Effectivity testing of Project SARAI’s Interactive maps

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# ABSTRACT

project SARAI’s mapping feature is in its early stages of development and the mapping feature has not been tested yet on its effectivity and usability, from which it may greatly benefit if done so before deployment. The mapping feature will undergo different testing techniques to evaluate its effectivity. After testing, features and changes will be suggested to the development team based on the results of the study. Interviews will be conducted, as well as hands-on testing of the prototype of the interactive maps will be done. Participants will be selected from a target audience, which includes the project stakeholders.

# INTRODUCTION

Project SARAI, an effort that promotes agriculture as an industry and aims to help farmers in various ways, part of which is through an online website with interactive features. This includes an interactive mapping feature that displays a specific crops vulnerability, suitability and hazard mapping on a Philippine map. As a feature, this should be visually appealing, interactive, as well as simple and easily understandable, so that users may be able to utilize this effectively and as soon as possible.

SARAI’s mapping feature is still being developed, and has not been deployed yet. These interactive maps will provide farmers with information critical in helping them make decisions through visual representation. The feature presents a lot of potential and possible benefits, as a user may be able to easily check if a certain crop grows well in a certain location. This also means that a user may be able to check which crops would grow well in a certain location, which crops would be most vulnerable in a certain location, which threats different crops face depending on location etc., giving the user a suggestion as to which crop to plant and which not to, based on where they are located. Given the lack of input and information from stakeholders as to the effectivity and usability of the system, the project would greatly benefit from a study that would test the features’ usability and effectivity.

The suitability, vulnerability and hazard interactive maps will be tested for effectivity and usability through various methods, this may include interviews with the projects stakeholders, as well as testing the mapping feature’s prototype for usability, navigability, and overall user experience. This would be beneficial not only to the ICS community, as improvement of the mapping feature based on the study will help in boosting the project’s effectivity as a whole, but also to the various stakeholders, particularly the farmers that will be using the system.

**RELATED WORK**

Interactive maps in general have been very helpful and have been widely used by different kinds of people for different purposes. With web maps usage becoming mass, the newly built web maps solutions have to be inevitably adjusted to user’s needs (Balciunas, 2013). As an integral part of the services that the web provides, mapping features need to be adjusted towards ease of use in favor the user’s different needs, as this affects the results and success of the mapping feature. Successful identification and realization of these needs determine if the newly built map will become successfully used (Balciunas, 2013). To successfully test the effectivity of the interactive maps, we need to check as to what degree users are able to:

• Understand the purposes of geo- visualization tools and learn how to use them;

• Retain the acquired skills after some period of not using them; and

• Develop a liking for the tools rather than being afraid of them.(Andrienko et al., 2002);

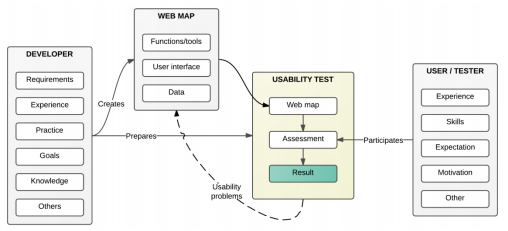
We also need to compare our study with other previously conducted studies that have tested other mapping features concretely, for example Usability Problems of Web Map Sites (Nivala et al., 2007) and discuss the various limitations of researching about interactive mapping and visualization, for example, research challenges in Geovisualization (MacEachren A. Kraak MJ, 2001).

Concrete testing techniques that may be used to test the usability and effectivity of the interactive maps will be used, as demonstrated in Evaluating the Effectiveness of Interactive Map Interface Designs: A Case Study Integrating Usability Metrics with Eye-movement Analysis (Coltekin et al., 2008). Testing the user experience for the website will be critical as well, as shown in Observing the User Experience: A practitioner’s Guide to User Research (Kuniavsky, 2003), Measuring the User Experience: Collecting, Analyzing and Presenting Usability Metrics (Tullis and Albert, 2013) and The Elements of User Experience (2004). Another helpful study would be the different usability techniques and observations regarding sample sizes, as shown in Beyond the five-user assumption: Benefits of increased sample sizes in usability testing (Faulkner, 2003).

Apart from the other references mentioned, this study aims to provide a more specific insight as to the usability of interactive maps, in particular one that focuses on agricultural elements, which sets it apart from the others, providing a new case that emphasizes points in the fields of web programming, geo-visualization and agriculture.

**METHODOLOGY**

As a study that aims to provide feedback as to the effectivity and usability of project SARAI’s interactive maps, several methods and techniques of testing will be used.



**Figure 1.** The standard process of usability researches (image from User-Driven Usability Assessment of Internet Maps (Balciunas, 2013))

As demonstrated in the scheme above, we will employ a similar approach in conducting the study, with a prototype of the Interactive map available. First, respondents, which will be comprised of various stakeholders of the project (this includes team members of project SARAI’s project 1 and project 2) will be interviewed and given questionnaires as to how they view the interactive maps and how it will be able to help agriculturally, as well as its various aspects when implemented, meaning the User Interface, functionalities etc., as well as the information that they think are most crucial and needed by the end-users.

Tests will also be conducted wherein respondents(end-users, particularly farmers) would have to use the prototype of project SARAI’s interactive maps, and rate the overall aesthetic and usability of the feature. If, after some tests, some correlation is to be seen between the response of the respondents, tentative changes will be made to the mapping feature based on those responses and may be presented again to the previous respondents to check if the tentative changes helped, or may altogether be presented with new respondents simultaneously with the version of the interactive map that is unchanged and gather response based on the various advantages and disadvantages of the presented different versions of the feature.

Responses from both the questionnaires and the prototype testing will be gathered and compared with each other. The alternate version as well as the previously unchanged version of the prototype mapping feature may also be presented to the project developers and managers for more input and comparison of the different versions. The respondents will also be asked if they will use the information they got from the prototypes (if, for instance, actual data was given) and If they will plant crops based on the suitability, vulnerability and hazard maps as suggested by the mapping feature.

**EVALUATION**

this study aims to provide suggestions on project SARAI’s interactive maps, based on the outcomes of different trials, which will be evaluated using guided metrics for the interactive maps various functionalities and overall usability, particularly its:

• Effectivity – how well the map is able to provide information and suggestions that would be beneficial to the different users of the feature; and

• Usability – the programs ease of use; this loosely correlates to the interactive map’s rating based on User Experience, and how the user perceives the interactive map as a whole.

Both of these will be the main focus of the study. Questions in the questionnaire will put emphasis on the aesthetic, functionality, ease of use and overall coherence of the interactive map, and the prototype testing will be guided to answer questions regarding these elements of the feature. Based on the tests, the different versions of the prototype will be scored by the respondents as to the previously mentioned factors. Effectivity then would be tested based on their response if they will use the data provided by interactive maps, particularly if:

1. They will plant crops based on the suitability map
2. They will avoid planting crops if they are vulnerable in a certain area; and
3. They will take the information from the hazard map into account when planting a certain crop based on the certain risks it faces on certain places

Usability would then be scored based on the aesthetic, ease of use, functionality and simplicity of the various functionalities of the webpage, all taking into consideration the overall User Experience of the feature.

**TIMELINE**

The study will be conducted from early January, wherein the preliminary questionnaires will be provided until mid-February. Interviews will also be done during this time. The prototype testing will be done from mid-February until the end of April, wherein the tentative changes will be done in between the various prototype testings. The end-users will be contacted again by the end of april to test the prototype again, and score the different versions of the prototype based on the different metrics mentioned. The study will conclude by mid-May and the results will be presented to project SARAI as a third-party study of their project.

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