Developing Web-based Search Portals on Birds for Different Target Groups

Renate Steinmann, Andreas Strasser, Andrea Mulrenin,
Amy Trayler, Sander Pieterse, Ivan Teage, Michael De Giovanni,
John J. Borg, Noel Zammit

Abstract — This paper presents the experiences and interim results from the ongoing iterative development and testing of four distinctive search portals on birds. The search portals are developed within the EU STERNA project and address different target user groups. Based upon specific use case scenarios the search portals are tested and validated in four specific phases, applying three different testing methods: WAMMI online evaluation, focus group evaluation and task-based usability tests. The paper introduces the four search portals, depicts the testing methodology and presents the first results from the ongoing user validation process.

Index Terms — digital library, web based search portals, iterative testing and development.

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1 INTRODUCTION

This paper presents the ongoing iterative development and testing of four search portals on birds, each addressing a particular target user group. The search portals have been developed as part of the EU funded *eContentplus* project STERNA. STERNA is a best practice network and stands for Semantic Web-based Thematic European Reference Network Application (http://www.sterna-net.eu). STERNA comprises 13 organisations and research institutes in the fields of natural history, wildlife and biodiversity. The project started in June 2008 and will finish in November 2010.

R. Steinmann, A. Strasser and A. Mulrenin are with the Salzburg Research Forschungsgesellschaft mbH, Jakob-Haringer-Strasse 5/3, 5020 Salzburg, Austria. E-mail: (renate.steinmann, andreas. strasser, andrea.mulrenin)@salzburgresearch.at.
S. Pieterse is with The Netherlands Centre for Biodiversity Naturalis, PO Box 9517 2300 RA Leiden. E-mail: sander.pieterse@ncbnaturalis.nl.
A.Trayler is with Archipelagos, Institute of Marine Conservation, PO Box 1 Rahes 83301, Ikaria, Greece. E-mail: amy.trayler@archipelago.gr.
I. Teage is with Wildscreen, Bristol BS14HJ, UK. E-Mail: ivan.teage@wildscreen.org.uk.
J. J. Borg, M. De Giovanni and N. Zammit are with Heritage Malta, Valletta VLT03, Malta. E-mail: (john.j.borg, michael.de-giovanni, noel.zammit)@gov.mt.

Following the goals of the European Digital Library Initiative, STERNA seeks to create a distributed and networked information space on nature and wildlife. The main architecture of STERNA utilizes semantic web technologies and standards which allow distributed querying of content based on metadata represented in the RDF (Resource Description Framework) format as well as reference structures represented in the SKOS (Simple Knowledge Organisation System) format.

Related work to this paper includes a short paper depicting the user validation process of STERNA which we have submitted to the Euromed 2010 Conference in Cyprus.

The following chapters describe the four search portals (Chapter 2), the ongoing user validation process and methodology (Chapter 3) and present results that are available after finishing the first two phases of testing (Chapter 4).

2 Four STERNA Search Portals on Birds

Birds and bird-related information are the main focus of the STERNA information space. STERNA addresses a wide range of target users that are interested in birds, ranging from dedicated bird watchers to wildlife enthusiasts in general.

Against this background, we wanted to develop search portals that address different user communities and that meet their specific requirements. To do so, we decided to adopt an iterative design and development process, in which we continuously develop, test and refine different search portals.

The search portals are based on four use case scenarios which were developed by STERNA partners.

The use case of the Netherlands Centre for Biodiversity Naturalis (NCB Naturalis) is targeted at bird watchers, a dedicated group of users that ranges from the more casual to the professional bird watcher. Wildscreen/ARKive, a UK based organisation promoting the appreciation of wildlife, has developed a use case that targets a young and digitally savvy audience. The use case developed by Archipelagos, a non-profit environmental organisation that focuses on the marine and terrestrial biodiversity of the Aegean Sea, addresses boaters and tourists at sea; the fourth use case was developed by Heritage Malta and is targeted at the "humble rambler", a more general audience that is interested in birds.

All four use cases were developed based on a common template and included one or more user scenarios, i.e. typical situations in which users would make use of the STERNA information space to search for bird-related information.

Based on these use cases we developed prototypes of four distinctive search portals. Each search portal addresses a specific target group and offers particular search functionalities: While the Wildscreen/ARKive and Archipelagos search portals provide text based search functionalities, the NCB Naturalis search portal, which is aimed at the more experienced bird watchers, allows users to search for bird related content in different ways and to further refine search results (faceted navigation). In addition to text based search the Heritage Malta search portal also offers a silhouette driven search functionality to better identify and learn about birds.
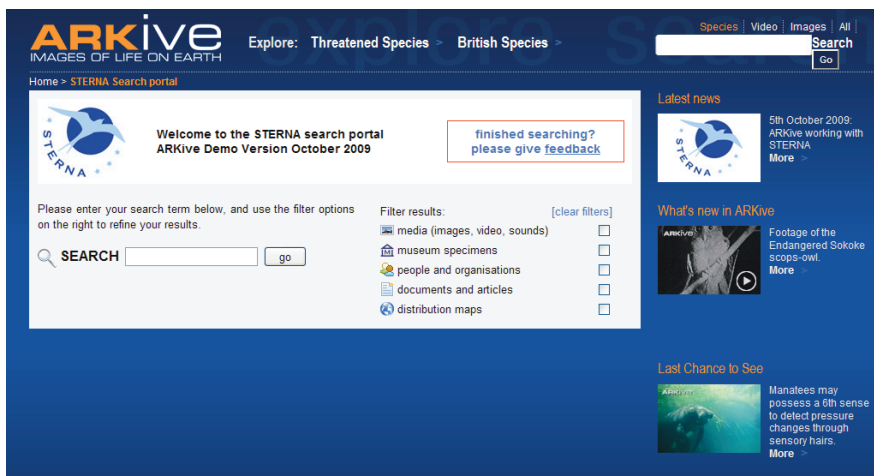
Fig. 1 – Homepage of the Wildscreen/ARKive search portal for young, digitally savvy users that was evaluated with WAMMI.

3 Iterative Development and Testing of STERNA Search Portals

After building prototypes of the four search portals we started iteratively testing and improving them against our target users.

Testing and development in STERNA follows an iterative and user-centred design approach for developing interactive systems. The major principles of this approach are a strong focus on the actual end users—which means that a system should suit the user rather than making users suit the system—and iterative design—which means that the search portals are designed, tested and modified repeatedly. Users are involved actively and early on in the design process: this helps us to gain a deeper understanding of user problems and to avoid taking wrong design paths [1].

The iterative testing and development process in STERNA encompasses four phases: A first online WAMMI evaluation; focus group evaluation; task-based usability tests; and a second online WAMMI evaluation. Due to limited available resources, we apply the WAMMI evaluation only for the NCB Naturalis and the Wildscreen/ARKive search portals. The more in-depth focus groups and task-based usability tests are applied for all four search portals.

The focus of testing in all these phases is both on the usability of the user interfaces as well as the presentation of content and search results.

3.1 WAMMI evaluation

WAMMI stands for Website Analysis and Measurement Inventory and is a web based analysis tool for testing and measuring the user satisfaction of a website or a web based solution. User satisfaction is measured in terms of attractiveness, controllability, efficiency, helpfulness, learnability and the overall global usability. WAMMI requests users to fill in an online questionnaire and to assess a web site or solution. It then compares the user reactions with values generated from

a comprehensive reference database of other tested sites and solutions, thus giving a better understanding of the quality of the tested solution(s).

We developed an online WAMMI questionnaire for evaluating the STERNA search portals which includes the standard 20 WAMMI statements as well as additional questions. It also invited users to comment on the ease-of-use of the search portals and to provide suggestions for how to improve them (see: www. wammi.com).

3.2 Focus Group Evaluation

The main objective of the STERNA focus groups is to identify shortcomings and problems of the four search portals as well as develop ideas and suggestions of how to improve them.

Focus groups are conducted with a small number of representative users. A moderator steers the focus group discussion without discouraging the participants from expressing their thoughts. With focus groups we can identify opinions, attitudes and preferences from participants and gather insights that are sparked by group interaction [1], [2].

3.3 Task-based Usability Tests

With usability tests representative users are requested to perform real-life tasks and thereby to evaluate the usability of the search portals.

While performing the tasks users are requested to comment on any usability problems they encounter ("thinking out loud"). Throughout the tests, users are video-taped for documentation and later analysis (with the documentation kept anonymous and confidential). After the test, the moderator and test users revisit the video documentation of the test in the form of a semi-structured interview, which allows the user to reflect on the test and to provide further feedback [2], [3], [4].

4 First Results of User Testing and Development

4.1 Status of user testing and development

User validation of the Wildscreen/ARKive and the NCB Naturalis search portal started in October and November 2009 respectively with the first round of WAMMI evaluation. Testing continued until early February 2010 when we received WAMMI evaluation reports and content analyses of the user comments provided.

Based on the findings from the WAMMI evaluation, both search portals were improved and then—together with the search portals from Heritage Malta and Archipelagos—tested in focus group evaluations. These took place in June/July 2010. We are currently integrating feedback from focus group evaluations to further improve our search portals. In late July/August, we will conduct the task-based usability tests, to be followed by the second round of WAMMI testing in September/October 2010.

4.2 FINDINGS FROM WAMMI 1 AND FOCUS GROUP EVALUATIONS

64 users filled in the online WAMMI questionnaire for evaluating the NCB Naturalis search portal, and 94 users filled in the questionnaire on the Wildscreen/ARKive search portal. Both search portals were rated below average in relation to the WAMMI reference database (i.e. the web sites and solutions that were previously tested), with the Wildscreen/ARKive search portal being rated considerably better than the NCB Naturalis search portal.

The NCB Naturalis search portal received a mean global usability score (GUS) of 21.8, the Wildscreen/ARKive search portal (targeting a young, digitally savvy audience) a mean GUS of 41.4 (on a scale from 1 to 100, where one is lowest and 100 highest; 50 represents the average of the reference database of tested web sites and solutions). For both search portals we received a considerable amount of positive user feedback, which helped us in specifying the main usability problems of the search portals, as well as providing us with valuable suggestions of how to improve them.

The four focus group evaluations conducted in June/July 2010 helped us in further specifying problems of our search portals. After discussing and identifying the main problems of the four search portals, participants provided us with concrete ideas and suggestions for how to tackle these problems and improve the search portals further.

While user feedback from the WAMMI and focus group evaluations was distinctive for each search portal assessed, it also showed us some common problems of our search portals that we need to address.

The visual interface design of the search portals was often not regarded as very attractive and also the search results presented should generally be more visual. Users often remarked that they would like to get more images, video or audio recordings while they were, usually, less interested in metadata lists. Users also noted that the search functionalities and filter mechanisms need to be improved in order to deliver more fitting results to target users. Navigating through the search portal could also be difficult at times, and some users also remarked that they were unsure about the purpose of the search portals.

The search portals thus have to be more intuitive and visually appealing, deliver more fitting results, and their meaning and functionality need to be more apparent for users.

5 CONCLUSIONS

The iterative design and testing approach that we applied has helped us in identifying usability problems of our search portals early on in the development process and hence to make the design and development process as resource and cost effective as possible. It has also helped us to better meet the needs and requirements of our respective target user groups. With the next two phases of user testing we expect to further improve our search portals and make them more user-friendly (however, since they are developed as part of a best practice network project, the final search portals will not be "market-ready products", but advanced prototypes).

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