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ErfgoedApp

An Educational Experiment with Augmented Reality, Cityscapes and Campusscapes in Brussels

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Abstract. In 2015 in Flanders (Belgium) an ErfgoedApp (heritage app) was launched. It was developed by Vidinoti and FARO with PixLive. The program allows to construct and use Augmented Reality applications, linked to heritage items, collections and institutions. In 2015–2016 master students in archaeology, arts sciences and archivists experimented with the app, as part of the course work. They managed to produce applications that work, provided feedback to further develop the App and offered reflection on the relation between heritage work, cityscapes and augmented reality and the differences between working with or towards texts or visual information. Low or no cost for distributing and using the applications in practice in heritage and academic contexts proved possible.

Keywords: Erfgoedapp · Heritage app · Augmented reality · Cityscapes · Campusscapes · Heritage studies

1 ErfgoedApp

First we briefly present the ErfgoedApp, an app that is introduced for free in Flanders not only for users but also for heritage institutions and students, as a tool to generate and experience Augmented Reality linked to heritage items and representations in the form of images. Then we will discuss the context in which the tool was launched, the organization that was the driving force and the underlying goals. In the third section we will discuss the context of the courses and some feedback that was provided. In the fourth part we will present one example and some issues related to it.

What is the ErfgoedApp (heritage app) and how does it work [1]? On the one hand, for the user (the visitor, the public, the student, …), it is a tool that one can use with an iPhone or another smartphone or an iPad or another tablet.¹ It is first necessary to download the app (10 MB) from the mayor app stores, via i-tunes store or the play.google.com/store/apps. This is for free. This has to be done only once: please try it out yourself. The

¹ The app requires iOS 7.0 or more recent for iPad or iPhone and 4.0 for phones and tablets that function on Android.
second necessity is that Bluetooth is activated, a standard feature on smartphones or tablets. Thirdly, one needs a wifi connection or access to mobile internet. There are however possibilities to also use the app in spaces where no wifi or mobile internet is available, e.g. via the option of downloading all the information on the smartphone or tablet.

What can users do? First it is necessary to make a connection between the app and the heritage item (or representation of it). This can be done by scanning a QR-code. An alternative method is by receiving and accepting a signal of an iBeacon. An iBeacon is a small Bluetooth transmitter powered by a battery (life span: two years, price 40 euros for the heritage institution). It sends a UUID: a universal unique identifier, triggering a specific scenario connected to one or more heritage items. It can be attached, via a simple paste or sticky substance, to the wall, floor or ceiling, to a fire extinguisher, near a painting, sculpture or window. Or, in an out-door version of the iBeacon, against a wall or a sign, somewhere in a garden or in front of a monument, etc. The range can be specified, ranging from a few centimeters to 200 m. It allows for negotiating or forcing a specific viewpoint, listening distance or perspective of the user. The version that will be released in December 2016 will also work on GPS-locations outdoors, a powerful combination with the iBeacon indoors.

Once the signal is received, then the app should be self-explanatory, offering visual and text information linked to an item, to a collection or a location or land- or cityscape. Scanning a QR code, or specific images or accepting the signal of an iBeacon allows to synchronize the content. This can yield the desired effect of augmented reality. This could be in an interaction with a painting, a photo or another work of art through smartphone or a tablet. But it could also involve the scanning of a picture, a drawing or a page in a book or magazine, on a postcard or sticker, or on a computer screen, with access to additional content in the form of a video or audio file or as a text.

For the heritage actor or mediator (a museum, an archive, volunteer organizations, professionals, students,…) the backend of the system is presented as a free tool to construct an experience and application for the users. The ErfgoedApp was developed by FARO. Flemish Interface for cultural heritage, sponsored by the Department of Culture, Youth, Sports and Media of the Flemish government (in Belgium), in collaboration with a spin-off of the Ecole Polytechnique de Lausanne (EPFL), called Vidinoti. The Swiss partner developed PixLive Maker, a CMS (Content Management System) that allows to create and manage augmented reality content. A connection is made with an image (pdf or jpg, or a QRcode) or iBeacons, and then scenarios can be activated. PixLive Maker provides a GUI-based scripting interface for building scenarios. The program allows to monitor the way the app is used (by tracking clicks and iBeacon activity), to follow-up and adapt the content. The state of the batteries can be monitored at a distance. The metrics allow to track the traffic and the pushed and demanded content. These iBeacons can work as a complement to GPS and Google maps, reaching users in indoor areas, tunnels, basements and spaces beyond the reach of satellite signals. Since 2016 the use of multiple languages to present and consult the content is available, a must in the Belgian context.
2 Interface, Brokers and Mediators

The Erfgoedapp is developed and distributed by FARO. In particular FARO’s talented ICT specialist and project manager Bram Wiercx, is also providing basic and advanced training in museums, archives and other heritage institutions in Flanders. Learn to DIY (do it yourself) is the moto of those courses but also the title of a (regularly updated) self-study module in Dutch that FARO has been developed and made available for free online [2]. Via erfgoedapp.be experiences are shared, new launches or use in exhibitions are announced. Important is the feature of www.erfgoedkaart.be. This was a result of a massive survey of the whole cultural heritage sector in the so-called Prisma project in 2011–2012. More than 1700 museums, libraries, archives, heritage cells or associations and volunteer organizations in Flanders are presented on Google Maps, with data and coordinates of those actors. They have priority access to the courses, are attributed a login on simple request and can obtain iBeacons to use.

The Cultural Heritage Decree (2008, updated 2012, to be revised in 2016) of the Flemish Community explicitly gave the task to FARO as a Flemish Interface for Cultural Heritage to inspire, propose, develop and support measures, networks and programs for museums, archives, libraries, centres of expertise, volunteer organizations, and so on. FARO also gives advice about safeguarding policy and practice for local, regional and (inter)national civil servants, politicians and other policy makers. FARO is called a “steunpunt” (pivot), an institution is up to now located and mediating between the government, the academic world, international networks and the field of cultural heritage (museums, archives, associations, networks,…): an in-between and thus interestingly ambiguous position. “Cultural brokerage”, “mediation” or “boundary spanning” are concepts used by heritage workers in FARO to describe their individual functions and “interface” the word for the combined effect. Underlying are theoretical and methodological choices, that are related among others to actor-network theory, participatory methods, reflexivity and the emerging paradigm of critical heritage studies. Cultural brokerage is a crucial factor here [3, 4]. Every year FARO organizes the Cultural Heritage Day in Flanders, on the second Sunday after Easter, which reaches on average 250.000 persons, see www.erfgoeddag.be, also a yearly chance to promote the heritage app. A tool like the ErfgoedApp illustrates the mission to introduce and translate innovation, to generate DIY applications at low cost and to invite as many actors and sectors as possible to collaborate in heritage work and reach a large public or audience, or even better to invite others to participate or co-create.

3 Context of the Courses with an ErfgoedApp Experiment

In 2015–2016, an experiment was conducted at the Vrije Universiteit Brussel in two courses: “Heritage and ethnology” on the one hand and “Forum: Contemporary issues in Art History and Archaeology” on the other, both offered by professor Marc Jacobs, on the master and the master-after-master level, at which in total 30 students participated. One third were students of the master-after-master archives sciences and (documentary) heritage management, usually with a previous training as historian (at the master level).
The rest were students aspiring to become master in arts sciences and archaeology. Six of these students are older, working students that bring much experience, only one trained and active as a visual content producer. The participants share the characteristics that they are of course computer literate but not specialists, highly trained in heuristics and interpreting historical sources, specialists in retrieving information and critically assessing and using those texts, images and objects. None of them are programmers. In both courses the students were challenged to use the ErfgoedApp, to develop an application that will be tested and if possible made available publicly by non-specialists. The participants agreed that at least first years students arriving on campus in September would be able and seduced to try it out.

Two types of projects were selected. In the course “heritage and ethnology” the university campus was used as the site where augmented reality constructions had to be developed. On the one hand special attention was devoted to works of art on campus, not only statues and art-work in open-air but also the enormous painting of Renaat Braem and his wife, spread over five flours and the basement in the central building M, where the rector and most of the central university services are based. That painting evokes the evolution from the Big Bang to the 20th century (inspiring one student to find inspiration in the trailer of the Big Bang Theory series). On the other hand the focus was on that M building itself, a piece of architecture developed by architect Renaat Braem and classified as a protected monument in Brussels. The students developed apps for the (freemasons’ and other) symbols at the entrance of the building, the statues of the founders and the building plans. They also developed apps for the Q building and the Kultuurkafee. The last decades the big aula Q was not only used for academic lectures and honorary doctorates, but also for music performances of pop musicians and concerts of classical music, and an annual singing feast of the students. The Kultuurkafee was famous for performances, wild parties and, in dark periods in the past, also for drug abuse. It was demolished two years ago and a building trajectory to replace it with new students homes, cultural spaces and a new Culture Café is going on now. The students conducted interviews with people who used to work, drink, party or meet there and integrated that material, together with photos and film footage in the app.

A specific requirement was to use archives and/or oral history. Therefore a close collaboration with the university archives (CAVA) was organized. They welcomed the students and helped to find the archival sources. The mixed group of arts students and archivists saw it as a particular challenge to use scans or original archive material in the app (even adding augmented reality to the archive material by scanning them and synchronizing with the QRcodes). This provided new challenges about permissions, copyright, on how to refer to original sources in a visual application. The choice to focus on festivities and cultural manifestations led the students to track down archive collections on campus that were not yet in the university archives, hence contributing to a win-win-situation with CAVA. Each student made a functioning app, and a research report on the story told, the sources found and used and the experience with the app. There were three groups that decided to make a collective presentation, of the buildings M, of the in between spaces outdoors and the building Q.

In another course called Forum, in 2016 the theme was “cityscapes”. A number of lectures on that notion in architecture, urban planning but also cultural studies, on
applications on for instance the interpretation of photographs or the representation of
cities and towns in the paintings of Peter Bruegel or the Flemish Primitives were given
as an introduction. Also a two hour introduction was given by Bram Wiercx on using
the ErfgoedApp. The students had to select a location in the city of Brussels and develop
an Augmented Reality experience. An extra challenge for the students that participated
in the Forum course was that they had to integrate and discuss the theory and practical
applications of “cityscape” in a paper accompanying their app. Several students opted
to work on the university campus (in Brussels), as mentioned above. One group worked
on the neighborhood of the Rijksadministratief Centrum in the heart of Brussels, where
also the Nationaal Stripmuseum (national museum for comic books, ranging from Kuifje
to Guust Flater) is located. They developed a very nice application to discover several
streets, statues and gardens in the city using tools from the comic books in the app,
including for instance the use of text balloons. Other students decided to work on the
North South train connection (Gare du Midi - North Station). In order to build this
trainline, many houses in the city center had to be demolished: an excellent topic to deal
with in Augmented reality. All these apps will be developed further in the course of
2016 and made available for a larger audience.

The general feeling and feedback of the students was that it took an investment of
time, sweat and frustrations, to get past the first hurdles of using a new program and
experimenting with it. But after many hours of experimenting, the participants were
satisfied that they could realize something that looked professional and that actually
worked in tablets and phones. They could apply the skills they had learned, including
the disposition not to be satisfied with easily available information online, in Wikipedia
or brochures or publications. They tried to discover, use, interpret and present new
material and insights. Some of the participants tried to add several layers and contra‐
dicting versions or interpretations or they attempted to generate eye-opener experiences.
They struggled with the format, e.g. of not resorting to the classical annotation systems
like using footnotes and they found ways around this, by smuggling in solutions via
PDFs and reference systems. They were happy to learn that the classes.

The students experimented with but often finally did not opt for iBeacons. This is of
course also partly due to the fact that they did not operate from within a heritage institu‐
tion or organization, with own buildings and other infrastructure. Most of the participants
opted for augmented reality experiments by uploading jpeg-, png-images or pdfs. They
could easily generate these records or QR codes. What the students particularly appreci‐
ated was the fact that the software suggested appropriate formats or sections when using
images. They also found the next step, connecting “content name” to the images and then
building scenarios a feasible step. The PixLive editor allows to connect scenarios and to
add different kind of buttons. Remarkable is that the art history students repeatedly
decided to use a number of the visual gimmicks available, like the “scratch and win”
option. Most of them used the scratch tool for making the user discover other versions,
other images and variations. It will be interesting to see how the game dimension of the
Scratch, Win or Lose possibility will be used, making random options possible.

The most successful results made a kind of storyboard first, on paper or in a drawing
program before starting to build the app. The promoters of the program claimed that the
application was intended more to make connections with one or a series of objects or
image and connect tours or a story to each of them. The students preferred to build complex tours and deep layers and scenarios, testing the limits of the program. A popular choice was the easy to use image carousels that user can swipe away. Here again the suggestion to carefully think about the order of the images first was emphasized by the students (chronological or by contrasts, organized in regions, per family or age group, per type of object, materials or significance, …). The present generation of students had no problems to work with YouTube-, Vimeo- or DailyMotion-videos (available online) and MP4-videos made, for instance with a smartphone, iPad or video cameras. Here again the choice was made to mobilize publicly available free software like http://handbrake.fr.

4 The Project of Morien and Joke

Let us present one example, a project developed in one month time, or better in about 60 working hours each, by two VUB-students in art sciences Morien Schroyen and Joke Vanderschoot [5]. As participants in the Forum course, they found inspiration in the lecture and the book by Isabelle Doucet (University of Manchester): “The Practice Turn in Architecture. Brussels After 1968”. She argued that late-20th (and 21st) century Brussels was composed of a number of layers and styles and she demonstrated and explained this on the basis of one very rich photograph of a contemporary cityscape. The students decided to repeat that experiment, to make a long walk in Brussels and ended up in what they considered as a suitable location. They opted to develop the idea of cityscape, by finding a vantage point in the center of Brussels, from a location with a distance of less than 400 meters of touristic hotspots like Manneken Pis, the Central Market and the Central Station of Brussels. The location they chose was not one of the places where foreign or domestic tourists normally come. They selected a view from alongside the Brussels North-South train axis, near the elite high school of the Sint-Jans Bergmanscollege and the graffiti rich skateboard ramp and transjunction near Kapellekerk. They shot the following panorama shot and went looking for different historical links and layers (Fig. 1).

From left to right they chose entry points, a new skatepark, the Anneessens tower and the remnants of the old city walls, the Hoogstraat, the Kappelekerk and the Bruegel sites. To demonstrate the potential they connected virtual tours to each of the sites. For the Anneessens tower abundant historical information could be found, both on the construction itself as about the historical figure of Anneessens. The remnants of the old city walls linked up with other remaining parts in several parts of the city offered another challenge. The vantage point of the train north south-connection in the 1950s and 1990s made it possible to mobilise that story of heavy disturbance of the cityscape [6]. It also allows to foresee a bridge to other apps of other students focusing on that issue, apps that were not yet available when writing the paper. The skatepark was constructed as a result of a commission by Leefmilieu Brussel granted to Recyclart in 2003 and realized via a participatory project. This opened the space during day time and in the evening for young people between 14 and 24 years old; a skater generation. All these examples are documented in other types of source material, hence providing challenges to find consistency. The fourth part explores the Kapellekerk, that originally was located outside the
city core but developed as the central point of a vibrant quarter. It was the neighborhood where the famous artist Pieter Bruegel was located. The internal history and the restoration of the church proved to be quite interesting.

Joke and Morien made an assessment of the risks of using iBeacons. The chance for theft or vandalism in the skate park was deemed too high. They negotiated with the person responsible for the Kapellekerk and obtained the permission to attach iBeacons in the church but also to consider putting sign or board to offer QR codes. Also leaflets could be made. They decided to develop a brochure that can be multiplied, and hence the QR-codes and images.

In the project of Morien and Joke the so-called Bruegelhuis was part of the application. Although there seems to be no hard evidence, the claim is made by Brussels officials that it was the house where Bruegel allegedly lived during the last days of his life. In 2019, the 450th anniversary of the death of the famous painter will be the occasion for big festivities. The Flemish community has opted to turn this into one of its main events, for attracting tourists, resulting in major exhibitions, connected to the blockbuster exhibition project in Vienna in 2019. The city of Brussels, but also the Royal museum of fine arts in Brussels, will also organize activities, focusing on the Bruegelhuis. Today, that 16th century house still has to be developed, constructed if one might say. It cannot be visited yet. In May 2016 Interpret Europe and Herita organized a congress in Belgium. From the congress venue in Mechelen they organized a number of workshops in Flanders, including Brussels. One of the workshops was about...
“Interpreting Bruegel” in Brussels. On the one hand the Bruegel Box, an installation powered by Google Cultural Institute in the Royal Museum of Fine Arts in Brussels was visited and tested. On the other hand the so-called Bruegel house in de Hoogstraat was visited. Afterwards a workshop took place in the offices of FARO, located nearby. During the discussions of the international specialists gathered there, it became clear that there was a lot of doubt about the potential of the place and the risks about building such an installation using vague source material. The two students were not convinced and decided not to go for a full-fledged story, but kept a critical distance when constructing the augmented reality. They presented it as a potential story that could be constructed and played out in the house. Two weeks after finishing their assignment an article was published in the heritage journal OKV that was picked up by the Belgian press. In the article the link between Pieter Bruegel and the house in the Hoogstraat was rejected and new sources located the place of residence in another street in Brussels.

During the exam and subsequent discussions, a new dimension was explored. Morien and Joke got hold of a study made by heritage students in 2009–2010, Pieter-Jan De Vos, Koen Aertgeerts, Audrey Dussaard and Sandrine Herinckx. They made a study to develop the attic of the college at the site into a new heritage attraction. Their work “The Sint-Jan Berchmanscollege and its Urban Environment in Brussels” offers a lot of possibilities. Their drawings and suggestions are interesting material to present to people looking at the (for outsiders) inaccessible building and huge roof, imagining what is in there and what could be in there. A 360 photo and a virtual visit of several of the potential developments could be offered. In the exam that turned into longue conversations, we concluded that several of the locations had similar stories to tell: not realized but potential heritage attractions.

Just like the other students, Joke and Morien provided several pages of feedback on what they liked and what they regretted, in particular voicing the request for better text processing facilities. This and other feedback was used in the summer of 2016 to improve the system, and to add a performant text editor to the app.

5 Conclusion

Even in – or precisely because of – the experimental phase of the app, inviting last year master students in heritage studies to use this device has proven to be interesting. It is empowering to be able to realize something that works in real life and that is more than only a paper. The students experienced that the same archival and heuristic work they are used to do can have a huge added value, that accompanying texts can be made and provided as PDF. They understood the power of mobilizing their skills with creativity, but also the importance of taking into account the role of end-users, readers and the public. Because the app is actually intended to be used, they also had to exercise their mediating skills and propose a marketing strategy. In the forum course of 2016–2017 the experiment will be repeated. The challenge we will use then is to also work with processes of assessing and formulating a statement of significance. At the end of the course, they will have experimented with two techniques that will be on the agenda in most heritage institutions in Flanders the next five years, augmented reality and frameworks of significance (Figs. 2 and 3).
Fig. 2. QR code used to synchronize the panorama photo

Fig. 3. Screenshot of basic structure developed by Schroyen and Vanderschoot
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