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Entry-Level free Commercial databases: A Usability Study.

Covering Oracle G10 Express Edition, DB2 Express-C 9.7.2 edition and SQL Server 2008 R2 Express Edition

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Abstract

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Title of report **Entry-Level free Commercial databases: A Usability Study.** *Covering Oracle G10 Express Edition, DB2 Express-C 9.7.2 edition and SQL Server 2008 R2 Express Edition*	**Number of pages and appendices** **46 pages, 9 appendices.**
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In this thesis, some theory of usability is first explained to give readers some context about the tests that took place afterwards The purpose of this thesis was to clarify some general components of usability and explain the principles of usability testing that were used in the test.

The readers, now armed with this knowledge of usability, can understand and appreciate better the test plans for the Usability Testing that took place on 16th of December 2010 at Haaga-Helia UAS.

Within this thesis project, two tests were conducted: a Cognitive Walkthrough and a Heuristic Evaluation of three commercial DBMS products and the official websites that provide help and support for these products.

The tests were quite succesful and produced copious amount of data that was used to generate some reccomendations about the products. The tests revealed that all the products had their strong and weak points.

In addition to these recommendations, there was also feedback received during the tests. This feedback will hopefully help other students and researchers to conduct similar tests in the future.

Keywords
Usability Testing, Heuristic Evaluation, DB2, Oracle, MS SQL Server, Cognitive Walkthrough, Thinking Aloud.

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1 Introduction

Exploring the exciting topic of Usability as it is applied to software and web pages is this thesis purpose. The thesis will be divided in two main parts, one purely theoretical in which the main points of Usability, focused on what will be useful for the second part, will be explored and explained. The second part will consist of a Usability test of three major Database software available on the market at the moment and their self-service help pages linked with the products.

The hope of the writer is to increase awareness of Usability both in the general public and in the development communities and how important such a subject is especially as our options in User Interfaces Design open up and become more and more advanced.

It is easy to notice how User Interfaces progression is going nearly as fast as the progression of computers and electronic devices in general. A few decades ago Input and Output were completely separated; there was no interaction at all between man and machine as the man inserted countless punch cards in the computer that then spitted out an answer, also on paper.

Things have progressed from then to first an interactive text interface on a monitor accessed by a keyboard to more advanced graphical user interfaces that also required a mouse and presented visually what the program was doing. Things are not slowing down at all and already we have User Interfaces using other senses than just vision like Haptic interfaces, i.e. Interfaces based on touch, with vibration being the most common use.

The idea of 3D is also experiencing a revival of interest and as interfaces advance and progress, their usability must keep pace. In the following chapters we will see what elements of an interface can be improved in various fields and how to measure such improvements in a scientific way where possible. Before getting all the way there, we must start with the basics, in this case to learn what Usability is.

2 What is Usability?

Usability is an IT discipline that has existed under different names, in one form or another, for as long as IT has existed.
In the earliest part of IT history, however, developers did not care too much about Usability due to other technical concerns and the limited use of these early computers.

During the development of IT this discipline has gone through a series of names like “user friendly” and it finally settled on Usability, hopefully for good.

In its modern form, Usability is part of the bigger concern of system acceptability which main goal is to find out if systems will have all the necessary features to satisfy all their intended functions (Nielsen 1993, 24).

2.1 System Acceptability

This concept includes a variety of topics that will not be covered here in details, but just mentioned. For first, it divides in two major fields: practical and social. We will talk about the practical one later on, but let’s discuss the social one for a moment.

Social acceptability refers to all those social issues that may arise due to the system. For example a system asking its users to reveal their real name to post on normally anonymous internet forums might be seen as socially unacceptable by some and as very welcome by others (Nielsen 1993, 24).

Usability, however, is not concerned with the social issues and so we will ignore social acceptability from now on. What Usability is concerned with is the other big field: Practical Acceptability.

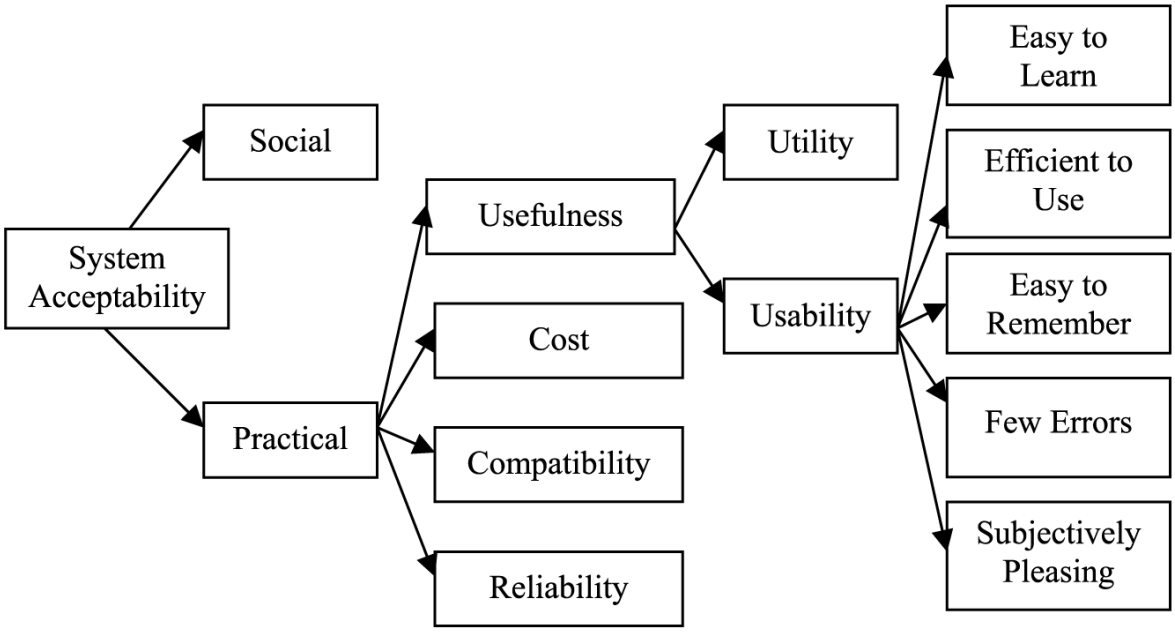
Practical Acceptability is also divided into various fields, like cost, compatibility, reliability and many others. One of these fields in particular is defined as Usefulness, meaning the field describing if the system can be used to do some specific

goal or to achieve what was originally wanted by the developers. (Nielsen 1993, 25).

Once again, Usefulness can be divided in two separate fields: utility and usability. Utility is the field describing if the system in question can function and reach its intended goals while Usability is concerned with how the users of the system can obtain such goals. (Nielsen 1993, 25).

As an example, the utility of an entertainment product would be if the product is fun to use, while its usability is if the users of such product can achieve the fun in an easy to use and intuitive way or if instead only a limited number of users will find the product to be fun, not because it isn't, but because they could not access all the functions of the system in question.

Here is a picture illustrating in a visual way how System acceptability is broken down.
We can easily see from the picture below that Usability is also broken up in different fields that we will describe in the following chapters (Nielsen 1993, 25).



Source: Nielsen (1993)

Figure 1

2.2 The components of Usability

As we found out from the previous chapter, Usability is merely a part of a much bigger issue, but even as a component of a bigger whole, Usability has sub-fields of its own. This is necessary because such fields are easily measurable in an engineering project and this gives the concept of Usability some much needed practicality. (Nielsen 1993, 26) We will now briefly describe the various components.

2.2.1 Learnability (Easy to Learn)

Perhaps one of the most important components of Usability, Learnability is concerned on how easy is for users to learn the system. This can be further described as how easy is for the users to start using the system once they have learned a little bit about it and how fast a user reaches a certain degree of knowledge of the system so to be considered a "learned" user.

All these can be easily measured for example by having users that have never seen the system try it out to see how easy they can learn its functions, or, in another example, the level of preparation of users can be measured by having them complete a task or a series of tasks in a certain amount of time, if they succeed then they have learned the system enough to pass this test.

It is also important and measurable to find out how easy is the system to "self-learn", meaning that many users will learn some bits of the system and then start using it right away, picking up more information as they go. This is usually measured by asking new users if they found the error messages useful and if they managed to figure out on their own how to do this or that operation. (Nielsen ,1993, 27-29)

2.2.2 Efficiency of Use

Efficiency here does not concern novice users at all, but instead focus on the expert and all those users that have learned "Enough" and whose learning curve has

reached the plateau meaning the user feels he knows enough of the system to do almost all everyday tasks. When such a time comes, the user is considered an expert and efficiency can then be measured by again asking the him or her to execute some task or series of tasks and checking how long and how well such tasks are executed. (Nielsen 1993, 30-31)

2.2.3 Memorability (Easy to Remember)

Memorability refers to how easy is the interface of the system to remember. This is an important factor and is distinct from Learnability even if systems that are easy to learn tend to also be easy to remember.

Casual users in particular, meaning those users that access the system only occasionally, are the most affected by this field that is however also very useful for systems that by design are used only occasionally, like the fire emergency exits and indeed their signs are quite easy to remember, or for users returning from a long period of absence, like from an holiday.

There are two main ways of measuring Memorability in a system: by performance testing of casual users that have been away from the system for a certain amount of time, or by having users test the system and then asking them questions about the various commands and icons they used to perform this or that operation.

The first method is more efficient and predictable as many systems nowadays tend to show the user all available options so even if the users do not remember them all, he will still be able to use the system. (Nielsen 1993, 31-32).

2.2.4 Few and Noncatastrophic errors

An ideal situation would have users never committing any errors when using the system. Such situations rarely ever happen, so measuring the quantity and quality of errors an user make while using the system is a valid guide to how Usable is the system overall.

There are two main type of errors: minor errors that the user will correct almost immediately do not need to be tested separately as the only thing they will achieve is to slow the user down and that can already be counted when measuring Efficiency for example; catastrophic errors on the other hand should be considered separately, these are significant errors that can cause some damage to the system and may not even be recognized as such by the user.

Recognizing and eliminating these errors is quite fundamental to the Usability of the system especially in the case of a user doing such an error while unaware of the problem. (Nielsen 1993, 32-33)

2.2.5 Subjective Satisfaction

Finally, once all the other measurements are taken, there is the matter of Subjective Satisfaction, i.e. what the user thinks of the system.

While it is possible to obtain the comfort or frustration level of an user with a complex psycho physiological test that is comprised of various physical tests of the user's condition while using the system, it is much more common and less intrusive to just present the user with a questionnaire or even a brief interview about his experiences with the system.

Such tests will invariably be subjective and will reveal certain things that may not be present in the system itself but just perceived by the user; for example users tend to think a system is hard to use because it has a very big manual, when the two do not necessarily have any correlation with each other. The answers of many users should provide highlighting of those experiences that share commonality across the users' spectrum.

Subjective questionnaires comes in many different forms, from free form questions to scales with which to rate the system in various areas. If asking questions, it is a well known practice to have certain question be positive (for example "How well did the system functions?") and others to be negative ("How frustrating was to com-

plete the tasks of the test?") so that certain users tendency to always answer in the positive or negative will be countered. (Nielsen 1993, 33-37).

Now that a general idea of what Usability is, we will concentrate on Usability Testing in general and then in details about the two techniques that will be used in our own test.

3 Usability Testing

In this chapter, we will describe in general what Usability Testing is before focusing on the two techniques selected for this test.

For Usability Testing, it is intended the process of testing a system's user interface with the users themselves. There are several techniques of testing that do not involve users, but it is considered wise to involve them in at least some of the tests (Nielsen 1993, 165-166).

There are, however, a couple pitfalls that can emerge from user centred testing that can invalidate the whole process: reliability and validity.
It is then a good idea to familiarize with them and be prepared to counter them (Nielsen 1993, 165).

Reliability is intended as the fact that if the test is repeated, the results should be the same or similar to the previous ones. It is possible, for example, to test users on a certain piece of software and noticing that User A was much faster when using interface X than User B using interface Y. But this could just be because User A is a faster user than User B in general, as such if the test would be repeated inverting the interfaces, it would probably generated quite different results.

It is impossible to remove completely this problem from user testing, as each user will be different, but by being aware of its existence and of statistical confidence intervals; its risk should be minimized (Nielsen 1993, 166).

Validity instead is about finding out if the test performed had any validity or if it was completely useless. This problem has much to do with the selection of users for the test or about giving them the wrong tasks to perform; for example using History students when testing complex technical software would not be the best of solutions, while using the students of an IT technical school would be more appropriate.

Another problem linked to validity is the fairness of the test and making sure no external inputs are falsifying it; for example, testing two similar interfaces on drastically different hardware may become a comparison of the hardware more than the interfaces. (Nielsen 1993, 168-169).

Once these problems are being considered, the actual test can be designed. There are various stages to a usability test and they will be described in the following chapters.

3.1 Test Plan

Before any test can be executed, it needs to have a precise goal. There are two main reasons to perform a usability test, either for a formative evaluation, meaning that the test will help the development of the application by highlighting what is good and what is bad in the interface so that the next one will be better, or comparitive evaluation where two or more interfaces are being evaluated against each other to find out which one is the best for the company's interests. (Nielsen 1993, 170).

Once the goal has been decided, the test plan must be prepared. The plan should answer all the questions about the test, such as what is the goal, where the test will take place, who will be the testers, what systems will be used for the test, what aids the testers can use during the test and so on. (Nielsen 1993, 170-171).

Beside the plan, also a test budget should be created, detailing the various costs and use of personnel intended during the test.

Once the test plan is completed, but before starting the test proper, a pilot test should be conducted during which flaws and problems in the test itself should be highlighted and solved so that the proper test can go as smooth as possible. (Nielsen 1993, 174)

Once all the plans and the pilot test have been completed, it is time to find the test users.

3.2 Finding the testers

One of the fundamental parts of doing a Usability test is finding the right users. Such users should always be as near to the end users of the system as possible. In certain specific situations it is better to have a broader selection of testers, like in the case of sales personnel that are used to give presentations about the system without having much experience, if any, with the system.

These exceptions aside, the rule of thumb is to use testers that are likely to use the system once it is released. (Nielsen 1993, 175-176).

Beside this, one also has to consider using novice or expert users for the usability testing. This might be influenced by a number of variables including what is the end goal of the system (if it is a walk-in touch screen information device to be placed in a railway station, for example, then it will be used for the most part by users that have never seen it before, so using novice users is the wise thing to do), what kind of test is being performed (Heuristic evaluations, for example, work best when using expert users) and also what kind of resources are available for the test or even if such resources are available at all (if the system is revolutionary, then there would be no expert users available) (Nielsen 1993, 177.)

Beside their original skill level, it has to be considered also if the users should be given some training before the test itself. It is usually a good idea to let the users familiarize themselves with the environment before the test so to avoid any problems

due to that, but if the system requires it like in the walk-in example above, then maybe no training is given to the users at all.

3.3 Test Tasks

Once the plan is ready and the testers have been found, it is time to talk about the actual tasks that the testers will perform during the test.

The tasks that are chosen for the users must obey a few simple rules: they must be pertinent to the use of the software and they must cover a reasonable area of use of the system itself, so that no wide areas of the system are left without any testing.

In addition, they should be short enough to be completed in the allotted time for the test and should also be serious tasks without any joke or frivolous situation.

The tester should be allowed to ask questions about the task itself if nothing else so that it is sure he or she has understood what the task is about and finally, the first task at least should be quite simple, so to give the user the time to warm himself up and get acquainted with the system before starting to do something more complex. (Nielsen 1993, 185-187).

3.4 Test's stages

Each Usability test is not executed in a single chunk, but it is divided in to smaller stages, here the stages will be briefly introduced.

Preparation: during the preparation stage, the moderator will make sure that everything is ready for the test, both by checking the room and the systems. He will also make sure that all the questionnaires, paper forms or what not that is needed for the test will be prepared and ready for the testers (Nielsen 1993, 187)

Introduction: In the introduction stage, the conductor of the test will address the testers and explain to them several things about the test like what is the test for,

what the results will be used for, if the test is voluntary that they can stop at any time, if the test is confidential or not, a bit about the computer systems used in the test and other things like that. It might also be helpful, especially for some test types, for the moderator to give an example of how the test is done. (Nielsen 1993, 188-189).

Running the test: while the test is running, the observer should mostly do that: observe. He should refrain from giving comments and accept the user's feedback with as neutral a tone as possible to not reveal to the tester if he is on the right track or not. While this is true in general, there are a few exceptions during which the observer should intervene: if the tester is stuck on a known problem and he does not seem able to proceed at all with the test, then the observer can explain to the tester how this is a known problem and what to do to solve it. (Nielsen 1993, 190)

Debriefing: after the test is over, the testers should fill in any subjective satisfaction questionnaires prepared by the moderator and then they can comment to the moderators about anything else they noticed during the test. (Nielsen 1993, 191).

Now we will observe a bit more in details a couple of the techniques used for such tests, specifically the ones that will be used in this test, Heuristic Evaluation and Cognitive Walkthrough.

4 Heuristics Evaluation

Heuristics are a series of guidelines designed usually by experts that can be used in a system to make it more usable to the end-users. There are several lists of such guidelines and one of the main ways of testing the Usability of a product is to ask the testers to evaluate the system along the Heuristics decided to be used for the system.

4.1 A sample list of Heuristics Principles

What follow is a sample list of Heuristics for Usability with a brief explanation of each:

- **Simple and Natural Dialogue**: the concept of "less is more" and that the goal of a user interface is to provide exactly the needed information at the right time, no more information and no less (Nielsen 1993, 115-116)
- **Speak the users' language:** The interface should be designed from the user point of view and not from the point of view of the application or the developer, so the interface, for example, use clearly labelled references to currency (like USD for US dollars) instead of the internal code used in the programming. (Nielsen 1993, 123-129)
- **Minimize User Memory Load:** The user should not be asked to keep in mind countless details. If something is important enough, then display it and keep a record from screen to screen. (Nielsen 1993, 129-132)
- **Consistency:** The same information should be presented in the same way across the system. So boxes and position should be similar or same if possible. (Nielsen 1993, 132-134)
- **Feedback:** The interface should provide meaningful feedback to the user also in positive or neutral situation, for example having loading messages and informing the user also of the success of an operation. (Nielsen 1993, 134-135)
- **Clearly Marked Exits:** the system should provide clear way to cancel the current operation and/or undo the last operation. Boxes should have exit buttons and so on. (Nielsen 1993, 138-139)
- **Shortcuts:** even if the interface can be used with just general information, it should also provide shortcuts for experts to use, anything from keyboard commands to way to repeat often used operations (Nielsen 1993, 139-141).

- **Good Error Messages:** the error messages of the system should be clear enough to be understandable and should give at least a clue about what to do to fix the situation and they should not be strongly worded. (Nielsen 1993, 144-145).
- **Prevent Errors:** the system can be designed to prevent a long list of common errors from happening at all, as for example asking the user to select something from a drop down menu instead of typing it in. (Nielsen 1993, 147-148)
- **Help and Documentation:** the system should have both good instruction manuals but also good online help as it has been proven that most users do not read the manual at all and online help has the advantage of being able to bring up information related to what the user is doing right now. (Nielsen 1993, 148-150).

4.2 Evaluation

Once the Heuristic principles have been decided, it is time to perform some evaluation. This usually consists of having a series of examiners use the system and then asks them to compose their comments and idea either in written form or orally to an observer. These written comments should take in account the Heuristic principles provided but the examiner is of course free to add his own ideas to the list.

For the evaluation to be successful a single examiner is often not enough and studies have suggested that the ideal number is 5 examiners with 3 as the minimum. This is because different examiner will concentrate on different problems in the user interface. (Nielsen 1993, 155-156)

These evaluation sessions usually last 1 or 2 hours and include the work on the user interface and then the work on the heuristic checklist. They are different from normal user testing in that the interest is not in seeing what the tester will do with the interface and identifying the mistakes he make, but into providing the tester the most complete overlook of the user interface so that his professional opinion can be captured.

As such if an observer is present to these tests, he will answer most of the tester questions about how to use the interface, especially if the tester is a professional but not familiar with the program in question. (Nielsen 1993, 157-159).

Furthermore, testers are often given a series of typical operations that users go through when using the application or system so that the tester would have a starting point, especially if they are not particularly adept of that system.

Finally, even if multiple testers are used, each of them will work individually both with the user interface and in completing his answers. Once all the testers are done, their answers can be compiled and a proper evaluation can be considered. By utilizing at least 3 testers, it is guaranteed to find most of the usability issues present with a single system.(Nielsen 1993, 158-160).

The expected output from a Heuristic evaluation is a list of usability problems encountered by the testers annotated with their comments and links to the principles that were violated in those particular cases. (Nielsen 1993, 159).

Heuristic Evaluation will be one of the main ways this usability test will be conducted; the other method to be used is the cognitive walkthrough that will be described next.

5 Cognitive Walkthrough

The cognitive walkthrough method of testing is here intended as the test in which the user is asked to speak aloud all he is thinking about the system and to also explain aloud his actions and why he is doing them.
While such a test will not give valid metric data as the act of speaking will alter the performance of the user, often in a surprisingly positive way, decreasing errors and

time to perform an operation, it will instead give a very good amount of qualitative data.

This type of tests is not an Heuristic Evaluation, as such the observer will not answer any question of the user on how to use this or that command, instead the observer's role is to prompt the user to continue talking with appropriate questions. So if a user would ask what this or that icon or button does, the observer should answer with another question like, for example "what do you think it would happen if you press that button?"

The main goal behind a cognitive walkthrough is to gather data about the real impact that the system has on the users and to get a very deep idea of why the user would do the operation in this way when the developer had thought of doing it in a completely other way for example.

It is important, however, to notice that the users will tend to also make theories about what went wrong and why. Such theories are to be discarded in most of cases as the users are not designers and do not know the internal workings of the system. The value of them talking instead is exactly in not giving them a possibility to rationalize what happened but to have the raw immediate reaction to the system. (Nielsen 1993, 195-196)

Thinking aloud does not come natural to most people, as such, the users should be giving the opportunity to "warm up" to the task, either by seeing the observer demonstrate the technique by, for example, visiting a common web site and thinking aloud on what they are doing, or by showing to the users a video made with this explicit purpose in mind that can show, for example, a brief ad-hoc thinking aloud session with some other testers.

Particular care should be taken to make sure that everything else but the system been tested is familiar to the user or this might very well distract and disrupt the ses-

sion. For example, when testing a web site, it would be wise to use an operating system and a web browser the users are familiar with. (Nielsen 1993, 197-198)

There are three variants of the cognitive walkthrough method that will be shortly presented here.

5.1 Variants

The first variant is the Constructive Interaction variant. In this test methodology, the user is not alone but is instead paired with another user, also a tester of the system, the two are expected to talk to each other as they tackle the various tasks and problems that may emerge during the test.

The good thing of this test is that is much more natural than the normal system as it comes natural to people to communicate with one another when executing a group task. On the other hand it is perfectly possible that the two users might have completely different approaches to solving this or that problem, resulting in two different methods applied in alternation that could disrupt the test itself. (Nielsen 1993, 198)

The second variant is the Retrospective Testing method in which once the first test is finished, the user is invited to a second session where the recording of his first test is shown to him. The user is expected to comment on the videotape and the examiner can easily stop the tape at any point to ask more details. This lead to a larger amount of comments from the user without the perceived situation of time limit and duress he was in when executing the first test and as such it can be very valuable. (Nielsen 1993, 199)

The last variant is called the Coaching Method, in which the tester is paired with a "coach" in the form of an expert that is familiar with the system being tested. The user is free to ask questions from the coach and the he will answer to the best of his capacity.

The value of such a test stands exactly in those questions the user would ask first of the expert and may help in determining what kind of training and documentation will be needed for the system. This system is also more natural than the thinking aloud method as people tend to naturally asks questions of their colleagues, especially experts in a certain field, when encountering difficulties. (Nielsen 1993, 199-200)

This concludes our brief explanation of the methods and principles behind this test. The rest of the material presented here will constitute of the tests descriptions, plans and then the results and conclusions obtained from such tests.

6 The Usability Tests

In this section, all the information gathered during the tests themselves will be reproduced. The first part will be about the test plan themselves, explaining a bit more how the tests were prepared and then we will have the test reports, detailing what happened during the procedure, followed, in the next section, by a series of recommendations and conclusions taken from the test results. All the forms, questionnaires and other material used in the test will also be included in the form of appendixes at the end of the document. Note that the test plans were created using premade template given by the United States Department of Health and Human Services specifically for the goal of conducting Usability Testings. The template has been altered to serve our goal and a blank copy of this template can be found in the appendices.

6.1 Web Heuristic Test Plan

6.1.1 Document Overview

“This document describes a test plan for conducting a usability test” of Db2 v9.7 Infocenter (http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp), Mi-

crososft MSDN for SQL server (http://msdn.microsoft.com/en-us/sqlserver/default.aspx) and Oracle database documentation library (http://www.oracle.com/pls/db112/homepage). "The goals of usability testing include establishing a baseline of user performance, establishing and validating user performance measures, and identifying potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction", the test's goals are also of learning how usability tests are performed in general.

"The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of error may include:
- Exercise the application or web site under controlled test conditions with representative users. Data will be used to access whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations."

The websites to be analyzed are all intended for users of the database products linked to them. The web pages do not make any distinction between beginners or expert users, so they are designed to be used by either group. For this test, a class on Usability's students at the Haaga-Helia AMK University of Applied Sciences, Helsinki, Finland will be used as testers. The students are all 2-3 years studying in a n IT related programme and as such are familiar with web site design and with databases in general even if they may not be familiar with that product in particular.

6.1.2 Executive Summary

This usability test is executed as part of a thesis project of a graduating student of the same University. It is one part of a series of Usability tests involving the three major commercially available database management systems and it is aimed at two main goals: the first goal is to become more familiar with the Usability testing procedures both for the writer of the thesis and for the students involved in the project, the second goal is to establish a preliminary conclusion on how these majorly used

software packages fare under a Usability test. The main concern is that as they are meant for technical individuals, the Usability parts would have been ignored or at least not given the effort they merit.

This part of the test will focus on testing the web sites that give help for people using the products both as administrator of the databases or as developers.

6.1.3 Methodology

The test will involve around 20 or so students, divided between a Heuristic Evaluation test and a Cognitive Walkthrough test to be executed in the same day, the 9th of December 2010, on site at Haaga-Helia AMK. This document is about the Heuristic evaluation test.

Each participant will use one of the standard school computers, using one of two browsers, Internet Explorer 7 or Mozilla Firefox and access the web sites from the addresses provided above.

A total of 14 participants are foreseen for this test and will be divided between the three web sites and will also be given observer roles when needed.

Each participant will also be given an introductory form where to put his or her skill knowledge level, a series of tasks to be completed in the web site, a list of the Heuristic points to be considered for this test and a final questionnaire composed mostly of open-ended questions to evaluate the site.

6.1.4 Participants

The participants to the test have been recruited trough the class on Usability being taught at the Haaga-Helia University right now through the support of the teacher, Seija Wolfer. Each of them is expected to know in some depth what Usability is as

they are just finishing (the test take part one week after the final exam) a course on Usability. In addition, they are all part of the Business IT programme that involve to at least a rudimentary level, concepts of web design and database knowledge. It is possible not all the participants will be present, that is why there is no sure schedule on how many testers will be assigned to each project.

“The participants' responsibilities will be to attempt to complete a set of representative task scenarios presented to them and to provide feedback regarding the usability and acceptability of the user interface. The participants will be directed to provide honest opinions regarding the usability of the application, and to participate in post-session subjective questionnaires and debriefing.”

6.1.4.1 Training

The participants that will take on the roles of observers will receive an half an hour training on what to do and what to sign on their own observers notes form. All the others will be given the documentation and they will be given time to look over them and to ask questions if something is unclear.

During the procedure, the observers are entitled to answer questions about the tasks to be performed.

6.1.4.2 Procedure

“Participants will take part in the usability test at” Haaga-Helia AMK Pasila campus. A Windows equipped PC computer with the Web site will be used in a typical class room environment. “The participant’s interaction with the Web site will be monitored by the facilitator seated in the same classroom”. The teacher and the observers will also be monitoring the situation from the same room.

“The facilitator will brief the participants on the Web site and instruct the participant that they are evaluating the application, rather than the facilitator evaluating the participant. The facilitator will ask the participant if they have any questions.”

“Participants will complete a pre-test demographic and background information questionnaire. The facilitator will explain that the amount of time taken to complete the test task will not be measured and that exploratory behaviour outside the task flow can occur during the task, if it is needed to better understand the site and to compare it to the Heuristic rules provided.”

The facilitator will observe and enter user behaviour, user comments, and system actions, if they are unusual, in their notes.

After all task scenarios are attempted, the participant will complete the post-test satisfaction questionnaire.

6.1.5 Roles

“The roles involved in a usability test are as follows. An individual may play multiple roles and tests may not require all roles.”

”Facilitator

- Provides overview of study to participants
- Defines usability and purpose of usability testing to participants
- Assists in conduct of participant and observer debriefing sessions
- Responds to participant's requests for assistance”

”Test Observers

- Silent observer”
- Work as a data logger, by taking notes of the participants actions
- Serve as note takers.

Test Participants

- Perform the tasks designed for the test
- Provide comments and feedback on the product
- Is honest and has no stake in the application

6.1.6 Ethics

“All persons involved with the usability test are required to adhere to the following ethical guidelines:

- The performance of any test participant must not be individually attributable. Individual participant's name should not be used in reference outside the testing session.”

6.1.7 Usability Tasks

Usability Tasks are described in the proper form attached to the final Thesis and this document called “weblistsoftasks.doc”.

6.1.8 Usability Metrics

Here we will describe what kind of elements will be taken in consideration when compiling the final report.

6.1.8.1 Heuristic Evaluations

The testers will be asked to take notes during their tasks following the Heuristic Principles of this test. At the end of the test, they will be asked to complete a final questionnaire where the site will be evaluated using the Heuristic Principles highlighted for this test.

6.1.9 Usability Goals

“The next section describes the usability goals for” multiple web sites test.

6.1.9.1 Heuristic Evaluation

The notes of the testers together with the notes of the observers and the answers to the final questionnaire will be compiled and analyzed to provide a complete report about this series of Usability Tests.

6.1.9.2 Reporting Results

“The Usability Test Report will be provided at the conclusion of the usability test. It will consist of a report and/or a presentation of the results;” a draft version of this report, with a simple presentation, will be shown to the testers on 16.12.2010.

(United States Department of Health and Human Services, 2010).

6.2 Cognitive Walkthrough Test Plan

6.2.1 Document Overview

"This document describes a test plan for conducting a usability test" of Db2 v9.7 express edition, Micrososft SQL server express edition and Oracle G10 express edition. "The goals of usability testing include establishing a baseline of user performance, establishing and validating user performance measures, and identifying potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction", the test's goals are also of learning how usability tests are performed in general.

"The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of error may include:
- Exercise the application or web site under controlled test conditions with representative users. Data will be used to access whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations."

The applications to be analyzed are all intended for technical users with at least a basic knowledge of the database products. The applications can be used by both beginners and expert users, so they are designed to be used by either group. For this test, a class on Usability's students at the Haaga-Helia AMK University of Applied Sciences, Helsinki, Finland will be used as testers. The students are all 2-3 years studying in an IT related programme and as such are familiar with databases in general even if they may not be familiar with that product in particular.

6.2.2 Executive Summary

This usability test is executed as part of a thesis project of a graduating student of the same University. It is one part of a series of Usability tests involving the three major commercially available database management systems and it is aimed at two main goals: the first goal is to become more familiar with the Usability testing procedures both for the writer of the thesis and for the students involved in the project, the second goal is to establish a preliminary conclusion on how these majorly used software packages fare under a Usability test. The main concern is that as they are meant for technical individuals, the Usability parts would have been ignored or at least not given the effort they merit.

This part of the test will focus on testing the user interfaces shipped with these major database management systems.

6.2.3 Methodology

The test will involve around 20 or so students, divided between a Heuristic Evaluation test and a Cognitive Walkthrough test to be executed in the same day, the 9th of December 2010, on site at Haaga-Helia AMK. This document is about the Cognitive Walkthrough test.

This particular test will be done as a Constructive Interaction test, in which the students will be paired off while using the application and are expected to talk to each other while experiencing the application.

For this test, the lab computers in class 5005 (the “ti-labra” class) will be used. These computers are unique in the school in the fact that they can be used by the students for computer-based experiments. Two external hard disks have been acquired for this test and have been installed with Ubuntu Linux and with the needed Virtual environments containing the products to be tested taken from the DBTECH-EXT project and web site (http://www.DBTechNet.org/download/VirtualBox_db-tech_debian.zip)

Each pair of students will use one of the computers. There will be a total of 6 pairs to test the products, in 2 rounds.
Each tester will also be given a demographic form to assess his skill level and a task list to help him or her with things to do during the test.

6.2.3.1 Participants

The participants to the test have been recruited trough the class on Usability being taught at the Haaga-Helia University right now through the support of the teacher, Seija Wolfer. Each of them is expected to know in some depth what Usability is as they are just finishing (the test take part one week after the final exam) a course on Usability. In addition, they are all part of the Business IT programme that involve to at least a rudimentary level, concepts of web design and database knowledge. It is possible not all the participants will be present, that is why there is no sure schedule on how many testers will be assigned to each project.

“The participants' responsibilities will be to attempt to complete a set of representative task scenarios presented to them and to provide feedback regarding the usability and acceptability of the user interface. The participants will be directed to provide honest opinions regarding the usability of the application.”

6.2.3.2 Training

The participants that will take on the roles of observers and/or facilitators will receive an half an hour training on what to do and what to sign on their own observers notes form. All the others will be given the documentation and they will be given time to look over them and to ask questions if something is unclear.

During the procedure, the facilitator is entitled to answer questions about the tasks to be performed and to encourage the flow of thinking aloud so that it never bogs down. The facilitator will also have to ask general questions to let the users continue in their work. General questions like “what are you thinking that would do?” and so on.

6.2.3.3 Procedure

“Participants will take part in the usability test at” Haaga-Helia AMK pasila campus. A Linux equipped PC will be used in a typical computer lab environment. “The participant’s interaction with the application will be monitored by the facilitator seated in the same classroom. “

“The facilitator will brief the participants on the application and instruct the participant that they are evaluating the application, rather than the facilitator evaluating the participant. The facilitator will ask the participant if they have any questions.”

“Participants will complete a pre-test demographic and background information questionnaire. The facilitator will explain that the amount of time taken to complete the test task will not be measured and that exploratory behaviour outside the task flow can occur during the task, if it is needed to better understand the site.”

The facilitator will observe and enter user behaviour, user comments, and system actions, if they are unusual, in their notes.

“After all task scenarios are attempted, the participant will complete the post-test satisfaction questionnaire.”

6.2.4 Roles

“The roles involved in a usability test are as follows. An individual may play multiple roles and tests may not require all roles.

Facilitator

- Provides overview of study to participants
- Defines usability and purpose of usability testing to participants
- Assists in conduct of participant and observer debriefing sessions
- Responds to participant's requests for assistance”

“Test Observers

- Silent observer

- Work as a data logger, by taking notes of the participants actions
- Serve as note takers."

Test Participants

- Perform the tasks designed for the test
- Provide comments and feedback on the product
- Is honest and has no stake in the application

6.2.4.1 Ethics

"All persons involved with the usability test are required to adhere to the following ethical guidelines:

- The performance of any test participant must not be individually attributable. Individual participant's name should not be used in reference outside the testing session."

6.2.5 Usability Tasks

Usability Tasks are described in the proper form attached to the final Thesis and this document called "cognitivelistsoftasks.doc".

6.2.6 Usability Metrics

Here we will describe what kind of elements will be taken in consideration when compiling the final report.

6.2.7 Cognitive Walkthrough notes

The observers (if any) and the facilitator will take notes of all happenings during the test; these combined with the final opinions of the users in the appropriate questionnaire will constitute the metrics used in this test.

6.2.8 Usability Goals

The next section describes the usability goals for this multiple DBMS test.

6.2.8.1 Cognitive Walkthrough Evaluation

The notes of the facilitators together with the subjective satisfactions of the testers will be compiled and analyzed to provide a complete report about this series of Usability Tests.

6.2.9 Reporting Results

"The Usability Test Report will be provided at the conclusion of the usability test. It will consist of a report and/or a presentation of the results;" a draft version of this report, with a simple presentation, will be shown to the testers on 16.12.2010.

(United States Department of Health and Human Services, 2010).

6.3 Web Heuristic Test Report

Date of Report: 22.01.2011
Date of Test: 16.12.2010
Location of Test: Helsinki,Finland

Prepared by: Alessandro Bruschi
Phone Number:
Email: alessandro.bruschi@elisanet.fi

6.3.1 Executive summary

This heuristic test was designed to examine 3 different web sites linked to the three major commercial database products, the goal of the test was to determine if these web site were easy to use and provided meaningful help to the IT specialists that are going to use the database systems and will need to find information about various functions and details on the software.

6.3.2 Methodology

6.3.2.1 Our Testers

The whole class of the Usability course in Haaga-Helia UAS was used as our testers. 19 students answered the demographic questionnaire and are so divided as de-

scribed in the following table; for a description of what the various levels in each category means, please consult the original demographics paper attached in the appendix.

The participants were divided between being web testers and observers. Not the whole class was used for this single test as also another test was being completed at the same time.

Most participants had some experience with DBMS, in particular Microsoft SQL Server.

Table 1 Demographics distribution, in terms of IT skills, of the participants

Computer Use	
Level 1	0
Level 2	0
Level 3	0
Level 4	4
Level 5	15
TOTAL (participants)	**19**

Web site navigation	
Level 1	0
Level 2	0
Level 3	3
Level 4	3
Level 5	13
TOTAL (participants)	**19**

SQL Knowledge	
Level 1	1
Level 2	2
Level 3	6
Level 4	7
Level 5	3
TOTAL (participants)	**19**

DBMS Knowledge	
Level 1	1
Level 2	2
Level 3	9
Level 4	6
Level 5	1
TOTAL (participants)	**19**

Usability	
Level 1	
Level 2	
Level 3	7
Level 4	11
Level 5	1
TOTAL (participants)	**19**

Interface Design	
Level 1	
Level 2	
Level 3	8
Level 4	7
Level 5	4
TOTAL (participants)	**19**

6.3.3 Particpants tasks

The participants were asked to find information in the web site and comment how well the web site performed, they were given a series of Heuristic points to keep in mind while they went through the timed procedure of finding the information needed.

The point of the test was not to gather the information, however, but to establish how helpful the site is in this endeavor. The testers, once the procedure was over, were then asked to compile a questionnaire highlighting how good or bad the site is in the various heuristic points selected for this test.

Some of the participants were assigned to be observers instead of testers; their role was to provide information on the testers' behavior and to help the testers when in difficulty.

The list of heuristic principles, as give to the testers, follows.

6.3.4 Heuristic principles

Introduction

This document explores the Heuristic principles to be used in the Web Usability Test. Each of them will have a brief description of what it exactly means.

Your duty, as a tester, is to simply read these points and keep them in mind when you answer your final questionnaire as many of those open-ended questions will be about how well did the site do in comparison to these Heuristic points.

Heuristic Principles

Simple and Natural Dialogue: the concept of "less is more" and that the goal of a user interface is to provide exactly the needed information at the right time, no more information and no less.

Minimize User Memory Load: The user should not be asked to keep in mind countless details. If something is important enough, then display it and keep a re-cord from screen to screen.

Consistency: The same information should be presented in the same way across the system so boxes and position should be similar or same if possible.

Feedback: The interface should provide meaningful feedback to the user also in positive or neutral situation, for example having loading messages and informing the user also of the success of an operation.

Shortcuts: even if the interface can be used with just general information, it should also provide shortcuts for experts to use, anything from keyboard commands to way to repeat often used operations.

Help and Documentation: the system should have both good instruction manuals but also good online help as it has been proven that most users do not read the manual at all and online help has the advantage of being able to bring up information related to what the user is doing right now.

Easy Navigation: the system should be easy to navigate, to go back to your previous searches and a way to go back to the general index, if it has one. As the system is primarily used for information gathering, it should be easy to move from one information node to the next.

References: Each help topic found should provide references and examples about it. References are intended as links to other topic that are related to the one found, so to help the user find exactly what he needs. Examples are instead a great way to make something dry and complex more understandable in general terms.

(Jakob Nielsen, 2005).

6.3.5 Data collected

The data collected is the result of the answers and notes done by testers and observers and here divided by product.

6.3.5.1 DB2

- Many users found that the search function did not work as they expected, one user commented that he found better results, inside the web site, by using the Google search engine.
- In the final answers, it was noted how the back button cancels everything and return to the home page, no matter the situation of the web site.
- It was noted that searches are not saved anywhere nor is it possible to access old results once the tester has moved on.
- The search results are displayed in a nicely orderly manner, but many times they are unrelated with what was searched.
- The information of the site was not always helpful, the syntax of the commands was hard to understand and there are not always good examples.
- Testers were generally not very satisfied with the web site, especially from a usability point of view.

+ The navigation of the site, with an index on the left and the topic on the right met with considerable satisfaction from many testers. As long as the testers could use this system, without using the search function, the navigation was good.

6.3.5.2 ORACLE

- The navigation of the site was not so great; however, it was hard to return to the home page for example. This was not an opinion shared with all testers. A minority found the navigation to be excellent as it is.

+ The search function works extremely well most of the time.
+ Testers were able to find information both by using the search function and also by following the links provided in the main page.

+ Testers reported how the extra features of the site are really helpful and provide output in various forms, including PDF.
+ Testers were very satisfied by the search function and the information provided by the web site was determined to be just the right amount, with possibility of going into more advanced topics if needed.
+ Testers were generally very satisfied with the web site, deeming that the navigation problems were overshadowed by the clearness and completeness of the information provided and the usefulness of the search box.

6.3.5.3 SQL SERVER

– The web site does not provide the option of printing pages as PDF.
– The navigation of the site was not excellent, it was lacking breadcrumbs and it was hard to realize in what part of the site the tester was at any given time.

+ The search function is very useful and works very well, even going outside the web site knowledge base and instead also querying forums based on the product, this feature was useful in at least one occasion to find out some option that was not possible to do with this software.
+ The search function will even suggest related keyword if the one searched for return no results as it is linked to the powerful “Bing!” search engine; it has more features that most other web site search engines.
+ The information provided was meaningful and helpful, with many examples showing the tester how the command can be used and so on.
+ Observers noted that even persons with little experience of SQL Server were able to quickly find the information needed thanks to the search functionality.
+ In general, testers and observers were quite satisfied with the performance of the site.

6.4 Cognitive Walkthrough Test Report

Date of Report:	22.01.2011
Date of Test:	16.12.2010
Location of Test:	Helsinki,Finland

Prepared by:	Alessandro Bruschi
Phone Number:	

Email: alessandro.bruschi@elisanet.fi

6.4.1 Executive summary

This cognitive Walkthrough test was designed to examine the ease of use and usefulness of the Graphical User Interface of the three major commercial DBMS products, namely Oracle, DB2 and SQL Server.
The goal of the test was to determine if the GUI could work equally well for novice and expert users, as many of the testers had experience with databases but not with some of the products tested.

6.4.2 Methodology

6.4.2.1 Our Testers

The whole class of the Usability course in Haaga-Helia UAS was used as our testers. 19 students answered the demographic questionnaire and are so divided as follows, for a description of what the various levels in each category means, please consult the original demographics paper attached in the appendix.

The participants were divided between being web testers and observers. Not the whole class was used for this single test as also another test was being completed at the same time.

Most participants had some experience with DBMS, in particular Microsoft SQL Server.

Table 2: Demographics distribution, in terms of IT skills, of the participants

Computer Use

Level 1	0
Level 2	0
Level 3	0
Level 4	4
Level 5	15
TOTAL (participants)	**19**

Web site navigation

Level 1	0
Level 2	0
Level 3	3
Level 4	3
Level 5	13
TOTAL (participants)	**19**

SQL Knowledge

Level 1	1
Level 2	2
Level 3	6
Level 4	7
Level 5	3
TOTAL (participants)	**19**

DBMS Knowledge

Level 1	1
Level 2	2
Level 3	9
Level 4	6
Level 5	1
TOTAL (participants)	**19**

Usability

Level 1	
Level 2	
Level 3	7
Level 4	11
Level 5	1
TOTAL (participants)	**19**

Interface Design

Level 1	
Level 2	
Level 3	8
Level 4	7
Level 5	4
TOTAL (participants)	**19**

6.4.2.2 Participants tasks

The participants were divided in teams of 2 persons each. Each team would alternatively be testing one of the products or be observers and facilitators for the testers. When testing, the team was given instruction to talk to each other aloud so that the facilitators can have a better idea of what is going on and why the testers are having an easy or hard time.

The teams were then asked to go through a series of tasks on the product they were testing. The tasks were identical for all three products, but there were some technical limitations. In particular, on the Oracle product, a new database could not be created, so task 1 was not performed there and some machines did not have access to internet that was needed for some help features to work. During the test, each team was asked to write down their notes on the operation, including how easy or hard it was and what difficulties did they find.

At the end of the test, each team was asked to compile a final paper where they could write their own personal notes or if they wanted to add something over what they have already written.

6.4.3 Data collected

The data collected is the result of the answers and notes done by testers and observers and here divided by product.

6.4.3.1 DB2

- Certain operations are not performed even when it is obvious they should be, for example the “instance” must be started before creating a database, but this is not done automatically when trying to create a new database.
- Windows of the GUI would not resize properly at times and tool tips would end up covering the input field.
- Feedback on operations is sketchy. Not always is a successful operation announced as one.
- Error messages are quite cryptic.
- The various wizards do not make clear which options are needed and which ones are optional, nor what would be the default values of the optional ones.
- The Help is online only and as such useless in case of machines not connected to the internet.
- A tester suggested colouring the messages in a more meaningful way, using green for success and red for failure for example.
- Some testers were confused by the number of tables present in the table folder of the GUI even if they just created one. System tables should be in their own folder so to not confuse the users.
- Tester experience was very mixed, with one tester having very strong negative feeling on the tool. Other testers fared better, but overall it was a mixed experience.

6.4.3.2 ORACLE

- Comment that “Object Browser” is not a proper name for the button that does many database operations like creating tables and the like.
- The help feature was available both online and offline, but the offline one was not very good and was mostly disregarded.
- No tester was able to complete a backup, they all got the same error message but no one was able to correct the problem and do a backup.
- Error messages were not very helpful.
- The home page is not very clear and does not explain what all the buttons are for.
- The help feature did not contain anything on SQL Syntax.

+ The GUI is generally easy to use and helped the testers a lot, but some had a hard time to realize what the various buttons do.
+ All the testers could find the database settings, but could not change them, even if the user they were using had admin rights.
+ The SQL editor does not highlight what line had the error in case of one.
+ The whole package is quite easy to use and encountered a lot of positive remarks for that, some testers, previously favouring SQL Server, finished the day preferring Oracle.

6.4.3.3 SERVER SQL

+ All the tasks were easy to do through the GUI, which is very accessible.
+ Error messages and tool tips are quite descriptive and are very helpful.
+ The product has both online and offline help, but the offline one has encountered mixed reviews from the testers with some claiming it is not useful at all.
+ Some tester did not use the GUI at all, going instead with the SQL editor for all tasks. The tester claimed this was his personal preference and not dependant on the product.
+ In general, most agree that this tool was very easy to use and had little or no problems to complete the tasks on time or even using less time than allocated.
+ Even beginner tester with no previous experience of this DBMS was impressed by the system and graded it 4 out of 5.

7 Results from the tests

In this section, results from the tests in the area of Usability for the products examined will be explained, together with feedback and suggestions on how to improve Usability Testing in the future.

7.1 DB2 Web Site

The web site navigation was quite its high point. The division of the screen with index on the left and topic on the right is a good one that was appreciated by many. The search function, however, was not so fortunate. It was noted how many times the search is just not good enough, so enhancing this would be a great boon. Some testers got better results by using Google, so that would be an option to use, as many web site do, a specialized version of Google limited to the web site for searches.

Otherwise, the search function need more options, it also need to show the old searches and should also present related results when a keyword does not return any.

The information provided was not always helpful to the testers, for one there is no way of filtering what kind of information one is seeking, so a tester might be looking for SQL commands and end up with a description of how to do what he wants, but in the GUI; some sort of filter would be recommended here. Syntax for the SQL command is hard to understand, but that is understandable. There is no easy to find legend however even if this should be a main feature of the site along with the help so that an user can just click a button and get a pop up display explaining how the syntax works.

Finally, not all the topics are covered with extensive examples and this was seen as a flaw by many testers as examples are one of the best way, it was felt, to understand the syntax.

Overall, the testers were not very satisfied with the site, finding it lacking in the areas highlighted above.

7.2 Oracle Web Site

This web site was noted for its good search functionality but especially for the usefulness of the information provided and how it is just the right level and how it is possible to find more advanced topics if needed.

What it was found to be lacking was good navigation. Some testers complained that it was hard to return to the home page for example, a main area where to improve this web site.

The search engine, while working fine, did not have all the features that other search engines had, like looking for related keywords or correcting common mistakes, so this could be improved upon as well.

The ability of printing out parts of the site as PDF pages was quickly found to be extremely useful by some testers.

Overall the testers were satisfied with the web site, suggesting the flaws found are minor in comparison to what works in the site.

7.3 Sql Server Web Site

This web site had the best search functionality of all three and is used as the yard stick for search engines. Of course the web site uses a full featured search engine that Microsoft developed for a much broader use, the Bing! Engine, but this does highlight the usefulness of using such an engine even for a single web site.

With its capability of searching also community forums of related subjects and providing related keywords results, this search engine was easily the diamond of the web site.

The information provided was also another positive highlight, with many users feeling satisfied by the many and extensive examples provided with each topic, making understanding it much easier.

One area, however, where the site is lacking is navigation. Many testers found it hard to see where they were inside the web site and found the lack of breadcrumbs to be particularly problematic.

Even so, it was noted even beginners had little problems using this web site.

It must be noted here, however, that most testers had some experience with SQL Server and their observations could be flawed by this. Some of them, however, were not very familiar with the site or the product; as such their observations still stand.

Some testers noticed the absence of a good way to make PDF out of the web site's HTML pages and how this might be a hindrance for those users wanting to make a reference book out of the information they find.

Overall, testers were satisfied with the web site, finding that the navigation problems were overshadowed by the good features, especially the search function.

7.4 Db2 Database Product

NOTE: IBM has deprecated the Control Center that was used for this test; they have provided a completely new GUI that resembles more what SQL Server has than this one. As such the comments of the testers might be obsolete and do not apply to the new interface. The test, however, can still provide good insight about the old, but still usable, GUI.

The GUI helped many testers to get their first grips with the product, even beginners that never worked with DB2 found little problem to create indexes and perform advanced database operations, but there were some flaws that made some of the operation unnecessarily frustrating.

In particular, the testers felt there was not enough automation with certain obvious action not being performed even when the tester is doing an operation that requires them. The error messages were a clear negative note by not being clear enough and using cryptic codes instead of clear messages of what went wrong.

The GUI was a bit rough around the edges with certain windows not sizing properly with the text inside, compelling the users to scroll not just up and down, but also left and right, one thing that should be absolutely avoided if at all possible.

Another problem highlighted by the testers is how the Wizards tend to provide several pages of options while not making it clear that many of them are optional. It is advised to structure the GUI so to have two levels or operation, one for basic operations in which all rarely-touched options are kept at their default values and not even showed, and one for more advanced users where the whole range of options is shown.

Some other testers noted how several tables already existed while they had not created any. They were clearly system tables but their presence in the ”tables” folder confused the users so it might be useful to hide the system tables in their own folder instead of leaving them together with the user created ones.

Overall, the tool received mixed feelings with some testers appreciating it and others growing quite negative against it. As the tool aroused such powerful negative reactions, it is advised to restructure the GUI to provide some of the features highlighted here.

7.5 Oracle Database Product

Testers found the GUI very easy to use and could complete most tasks with ease. The test, however, did highlight some problems.

The home page of the GUI was not considered very helpful as many of the buttons were not explained exactly. The “Object browser” button in particular was not understood correctly by many, while it is the one that permits most operations like table creation.

Another aspect that the testers highlighted was how the SQL editor could have been better as, for example, it does not highlight errors nor does it tell in what line the error would be.

Problems were found in general with the error messages, again considered too cryptic, while the offline help feature wad criticized by many as useless, with backups being a particularly problematic area with no tester being able to complete successfully a backup.

Beside these problems, however, it is good to highlight that even testers with absolutely no experience with the Oracle GUI were able to complete most tasks with little difficulty, making this the easiest product to use of the three examined.

The general feeling was very positive and with a few adjustments, this could be a really great GUI.

7.6 Sql Server Database Product

There is not as much to say about this product, mostly because the testers found little to highlight as problems here.

Most testers agree that this is a very easy to use product and go on to add that the help features was actually helpful and the error messages are meaningful and actually point out where the error is, even to the line number in case of the SQL editor.

Some testers felt that the offline help feature was not as good as it could be, but that is the extent of the problems highlighted by the testers.

Overall all the users, even the beginners ones, agreed on the validity of the product as much as the GUI is concerned.

7.7 Test Feedback

The usability test was much bigger and harder than I had anticipated and I collected some feedback and suggestions that may be useful for future tests.

The idea of testers that also perform as observers is a valid one and should be noted that people being only observers would have liked very much to be testers too, there is so a perception that the tester's input is more important than the observer's.

In the cognitive walkthrough test, one facilitator should be present for each individual test. A single person cannot serve as facilitator for several tests at the same time.

Great attention must be paid to be sure that the testers know the details of the test and what is going on, a more structured introduction, taking some more time, would have been helpful.

The amount of forms and papers used in the event was very incredible and there were cases of forms getting lost or getting confused with other forms. Either one has to be very careful about all the forms and make sure the testers label what are they testing precisely, or a different method has to be used, maybe by using a dedicated web site with online forms one can fill in while doing the test would be the best solution.

Testers felt much more engaged in using an actual application instead of just browsing a web site.

Using pairs in the cognitive walkthrough test, especially for a test like this involving highly technical products, turned out to be a very good decision. The pair could feel like working together to solve problems and all in all it seemed to be very helpful. A note: there is no need for the pair to compile TWO sets of notes, one is enough, I would suggest having one person use the GUI while the other write and inverting them at each task would be helpful or just leave it to each pair how to handle it.

7.8 Test Moderator's Experience

In this chapter, my experiences as test moderator will be expressed, during the chapter; I will address as "you" any readers that are potentially looking into conducting Usability tests.

Let me start by saying that when I started this Thesis I had already been the project manager for the Usability Tests done during the Usability class of the previous semester; as such I thought to have some experience in the field that would have helped me go through this project.

My experience as Project Manager was a very successful one, but also very demanding. I had thought this project would require about the same level of effort, but I was sorely mistaken. What I had failed to consider was that even if I was the project manager and so had to supervise the work of four different groups preparing their usability tests, I was not doing much of that specific work, but instead I was doing work as project manager.

While preparing and executing this Usability test, I realized that in addition of taking care of all the details of managing the project, I was also expected to actually prepare all the usability test plans, forms, questionnaires etc. needed in the test. A work previously performed by a group of 4 people, for each test.

Saying this was a taxing endeavour would be putting it lightly.

Researching on the Usability topic was the easiest part, there is not much literature on the argument and picking Jakob Nielsen, the father of Usability, as my focus was an easy choice that lead to very interesting insights in the discipline.

Expanding on his material to create the test was a completely different matter. For one, I am glad part of the burden was taken by Seija Wolfer, lecturer at Haaga-Helia, that kindly gave permission to use her class' students as my testers. Otherwise that would have been an additional task to complete that would have entailed advertising the test on and off the school and in general leading to even more work.

Even with the testers secured, I still needed to take care of the equipment. Here the school once again provided in the person of Olavi Korhonen, teacher of another course there. He granted me the use of three external hard disks with which I was able to set up the needed software for the test. Luckily, the DBTech EXT program, a research program shared between several European universities and conducted under the Eropean Union authority had done most of the work for me, providing virtual machine images with Oracle and DB2 already installed and working. I "just" had to download the images, set them up on two of the hard disks and make sure they worked before setting up the third machine from scratch with Windows 7 (Student version, given for free by Microsoft to all students of Haaga-Helia) and SQL Server, the free edition available on their web site.

I suppose all this to tell that you should take advantage of the resources available to you. If I would have had to do EVERYTHING from scratch, it would have taken even more time, probably too much time. So be informed, use the ready material available in the school and abroad.

Once all is set up, the actual tests must be readied. This is another big piece of work. Not only test plans must be prepared (luckily there are templates for this that

provide what information you need to put in them), but most importantly, the tasks to be performed must be finalized, keeping in mind how they should be significant and at the same time short enough to be completed in the test time.

The only way to be sure that the tasks are valid is to execute a pilot test. This, at the minimum, means you going through all the tasks on all the products you are testing, making sure they can be executed in a reasonable amount of time.

Do not forget you will also need forms for all of this, not to speak of demographic questionnaire, without which you would not know what kind of testers you have available.

Once the plans are done, all the forms are finalized and the pilot test was successful, all is ready for the big day: The test itself.

Time seems to be the main enemy here. Everything in the test will be clear to you, but the testers are a different story. Managing to make them understand what exactly is needed of them, within the time limits of a class, can be a challenge. Do not expect them to know things, spell everything out. They might know what you mean, but if they didn't, they will rarely asks for explanations, so it is better to spend some extra five minutes in this than regret it later on.

During the test, your goal will be to keep the testers motivated and engaged in the test. Failure to do so, like it happened in my case during the Web Heuristic test, will lead to not stellar results. Remember the testers are doing this mostly for your own benefit, so remember to thank them. Thank you testers!

A particular note must be said about observers and facilitators; here you should know the testers a bit better than you do, so asks the teacher for help, if you have access to a class like I did. Observers and facilitators will not have as much "fun" as the normal testers will, but their work is extremely important, so choose them carefully, they should be the top students if available.

Eventually, you will survive the test day and when all is said and done, you will find yourself face to face with a mountain of paper to be sorted, analyzed and checked, how to do all this?
The answer is quite simple, actually: patience and common sense. Let the testers speak, collect all their notes in few paragraphs. Especially when several testers agreed on something, but also do note mixed results in case you had any. At the end, you first need to have a draft with just the paraphrased notes of the testers on electronic format and then you should take this draft version and merge the similar notes together until you have some recommendations.

In the end there is no better way to learn this than by doing. I definitely learned a lot, like how next time I will let the testers have some time to familiarize with the products and make them alternate more between observers and testers.

8 Conclusion

In the end of this project, I gained lot of valuable insight in the discipline of Usability and hope the results of the tests can be useful, especially to my fellow students.

It is my wish that the information collected here could spark others to try this out and I hope that my experience could offer them valuable insight in this interesting field of IT sciences.

I feel like only the surface has been touched in this field and that is mostly reserved for web sites that surely are one thing many people do use constantly. I do feel though that with better GUI and a better understanding of usability principles, all products could improve.

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1 Appenedices

2 Appendix 1: Blank template form for Usability Test Plans.

2.1 Document Overview

This document describes a test plan for conducting a usability test during the development of [web site name or application name]. The goals of usability testing include establishing a baseline of user performance, establishing and validating user performance measures, and identifying potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction [add or delete goals].

The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of error may include:
  - Navigation errors – failure to locate functions, excessive keystrokes to complete a function, failure to follow recommended screen flow.
  - Presentation errors – failure to locate and properly act upon desired information in screens, selection errors due to labeling ambiguities.
  - Control usage problems – improper toolbar or entry field usage.
- Exercise the application or web site under controlled test conditions with representative users. Data will be used to access whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- Establish baseline user performance and user-satisfaction levels of the user interface for future usability evaluations.

[Add a paragraph that summarizes the user groups that the application or Website will be deployed/launched to, the user groups that will participate in the usability test and the number of participants from each user group that are expected to participate. Indicate whether the testing will occur in a usability lab or remotely and the expected date range for testing.]

2.2 Executive Summary

[Summarize specific details of the usability test for the given application or Web site; describe specific functions to be evaluated. Summarize the usability goals.]

Upon review of this usability test plan, including the draft task scenarios and usability goals for [web site name or application name], documented acceptance of the plan is expected.

2.3 Methodology

[Describe briefly the number of participants, the setting of the usability test sessions, the tools used to facilitate the participant's interaction with the application (ex., browser), and

the measures to be collected, such as demographic information, satisfaction assessment, and suggestions for improvement.]

2.3.1 Participants

[Thoroughly describe the number of participants expected, how they will be recruited, characteristics of their eligibility, and expected skills/knowledge.]

The participants' responsibilities will be to attempt to complete a set of representative task scenarios presented to them in as efficient and timely a manner as possible, and to provide feedback regarding the usability and acceptability of the user interface. The participants will be directed to provide honest opinions regarding the usability of the application, and to participate in post-session subjective questionnaires and debriefing.

[Describe how the team will select test participants to meet stated requirements. Explain if participants will have certain skills and/or background requirements, if they will be familiar with the evaluation tasks, or have experience with performing certain tasks.]

2.3.2 Training

[Describe any training provided as an overview of the Web application or Web site.] The participants will receive and overview of the usability test procedure, equipment and software. [Describe any parts of the test environment or testing situation that may be nonfunctional.]

2.3.3 Procedure

[Usability Lab Testing]
Participants will take part in the usability test at [put the name of the testing lab here] in [location here]. A [type of computer] with the Web site/Web application and supporting software will be used in a typical office environment. The participant's interaction with the Web site/Web application will be monitored by the facilitator seated in the same office. Note takers and data logger(s) will monitor the sessions in observation room, connected by video camera feed [describe if lab has one-way mirror or video feed]. The test sessions will be videotaped.

[If the facilitator is seated in a control – describe the environment and the equipment and how communication is supported.]

The facilitator will brief the participants on the Web site/Web application and instruct the participant that they are evaluating the application, rather than the facilitator evaluating the

participant. Participants will sign an informed consent that acknowledges: the participation is voluntary, that participation can cease at any time, and that the session will be video-taped but their privacy of identification will be safeguarded. The facilitator will ask the participant if they have any questions.

Participants will complete a pretest demographic and background information questionnaire. The facilitator will explain that the amount of time taken to complete the test task will be measured and that exploratory behavior outside the task flow should not occur until after task completion. At the start of each task, the participant will read aloud the task description from the printed copy and begin the task. Time-on-task measurement begins when the participant starts the task.

The facilitator will instruct the participant to 'think aloud' so that a verbal record exists of their interaction with the Web site/Web application. The facilitator will observe and enter user behavior, user comments, and system actions in the data logging application [describe how these metrics will be recorded if a data logging application is not used.]

After each task, the participant will complete the post-task questionnaire and elaborate on the task session with the facilitator. After all task scenarios are attempted, the participant will complete the post-test satisfaction questionnaire.

[For Remote Testing]

Participants will take part in the usability test via remote screen-sharing technology. The participant will be seated at their workstation in their work environment. Verbal communication will be supported via telephone.

The facilitator will brief the participant and instruct that he or she is evaluating the Web site/Web application, rather than the facilitator evaluating the participant. Participants will complete a pretest demographic and background information questionnaire. Sessions will begin when all participant questions are answered by the facilitator. The facilitator will inform the participant that time-on-task will be measured and that exploratory behavior outside the task flow should not occur until after task completion.

The facilitator will instruct the participant to read aloud the task description from the printed copy and begin the task. Time-on-task measure will begin. The facilitator will encourage the participants to 'think aloud' and that a verbal record will exist of the task-system interaction. The facilitator will observe and enter user behavior and comments, and system interaction in a data logging application.

After each task, the participant will complete the post-task questionnaire and elaborate on the task session. After all tasks have been attempted, the participant will complete a post-test satisfaction questionnaire.

2.4 Roles

The roles involved in a usability test are as follows. An individual may play multiple roles and tests may not require all roles.

Trainer

- Provide training overview prior to usability testing

Facilitator

- Provides overview of study to participants
- Defines usability and purpose of usability testing to participants
- Assists in conduct of participant and observer debriefing sessions
- Responds to participant's requests for assistance

Data Logger

- Records participant’s actions and comments

Test Observers

- Silent observer
- Assists the data logger in identifying problems, concerns, coding bugs, and procedural errors
- Serve as note takers.

Test Participants

- Provides overview of study to participants
- Defines usability and purpose of usability testing to participants
- Assists in conduct of participant and observer debriefing sessions
- Responds to participant's requests for assistance

2.4.1 Ethics

All persons involved with the usability test are required to adhere to the following ethical guidelines:

- The performance of any test participant must not be individually attributable. Individual participant's name should not be used in reference outside the testing session.
- A description of the participant's performance should not be reported to his or her manager.

2.5 Usability Tasks

[The usability tasks were derived from test scenarios developed from use cases and/or with the assistance of a subject-matter expert. Due to the range and extent of functionality provided in the application or Web site, and the short time for which each participant will be available, the tasks are the most common and relatively complex of available functions. The tasks are identical for all participants of a given user role in the study.]

[Describe the application's test setup up such as special development environments or test databases; concurrent development activities that may impact the test application's availability or performance; and impact to real data or workflows outside the testing situation.]

The task descriptions below are required to be reviewed by the application owner, business-process owner, development owner, and/or deployment manager to ensure that the content, format, and presentation are representative of real use and substantially evaluate the total application. Their **acceptance is to be documented** prior to usability test.

[Describe the scenarios and groups of participants whom will attempt to complete tasks and documented in sufficient detail to warrant customer sign-off. Describe how typical and encompassing these scenarios are in the overall scope of tasks that the application or Web site will support.]

2.6 Usability Metrics

Usability metrics refers to user performance measured against specific performance goals necessary to satisfy usability requirements. Scenario completion success rates, adherence to dialog scripts, error rates, and subjective evaluations will be used. Time-to-completion of scenarios will also be collected. [include or delete any metrics not used in the planned test]

2.6.1 Scenario Completion

Each scenario will require, or request, that the participant obtains or inputs specific data that would be used in course of a typical task. The scenario is completed when the participant indicates the scenario's goal has been obtained (whether successfully or unsuccessfully) or the participant requests and receives sufficient guidance as to warrant scoring the scenario as a critical error.

2.6.2 Critical Errors

Critical errors are deviations at completion from the targets of the scenario. Obtaining or otherwise reporting of the wrong data value due to participant workflow is a critical error. Participants may or may not be aware that the task goal is incorrect or incomplete.

Independent completion of the scenario is a universal goal; help obtained from the other usability test roles is cause to score the scenario a critical error. Critical errors can also be assigned when the participant initiates (or attempts to initiate) and action that will result in the goal state becoming unobtainable. In general, critical errors are unresolved errors during the process of completing the task or errors that produce an incorrect outcome.

2.6.3 Non-critical Errors

Non-critical errors are errors that are recovered from by the participant or, if not detected, do not result in processing problems or unexpected results. Although non-critical errors can be undetected by the participant, when they are detected they are generally frustrating to the participant.

These errors may be procedural, in which the participant does not complete a scenario in the most optimal means (e.g., excessive steps and keystrokes). These errors may also be errors of confusion (ex., initially selecting the wrong function, using a user-interface control incorrectly such as attempting to edit an un-editable field).

Noncritical errors can always be recovered from during the process of completing the scenario. Exploratory behavior, such as opening the wrong menu while searching for a function, [will, will not (edit Procedure)] be coded as a non-critical error.

2.6.4 Subjective Evaluations

Subjective evaluations regarding ease of use and satisfaction will be collected via questionnaires, and during debriefing at the conclusion of the session. The questionnaires will utilize free-form responses and rating scales.

2.6.5 Scenario Completion Time (time on task)

The time to complete each scenario, not including subjective evaluation durations, will be recorded.

2.7 Usability Goals

The next section describes the usability goals for [web site name or application name].

2.7.1 Completion Rate

Completion rate is the percentage of test participants who successfully complete the task without critical errors. A critical error is defined as an error that results in an incorrect or incomplete outcome. In other words, the completion rate represents the percentage of participants who, when they are finished with the specified task, have an "output" that is correct. Note: If a participant requires assistance in order to achieve a correct output then the task will be scored as a critical error and the overall completion rate for the task will be affected.

A completion rate of [100%/enter completion rate] is the goal for each task in this usability test.

2.7.2 Error-free rate

Error-free rate is the percentage of test participants who complete the task without any errors (critical **or** non-critical errors). A non-critical error is an error that would not have an impact on the final output of the task but would result in the task being completed less efficiently.

An error-free rate of [80%/enter error-free rate] is the goal for each task in this usability test.

2.7.3 Time on Task (TOT)

The time to complete a scenario is referred to as "time on task". It is measured from the time the person begins the scenario to the time he/she signals completion.

2.7.4 Subjective Measures

Subjective opinions about specific tasks, time to perform each task, features, and functionality will be surveyed. At the end of the test, participants will rate their satisfaction with the overall system. Combined with the interview/debriefing session, these data are used to assess attitudes of the participants.

2.8 Problem Severity

To prioritize recommendations, a method of problem severity classification will be used in the analysis of the data collected during evaluation activities. The approach treats problem severity as a combination of two factors - the impact of the problem and the frequency of users experiencing the problem during the evaluation.

2.8.1 Impact

Impact is the ranking of the consequences of the problem by defining the level of impact that the problem has on successful task completion. There are three levels of impact:

- High - prevents the user from completing the task (critical error)
- Moderate - causes user difficulty but the task can be completed (non-critical error)
- Low - minor problems that do not significantly affect the task completion (non-critical error)

2.8.2 Frequency

Frequency is the percentage of participants who experience the problem when working on a task.

- High: 30% or more of the participants experience the problem
- Moderate: 11% - 29% of participants experience the problem
- Low: 10% or fewer of the participants experience the problem

[For studies with less than ten participants in a group, the percentages may to be adjusted. For example, for a study with 8 participants the low frequency should be 12.5% (1/8 = .1250]

2.8.3 Problem Severity Classification

The identified severity for each problem implies a general reward for resolving it, and a general risk for not addressing it, in the current release.

Severity 1 - High impact problems that often prevent a user from correctly completing a task. They occur in varying frequency and are characteristic of calls to the Help Desk. Reward for resolution is typically exhibited in fewer Help Desk calls and reduced redevelopment costs.

Severity 2 - Moderate to high frequency problems with moderate to low impact are typical of erroneous actions that the participant recognizes needs to be undone. Reward for resolution is typically exhibited in reduced time on task and decreased training costs.

Severity 3 - Either moderate problems with low frequency or low problems with moderate frequency; these are minor annoyance problems faced by a number of participants. Reward for resolution is typically exhibited in reduced time on task and increased data integrity.

Severity 4 - Low impact problems faced by few participants; there is low risk to not resolving these problems. Reward for resolution is typically exhibited in increased user satisfaction.

2.9 Reporting Results

The Usability Test Report will be provided at the conclusion of the usability test. It will consist of a report and/or a presentation of the results; evaluate the usability metrics against the pre-approved goals, subjective evaluations, and specific usability problems and recommendations for resolution. The recommendations will be categorically sized by development to aid in implementation strategy. The report is anticipated to be delivered to the Project UCD Contact by [enter date].

3 Appendix 2: Demographics Questionnaire

Introduction

Welcome to the DBMS Usability Test.
Before you start testing the web site or the application, it is important for us to know a little bit more about you, so please answer the following questions.

The test is fully anonymous, none of this information can be linked directly to you. These information are gathered only on the intent to establish certain basic facts about the tester's groups that will test these web sites and applications.

Be also advised that the test is completely anonymous and voluntary, your personal data is not gathered in any way and no comments on your personal performance will be reported to your teacher or anyone else. The data collected will only be used as a whole to generate a usability report.

For each question, please use this scale:

1	2	3	4	5
Very Low	Low	Average	High	Very High

1. Please rate your generic use of computers. A rate of 1 would mean you have never used a computer in your life, a 3 would mean that you use computers fairly regularly, like 3-4 times a week or for your job/school while a rate of 5 would mean that you use computers almost every time you can, even in your free time.

Answer: _____

2. Please rate how expert you are in navigating web sites and using the Internet in general. A rate of 1 would mean you hardly ever use it, a 3 would mean you use It for many common operations, like checking bus timetables and paying bills while a rate of 5 means you use the Internet very often, also in your free time for entertainment purposes.

Answer: _____

3. Please rate your level of knowledge of general SQL terms. A rate of 1 would mean you do not know anything about SQL, a rate of 3 means you know some of the general SQL commands, like SELECT, ALTER and so on while a rate of 5 would means you have used SQL databases extensively and you have a great knowledge of SQL.

Answer: _____

4. Please rate your level of knowledge of Database Management Systems in general, meaning the system that goes around the database. A rate of 1 would mean that you do not know much about the principles of DBMS, a rate of 3 means that you have a fair understanding of the different levels that goes in a DBMS (physical, logical and so on) while a rate of 5 means you are fully confident on the workings of a DBMS.

Answer: _____

5. Please rate your knowledge of Usability principles, a rate of 1 would mean you have hardly heard of Usability, a rate of 3 would mean you are familiar with the concept and know about the major fields of it while a rate of 5 means you have extensive knowledge of the subject.

Answer: _____

6. Please rate your knowledge and experience with user interface design, a rate of 1 would mean that you have only used user interfaces, but never thought of how to make one for your own, a rate of 3 would mean you are familiar with user interface design concepts and maybe even designed one or two interfaces while a rate of 5 means you have done design many times in the past and maybe you even work as one.

Answer: _____

Thank you for your time!

4 Appendix 3: The Master Plan, a timetable of the test day

TIMETABLE

12:15 – 12:30 Introduction (All)

- My introduction
- Test introduction – Web and Cognitive.
- Demographics + Ethics

12:30 – 12:45 Observers Coaching /Demographics questionnaire (All)

- Demographics is delivered to all students
- short coaching of the observer (both web and all Cognitive walkthrough)
- How the presentation work
- What to write on the papers: notes on the testers behaviour, difficulties they had.
- What to write on the observations notes: just ideas of their own about what the web sites was like, keep in mind the heuristic principles!
- What they can tell the testers: they can try to help them not get stuck.

12:45 – 12:55 Web site test starts (Class 4008)

- Division of the testers for Round 1. There are going to be 2 Rounds
- Distribution of the tasks, questionnaire and heuristic principles.
- How to use the papers.
- They can ask help from the observers or even each other
- Explanation of the power point. They should follow it more or less, but it is not dictated in stone. IE. if they need 30 seconds to complete the previous task, go ahead and do it, but if you are nowhere near, then pass on.
- The Solved? space is completely subjective, meaning they answer if they think they found enough info about the task.

12:55 – 13:40 Actual test (last 45 minutes) (Class 4008)

13:40 – 14:00 BREAK (Class 4008)

14:00 – 14:20 Compilation of the Final Questionnaire for the first round (Class 4008)

14:20 – 15:05 Second web test round (Class 4008)

- Web testers get switched around to another web site, observer remain put.
- Same as for earlier.

15:05 – 15:25 Compilation of the second Final Questionnaire. (class 4008)

15:25 – End of test. (Class 4008)

12:55 – 13:05 Preparation of the Cognitive Walkthrough test (Class 5005)

- Systems put online, logged in, all ready for the first testers.

13:05 – 13:15 Demonstration of the system (Class 5005)

- Show how thinking aloud works on a random web site.

13:15 – 14:00 First round of Cognitive Walkthrough testing (Class 5005)

- 1st round will be: 1x SQL Server, 1x Oracle and 1x DB2. Others observe, each a team.

14:00 – 14:10 Writing of the round 1 notes (Class 5005)

14:10 – 14:25 Break (Class 5005)

14:25 – 15:10 Second round of Cognitive Walkthrough testing (Class 5005)

- 2nd round: SQL observers -> Oracle. Oracle Observer -> DB2. DB2 Observer -> SQL Server

15:10 – 15:25 Writing of the round 2 notes (Class 5005)

15:25 End of test.

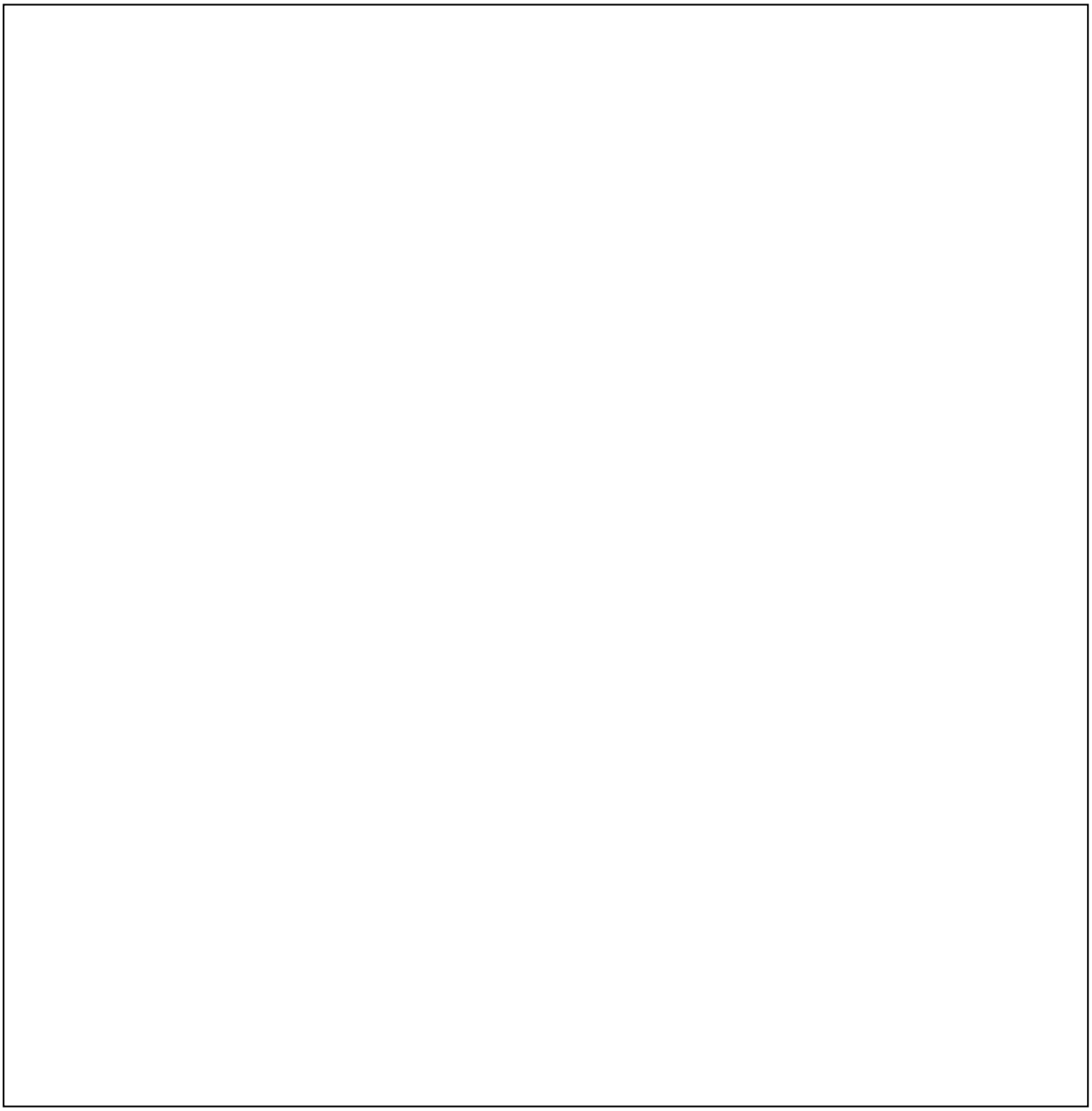
5 Appendix 4: Observer and Facilitator note form

Mark which web site or application are you observing:

Instructions

Complete your duty as an observer or a facilitator. While you are doing that, take notes about the behaviour of the tester and of the web site/application with special care on those parts that show a good or bad Usability in the user interface. Please divide your note following the tasks of the tester. At the end, there is space for your own personal observations.

NOTES



PERSONAL OBSERVATIONS

Feedback, observations, comments, anything can go here.

6 Appendix 5: Cognitive Walkthrough list of tasks

Mark which application are you testing:

____ DB2

____ Oracle

____ MS SQL Server

Instructions

Complete each of the following tasks as best as you can and in the time you need. If a task is too hard and you cannot finish it, ask for the facilitator help as many of them are dependant on each other.

For each task, you are given a box where you can write your notes about it. This notes are here to record your observations and opinion for you to keep track of them. Later on you will be asked for your personal satisfaction in using the software and these notes will then come in handy.

Once you are done answering these, please check the Final Questionnaire and keep in mind these questions are meant to get you to familiarize yourself with the web site and in no way, shape or form are they testing you.

TASK 1

Create any database you like.

Solved? ____

TASK 2

Create some table or tables inside the database.

Solved? ____

TASK 3

Insert some data in the tables you created previously, how easy it is to do so?

Solved? ____

TASK 4

Play around with the editor, see if you can insert new constraint to your tables or modify them in a way that make your data invalid, check what error messages it give and if they are easy to understand.

Solved? ____

TASK 5

Play around with the settings of the database. Can you access them easily? Can you modify them?

Solved? ____

TASK 6

Play around with the more advanced parts of the application. Can you backup the database? Can you create indexes?

Solved? ___

TASK 7

Try out the help and documentation available if you haven't yet. Is there offline and online help available? Does it HELP?

Solved? ____

TASK 8

Get a general feeling of the interface. Menus, buttons and other elements, are they recognizable for what they are? Do they work as you expected them to work?

Solved? ____

7 Appendix 6: Cognitive Walkthrough final questionnaire

Introduction

After successfully completing your cognitive walktrough testing, please take some time to let us know your comments and thoughts.

Thank you for your time!

Thank you for your time!

8 Appendix 7: Web Heuristic test List of tasks.

Mark which web site are you testing:

____ DB2 (http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp)

____ Oracle (http://www.oracle.com/pls/db112/homepage)

____ MS SQL Server (http://msdn.microsoft.com/en-us/library/bb545450.aspx)

Instructions

Complete each of the following tasks as best as you can and in the time you need. If a task is too hard and you cannot finish it, pass to the next but remember to always put down your notes about it.

For each task, you are given a box where you can write your notes about it. Keep in mind the Heuristic principles you have on the other paper, the notes should be about how easy or hard was to find the information and how did the web site feel like when using it, NOT about the solution you found. You can reference the solution if it helps, of course.

Once you are done answering these, please check the Final Questionnaire and keep in mind these questions are meant to get you to familiarize yourself with the web site and in no way, shape or form are they testing you.

TASK 1

Find out the correct syntax for the SELECT SQL command and examine all the options that command can have.

Solved? ____

Find out how can you create a database and what options you have in creating it.

Solved? ____

TASK 3

Find out some of the various ways and options you can use when taking a backup of your database.

Solved? ____

TASK 4

Tablespaces: Find out about them, especially how this DBMS uses it and what options they provide.

Solved? ____

TASK 5

Try to find out how this database system handles LOCKS and what configuration settings or others affect on them. Find out if the web site provide tips and suggestions about this topic beside the descriptions of the command.

Solved? ____

TASK 6

Investigate what pre-requisites are necessary to install the DBMS on your favourite OS.

Solved?

TASK 7

Find out all the various different versions of the DBMS are available at the moment. For different versions it is meant for example the difference between SQL Server Express edition and the full edition.

Solved? ____

TASK 8

Web site resources. Explore the tools provided by the web site, such as a printing facility or a index. See if they are actually helpful.

Solved? ____

9 Appendix 8: Web Heuristic Test final questionnaire

Mark which web site are you testing:

____ DB2 (http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp)

____ Oracle (http://www.oracle.com/pls/db112/homepage)

____ MS SQL Server (http://msdn.microsoft.com/en-us/sqlserver/default.aspx)

Instructions

After you have completed all the tasks of this test, please answer the following open questions keeping the heuristic principles in mind. You can be as short or verbose as you like in your answer, but please keep to the principles, beside for the last question in which it is explicitly asked of you what is your personal subjective satisfaction with the web site.
If the space is too small for the questions, you can use empty papers as long as you mark clearly to what question you are answering.

QUESTION 1

Does the web site provide the needed information and never too much or too less of what is needed?

QUESTION 2

Is the web site easy to use? Does it provide enough information on how to navigate and use the web site or you feel there was too much left unsaid? If the web site has an help feature, was it useful to your research?

QUESTION 3

Does the web site save your searches or at least show you what did you search right now? Does it shows the search results in a meaningful way?

QUESTION 4

Is the site feedback good enough? Does it convey nicely how many results were found and if anything was found at all?

QUESTION 5

How were the references inside a searched topic? Did the provide useful extra information or did they confused you? Were there examples included in the topic? If there were, did you find them useful?

QUESTION 6

Is navigation of the site easy? Is it easy to go back to a general index or home page? What about moving through the topics, are there good hyperlinks?

QUESTION 7

Personal satisfaction. Describe your own personal opinion of the site. What did you like, what you did not like etc. Try to give logical reasons for each of your likes or dislikes.

10 Appendix 9: Draft version of the testers note

Draft Analysis

Web Usability, notes on tasks papers

1 – db2:

Task 1: description of the solution

Task 2: Description of the solution

Task 3: Description of the solution

Task 4: Description of the solution

Task 5: Description of the solution

Task 6: Description of the solution

Task 7: Description of the solution

Task 8: Most tools are useful, but for “Search topic: Search is stupid”

2- Oracle:

Task 1: Description of the solution

Task 2: Description of the solution

Task 3: Description of the solution

Task 4: Description of the solution

Task 5: Description of the solution

Task 6: Description of the solution

Task 7: Description of the solution

Task 8: “All is really helpful”

3 – Ms SQL:

Task 1: Description of the solution

Task 2: Description of the solution

Task 3: Description of the solution

Task 4: Description of the solution

Task 5: Description of the solution

Task 6: Description of the solution

Task 7: Description of the solution

Task 8: “Very useful site and it's easy to use”

4- Oracle

Task 1: Used the search form, the first result was what the tester was looking for.

Task 2: Did the same, but the options were not clear and had to check the examples

Task 3: Again used the search form and found what was needed in the first try.

Task 4: Could only find a definition of Tablespace and not the options.

Task 5: With good keyword, tester found the needed information.

Task 6: Tester found the needed information by following the navigation on the main page.

Task 7: Tester found the information by using the search function.

Task 8: Web site is very useful, provides both index html pages and pdf printouts.

5- Ms SQL

Task 1: Used the search field with keyword and found the information easily.

Task 2: Same as above, same ease of use.

Task 3: Same as above.

Task 4: Same as above.

Task 5: Used search engine and found some information, but no examples.

Task 6: The search returned forum community posts highlighting how the searched keyword is not possible on this program. (Installing on linux).

Task 7: Found information from the home page.

Task 8: No pdf print outs option exists, making it hard to make a reference book out of them.

6- MS SQL

Task 1: It was easy to find it with the search function.

Task 2: Found steps how to create a database

Task 3: Description of the solution

Task 4: Description of the solution

Task 5-8: Empty

7- DB2

Task 1: Select was found with a bit of difficulty

Task 2: It was difficult to find

Task 3-8: Empty

8 – DB2

Task 1: Took time to find the information because the search did not work as the user expected.

Task 2: Description of the solution.

Task 3: Empty

Task 4: Description of the solution

Task 5: User found plenty of information about locks, but it was not clear.

Task 6: Description of the solution

Task 7: Description of the solution

Task 8: The web site resources were completely useless and no help to this user.

9 – DB2 (STAR)

Task 1: Not really easy to find, found many similar commands but not the select command. The navigation system was unsatisfactory.

Task 2: User could not find how to create a database, instead found out about database connections.

Task 3: Easy to find.

Task 4: Easy to find much information, but too many options made it difficult. Could not find what a tablespace is at all.

Task 5: Was easy to find with the search options and the commands provided were full of tips and examples.

Task 6: Found easily on the front page.

Task 7: It was easy to find, but could be hard for a beginner.

Task 8: The web site resources were extremely good, especially the index. The Print option was small and not easy to find though.

10 – Oracle

Task 1: Found from the search box, first of the list.

Task 2: Easy to find through the search box.

Task 3: Easy.

Task 4: Easy to find.

Task 5: Very easy to find.

Task 6: Easiest as the information was available readily.

Task 7: Very simple and easy to find

Task 8: Really helpful.

Web Usability: Final Questionnarie.

1 – MS SQL

Question 1: Web site provided just the right information, it was easy to find and provided useful links.

Question 2: One of the helpful feature was the search bar.

Question 3-7: Missing

2- Oracle

Question 1: All needed information was there.

Question 2: Web site was really easy to use, mavigation was wonderful and very easy both for beginning and advanced information.

Question 3-4: Empty

Question 5: References and examples were very useful

Question 6: Very easy and nice navigation

Question 7: Very satisfied.

3 – Oracle

Question 1: The website provides all the necessary information that the user needs. Good organization and clear layout. The page shows the user what they need, from basic to advanced and this is a good thing. Search box also very useful.

Question 2: The web site is easy to use and offer different ways to access the content, by searching, by navigating the menu or the three menus.

Question 3: The site does display keywords, but sometimes will not provide the right information or links and need to navigate somewhere else to find it.

Question 4: the site returns result based on user keyword (did not understand the question)

Question 5: Empty

Question 6: It is not easy to go back to the home page while moving through topics is quite ok.

Question 7: Everything went well except the navigation that should be reorganized.

3 – MS SQL

Question 1: Website provides enough information

Question 2: The website is easy to use, but it is difficult to realize in what part of the website you are as it does not have breadcrumbs.

Question 3: Search was displayed in a meaningful way and would also see recommendations if the keyword would not match up.

Question 4: site recommend relevant topic if the keyword was not a match, will also search outside as it is linked with bing! search. (Did not understand the question)

Question 5: Topics had plenty of examples that are helpful to users to realize how a command syntx is used.

Question 6: The navigation is not as good as the Oracle page, not easy to get back to the home page and it is lacking breadcrumbs to show where you are.

Question 7: empty

4 – DB2 (STAR)

Question 1: In terms of usability testing, this site is a disaster. What the site produces when a search is conducted is unrelated junk.

Question 2: It did not provide needed information when a search is conducted.

Question 3: Does not save the searches and most searches are meaningless.

Question 4: The web site convey the results of the search nicely in an orderly manner.

Question 5: The extra information provided during a search are sometimes useful and sometimes not.

Question 6: Navigation is absolutely rubbish.

Question 7: In this user opinion, the web site should be reconstructed to give the required information during a search. The navigation system is also so tiny that people will not notice it and the back button cancels everything and return to the main page.

5 – Oracle (STAR)

Question 1: The required information are displayed on the web site along with related topics during a search.

Question 2: The navigation is fantastic and very easy to find your way back.

Question 3: Search results are displayed in a meaningful way and saved the user a lot of time in finding what he needed.

Question 4: feedback is good and convey the results in a nice way.

Question 5: The references really helped to give more information and details of what to do and on things often related with what the user searched for.

Question 6: The navigation is very easy.

Question 7: The web site is very easy to use and information is readily available. The site navigation is commendable, the user was satisfied by the site.

Congitive Walkthrough: Tasks notes

1 – DB2

Task1: Had some problems because they did not know to start the instance but the steps for creating a database were simple and self explanatory.

Task2: Used the GUI for this task and it was quite simple.

Task3: The gui to insert the data was easy to use, but it does not give feedback about the success of the operation, the mouse over tooltip cover the field where the user is writing in.

Task4: The Alter Table window was not sizeing up properly. Could not figure out what to write in the check constraint condition field.

Task5:Right clicking the database name gave the user access to the database setting and they could modify them there.

Task6: Users could create indexes and backup the database, the steps were easy and self explanatory.

Task7: Help is only online.

Task8: Empty

2 – DB2

Task1: Had some problems to create the database because they did not know how to do it, but then they could solve the error thanks to the “text holder”, they could create it through the GUI.

Task2: Used GUI, was easy.

Task3: The tooltip would cover the text field where typing, then you need to press the “commit” button or the data is not saved, but this is not mentioned anywhere, even when pressing the button there is no message giving feedback about the operation.

Task4: User had an hard time finding the place where to place or alter constraints, the window would not resize properly and there was no clear idea what to put in the check condition field.

Task5: Right clicking the database name gave the user access to the database setting and they could modify them there.

Task6:Users could backup and create indexes easily from the GUI.

Task7: Helpi is only online and their machine was not online.

Task8: Empty.

3 – Oracle

Task1: Does not apply.

Task2: Description of the solution.

Task3: Description of the solution

Task4: Description of the solution (Users were using google search and manual SQL to this point cause they did not realize how to do things differently)

Task5: User could easily see the settings, but not modify them.

Task6: they could create an index and it is unclear if they could backup the database.

Task7:The online help feature was helpful

Task8: it took some time to realize what the buttons did, but once they found out, all the operations would have been very easy to do.

4 – Oracle

Task1: does not apply.

Task2: Difficult to find the SQL editor when using this for the first time.

Task3-4: Empty

Task5: Can't modify the settings.

Task6: Can create indexes, can't backup, problem with log.

Task 7: Could not find the backup options, the online helps showed how to manyally backup, it helped.

Task8: Take some time getting used to, but once it is understood, it is easy to use.

5- Oracle

Task1: Does not apply.

Task2: Tables were easy to create and the interface was very straightforward, user noted similiarities with SQL Server.

Task3: Adding data was also very straightforward

Task4: That's ok.

Task5: Could access but not modify the settings, maybe due to admin rights.

Task6: Backups did not work for some lock or logs issues.

Task7: Users could not access either help (the online because of internet connectivty problems on the test machine)

Task8: They are familiar.

6 – Oracle

Task1: does not apply.

Task2: used object browser to complete.

Task3: Very easy to do.

Task4: It was easy to understand.

Task5: It was not straightforward, but the user was able to find how to modify the settings, but were unable to.

Task6: Empty.

Task7: Doesn't Work Offline. It works offline | online (???). It helps.

Task8: It is easy to use with previous experience in another DBMS.

7- MS SQL

Task1: It was pretty straightforward.

Task2: It is pretty straight forward since the tool is allowing you to create a table fast.

Task3:Easy, when creating the table, you can also add data to it.

Task4: It was pretty straightforward to add a primary key and the error messages are quite descriptive.

Task5: No setting were changeable and they were not descriptive.

Task6: The user could create an index and backup the database easily through the interface.

Task7: There is offline and online documentation.

Task8: The tooltips make it easy to understand what the buttons do.

8- MS SQL

Task1: Description of the solution

Task2: Description of the solution

Task3: Description of the solution

Task4: Not allow rules shows (??)

Task5: Users could access the settings but not modify them.

Task6: Description of the solution

Task7: Yes, it helps.

Task8: The options are ok.

9 – MS SQL

Task1: Description of the solution

Task2: Description of the solution

Task3: Description of the solution

Task4: Description of the solution

Task5:User could access but not change the settings.

Task6: Description of the solution

Task7: Offline and Online documentation, offline is not readable.

Task8: Menu options are clear and the tooltips work ok.

10 – DB2

Task1: It was stuck, needed to start something, why?? Creating the database took a long time.

Task2: Easy.

Task3: Sometimes it worked and sometimes it didn't, not consistently.

Task4: Error messages were not clear, not able to change (?)

Task5: Can, but not easily.

Task6: The backup did not work as the database was in use, eventually it worked. Index worked ok.

Task7: Only online and no internet access.

Task8: Empty.

11 – MS SQL

Task1: Description of the solution

Task2-3: Blank

Task4: There was difficulties in inserting a new constraint

Task5: No “important” things can be modified.

Task6: empty.

Task7: There are both.

Task8: Empty.

12 – DB2

Task1: The database creation wizard does not make clear what options are required and what would be the default of the optional ones.

Task2: There were too many unessential questions.

Task3: The data insertion has some really weird problems, had to try it many times to make it work.

Task4: It could not convert a varchar to a smallint but the error message was not helpful.

Task5: The settings can be changed, but it is not obvious how or where.

Task6: Cannot backup a database and the error message did not help, creating index was easy.

Task7: Help does not work offline.

Task8: Empty.

Cognitive walkthrough final questionarrie.

1 - MS SQL

The program was user friendly, the tooltips help to understand the functionalities of the buttons. User had familiarity with the system and that helped too.

2 – Db2

The tool was not easy to use and needed time to get used to it, some functions of the tool were not working at all.

If it is possible, I would like to google for help.

A clear introduction from the test holder will be very helpful and important.

3 – Oracle

The user thinks the software is good to deal with databases. It took some time to get used to it, but afterwards it was really easy to use and clear, not needing any effort to memorize all the statements of the queries.

4- DB2

Using the DB2 environment for the first time was on some level easy. The user thinks an introductory session with the tool or more time to get acquainted with it would have been very helpful. The user believes the tool needs improvements because solutions to certain problems are not always obvious, but overall it was a nice experience.

5 - Oracle

It was hard in the beginning, because it was not obvious to the users that the “object Browser” button was used to do all sorts of basic operations for a database management system (like creating a table), so the users instead did everything with the sql editor. The help features was not helpful but when dealing with the backup of the database.

6 – MS SQL

The user was unfamiliar with the tool and had problems with it due to this. Also bad was that the pair used SQL queries all the time, instead of using the GUI to perform operations. Overall though, the DBMS system worked well and the help gave enough information. User graded the DBMS 4 out of 5.

7- Unknown (does not speak of the product anyway)

The user thinks that these kind of tests make them understand easier how the usability studies are done and so it makes activities easier.

8 – DB2

The DB2 management system is horrible. The tester hopes this is the last time he has to touch the product, The help messages were confusing and so was the interface.

Observers/Facilitator notes

1- MS SQL web site

Notes: The tester was very fast in resolving all tasks, the observer note the tester is probably expert in the use of this tool.

Personal Observations: The tester used the serarch function extensively and knew what he was looking for. MS SQL is easy to use.

2- MS SQL web site

Notes: The user interface was good because the testers were able to find information about create database, backups easily and fast. Tester B had problems with task 6,7,8 while Tester A took some time on Task 5 but it was easy overall.

Personal Observations: Tester A had easy time to find the information because he knew SQL Server but also because the interface was good. Tester B problems are all because of his lack of knowledge of SQL Server. The search function helped both testers greatly.

3 MS SQL tool

Notes: The testers were constantly confused and not knowing much what to do at any given task, they also used alternative methods to execute simple tasks.

Personal Observations: the test was ok, straightforward and easy to understand.

4 DB2 tool

Notes: Interesting note on the user: Would like to have messages in color, green for success, red for failure.

5 Oracle tool

Notes: Error messages are not very helpful, especially the one about using double quotes instead of single quotes, the testers failed to backup the db, even after locating the help from the system, it could not succeed.

Personal observations: The home screen does not appear to be very useful as it does not explain what all the options are. The help system does not cover SQL syntax, the SQL editor does not highlight what line has the error if an error is found. The testers did not find the GUI, because “object browser” is not a good description for it.

6 MS SQL tool

Notes: Testers had little difficulties with the first tasks, but had problem with indexing. Help features helped somewhat and the tooltip were really helpful

Personal Observation: The testers did all the tasks on time and were either familiar with the tool or found it really easy to use. They had only one complaint and that is that the offline help was not reliable. The online one, though, was working fine.

7 Oracle Tool

Notes: Clear buttons but not clear where to go to do things, creating the table was difficult. Could not handle two statements/queries. Has nice feature of showing you the old queries on two screens.

Personal Observations: Did not go where to go at first, had to open/select everything, but after that it looked very easy and simple to use. Help was not very effective and google was a better tool.

8 DB2 Tool

Notes: It is clear the user is familiar with databases but does not have much familiarity with DB2.

Personal Observations: Some usability issue in the tool, for exmple windows that do not open right but need to scroll not upand down, but from right to left.

Seems to be that the DB2 platform is not very friendly to use.

9 MS SQL Tool

Notes: The user did not use the GUI almost at all, either cause he did not want to or he could not find what he wanted. He used the SQL editor for the most part but also could not do some of the tasks.

Personal Observation: The GUI is good, but the user did not use it before, need some time to get adjusted to it.

10 MS SQL Tool

Notes: The testers were familiar with the tool and this made all the tasks easy beside finding the settings of the database and some problem with understanding what indexing meant.

Personal Observations: None.

11 Oracle Tool

Notes: Easy to use and understand interface, Could not backup and the help could not connect.

Personal Observations: The observer realized how easy it was to use Oracle, once the object explorer problem was solved by observing the other testers having a much easier time with it than her. This made her change her mind about Oracle as being hard. She likes that no matter the system, you can fall back to pure sql queries and had to use Google for help for the most part.

12 DB2 Tool

Notes: The users got frustrated in various parts of the experience, like inserting data in the table (double clicking the table name did not help) and how the table folder was populated with many tables even if they just created one (the system tables were all there), the error messages were vague and the tool did not give enough feedback about operations.

Personal Observations: The users did not enjoy the experience and one of the users wishes to never have to do with the application again.

13 Oracle Tool

Notes: The testers had some problems dealing with the fact they could not create their own databases, could though access tables and the like, backup could not be done with the same errors as before.

Personal Observations: The observer is familiar with SQL and observed Oracle in the test and came to appreciate the latter over the former for ease of use. It seems Oracle has more ready-made functions that make the work much easier.

14 – DB2 Web

Notes: The search option was not very useful, not even finding a page with the same name. The content index on the left is the best option to find things and the information, once found, is very exaustive, but the testers were so frustrated with the search options that they switched to Google with much better results, finding pages in the web site via that.

Personal Observations: Some questions had different interpretations, the search engine only returned command syntax and not explanation of what the command is for. Observer would want to be tester too.

15 – DB2 Web

Notes: Beside more search function being useless, also there are problems with examples of the syntax not being easy to understand.

Personal Observations: The search should have more options than just one word/sentence.

16 – Oracle Web

Notes: The tester had some issues, but for the most part the search engine was really good, offering several options and everything could be easily found through that.

Personal Observations: Navigation: could be improved as it is not straight to the point. The site provided enough information, but sometimes too much.

17 – Oracle Web

Notes: The search engine was used to found most information and it is good that the search engine works really well in this web site, giving several options and finding what is needed most of the time. The users were satisfied with it and everything was easy and fast.