

The Open Key Player: A new approach for online interaction and user-tracking in identification keys

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Abstract — This paper describes a new approach for creating and using identification keys based on two main components: the Open Key Editor and the Open Key Player, both of which were created within the European project *KeyToNature*. The Open Key Editor can be used to produce custom identification keys starting from a master key and to add original user-generated content, while the most important feature of the Open Key Player is the possibility to track relevant user activities into an eLearning environment, in order to collect data to improve the design and usability of identification keys.

Index Terms — identification key, eLearning, user-tracking, Rich Internet Application.



1 INTRODUCTION

Identification keys are used to identify biological entities such as plants and animals. Since the beginning of the digital era, the keys have undergone a great improvement from the early, paper-printed versions [1]. Modern digital keys are easier to access and to use, and can be used into schools as new, efficient and interactive instruments for teaching biodiversity. However, building an original identification key is still a task which can be carried on by an expert only.

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2 THE OPEN KEY STANDARD

The Open Key Standard from the *KeyToNature* project has been developed to make the creation and the use of an identification key easier, as well as to improve its accessibility (Fig. 1). The standard contains two major components: The Open Key Editor (OKE) [2], [3] and the Open Key Player (OKP).

The Open Key Editor provides the necessary interfaces to manage an identification key created from scratch, or imported using the Structured Descriptive Data (SDD) standard, as well as other file formats. From an original key, called “master key”, it is possible to create a virtually unlimited number of derived keys to different lists of taxa, containing new and original user-generated content, and devoted to different target users.

The identification keys can then be used in the Open Key Player. This is a Flash application developed by using Adobe Flex, which operates on the database of the OKE, and displays in a modern, interactive way the keys to the user [4], [5].

3 OPEN KEY PLAYER DESIGN

The Open Key Player has been designed following several requirements: 1) cross platform and browser compatibility, with the possibility to interact with MySQL databases, and to display data in XML (eXtensible Markup Language) format [6], [7]; 2) user interaction and information specific for dichotomous keys; 3) tracking the features selected along the identification path, and revising the selection history; 4) ability to communicate, and to be integrated within an eLearning platform, such as ILIAS or MOODLE.

A demo version of the Open Key Player running a key on woody plants of Romania can be found at the URL specified at [9]. The application requires the input of two parameters: the name of the database which contains the identification key, and the code of the specific key in the database (since the same database can store multiple identification keys).

The user interface is divided into two panels (Fig. 2). The left panel contains a “Reset” button, which starts the identification process from the beginning, and reports the number of remaining species and the history of the identification steps (“Selected Features”). The right panel contains the current choices of the identification process, which can be illustrated by images. The counter of remaining species is updated, and the last step is added to the “Selected Features” list at each step of the identification process.

When one of the choices leads to a result (Fig. 3), the scientific name of the taxon appears in brackets. The information related to the identified taxon is displayed in a pop-up window at the end of the identification process. It can also contain an image gallery, when this gallery is available in the database.

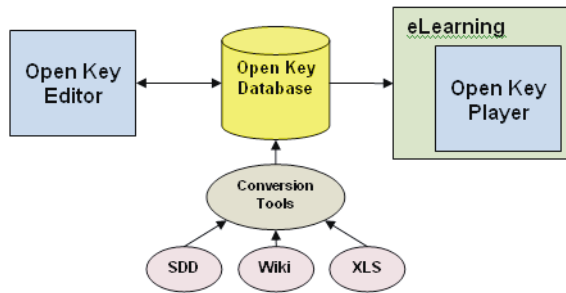


Fig. 1 – The architecture of the *KeyToNature* Open Key Standard (Editor, Player, Conversion tools).

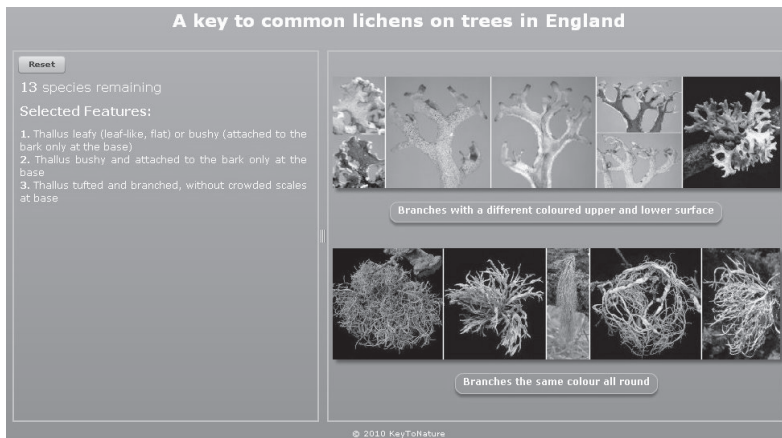


Fig. 2 – The interface for the Open Key Player (Left: selection history, Right: selection options).

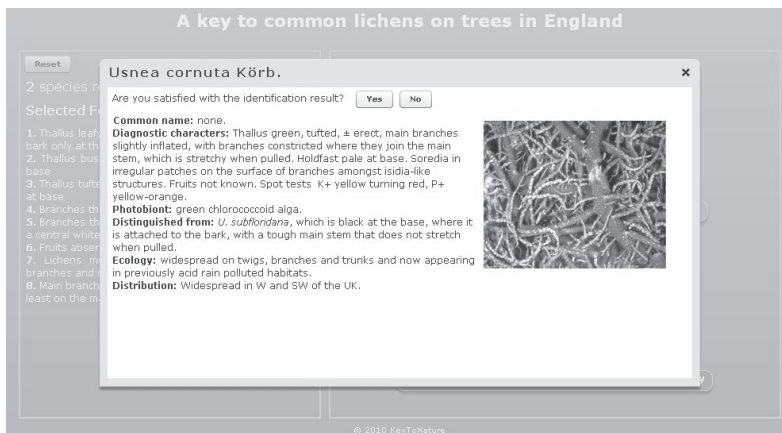


Fig. 3 – The panel with the final result of the identification process.

4 USER TRACKING

One of the most interesting features of the OKP is the possibility of integrating it in an eLearning environment, thus providing user-tracking. The application can communicate to the eLearning environment each interaction made by the user. This feature allows the creators of identification keys to access interesting statistics on users behaviour, and to use them to improve the keys. The Open Key Player has been successfully integrated in ILIAS, and was tested in several Romanian high schools, giving back valuable information about the key of woody plants of Romania.

5 CONCLUSIONS

The OKP has proven to be a valuable asset for the Open Key Standard of *KeyToNature*. It provides a modern, user-friendly interface, which it can be integrated into eLearning environments, providing user-tracking statistics. The tests carried out in the Romanian high schools showed that the application is an efficient interactive tool, and that it could be an important component in teaching and learning biodiversity.

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