TAILORED USABILITY ENGINEERING METHODS AND TOOLS

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ABSTRACT

In usability consulting projects the executing expert is confronted with a wide range of requirements regarding practical issues, which aren't covered by conventional methods. The paper describes our approach to improve and accelerate professional usability consulting through the support of methods and tools, which are tailored specially for the use in this context. Two Examples – WRAT and EXDAT - concerning the analysis of web requirements as well as the capturing and structuring of fast expertise driven usability assessment findings are presented in detail to demonstrate the concept, show the advantages and provide experiences from real-life-usage.

Keywords

UE Support Tools, Usability Consulting, UE Methods

1. INTRODUCTION

Typically, usability engineering projects in the context of professional usability consultancy have to deal with constraints like pressure of time, tight deadlines, or the need for immediate decisions. The employment of conventional usability engineering methods in this context shows that they are pretty well developed from a methological point of view but usually there is little guidance given on how to efficiently use these methods in praxis. Additionally, modern technologies provide possibilities to improve the efficiency of these methods regarding the practical application. Characteristical issues emerging in practical use not or only partially answered in the common approaches concern aspects like writing reports, merging of findings from different team-members, integrating knowledge, analysing qualitative data, or storing of gained knowledge for future use.

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2. BASIC APPROACH

Our basic approach to overcome most of these problems is to support the usability experts and consultants in their everyday work by providing tools and environments that are tailored to the special conditions and requirements of the usage in a professional consulting context.

From our experience and internal focus groups we found that the following requirements are substantial for usability engineering tools and methods to provide optimal support. The tools and methods should:

- help to structure the work;
- automate standard workflows;
- allow to use, integrate and directly access the experiences from prior work/projects;
- provide fast and accurate access to information resources;
- provide possibilities to immediately produce, analyse and communicate results;
- enable to include the results from a project directly into an experience database for future use;
- provide the possibility to be adapted easily to emerging requirements and changing conditions;
- be flexible enough to meet different needs in different projects.

3. EXAMPLES

According to this approach we have developed two tools with the aim to meet these requirements and provide optimal support for the experts. In order to demonstrate the concept, we characterise the background of the tools, discuss

the underlying method, describe the application of the tools in exemplary situations and present examples and experiences from projects.

3.1 WRAT - Web Requirements Analysis Technique

Typically in usability engineering, a requirements analysis stands at the beginning of any development process [3]. Especially in web site design, gathering requirements about users, their goals and tasks etc. is of primary importance, because these decide whether the web site will meet the future users' needs, and thus will be successful or not. The results from a requirements analysis serve as an indispensable basis for feature and user interface specifications as well as for a number of organisational and business decisions throughout the development process [4].

However, requirements analysis activities are not carried out at all (or at least not sufficiently) in the majority of web projects, and definitely hardly ever from the usage perspective. This not only leads to unusable and often useless web systems but also to increased development efforts and repeatedly discarded designs. The reasons for this malpractice can be found in the lack of respective knowledge and skills as well as available methods and tools. Therefore we developed WRAT, a requirements analysis technique that is implemented in a web-based tool. WRAT enables a structured, methodological and therefore thorough gathering of requirements, incorporating also past experiences of the specific client, his sector or web based systems as a whole.

WRAT is developed for usage within a workshop, ideally with most representatives of a developing team (designers, programmers, marketing, business representatives etc). In such a "WRAT session" the team is guided through discussions on all relevant aspects of a web development. WRAT incorporates a very detailed set of questions and "issues" (requirements) that have to be considered in any development. These requirements are combined to so-called "views", (an issue can be found in more than one view) which each represent a specific perspective on the development (e.g. usage aspects view or organization aspects view) [2]. While discussing an issue (e.g. screen resolution), it is possible to regard former experiences and results from other projects (anonymous) and include these into ones' own considerations and decisions. This represents a highly valuable, unique possibility to methodologically capture experiences, enable learning transfers and also accompany website developments over a perpetual life cycle.

Dependent on the web site which shall be developed one can tailor WRAT insofar, that irrelevant issues or views can be discarded, but it is important to mention that this should only be done by an experienced usability engineer.

The WRAT views are:

- Frame of Reference. Includes the basic backgrounds of a development, e.g. its general purpose, outstanding characteristics, principal technical scope etc. Intended for rapidly forming a common principal understanding;
- Usage Aspects. Include typical questions about user groups, their tasks, and the context of use;
- Organizational Aspects. Include organizational aspects of the first development as well as the ongoing operation of the website;
- Strategic Aspects. Include aspects of the business model, marketing and communication issues as well as expected strategic impacts;
- Technical Aspects. Include technical restrictions and possibilities.

The views need not to be handled in a specific sequence, although certain aspects are recommended to follow other ones. For example, the frame of reference serves as a basis for all other views and should thus be the very first view to be discussed. Most other views include aspects which need to be considered from various viewpoints (in various views) and therefore any sequence is equally suitable. A very important feature of WRAT is, that if an issue has already been discussed within one view, all notes, decisions etc. will be seen when discussing that issue in other views.

Through the integration of an experience database, where not only best practices and decision templates from previous sessions, but also common statistics about web usage or web user characteristics are captured, a highly interactive session can be achieved and all decisions can be founded in a valid way.

During the session the statements and decisions are journalised and projected onto a wall in real time. This enables the participants to easily keep track of the discussion process. WRAT is designed in a way that it best possible supports the needs of the session participants as well as the moderators and analysts, each seeing and interacting only (with) those parts, user interfaces, and contents, which are required for their specific role in the session. For instance, while the analyst types in discussion points and results on specific issues (logging mode), the

participating designer cannot see the monitor's typing unless the monitor actively releases it for joint adjustments or even votings (presentation mode). At such times the participants might, for example, only see the headline for the discussed issue and statistics on relevant existing experiences from former projects. This is also a very valuable feature from the moderations perspective because it is very distracting for participants if they are always tempted to read the typing of the analyst.

In the post-session phase, the administration interface is used to generate a session report with all discussion points, open issues, decisions etc. The report can be immediately printed out, so that all participants can leave with the results directly in hand. Waiting for reports and protocols is no longer required.

3.2 EXDAT - Expertise Driven Assessment Tool

EXDAT was developed to serve as a usability assessment support tool, which enables the expert to review systems rapidly. This means that the main goal is not to conduct a review that covers every aspect of the system but to efficiently collect findings that can be used immediately for various purposes (e.g. first feedback in early design stages).

According to this background, some special conditions have to be considered. The results should facilitate the extraction of relevant information and provide a clear image what the main usability drawbacks are and how the overall usability is rated.

The proposed methods on doing usability assessments are mainly to follow predetermined guidelines, checklists and procedures whereby these procedures differ slightly in their main focus. Although this approach surely is very reasonable and well established it doesn't fit the special needs in rapid assessments very well.

From observing and analysing the work of experienced usability experts we found that - especially under conditions of time constraints - the experts are diverging from the "ideal" process. They are adapting the proposed procedures to their own and the projects needs and combining elements from different approaches. Watching an expert you can get the impression as if she/he where following multiple guidelines at once. Additionally you'll find approaches and procedures an expert has invented himself and can't be found in any guideline. Thus, the common solutions and guidelines for collecting and capturing usability findings don't fit the needs properly in all conditions.

The methodological basis of EXDAT is derived from socio-psychology, where "structuring of spontaneous associations" is used for product testing [1]. This method enables the participant to communicate his impressions on a product in a totally free manner. Nevertheless, it still allows the person conducting the test to analyse the results and comments in an efficient and reliable way (which is usually not easily the case for qualitative, verbal comments). The original method has been adopted to meet the needs of a usability engineer, who assesses a systems usability following his intrinsically applied expertise and not necessarily following explicit rules. He approaches his tasks solely expertise driven.

While analysing a user interface, the expert very briefly writes down his usability findings (good and bad ones), in the order that they are identified. Thereby the approach of the expert is guided by his knowledge and experiences.

These findings are then each rated on a scale from –2 (bad) to +2 (good) regarding their relevancy for the products usability.

Then all findings are categorized by the usability expert, whereas the categories represent areas and aspects of the system. This categorization has been developed based on intensive usability assessments experience and serves the purpose of a) achieving an overall usability ratings of the system and b) identify especially problematic areas (e.g. navigation).

Through this methological approach it is possible to quickly and easily analyse the comments and ratings of the experts while not forcing the expert to adapt his "style" to a predetermined structure. Furthermore, this approach provides fast and reliable comparative assessments. Through the collection of the results in our experience database it is also possible to assess the system usability in comparison to related products.

4. CONCLUSION AND FUTURE WORK

WRAT and EXDAT were designed to be part of our Usability Engineering Environment that supports single phases of a Usability Engineering process as well as the whole process itself.

WRAT has shown to be a unique tool to integrate various (partly competitive) interests and perspectives in requirement gathering and to achieve a sufficiently complete requirements base for further activities in the development process. The integration of an experience database has shown to be of major value for all involved parties. Future work on WRAT will include the extension of the issues as well as the transformation into other areas (e.g. mobile devices).

EXDAT is a tool to facilitate the daily routine of expertise driven rapid usability assessments. Expertise driven assessments are performed straightforward and deliberated from following specific checklists or procedures. EXDAT has proven to work well for rapid reviews. Now we are investigating the potentials for applying an adapted EXDAT to support the whole assessment process.

We found that also the methods and ways of the different experts have proven to be worth further investigations, which we plan to study in detail.

Also we plan to conduct comparative studies on the efficiency and accuracy of the findings with and without tool support.

5. ACKNOWLEDGEMENT

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6. REFERENCES

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Tailored Usability Engineering Methods and Tools

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Overview

Introduction
Basic Approach
WRAT & EXDAT
- Scope
- Concept
- The Tool
- Experiences

Recommendations
Conclusion

Introduction

The Situation

Typically in professional usability consulting projects you have to deal with challenging constraints and requirements like

- pressure of time
- tight deadlines
- the need for immediate decisions
- limited resources
- ....

Introduction
The Questions (1/2)

Considering this requirements and constraints in doing your job there are some questions emerging like:

How to

- produce and report results immediately;
- merge the findings from different experts in an efficient and comprehensible way;
- integrate the knowledge gained in prior projects or from external resources

Introduction
The Questions (2/2)

- communicate and present the done work fast and properly
- analyse and report qualitative data in a proper and efficient way
- store and provide access to findings and experiences for future use

Basic Approach
Not the Holy Grail

Our basic approach to answer at least part of this questions is to

- think about them
- do research on how this problems are dealt with now
- study related solutions especially in the field of knowledge management and

last but not least

- provide our experts with tailored tools and
- continually further develop our UE environment

Basic Approach
Requirements (1/2)

The supporting tools should:

- help to structure the work
- automate standard workflows
- allow to use, integrate and directly access the experiences from prior work/projects
- provide fast and accurate access to information resources

Basic Approach
Requirements (2/2)

- provide possibilities to immediately produce, analyse and communicate results
- enable to include the results from a project directly into an experience database for future use
- be able to be adapted easily to emerging requirements and changing conditions
- be flexible enough to meet the different needs in different projects

Examples
What we´ve done

WRAT

- Web Requirements Analysis Technique
- web based tool to support gathering and further utilization of requirements in web site development

EXDAT

- Expertise Driven Assessment Tool
- computer supported method for rapid expertise driven usability assessments, comparisons and ratings

WRAT
Scope

Scope of WRAT
- usage within a workshop
- team is guided through discussion
- detailed set of questions
- while discussing it is possible to access further information
- capturing of discussed topics/decisions
- print reports immediately
- save data for future use

WRAT
The Concept

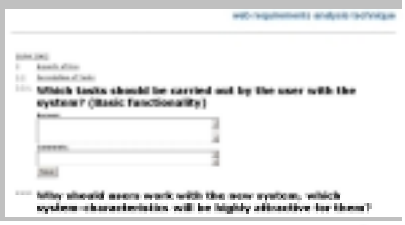
WRAT
Views

WRAT Views
- Frame of Reference
- Usage Aspects
- Organizational Aspects
- Strategic Aspects
- Technical Aspects

WRAT
Screenshots

Presentation Mode

Logging Mode



WRAT
Preparing

Preparing a WRAT Session:

- select relevant questions
- if needed: ad questions
- define sequence/order
- provide links to resources, best practice examples, ...
- prepare materials (agenda, ...)
- ensure access to Internet

WRAT
Running

Running a WRAT Session
Presentation mode:

- agenda
- WRAT questions
- logged discussion
- experiences, background information

Logging mode:

- log discussion process
- add new questions/topics

WRAT
Post Session

Post-session activities:
- generate session report
- print report
- adapt templates if necessary

WRAT
Experiences

Experiences from use:
+ clients like it
+ preparation and capturing effort is reduced
+ integration of examples & information ressources fasten up decisions
+ the tool improves itself

- web-access or synchronisation problems
- layout possibilities of taken notes are limited

WRAT
Some Notes

Note: using supporting tools like WRAT doesn´t mean
- you don´t have to prepare a workshop well
- emerging disagreements needn´t to be handled carefully
- just writing down an answer means everyone is agreeing
- you should hide behind a laptop during the workshop

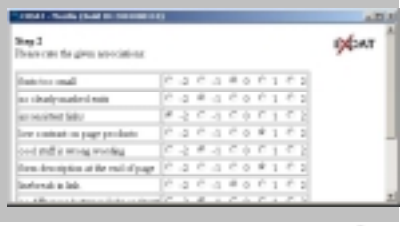
EXDAT
Scope

Scope of EXDAT
- conducting rapid expert based reviews
- capture findings & enable comparative assessments
- merge results from different experts
- support automated, quantitative analysis
- support time-splitted assessment work flows

EXDAT
Concept

Basic Concept
- derived from socio-psychology
- „structuring of spontaneous associations“ used for product testing
- reversion of guided process / checklist approach:
  associations first, then rating, then classification

EXDAT
Screenshots



EXDAT
Conducting

Conducting a Review
- Step 1: Entering Findings
  - the expert enters every found usability problem into the tool
- Step 2: Rating of Findings
  - the findings are rated regarding their impact on the whole systems usability on a scale from –2 (bad) to +2 (good)
- Step 3: Classification
  - the associations are then assigned to predetermined categories

EXDAT
Analysis & Results

Running Analysis and Reporting Results
- automated process
- ratings for categories / whole system
- including comments of reviewers
- possibility to produce charts
- comparison to other projects
- automatically added to experience database

EXDAT
Experiences

Experiences from use:
+ easy to rapidly produce results
+ parallel and time-shifted working possible
+ findings can be used for multiple purposes
- classification of findings is sometimes difficult
- comparability depends on amount of findings

Version 2 is under construction
- applying the concept to whole assessment process
- solving the classification/comparing problems

Recommendations

In case you´re going to develop your own tools

- don´t think about tools for workflows needed only once a year
- make sure the tools can be adapted easily to new conditions
- integrate your tools into an environment
- keep development effort low until you know it‘s worth the trouble

Conclusions

Well designed and tailored tools may

- provide new possibilities,
- support high quality consulting and
- help save time and money.

Thank You!

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