Nimis P. L., Vignes Lebbe R. (eds.)
Tools for Identifying Biodiversity: Progress and Problems – pp. 89-93.
ISBN 978-88-8303-295-0. EUT, 2010.

Wiki keys on mobile devices

Gisela Weber, Gregor Hagedorn

Abstract — The development of increasingly powerful mobile devices like PDAs (Personal Digital Assistants) and Smartphones, with larger displays and greater resolution makes them increasingly suitable for identification tools available directly "in the field". One of several approaches towards this aim in the *KeyToNature* project is based on wiki-stored documents. Important features of wiki-based keys, such as hidden text and media information as well as links to glossary entries are supported. The illustrated keys can be used online or downloaded in a zip file. An extension to support the application stores of various mobile platforms (Android, Apple iPhones, etc.) is under development.

Index Terms — mobile devices, smartphones, MediaWiki, identification software Tools.

1 Introduction

Digital identification keys traditionally are built to be used on CD-ROM or over the internet. They have some advantage over printed books in the ease of including a rich selection of colour illustrations, in the speed of updating, and in certain advantages of interactive use, which are especially relevant in pedagogical scenarios. However, they are suitable primarily for indoor workplaces, but usually not practical in the field. With the development of more powerful mobile devices with higher resolution it becomes worthwhile to create digital keys for mobile devices. Such keys must take into account the specific requirements of a small display screen and cumbersome typing to achieve a user-friendly design. In the *KeyToNature* project, several approaches towards this aim have been realized in order to compare different approaches (e.g. [1], [2], [3]).

The application described here is based on the key authoring abilities of the MediaWiki platform described separately [4]. The Wiki is a document storage and authoring platform that allows to embed structured information inside unstructured documents (called "templates"). Based on these structured elements, and taken the freedom of authors to develop new solutions into account, the web-based identification tools are transformed into mobile keys. These can be used online or downloaded packaged into a zip file that can be transferred to mobile devices for offline use.

The authors are with the Julius Kühn-Institute, Federal Research Centre for Cultivated Plants, Institute for Epidemiology and Pathogen Diagnostics, Königin-Luise-Straße 19, D-14195 Berlin. E-mail: gregor.hagedorn@jki.bund.de.

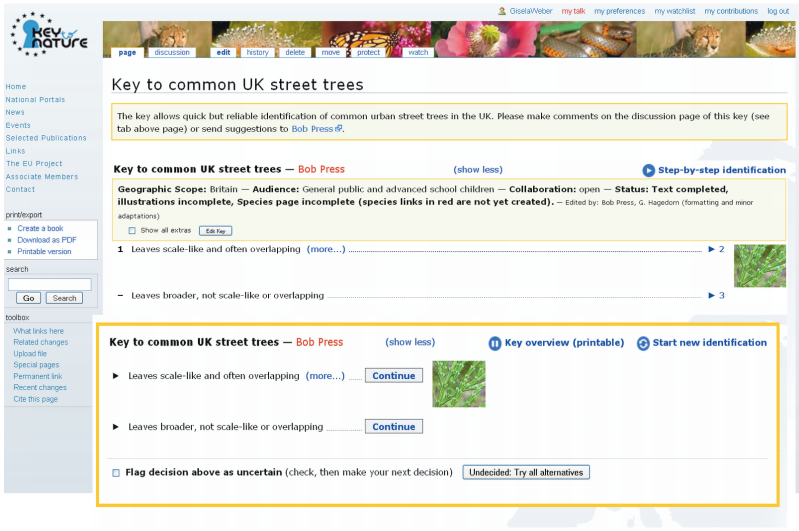

Fig. 1 – Wiki key to common UK street trees, printable overview with interactive mode (chosen by upper right “Step-by-step identification” link) shown as overlay in the bottom right.

2 Wiki keys

In the *KeyToNature* project, one approach to enable users to create and edit their own identification keys is the MediaWiki platform. Users can create online single access keys (i.e. dichotomous or polytomous keys) which include images and additional information [5]. These keys can be viewed in a printable overview mode and also interactively in a one-couplet-at-a-time-mode (Fig. 1). Editing of keys occurs online. Special features of the wiki keys are up to 5 images per lead in the right-hand side bar, an extra 2 images below the lead statement, and 6 further images, plus extra text (description, remarks, occurrence) which is initially hidden and requires user interaction to be shown. This principle of showing secondary information only on demand is also used in the display of illustrated term definition (glossary) directly where they are used in the lead statements, and in providing additional information, including legally required IPR and licensing information on the images. All images are zoomable to the maximum possible extent of the source image and display device.

3 Wiki keys on mobile devices

For the transformation of the identification keys from Wiki pages to downloadable HTML-pages optimized for mobile devices we have written a software that is installable as an extension for MediaWiki. This software, called “MobileKey” requires another extension “TemplateParameterIndex”, also written in the *KeyToNature* project, which harvests name-value pairs from template calls on Wiki pages and stores them in a database table. The MobileKey extension uses this index to directly access data behind the Wiki keys. Both extensions of

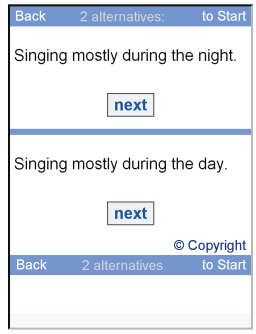

Fig 2 – Couplet with two alternatives (a key to birds based on their sounds).

MediaWiki will be made available as Open Source.

The mobile key extension adds a “Special Page” that allows to create a mobile key that starts at any selected Wiki page with an identification key. The extension:

- recognizes a key on the page and formats the metadata of the key into a start screen
- aggregates the leads that belong to the same couplet;
- splits the key into couplets (= decision), with each couplet being rendered on its own HTML-page in a layout suitable for the small display of mobile devices (Fig. 2);
- puts the additional information on extra HTML pages (Fig. 3, 4);
- puts glossary text on extra HTML pages (Fig. 5);
- stores these files that have been optimized for mobile-devices on the server;
- stores the images on the server;
- replaces the existing links on the Wiki page with the appropriate local links;
- packs all pages and images into a zip file to be downloaded.

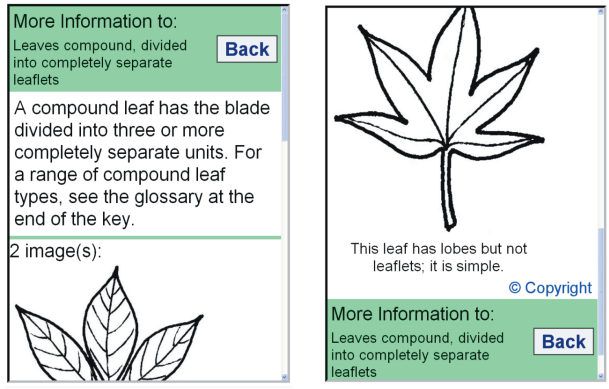

Fig. 3 – Page with additional information and two images.

The HTML is designed to adjust to some extent to the screen size and landscape versus portrait orientation (Fig. 3, 4). As a mechanism to assess the

display on various devices, the MobileKey Special Page provides two iFrames with different sizes (240 x 320px and 480 x 320px) in which the mobile key can be viewed. Images can be displayed side by side or one below the other according to the display width. Importance is given to good readability of the texts and clear structuring of the displayed page.

The information for a single decision is often longer than the viewport of the mobile device, requiring the user to scroll. At the top of each page, information on how many alternatives are available in the couplet is given. Also the links to go back to the previous couplet or to return from any couplet to the start of the key or a subkey (e.g. for species of a genus) are given there. This information is repeated at the bottom of the page so that the user does not have to scroll all the way up again.

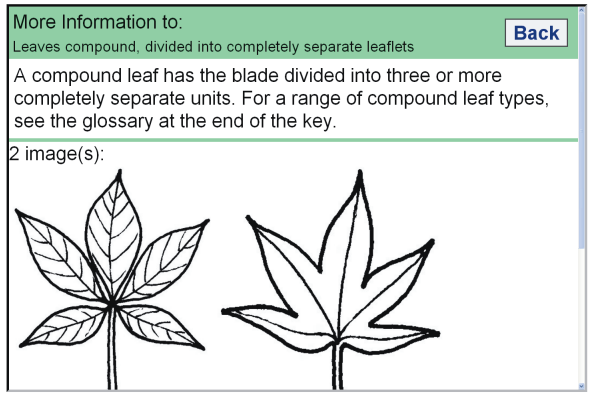

Fig. 4 – Same as Fig. 3, but in landscape orientation.

The bars which contain that information above and below the text are given different colours, supporting the users intuition as to whether a key couplet, a page with additional information or a glossary page is displayed. Only the couplet pages allow navigation within the key or to a subkey, whereas the extra information and glossary pages only offer a link back to the page from which they were called

Fig. 5 – Page with glossary links (left, “Unterlippe”, “Schlund”, coloured) and glossary page (right).

4 Outlook

The application for mobile keys is still under development. At the moment, one still has to manually download the zip file to a PC, unzip it, copy the folders to the mobile device's SD card using an USB cable, and manually point the mobile browser to it. It is clear that on mobile devices that support this (especially Android and Apple iPhone), it would be desirable to wrap the identification tools into downloadable mobile apps. In fact, this is the only option iPhones provide.

5 Conclusion

The challenge of developing identification keys for mobile devices is becoming more and more promising with the evolution of better devices. The MediaWiki technology appears to be a good platform to combine user input to create and edit keys with the possibility to make existing keys usable on mobile devices.

Acknowledgement

This work has been supported by the *KeyToNature* project, ECP-2006-EDU-410019, in the frame of the *e*Content*plus* Programme.

References

[1] P. L. Nimis and S. Martellos, "Progetto Dryades", http://www.dryades.eu/home1.html, 2008.

[2] S. Martellos, E. v. Spronsen, D. Seijts, N. Torrescasana Aloy, P. Schalk and P. L. Nimis, "User-Generated Content in the Digital Identification of Organisms: the *KeyToNature* Approach". *International Journal of Information and Operations Management Education (IJIOME)* vol. 3, 3, pp. 272–283, 2010.

[3] E. v. Spronsen, S. Martellos, D. Seijts, P. Schalk and P.L. Nimis, "Modifiable digital identification keys". In: P. L. Nimis and R. Vignes Lebbe (eds.), *Tools for Identifying Biodiversity: Progress and Problems,* pp. 127-131, 2010.

[4] G. Hagedorn, G. Weber, A. Plank, M. Giurgiu, C. Veja, G. Schmidt, P. Mihnev, M. Roujinov, D. Triebel, B. Zelazny, E. v. Spronsen, P. Schalk, C. Kittl, R. Brandner, S. Martellos, P. L. Nimis, "An online authoring and publishing platform for field guides and identification tools". In: P. L. Nimis and R. Vignes Lebbe (eds.), *Tools for Identifying Biodiversity: Progress and Problems*, pp. 13-18, 2010.

[5] G. Hagedorn, B. Press, S. Hetzner, A. Plank, G. Weber, S. v. Mering, S. Martellos, P. L. Nimis, "A MediaWiki implementation of single-access keys". In: P. L. Nimis and R. Vignes Lebbe (eds.), *Tools for Identifying Biodiversity: Progress and Problems*, pp. 77-82, 2010.