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## Visualizing the historical Utrecht skyline

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*Summary:* For centuries, the medieval city centre of Utrecht has been surrounded by a defensive moat. Part of it – the Catharijnesingel – was reclaimed in the seventies of the 20th century, but has recently been restored to its former glory. This canal features on many old town profiles of Utrecht viewed from the west, thus providing a striking picture of the development of the urban skyline.

To celebrate the return of water in the Catharijnesingel, the Utrecht Archives have set up an exhibition of town profiles and launched an innovative web application to accompany it. The purpose of this application is to show Utrecht's skyline development on the basis of the old town profiles. Major buildings mentioned on these profiles are highlighted in text and image. The panoramas are also linked to old plans. This creates an interactive time-space approach to the city of Utrecht, in which the development of the Utrecht skyline and town can be followed in detail.

In the future, the application may also be used as a geographical interface for the visualization of other types of historical elements with a spatial component. Furthermore, the software is open source so can be used for other cities as well.

### Introduction

In the summer of 1674, a devastating storm passed over the Republic of the United Netherlands. The city of Utrecht is hit by an extreme fall wind, possibly a tornado, which caused great damage to buildings. One of the oldest churches, the 11th-century Peters church, lost both its towers. These towers still adorn the panorama of Utrecht that Herman Saftleven drew in 1669, but which he was forced to omit in a revised profile in 1684 (Figure 1).



Figure 1. Details of the Peters church on the town profiles of 1669 (with two towers) and 1684 (without the towers, because of the severe thunder storm in 1674), made by Herman Saftleven (Utrecht Archives).

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Saftleven's profiles are now central to a web application about the historical development of the Utrecht skyline. After all, that skyline has always been subject to change. And especially nowadays, many spatial developments due to urbanisation, congestion and demographics lead to changes in the city's appearance. The Catharijnesingel – element of the defensive moat around the medieval city centre – is a striking example. Part of it was reclaimed in the seventies of the 20th century, but has recently been restored to its former glory (Figure 2). Since the middle of the 16th century, this canal features on many old town profiles of Utrecht viewed from the west, thus providing a beautiful picture of the development of the urban skyline. The former defensive moat also figures on old plans.

To celebrate the return of water in the Catharijnesingel and the completion of the old canal, the Utrechts Archief ('Utrecht Archives') has set up an exhibition about the re-opening of the moat and launched an innovative web application to accompany it: <https://utrechtinperspectief.nl/>.<sup>1</sup> The purpose of this application is to create an interactive time-space approach to the city of Utrecht, in which the historical development of the Utrecht skyline combined with town plans and images of the most important buildings can be followed in detail. This article focuses on the realization and the usability of this application. Some potential extensions in the future are also highlighted.



Figure 2. The restored part of the defensive moat of Utrecht; now it's possible to navigate around the whole downtown again (Wikimedia Commons, Jan Dijkstra CC BY-SA 4.0).

### **The historical skyline of Utrecht**

Utrecht has long been the most important city in the Northern Netherlands.<sup>2</sup> From the appointment of Willibrord as archbishop of the Frisians in 695 until the death of Frederick Schenck van Toutenburg in 1580, it functioned almost continuously as the only episcopal city in this area. For centuries, numerous clergymen and monks moved to Utrecht and many churches, chapters, monasteries and convents were founded here. In the late Middle Ages, the city held a position as

<sup>1</sup> Reference date URL's in this article: 15 April 2021.

<sup>2</sup> About the spatial history of Utrecht: Renes et al. (2005, 2020).

the intellectual and cultural centre of the Northern Netherlands. It was also the most important place for education and science, mostly in the context of religion. The city was dominated by its many churches and monasteries, with the colossal Dom tower – still the highest church tower in the Netherlands – as the ultimate landmark (Figure 3).



Figure 3. Painted view of the city of Utrecht by Joost Cornelisz. Droochsloot, between 1650 and 1665 (Utrecht, Centraal Museum, inv. nr. 2298).

Like any other large city or strategic place, Utrecht eventually received a military fortification with an accompanying moat for protection. From the middle of the 16th century, this moat appears on numerous drawn, painted and printed profiles of the town (Figure 4).



Figure 4. Manuscript town profile of the city of Utrecht viewed from the west, painted by the historian Arnoldus Buchelius in his *Commentarius rerum quotidianarum* [...] ('Diarium'), c. 1593-1600 (Utrecht, University Library, Ms. 798-I, fol. 10v). In front of the Catharijnesingel, the moat which was partly reclaimed in the seventies of the 20th century.

The town profiles, often composed of several sheets, depict the grandeur of the former Dom town. They mainly decorated the walls in the houses of the wealthy citizens of Utrecht. Despite the fact that from the end of the 16th century the city was surpassed economically, culturally and in terms of planning by Amsterdam, the proud inhabitants and administrators continued to believe in a renewed hegemony. However, this desired hegemony could no longer rely on an episcopal basis, because in 1568 Utrecht switched to Protestantism and in 1580 banned Catholic worship. With the

foundation of the university in 1636, the city council hoped for a new scientific impetus. In addition, numerous expansion plans appeared in the 17th century. Unfortunately, these plans all turned out to be too ambitious, as Utrecht sank into an economic recession. The times of yore did not return and the city would never again play first fiddle in the Netherlands. However there is still an impressive legacy of magnificent profiles of Utrecht!

The town profiles potentially form a fine temporal source for studying the development of Utrecht's historic skyline from the mid-16th century onwards. For in the past, that skyline was anything but static; all sorts of developments led to changes in Utrecht's appearance. City mills arose and disappeared, towers of monasteries were demolished, fortifications were modernized and in 1674 a fall wind destroyed part of the nave of the Dom Church. The panoramas – and of course the old plans – reflect these kinds of spatial 'mutations' in optima forma.<sup>3</sup>

### Occasion

In August 2019, the Utrecht Archives announced an exhibition on Utrecht city panoramas. This exhibition would take place in the archive's building in the summer of 2020 and mainly revolve around two large profiles of Utrecht by the graphic artist and draughtsman Herman Saftleven (1609-1685). In 1669, the local artist made a meticulously detailed survey drawing of the city viewed from the west, showing the city wall, the moat and the many churches and windmills (Figure 5).



Figure 5. Manuscript town profile of the city of Utrecht viewed from the west by Herman Saftleven, 1669 (Utrecht Archives, cat. nr. 27570).



Figure 6. Printed town profile of the city of Utrecht viewed from the west by Herman Saftleven, 1684 (Utrecht Archives, cat. nr. 28386-28389).

This drawing, in turn, formed the basis for a printed version, using four large etching plates. In 1684, Saftleven adapted the plates due to the drastically changed skyline as a result of the storm mentioned earlier (Figure 6). The nave of the Dom cathedral disappeared, the Jacobi church lost its spire and the Peters church lost both its towers. In the summer of 2019, the Utrecht Archives – preserving Saftleven's drawing from 1669, as well as a copy of the printed profile from 1684 – called on the public to contribute ideas for digitally 'bringing both panoramas to life'. This digital presentation was to be given a central place in the upcoming exhibition.

The immediate cause for the exhibition was, as mentioned earlier, the restoration of the Catharijnesingel and its official opening in 2020. From then on, water flows through the entire

<sup>3</sup> About the cartography and topography of Utrecht: Donkersloot-de Vrij (1989, 1990).

Utrecht city moat again, which of course has changed the face of the city. In the 1970s, the Utrecht City Council decided to reclaim the northern part of the Catharijnesingel. From a modernist point of view, car traffic was given free rein and the inner city was opened up by a wide motorway. The ancient moat was rigorously interrupted. Luckily today, more attention is being paid to the cultural-historical aspects of the former fortifications, and the canal has been restored to its former glory. The Utrecht Archives' call for ideas for a digital panorama application resulted in a dozen creative submissions. In the end the institution preferred the joint initiative of the Utrecht University Library and the cartographic project team 'Hic Sunt Leones'. This proposal involved a 'time-space approach' to Saftleven's town profiles, linked to old city plans and images of the most important buildings. The initiators especially wanted to make the Utrecht skyline development visible in an intuitive way. In addition, the application had to form a geographical and visual interface to the prints and photos of buildings in the image database of the Utrecht Archives. Finally, the functional web application should draw digital attention to the somewhat scientifically neglected town profiles as a historical source. Based on this idea, a successful grant application was submitted at the end of 2019 to the Mondriaan Fund, a Dutch fund in the field of heritage. The implementation of the Utrecht panorama project – titled *Utrecht in Perspectief* ('Utrecht in Perspective') – could begin!

### Developing a time-space approach

Building the time-space application in question naturally involved the necessary challenges. How can you relate the prints and photos of the special buildings to the cartographic (old maps) and topographic (old town profiles) source material in a way that is intuitive, clear and visually attractive for the user, and then also add the time dimension? The solution was sought in the integral presentation – via a screen split into three sections – of a certain town profile with the corresponding old map and the layer with the pictures of the most important buildings (Figure 7).

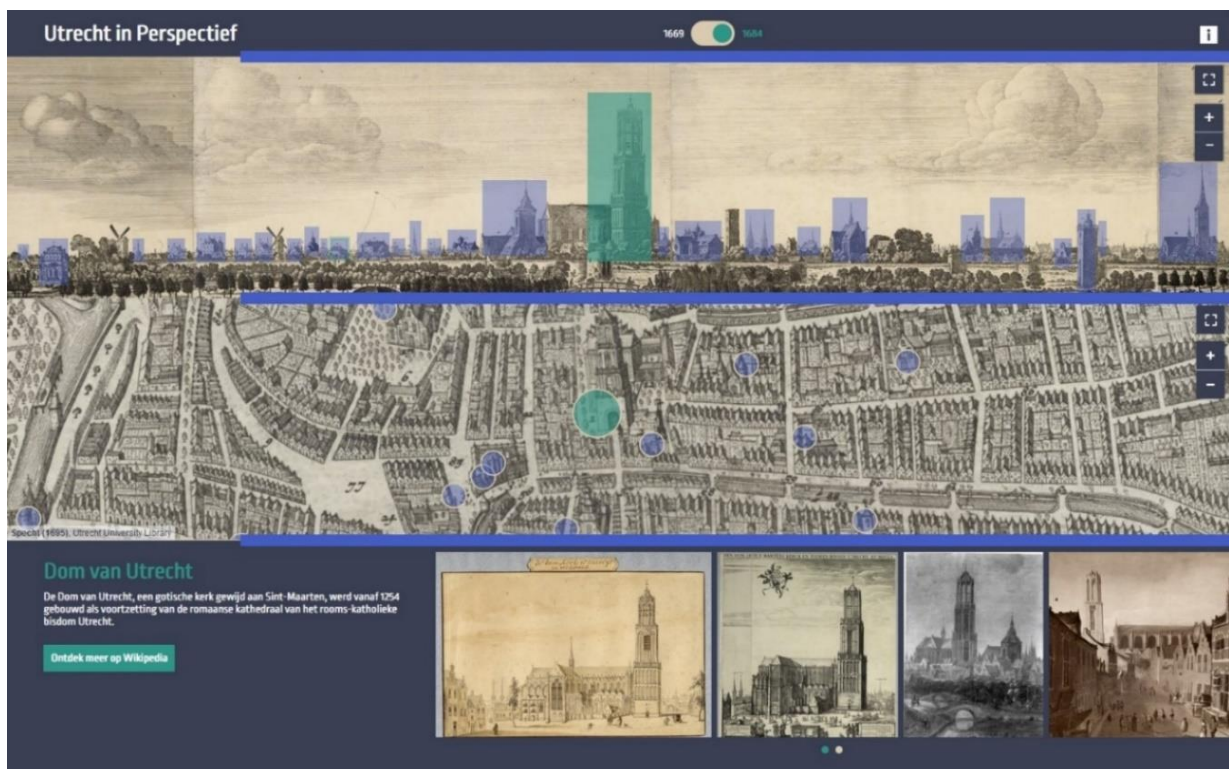


Figure 7. Screenshot of the application *Utrecht in Perspectief* ('Utrecht in Perspective'), highlighting the Dom church.

On the town profile and plan, these buildings are marked by means of coloured rectangles and circles respectively and made clickable. By pushing a button one can switch to the other panorama of Saftleven and the corresponding old town plan.

By zooming in, all the visual material, from the town profiles to the images of the special buildings, can be viewed in detail. Profile and map are also available for analysis separately and in their entirety (Figure 8 and 9).



Figure 8. Detail of Saftleven's printed town profile of Utrecht (1684) in the application of *Utrecht in Perspectief*.

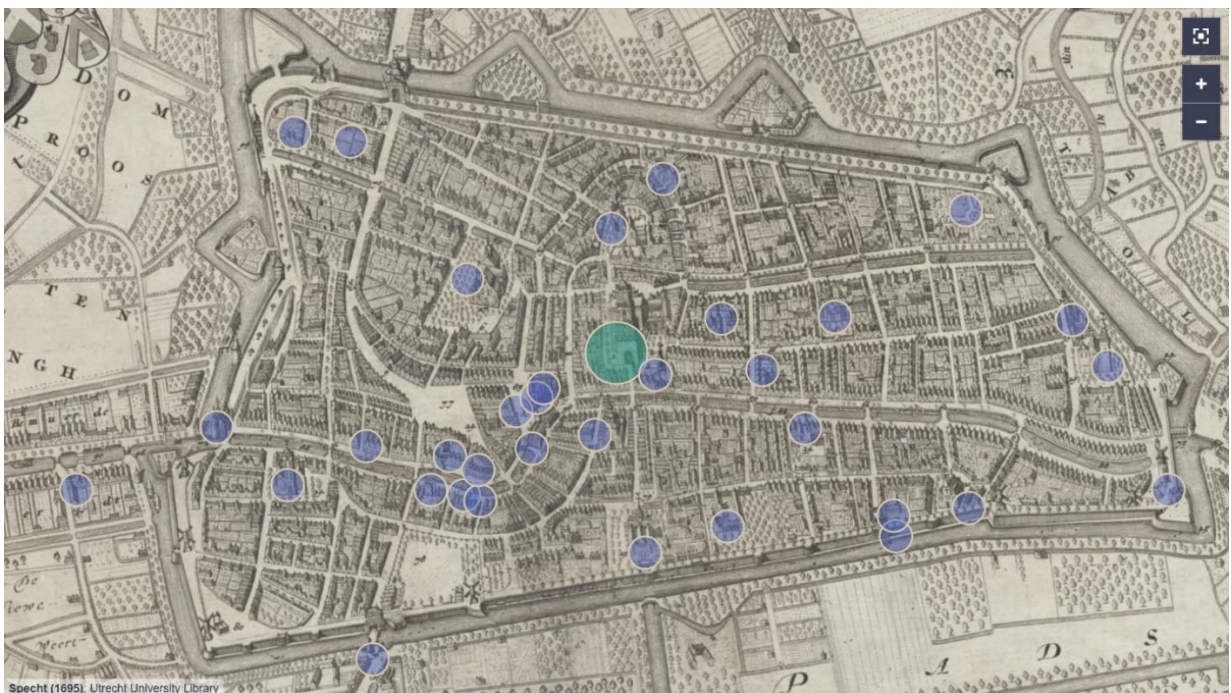


Figure 9. Plan of Utrecht by C. Specht, 1695, in the application of *Utrecht in Perspectief*.

The old plans used come from the collection of the Utrecht University Library and are georeferenced; through the XYZ protocol the maps are directly loaded in the application. All highlighted buildings are identified using Wikidata IDs; some of these IDs already existed or were created specifically for this purpose.<sup>4</sup> The town profiles, maps and prints from the image database of the Utrecht Archives are linked via the Wikidata entries of each building. The application also provides access to the Wikipedia page of each building.

This results in a kind of interactive time-space approach, in which the various dimensions or perspectives of historic Utrecht are brought to life. Hence the appropriate name ‘Utrecht in Perspective’. There is the perspective of the side view of the city by means of town profiles. In cartographic terms there is the orthogonal perspective of Utrecht through old maps. And in relation to iconography the application offers geographical access to prints, drawings and photographs of old buildings (Figure 10).

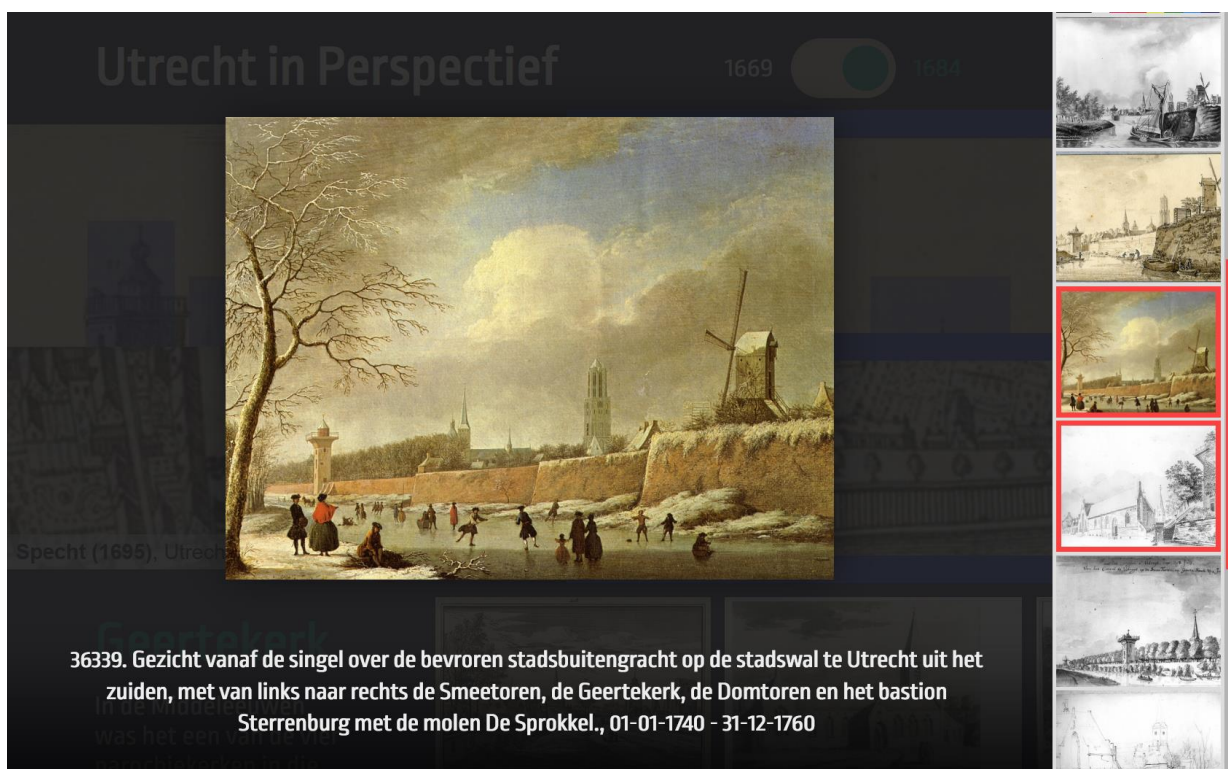


Figure 10. Painting of the Utrecht city wall and moat (c. 1740-1760), in the application of *Utrecht in Perspectief*.

Finally, there is the longitudinal perspective by choosing the profile from 1669 or 1684. The latter time dimension is still rather limited. It is the intention that the application is expanded in the future with other profiles and maps from the 16th to the 20th century. Only then will a true ‘time machine’ emerge, in which the development of the Utrecht skyline and the spatial structure of the city can be

<sup>4</sup> Such an identifier is also a sort of ‘conceptual’ link; if other institutions would use this Wikidata identifier for the same building in their dataset as well, then a potential linking is conceptually possible. One can actually use this link in an application to retrieve data from Wikidata by means of a query. One can also send a query to Wikidata, and get the results back as JSON data instead of a webpage with a table. This way it is not necessary to store data like year of construction, users of the building, Wikipedia page about the building, etc. in the application, but easily retrieve it. And because Wikidata is an open system where everyone can add and amend information, the application will always be up to date. See: <http://islandsofmeaning.nl/straten-in-collecties/> (in Dutch) for an extensive explanation of this principle.

followed in detail by means of a timeline between circa 1550 and now. The application can then also be used as a geographical interface for the visualization of other kinds of historical elements with a spatial component, for example by linking historical datasets.

### Concluding remarks

From September 2020 until January 2021, visitors of the exhibition *Utrecht aan de Singel* ('Utrecht at the moat') could get acquainted with the new application via a large touch screen (Figure 11). The exhibition and application were well received, even though the visitor numbers were of course lower than usual due to Covid-19.



Figure 11. Touchscreen application of Utrecht in Perspective at the exhibition *Utrecht aan de Singel* ('Utrecht at the moat'), Utrecht Archives.

In addition to this touchscreen application and the web application, the project team also thought hard about the sustainability and reusability of the data and code. To this end, a Github was set up, with which heritage institutions and historians, for example, can make a comparable tool for other cities in the world.<sup>5</sup> The data and internet code used are open source and freely available. And who knows, perhaps such applications can eventually be 'linked' together, so that users have more supra-local access?

It is expected that the current Utrecht application will in any case be expanded to include other town profiles and maps from other time periods. Work is also underway on adding new content in the form of extra images of buildings from the Utrecht Archives' image database, so that the application will have more 'body' and be truly suitable as a geographical access point for the iconographic material. Finally, the project team hopes that the application will become part of the ongoing Utrecht

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<sup>5</sup> URL of this Github: <https://github.com/hetutrechtsarchief/Utrecht-In-Perspectief>.

Time Machine (UTM) project.<sup>6</sup> Within the international programme of Time Machine Europe, UTM has been working for some time on making the long history of Utrecht visually accessible. This is done by linking location data to innovative applications, such as Virtual Reality and Timesliders. The Utrecht University Library and the Utrecht Archive are also partners in this project and are closely involved in the realization of the ambitious plans, for example by contributing ideas, supplying content and setting up data management. In addition, the Special Collections Department of the university library facilitates the *Living Pasts* course, in which students try out new ideas for UTM in a test environment and mould them into a prototype. One of these future prototypes will focus on Utrecht University's upcoming 385th anniversary and will be partly based on 'Utrecht in Perspective'. The application will perhaps also play a role in the 900th anniversary of the town of Utrecht in 2022. Local history is vivid and vibrant in Utrecht today, just like the dynamics of the skyline. This skyline will always be subject to change. Let's only hope that the future skyline change will never again be the result of a natural disaster!

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<sup>6</sup> URL: <https://utrechttime-machine.nl/>