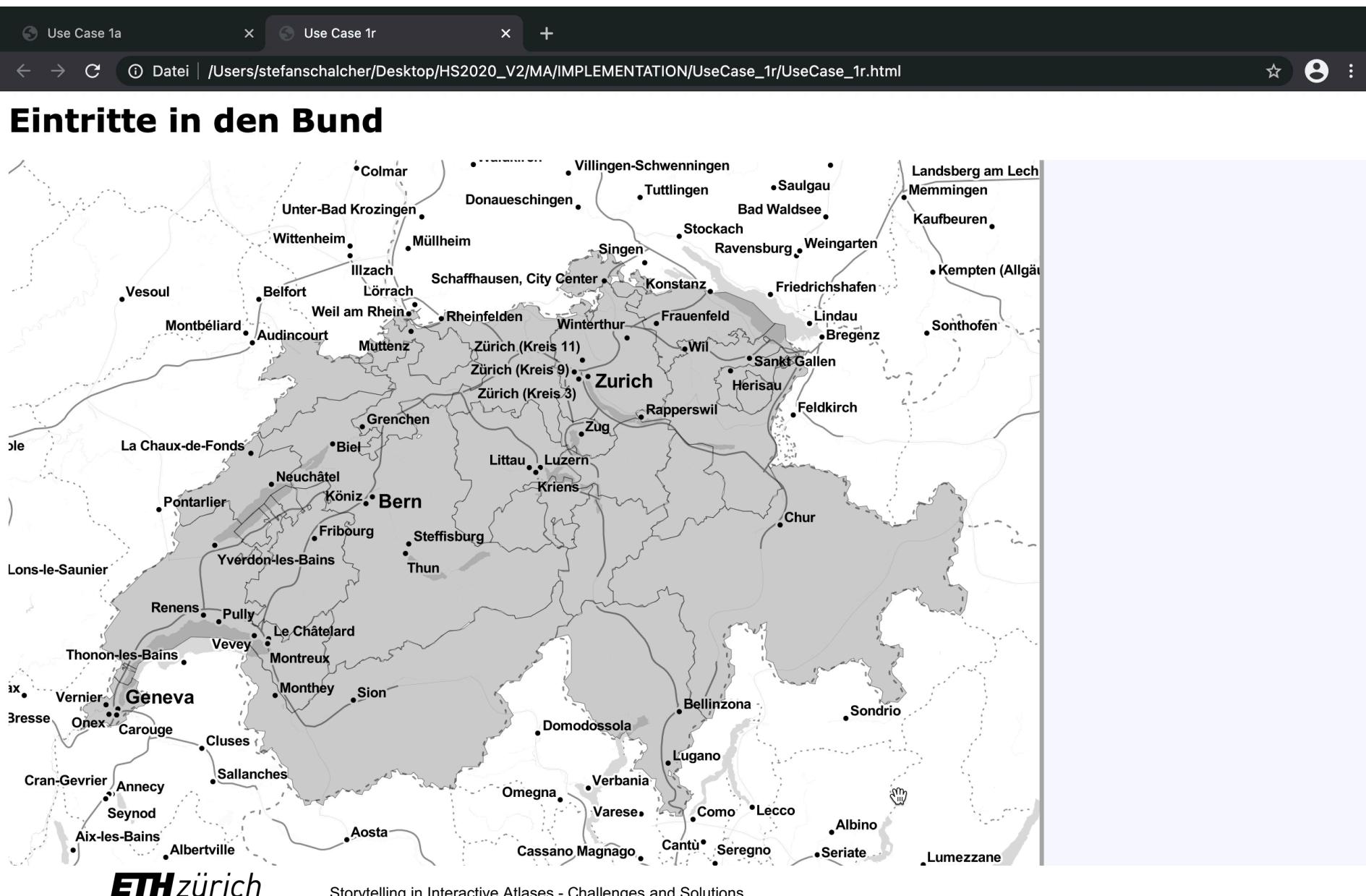
Interactivity

- Navigating

Messaging

- Headlines
- Article
- Labels

Use case 1, Reader-Driven-Approach



Visual Narrative Tactics

Visual Structuring

Highlighting

Transition Guidance

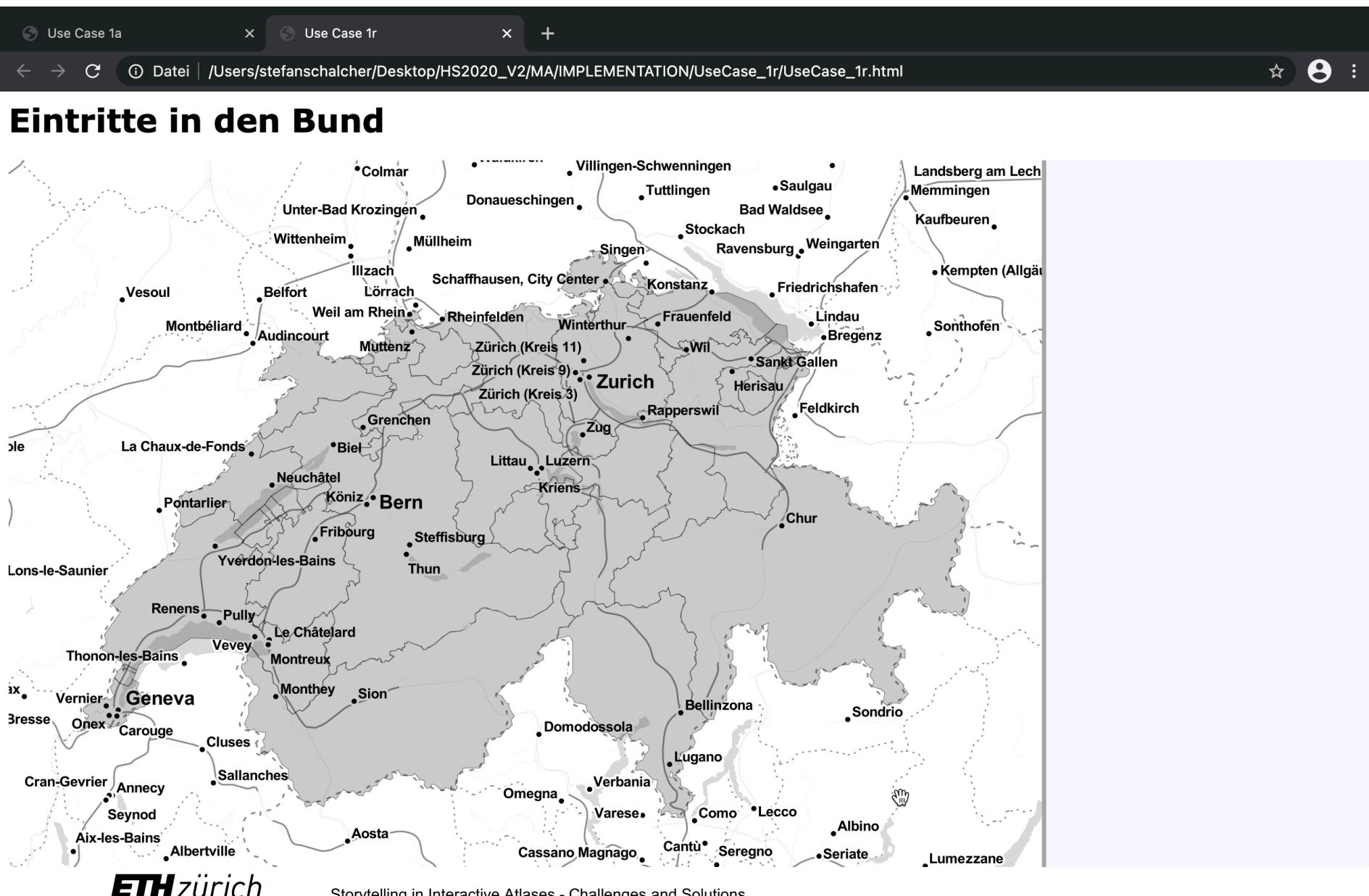
Narrative Structure Tactics

Ordering

Interactivity

Messaging

Use case 1, Reader-Driven-Approach



Visual Narrative Tactics

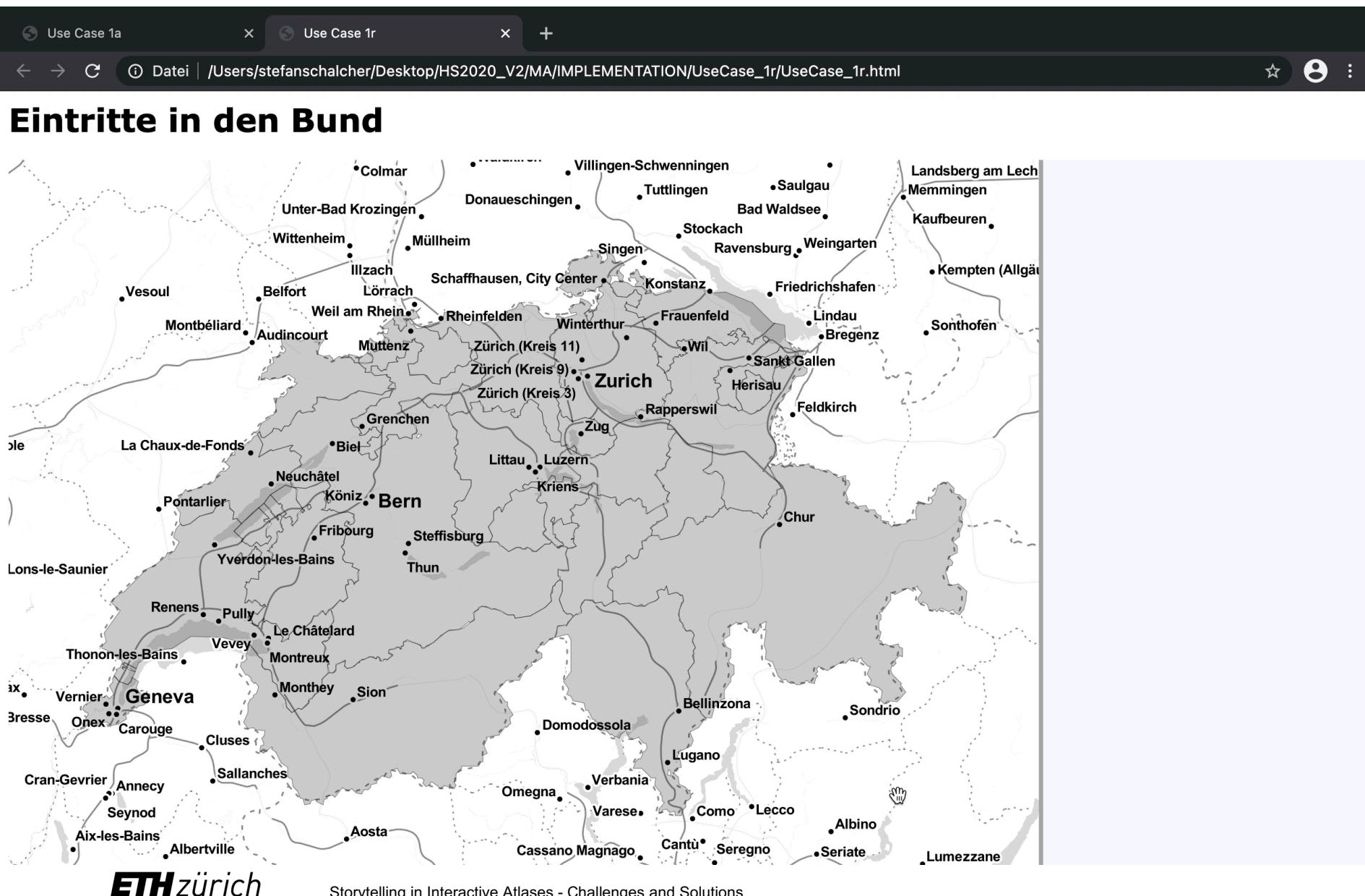
Visual Structuring

- Consistent visual platform

Highlighting

- Color
 - Transparency
 - Contouring
 - Style reduction

Use case 1, Reader-Driven-Approach



Narrative Structure Tactics

Ordering

- Random access

Interactivity

- Navigating

Messaging

- Headlines
- Article
- Details on demand

Use case 2, Author-Driven-Approach

Use Case 2a Use Case 2r Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_2a/UseCase_2a.html

Schlachten Napoleon's

Italienfeldzug Ägyptische Expedition Russlandfeldzug Belgien: Das Ende Übersicht

Montenotte Millesimo Caldera Rivoli Pyramids Tabor Abukir Smolensk Borodino Krasnoje Ligny Waterloo

A map of Europe with various battle locations marked by red circles numbered 1 through 4. The locations are: 1. Montenotte (Italy), 2. Millesimo (Italy), 3. Caldera (Italy), 4. Rivoli (Italy). Other locations shown include Pyramids (Egypt), Tabor (Egypt), Abukir (Egypt), Smolensk (Russia), Borodino (Russia), Krasnoje (Russia), Ligny (Belgium), and Waterloo (Belgium).

IRELAND BELGIUM POLAND UKRAINE ROMANIA TURKEY GREECE AKRÓTIRI IRAQ

Leaflet | © Thunderforest, © OpenStreetMap contributors

Visual Narrative Tactics

Visual Structuring

Highlighting

Transition Guidance

Narrative Structure Tactics

Ordering

Interactivity

Messaging

Use case 2, Author-Driven-Approach

Use Case 2a Use Case 2r Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_2a/UseCase_2a.html

Schlachten Napoleon's

A map of Europe with various battle sites marked by red circles numbered 1 through 10. The locations are: 1. Montenotte, 2. Millesimo, 3. Caldiero, 4. Rivoli, 5. Pyramids, 6. Tabor, 7. Abukir, 8. Smolensk, 9. Borodino, 10. Krasnoje, 11. Ligny, and 12. Waterloo. The map also shows national borders and major rivers.

Legend:

- Italienfeldzug
- Ägyptische Expedition
- Russlandfeldzug
- Belgien: Das Ende

Übersicht

Am 15. August 1769 in Ajaccio auf Korsika geboren, stieg Napoleon während der Französischen Revolution in der Armee auf und erwies sich als ein militärisches Talent. Vor allem die Feldzüge in Italien und in Ägypten machten ihn populär. Durch den Staatsstreich des 18. Brumaire VIII (9. November 1799), gelang es ihm die Macht in Frankreich zu übernehmen. Von 1799 bis 1804 als Erster Konsul der Französischen Republik und anschließend bis 1815 als Kaiser der Franzosen. Außenpolitisch errang er zeitweise die Herrschaft über weite Teile Kontinentaleuropas. Er war ab 1805 auch König und setzte in einigen weiteren Staaten Familienmitglieder und Vertraute als Monarchen ein. Der katastrophale Ausgang des Feldzugs gegen Russland ab 1812 führte zur Erschütterung seiner Herrschaft über große Teile Europas und letztlich zum Sturz Napoleons. In der Schlacht bei Waterloo wurde er endgültig besiegt und bis zu seinem Lebensende auf die Insel St. Helena verbannt.

Leaflet | © Thunderforest, © OpenStreetMap contributors

Visual Narrative Tactics

Visual Structuring

- Establishing shot
- Consistent visual platform
- Checklist structure

Highlighting

- Close-up / Framing
- Color

Transition Guidance

- Animated transitions
- Camera motion
- Object continuity

Use case 2, Author-Driven-Approach

Use Case 2a Use Case 2r Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_2a/UseCase_2a.html

Schlachten Napoleon's

Italienfeldzug Ägyptische Expedition Russlandfeldzug Belgien: Das Ende Übersicht

Montenotte Millesimo Caldera Rivoli Pyramids Tabor Abukir Smolensk Borodino Krasnoje Ligny Waterloo

A map of Europe with several red numbered circles indicating battle locations. Circle 1 is in Italy (Rivoli). Circle 2 is in Belgium (Waterloo). Circle 3 is in Russia (Borodino). Circle 4 is in France (Tabor). Other locations shown include Montenotte, Millesimo, Caldera, Abukir, Pyramids, Smolensk, Krasnoje, Ligny, and Akrotiri.

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Leaflet | © Thunderforest, © OpenStreetMap contributors

Narrative Structure Tactics

Ordering

- Linear

Interactivity

- Navigating
- Selecting

Messaging

- Introductory text
- Headlines
- Annotations
- Article
- Details on demand

Use case 2, Reader-Driven-Approach

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Schlachten Napoleon's

Übersicht



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Visual Narrative Tactics

Visual Structuring

Highlighting

Transition Guidance

Narrative Structure Tactics

Ordering

Interactivity

Messaging

Use case 2, Reader-Driven-Approach

Use Case 2r +
Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_2r/UseCase_2r.html

Schlachten Napoleon's

Übersicht

A map of Europe with several red numbered circles indicating battle sites. The numbers correspond to the following locations:

- 2: Belgium
- 3: Russia (near St. Petersburg)
- 3: Iraq (near Akrotiri)
- 4: France

The map also labels various countries and regions: SWEDEN, IRELAND, BELGIUM, POLAND, UKRAINE, ROMANIA, TURKEY, GREECE, ITALY, TUNISIA, MOROCCO, PORTUGAL, FRANCE, and AKROTIRI.

Am 15. August 1769 in Ajaccio auf Korsika geboren, stieg Napoleon während der Französischen Revolution in der Armee auf und erwies sich als ein militärisches Talent. Vor allem die Feldzüge in Italien und in Ägypten machten ihn populär. Durch den Staatsstreich des 18. Brumaire VIII (9. November 1799), gelang es ihm die Macht in Frankreich zu übernehmen. Von 1799 bis 1804 als Erster Konsul der Französischen Republik und anschließend bis 1815 als Kaiser der Franzosen. Außenpolitisch errang er zeitweise die Herrschaft über weite Teile Kontinentaleuropas. Er war ab 1805 auch König und setzte in einigen weiteren Staaten Familienmitglieder und Vertraute als Monarchen ein. Der katastrophale Ausgang des Feldzugs gegen Russland ab 1812 führte zur Erschütterung seiner Herrschaft über große Teile Europas und letztlich zum Sturz Napoleons. In der Schlacht bei Waterloo wurde er endgültig besiegt und bis zu seinem Lebensende auf die Insel St. Helena verbannt.

Storytelling in Interactive Atlases - Challenges and Solutions

ETH zürich

Visual Narrative Tactics

Visual Structuring

- Establishing shot
- Consistent visual platform

Highlighting

- Close-up / Framing
- Color

Transition Guidance

- Animated transitions
- Camera motion
- Object continuity

Use case 2, Reader-Driven-Approach

Use Case 2r Datei | /Users/stefanschalcher/Desktop/HS2020_V2/MA/IMPLEMENTATION/UseCase_2r/UseCase_2r.html

Schlachten Napoleon's

Übersicht

The map shows the following labeled countries: SWEDEN, IRELAND, BELGIUM, POLAND, FRANCE, ITALY, GREECE, TURKEY, ROMANIA, UKRAINE, TUNISIA, MOROCCO, AKROTIRI, IRAQ, and MOROCCO. The numbered locations are: 1 (Belgium), 2 (France), 3 (Russia/Ukraine), and 4 (Italy).

Am 15. August 1769 in Ajaccio auf Korsika geboren, stieg Napoleon während der Französischen Revolution in der Armee auf und erwies sich als ein militärisches Talent. Vor allem die Feldzüge in Italien und in Ägypten machten ihn populär. Durch den Staatsstreich des 18. Brumaire VIII (9. November 1799), gelang es ihm die Macht in Frankreich zu übernehmen. Von 1799 bis 1804 als Erster Konsul der Französischen Republik und anschließend bis 1815 als Kaiser der Franzosen. Außenpolitisch errang er zeitweise die Herrschaft über weite Teile Kontinentaleuropas. Er war ab 1805 auch König und setzte in einigen weiteren Staaten Familienmitglieder und Vertraute als Monarchen ein. Der katastrophale Ausgang des Feldzugs gegen Russland ab 1812 führte zur Erschütterung seiner Herrschaft über große Teile Europas und letztlich zum Sturz Napoleons. In der Schlacht bei Waterloo wurde er endgültig besiegt und bis zu seinem Lebensende auf die Insel St. Helena verbannt.

Storytelling in Interactive Atlases - Challenges and Solutions

ETH zürich

Narrative Structure Tactics

Ordering

- Random access

Interactivity

- Navigating
- Selecting

Messaging

- Introductory text
- Annotations
- Article
- Details on demand

Use case 3, Author-Driven-Approach



Visual Narrative Tactics

Visual Structuring

Highlighting

Transition Guidance

Narrative Structure Tactics

Ordering

Interactivity

Messaging

Use case 3, Author-Driven-Approach



Visual Narrative Tactics

Visual Structuring

- Consistent visual platform

Highlighting

- Close-up / Framing
- Color
- Size

Transition Guidance

- Animated transitions
- Camera motion
- Object continuity
- Continuity editing

Use case 3, Author-Driven-Approach



Narrative Structure Tactics

Ordering

- Linear/User-directed

Interactivity

- Navigating
- Selecting

Messaging

- Introductory text
- Headlines
- Annotations
- Article
- Audio/Video

Use case 3, Reader-Driven-Approach



Visual Narrative Tactics

Visual Structuring

Highlighting

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Narrative Structure Tactics

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Visual Narrative Tactics

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Use case 3, Reader-Driven-Approach



Narrative Structure Tactics

Ordering

- Random access

Interactivity

- Navigating
- Selecting

Messaging

- Introductory text
- Headlines
- Annotations
- Article
- Audio/Video

3. Implementation

b) Findings & recommendations

😊 **Necessary tools**

😊 **Not necessary, but useful tools**

Visual Narrative Tactics

Visual Structuring



- ++ Consistent visual platform
- + Establishing shot

Highlighting



- ++ Close-up / Framing
- + Color
- + Size
- + Transparency

Transition Guidance



- ++ Animated transitions
- ++ Camera motion

Narrative Structure Tactics

Ordering



- ++ Linear
- + Random access

Interactivity



- + Navigating
- + Selecting

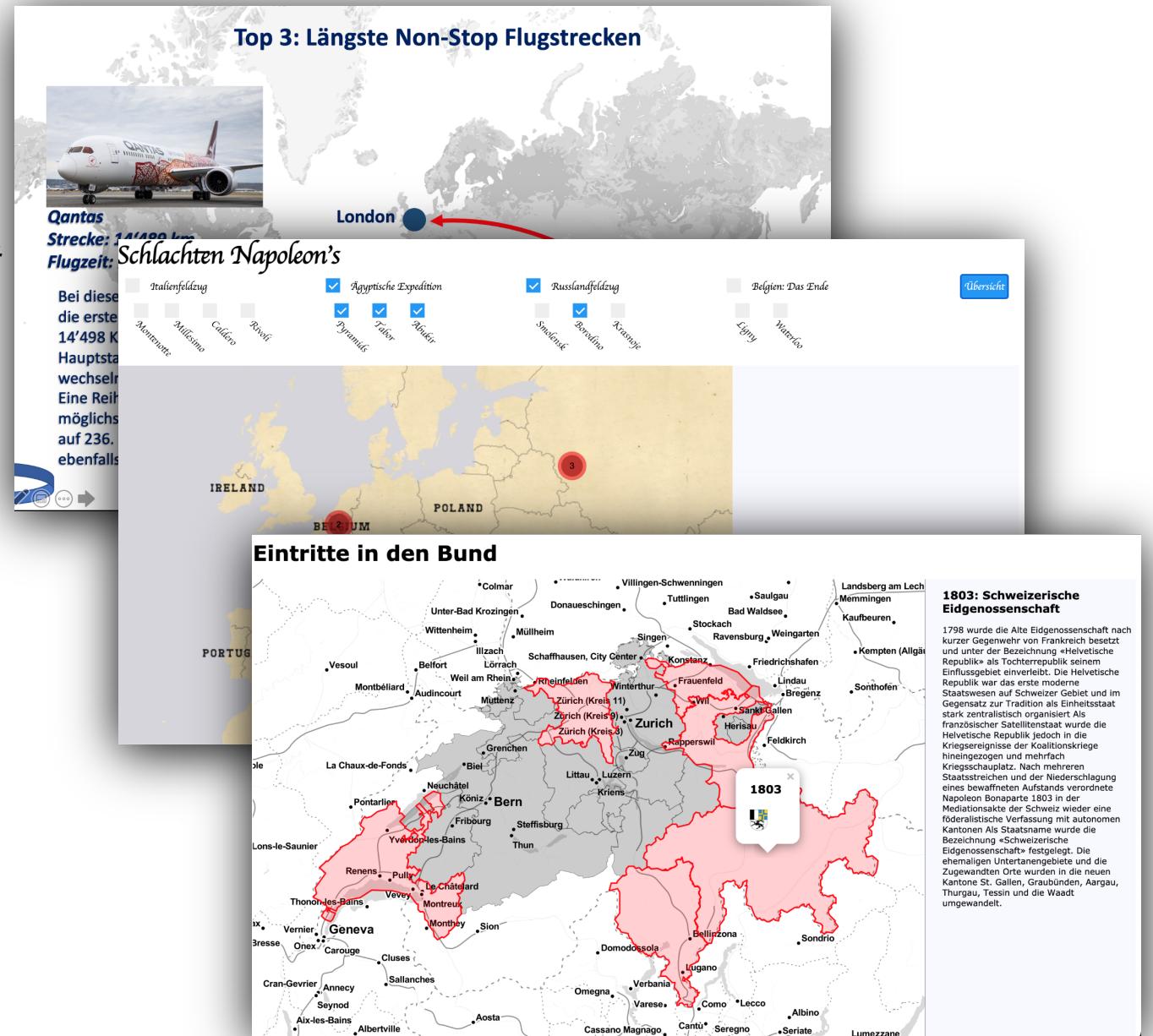
Messaging



- + Headlines
- + Introductory text
- ++ Article
- + Details on demand

4. Conclusion & outlook

- *Storytelling in cartography:*
 - *large and wide domain*
 - *unification of techniques and concepts difficult*
- *Toolbox:*
 - *basic concepts and techniques*
 - *good base for map implementations*
 - *designed as open toolbox*
→ *adaptable and expandable in future work*



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