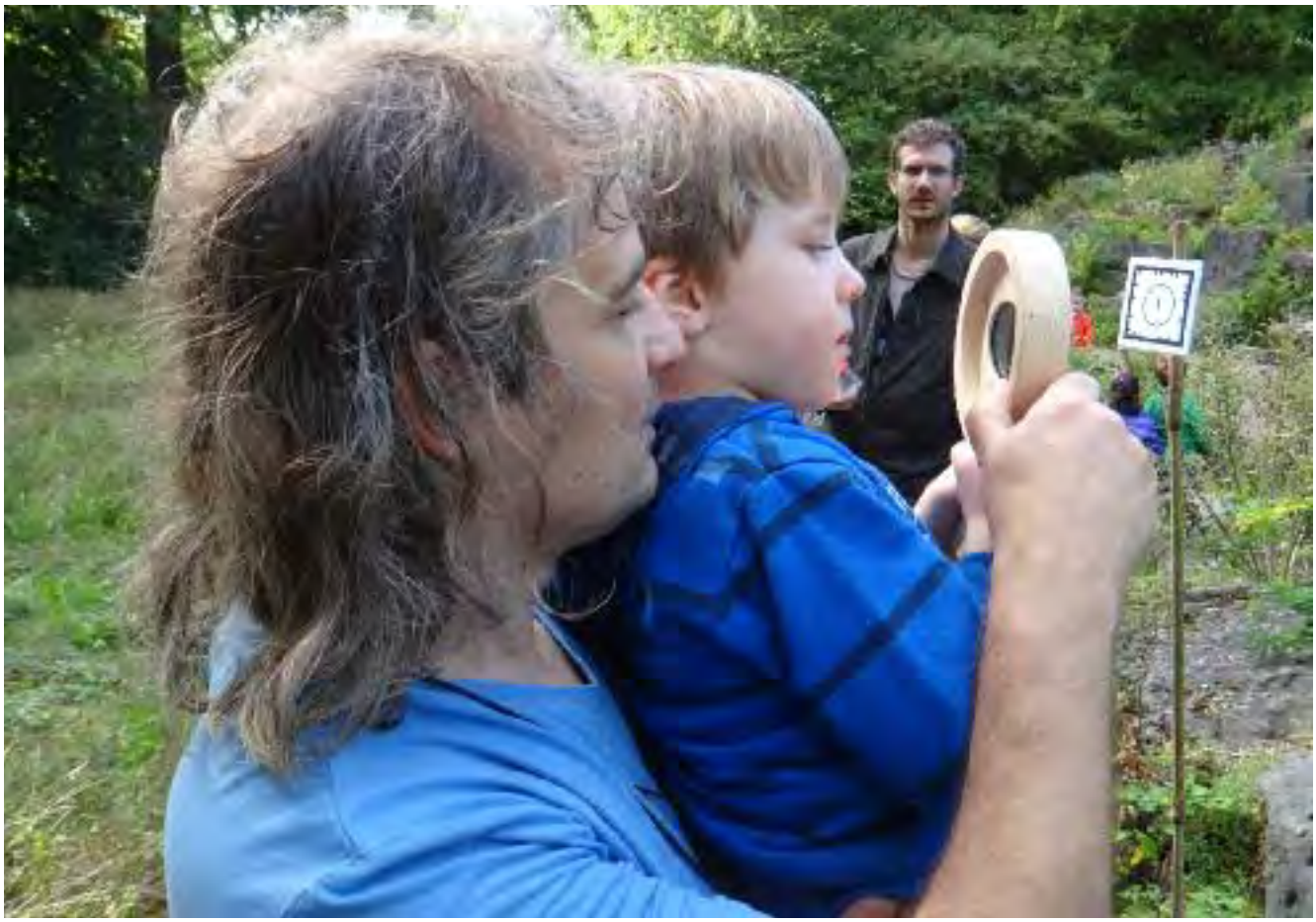
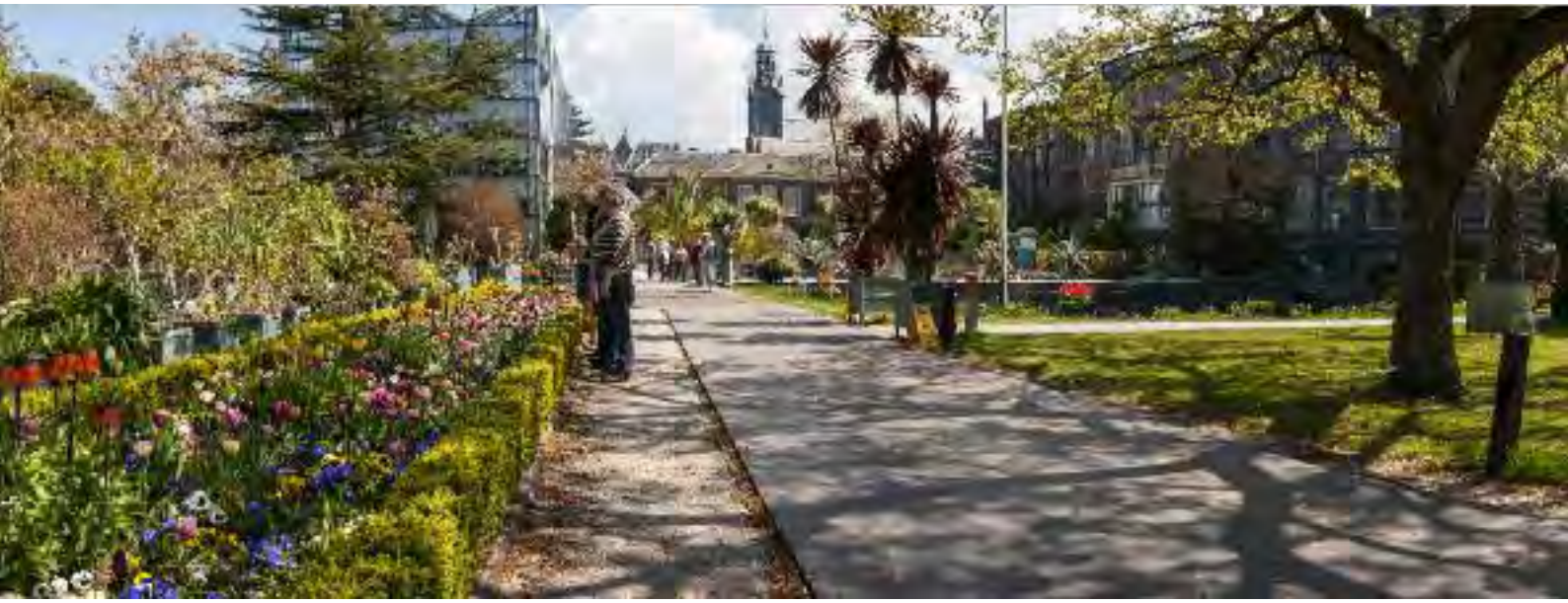
Apps in botanic gardens:
Dos and Don'ts

Botanic gardens in the Netherlands are discovering how important a collaborative Approach is when it comes to developing new technologies. From digital guides to talking trees and digital magnifying glasses **Hanneke Jelles** & **Paul Kessler** tell the story of Hortus botanicus' adventure into the world of Apps.

The Apple App Store had only been available for three years when Hortus botanicus became the first museum in Leiden to launch its own App. We envisioned that the App would fill a gap in the services the garden offered to the public. In the end, what was developed was a very flexible digital guide which would tell the visitor with pictures, sound and more about their location, allowing them to be independent



The new prototype is easy to use by adults and children. Looking at markers through the 'magnifying glass' shows visitors more information (Hortus botanicus)



Visitors to Hortus botanicus enjoying the plants in the sunshine (Hortus botanicus)

from a fixed tour. In order for this to work it was important to update the App weekly with information about flowering or fruiting of special plants.

The failure of this approach was only fully understood after the Hortus App's launch. In 2011, the App was unfortunately only available for the iPhone , a device which was not commonly used by our visitors. It could not be directly accessed through the App Store, but was only available through the 'Hopper'- a platform which was not well known. Even the 22 iPods which were available for hire from the front desk were not used as frequently as we had anticipated. Most of our elderly visitors were not used to this type of device and had seemingly no interest in being informed on how to use it. Also, on busy days, with large queues of visitors, spending time explaining how to use the devices was not practical. The major problems, however, were the absence of Wi-Fi in the garden and the cost of using internet on the mobile phones, which in 2011, was still quite high. Luckily, the visitors who actually used the App were satisfied with this new service, but their number was much too low to justify the investment in developing this resource. Additionally, the garden's iPpods were not easy to synchronize with new information and due to staff's other priorities it was not possible to carry out the intended weekly updates on flowering and fruiting or other events in the garden. It should be also noted that a garden is constantly changing and therefore information about its plant displays is quickly outdated.

Pioneering

Many changes have happened since the launch of the first App in Hortus botanicus. Following the addition of a national flora and a bird guide to the contents of the iPods there has been an increase in the hiring of the devices. Moreover, in the last few years the costs of producing an App have decreased, and other alternatives like the podcatcher have become available. Many more people own smartphones nowadays and in some areas of the garden Wi-Fi is available for free. However, we felt that the original App is already outdated and an Android version was never realised. This could have meant a sad end to our adventure into Apps. This outcome was overturned on 13th February 2013 when the Postcode Lottery announced its generous funding of two million Euros, over four years, for the project 'Plant (s) for the Future'. The project aims to retrieve, manage and organise information from the living collections of Dutch botanic gardens so that this will be made accessible to the wider public. The project's Partners are the botanic gardens who are members of the Dutch Botanical Gardens Association (NVBT) and the 'Waag Society', an organization that develops technology through creative research and participatory design so that the Applications are suited to the needs and abilities of their users.

This project involves organizing three 'experimental gardens'. An 'experimental garden' is a format for bringing together staff from the botanic garden, designers and developers of technological Applications and members of the public (garden's current audiences and targeted new audiences). The aim of these 'experimental gardens' is to find new ways to connect the knowledge about plants and biodiversity to the needs of diverse audiences. Each 'experimental garden' involves running six weekly design sessions focused on different topics.

Participants of these sessions discuss which stories from the botanic gardens are important and relevant to the public, identify who our current visitors are and new target audiences, and decide which stories or methods can be used to reach these new audiences. The outcome of this process is the development of a new 'product' - possibly an App or perhaps another form of innovative technology. This product will provide information in a form that meets the interests of the visitor at the time and place they will choose to use it. In September 2013 the first 'experimental garden' took place. In the beginning, we discussed what stories could be told and which would be the best medium to use. At the same time we conducted a survey of all the

Dutch Partner gardens to identify which systems and programs they use for their collections' management. The results of the survey will be used at a later stage to determine how to make the information from the gardens' collections available to garden staff and wider audiences.

Three favorites

The discussions with the participants of the first 'experimental garden' suggested that the best way to tell the story about plants and botanic gardens is still a guided tour, given by a member of staff or a volunteer. Unfortunately, it is simply not possible to organise a tour for every single visitor. For that reason the following ideas were proposed as alternatives to a guided tour: the 'talking tree', the 'fast route App' and a 'digital magnifying glass'.

The idea for the 'talking tree' was a living tree telling its story in an accessible way. Visitors could touch parts of the living tree e.g. its bark or leaves and an audio recorded story would start to play. By placing sensors at different heights of the tree both adults and children would be able to activate the audio recordings. In the end, this idea was not taken forward to the pilot phase as it is technically challenging and expensive to implement. In particular, it requires access to electricity on the spot and also there is the danger of disturbing the tranquility of the gardens by playing the audio recording in an open space. In addition, it was pointed out that this technological Application could soon become boring for the repeat visitors of the garden.

The 'fast route App' is the easiest to implement idea as it is a variation of an existing technology used in the gardens. The 'Waag Society' has developed an App for a number of museums in Amsterdam that allows staff with little technical knowledge to create a tour in a short amount of time for locations that are at least 15 meters apart. The App enables sound clips, videos, or photos etc to be added easily in order to update information related to each location. However, this Application requires establishing Wi-Fi in the garden. Another challenge is also that mobiles have small screens so using the App under strong sun or rain might be difficult. During the 'experimental garden' sessions it was discussed that in the near future most, if not all, botanic gardens will offer Apps related to their sites. The Apps will use data from either each individual garden or from a larger, combined database. As it was felt that the gardens would develop this technology by themselves any way and at a low cost, it was decided that the project should focus on a more innovative solution.

Inspiration

The third idea that came out of the 'experimental garden' sessions was the 'digital magnifying glass' which inspired both garden staff and the target audiences the most. The digital magnifying glass will enable the visitors to focus on and immerse themselves in a particular display in the garden.

By using the form of a magnifying glass which is recognizable to everybody the technology will encourage people to focus their attention to plants in a familiar way. As the model of a magnifying glass is familiar to visitors, they therefore will automatically look through it.

The digital magnifying glass will display, in its lens, any relevant information about the plants by using pattern recognition. It will also give visitors the option of making movies which they can then share. A digital prototype device was designed and tested during the project. The visitors who tested the prototype found that it was intuitive to use, they used it to zoom in and out of a display/plant, walked around objects and looked at them from different angles. The prototype of the digital magnifying glass has hidden smartphone embedded and uses its camera and communication functions. The suggested route for using the digital magnifying glass is plotted by using markers: small symbols which the Application is able to recognize. A lot of technology is required to fully realise the functions of this prototype, but this is by no means impossible.

Looking ahead

Outlined above are our preliminary results so far. So, what's next? The next steps will be determined in the second and third 'experimental garden'. So far

Staff and visitors investigating plants to test the new prototype (Hortus botanicus)

Hortus botanicus staff shows-off the prototype designed to be used and look just like a regular magnifying glass (Hortus botanicus)

we can conclude that the collaboration between staff and visitors from different gardens, with different roles and backgrounds has proved rewarding, enabling us to think creatively and enthusiastically. The input of our visitors into how we develop public engagement methods is invaluable. Since the project started we have also found an increase in the interactions between the Partner gardens and how we share materials and stories between our organisations. The use of new technologies in gardens has lots of potential and it can be best realised by joint development including many botanic gardens. Moreover, using technologies such as Apps in gardens requires frequently updated information and by doing this in a Partnership with other botanic gardens the risk of outdated or obsolete information is minimized.

The technological outcomes of the 'Plant(s) for the Future' project will be revealed in 2017, the 'Year of the botanical gardens' in the Netherlands. Yet, what is evident already is that the close collaboration and sharing of information amongst the botanic gardens is crucial for the development of new technologies for public engagement.

More information about the project and the 'experimental gardens' sessions can be found at: http://waag.org/en/project/botanical-gardens

Indicative list of botanic gardens with an App:

- Botanischer Garten der Universität Basel
- Coastal Maine Botanical Garden
- Desert Botanical Garden, Arizona
- Chicago Botanic Garden
- Royal Botanic Gardens, Kew (Apps for adults and for children)
- Memphis Botanic Garden
- Naples Botanical Garden
- National Botanic Gardens of Ireland
- Royal Tasmanian Botanical Gardens
- Singapore Botanic Gardens
- The New York Botanical Garden (Apps for each new exhibition).

RÉSUMÉ

En 2011, l'Hortus Botanicus de Leyde est devenu le premier musée ou jardin botanique des Pays-Bas à développer une appli gratuite pour ses visiteurs. Ceux qui n'avaient pas de smartphone pouvaient louer un Ipod avec l'appli installée. Après coup, nous avons trouvé que les raisons de la faible popularité de ce produit étaient évidentes. Dans cet article, nous expliquons comment les autres jardins peuvent éviter les mêmes erreurs que nous avons faites et comment, au travers du projet « plante(s) pour le futur », tous les jardins botaniques des Pays-Bas coopèrent actuellement pour développer un meilleur produit qui, nous l'espérons, sera plus utile au public. Dans ce but, nous avons réalisé un sondage pour collecter des informations sur les besoins et les demandes du public au sujet des contenus et des expériences lors de l'utilisation. Le sondage portait une attention particulière aux groupes sous-représentés parmi les différents publics du jardin. Le projet est actuellement dans sa phase pilote et les nouveaux produits développés sont prometteurs..

RESUMEN

En 2011, el Hortus Botanicus de Leiden se convirtió en el primer museo o jardín botánico que proporcionó aplicaciones Apple gratuitas para sus visitantes. Aquellos que no disponían de un Smartphone podían alquilar un iphone con la aplicación instalada. A posteriori, sabemos por qué este producto no tuvo mucho éxito. En este artículo, explicamos cómo otros jardines pueden evitar cometer los mismos errores y cómo, a través del proyecto `plant(s) for the future' ('Plantas para el futuro') todos los jardines botánicos holandeses están cooperando para desarrollar un producto mejor, que con suerte, sea más útil para el público. Para lograr esto, se hicieron encuestas, para recoger información sobre las necesidades del público, sus preferencias y su experiencia. La investigación puso especial énfasis en aquellos grupos de visitantes del jardín poco representados. El proyecto se encuentra en la fase piloto y los resultados recientes son prometedores.

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