

Guidelines for Describing Usability Problems

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Abstract

This paper explains some recommendations on how to communicate usability findings and, in particular, on how to describe usability problems so that the reporting to the various stakeholders (developers, designers or client) might be done in a more effective and efficient fashion. On the basis of state-of-the-art research on usability, the authors illustrate with examples dos and don'ts in characterizing the problems emerged during usability analysis. The examples shown from real usability reports mainly concern content-intensive web applications characterized by a significant complexity in user requirements addressed (a very open set of user profiles and goals), information architecture, navigation capabilities and presentation strategies. However, the essence of the paper may be used independently from any usability method employed and across a variety of interactive application domains and families.

1 Introduction and Motivation

Discovering usability breakdowns is just half of the work in carrying out a usability evaluation. Since the outcome of a usability evaluation has to be communicated *somehow* to people who are different from those who did the analysis, communicating usability problems effectively to the relevant stakeholders (client, designers, and development team) becomes a crucial concern for the problems to be taken care of and for the recommendations to be understood as a useful input for the redesign work. The outcome of an excellent usability analysis (performed by whatever method, being it a user testing or an inspection) may be compromised by poor communication of the usability problems. In fact, problems should be described and communicated in such a way that stakeholders are convinced of their relevance and gather all the necessary elements to orchestrate the proper strategies for fixing them.

This paper is not about how to make a usability report (the literature on this theme is abundant), but it provides experience-based guidelines and principles which may help usability experts to deliver an effective description of the usability problems. It is not primarily a question of the communication medium used (being it a written report, a talk in front of the client, a multimedia presentation, etc.) but a *forma mentis* to mature which may improve not only the way findings are delivered but even the evaluation outcome itself. Anecdotic evidence shows in fact that being “forced” to convince someone about a usability problem is an extremely effective way to understand whether or not the problem is an actual problem, or whether it has been well grounded and explained.

How often does it happen that usability reports miss the point? Why are usability problems hard to understand for stakeholders (even within the same design team)? Why is so hard to convince somebody about the actual usability issue we are trying to describe? Why are stakeholders puzzled about a huge amount of issues reported, not finding a way to interpret the material and plan a consequent action? Some of the causes of these problems concern not merely a communication style or skill, but involve a deeper learning on how to analyse and characterize usability issues, so to facilitate the communication of their essence to the various stakeholders.

On the basis of real-life excerpts from usability reports and running websites, the paper explains guidelines and recommendations for usability experts in order to avoid the abovementioned flaws in describing usability problems. For each of the aspects described, specific suggestions will be formulated, corroborated by examples for making them more vivid and easily applicable.

The reminder of the paper is as follows: in section 2 we introduce the different aspects entailed by the activity of describing usability problems, thus setting the context in which guidelines for usability analysts (especially novice ones) are needed. Section 3, 4, and 5 illustrate the guidelines for respectively improving analysis, characterization

and the communication of usability problems. Finally section 6 offers a synopsis of the recommendations and sets the hints for future research.

2 Communicating Usability Problems

What is a usability problem? In general, we can state that a usability problem is an obstacle to the quality of the user experience. Usability problems should be the key result of any usability analysis, being it performed via inspection methods [4] or user-based methods [1]. Often, usability problems are coupled with a set of design recommendations suggesting possible strategies to cope with the problem described. However, problems and recommendations are two elements very different in nature. Whereas a problem description state the potential or actual impediment for the user or a breakdown of the application, the recommendation moves in the solution world, trying to devise what can be done to overcome the problem identified. Therefore, it is very important to distinguish among these two types of elements, since those who may agree on the problem statement (which is a proper field of the usability expert), may not agree on the solutions provided (which is a proper field of the designers). For better focusing the purpose of our paper, we will concentrate on guidelines for describing usability problems (and not design recommendations), being aware that these two aspects are often coupled together.

Describing problems “the right way” should not be a worry necessarily delayed to the so called “reporting” phase, but it should be a relevant concern as early as possible during usability evaluation. In fact, the different activities concerning the management of usability problems from the usability experts’ perspective (see Figure 1) are strongly intertwined.

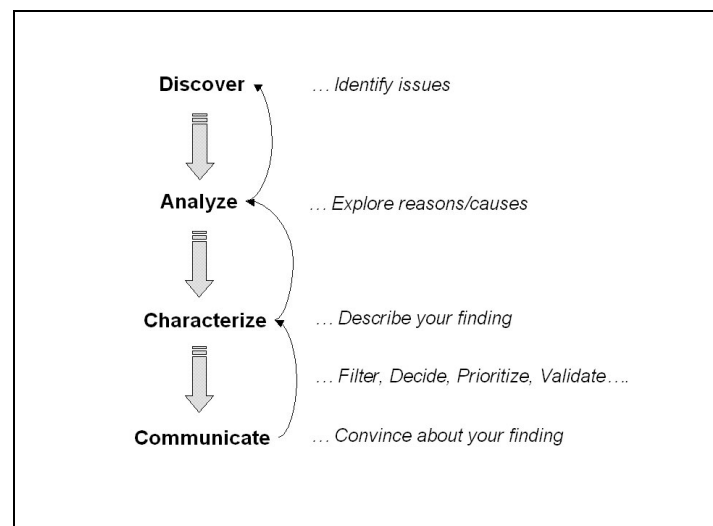


Figure 1. The usability problem lifecycle.

Problems have to be *discovered*, meaning that usability experts should be able to identify those aspects of the user experience which do not work. Experts may use one or a combination of usability methods and techniques or may rely on their experience, assuming that no method can replace the ability and intuition of the expert in “spotting” the real problems. This phase is highly heuristic in the sense that it is the activity (however is carried out) in which the raw material for subsequent analysis should emerge, and the necessary elements to contextualize the problems and understand them should be drawn from. In this phase (whose boundaries cannot be set absolutely and in a clear-cut fashion) the obstacles for the user experience should be circumscribed and detected, even if not yet clearly formulated and reasoned.

To elaborate the ideas, intuition and rough findings of the discovering phase, a further activity entailing an accurate *analysis* should take place. Here, the various elements composing a usability problem should be decoupled and inspected under different perspectives so to understand the causes and the origins of the issues detected. This analysis is very important, since it often enable usability analysts to make better rationalize their findings, aggregate, generalize their results or plan to go back to discover more.

Note that these activities or phases for the proper management of usability problems are cross-methods or method independent, in the sense that they should be applicable to any structured method or technique in order to manage the finding of the analysis at issue.

Moving from the analysis to the *characterization*, the usability problem management trespasses the boundaries of the mind of the usability experts or of the usability team, and cope with that fact that problems should be understood by external stakeholders. So, characterizing a problem means accurately and completely describing the findings and consistently orchestrating the analysis elements emerged so far for shaping coherent problems statements.

Finally, the *communication* effort is of utmost importance for sending the right message to the various stakeholders [1]. Communicating problems means deciding what to say and how to say it according to the circumstance of reporting and to the addressee, how to prioritise and order the presentation of the findings, what to stress more and what to mitigate, what bridges should be built among the different parts of the analysis, and how to provide convincing arguments to support the results.

Guidelines	Usability problem lifecycle		
	Analysis	Characterization	Communication
Separation of concerns	X		
Abstraction level	X		
Extendibility		X	
Authority		X	
Technicality			X
Prioritization			X

Table 1. Coverage of the guidelines presented in this paper.

The guidelines provided in the following sections may be useful in various activities discussed so far (especially for novice or less-experienced usability analysts), and namely with respect to analysis, characterization and communication. The discovering phase is more method-dependent and therefore guidelines for it are already provided by the variety of the usability methods available in the literature and in the practice. The guiding principles illustrated in the next sections respectively support the aforementioned activity as shown in Table 1.

3 Analyzing Usability Problems

3.1 Separate Concerns

Guideline: Decouple a usability problem into the various design dimensions it is concerned with (content, navigation, semiotics, graphics, etc.) and distinguishing between problems which are requirements-independent and problems depending on the purpose of the application (e.g. scenarios supported).

Consider that one of the results of an observation is the following: “Navigation is hard in section X”; this problem is a statement that clearly glues different elements that should be distinguished for knowing where to intervene exactly. It is too vague, not well explained and justified. In fact, having such a problem statement, it is not at all clear where the usability problem actually lies. Is it a problem of link names? Is it a problem of link position and order? Is it a problem of link colors? Is it a problem of content structure in the page and across pages? Is it a pure navigational problem? If yes, which aspects of navigation are not working?

A problem often may emerge as an aggregation of different elements, which should be clearly distinguished during analysis in order understand where the actual problem is, to make the different usability elements emerge and to be able to intervene more analytically.

It is known that the user experience (especially if expressed by the user herself) is highly synthetic. The work of the usability expert is to transform this synthetic experience, feeling, impression or reaction into an analytic and reasoned judgment which may isolate the various concerns of the problems.

An important separation of concerns is between problems with strictly concern the design level (also called “technical problems” [5]) and problems strictly related to the application scenarios. Technical problems (those concerning navigation, consistency in layout, in link labels, in information architecture, or technological breakdowns) are typically application independent problems, in the sense that they can be well detected without

knowing the specific purpose and communication goals of the application (see the navigation problem in Figure 2). Other, more crucial problems are those who significantly obstacle the fulfilment or the efficiency of important user scenarios (see content problem in Figure 3). However, in case that the actual application requirements are not known (strategic objectives, communication goals, specific scenarios that have to be supported), and the analysis of the problems emerged strongly depend on this information, analysts should limit to raise issues about the problems encountered (keeping open the possibility of considering it a real problem or not), providing the stakeholders the elements to reason about their requirements in relation with the issue raised. In other words, as shown in Fig. 3, if analysts do not know the goals of the stakeholders, they cannot assume that the museum wants to promote the exhibition and thus supporting the user in gathering the necessary details to plan a visit to the exhibition.



Figure 2. Hermitage Museum website: Orientation clues in this guided tour (e.g. 6th step out of 10) are completely missing (navigation problem) [6].

Among the various concerns to consider when analyzing usability problems, the following should at least be taken into account (see detailed explanation of these aspects in the MILE method [4]):

- *Content*: problems concerning the main messages of the application and all the information contained (produced by the content providers).
- *Semiotics*: problems concerning the interface signs, including link names, labelling, page widgets, and micro content.
- *Information Architecture*: problems concerning the overall partition of the content in the application structure, the organization and balance of the content across sections and pages.
- *Navigation*: problems concerning the connections among pages, i.e. the decisions of linking a given page, a set of pages or a type of page to another one somehow related.
- *Operations/Transactions*: problems concerning improper design of operations available to the user or bad design of the transaction flows.
- *Technology*: problems concerning technological breakdowns (including compatibility, plug-ins) and bad functioning of operations or transaction due to implementation errors.



Figure 3. Hermitage Museum website: planning a visit to the exhibitions is simply unfeasible with such poor information (content problem) [6].

Each usability problem should be analyzed and examined until each of its elements falls in one of these categories. If there are cross-concern problems, then further elaboration is needed, or a novel category should be introduced and used.

3.2 Balance Abstraction Levels

Guideline: Describe usability problems keeping a consistent level of granularity, moving from general to specific and without abruptly mixing details with strategic issues.

Macro-problems should not be confused or intermingled with micro-problems. The difference in granularity may be decided according to the degree of impact of the problem on the overall application. It is important to characterize in depth high level and very general problems before digging into the details of the problems concerning specific features. Important details such as “difficulties in subscribing to the mailing list via form” should not hide or being intermingled with issues at a higher level of abstraction such as “purchase service declared but not actually possible”.

The level of abstraction of the problem is a good sign of how deep the analysis is and how usability experts master the results delivered. Moving from general to specific is also effective for having stakeholders agree first on the major issues, and then discussing the details. The level of abstraction in which problems are characterized and reported should be kept consistent and balanced, at least for two reasons:

- a) if analysts start to focus on fine grained issues (not necessarily less important), they risk to lose the “big picture” of the application;
- b) stakeholders are facilitated in following your reasoning, if you move from general concerns to detailed ones.

The same usability problem may be described at different levels of abstraction. Let us consider the example illustrated in Figure 4.

Services	Information
Shop Online	Ticket Prices
Museum Shop with E-Shop functionality	Telephone and Fax Numbers
Shops inside the museum	Directions
Scholarly Publications	Tours and Lectures
Ordering Images and Photographs	Floor Plans
Education and Technology Center	Contact Information
Info Stands	Publications
Ticket Bookings	Museum Departments
Floor Plans Location of Services	

Figure 4. A typical Information Architecture problem [6].

The problem shown may be described at least at three different levels of abstraction:

A1. The criteria used for the information architecture are not always clear. See for example the redundancy in section “Service” and “Information” (Figure 4).

A2. Some link names in the “Service” section overlap almost entirely with some link names in the “Information” section (see Figure 4). Having this situation, the user is never sure to have consumed all the content available for a given tropic (e.g. museum publications).

A3. The difference between the sections „Information“ and „Services“ remains unclear, even more so because the contents of these two sections are partially overlapping and repetitive. In Figure 4, the grey labels are very similar; the white labels are quite similar. The distinction between “Shop online”, “Museum shop with E-Shop functionality”, “Shops inside the museum” and “Ordering images and photographs” is not quite clear and is rather complicating the orientation than clarifying it. Also the difference between “Telephone and Fax Numbers” and “Contact Information” (consisting of a long list of telephone numbers and addresses), is not clear [6].

All three statements are true and accurate in describing the problem in Figure 4. Not all of them are equally relevant in every communication context. A1 is a very general statement characterizing a problem at the information architecture level. As an example, it refers to the specific section illustrated in the picture, without commenting further on. This quite high level of abstraction is good for overview purposes, such as executive summaries or synopsis, or conclusions, to give the essence of the usability problems and then pointing to more detailed descriptions.

A2 describes the problem in the specific case, interpreting the issue at the semiotic level (link labels), and provides grounding related to the impact on the user experience. This middle level of abstraction is quietly focused on the details and of course should be complemented by a description of the “information architecture” concern (it is not enough to change the labels to fix the problem). This statement can be considered as a synthetic description of the specific problem.

A3 adds a number of details to the problem, describing what precisely is not clear in which labels and introducing a further concern, which is the degree in which the content sections are overlapping. This is a low abstraction level which is entirely flattened on the details of the specific case and it is good for discussing in-depth the two specific sections at issue, typically as a comment of the table, if the problem illustrated is unique in its nature.

4 Characterizing Usability Problems

4.1 Extendibility: Represent Classes of Problems

Guideline: In case of complex applications, describe each problem as a representative of a class of problems, and characterize each problem by providing a general statement pointing to specific examples.

Usability experts do not often have the time and resources necessary to analyze thoroughly a complex application. It often happens that problems are recorded and described as they emerge from the analysis, wrongly assuming that the spotted issue is so unique and peculiar. As a consequence the characterization of such problem is only valid for the incidental context in which it emerged, and the consequent recommendation for improvement just addresses the fixing of that specific situation.

Let us consider the following problem description: **As entering the category “Jewels”, the user can choose among “handmade jewels” but also “bronze”, “everyday tools”, and “wooden products”, whereas the user expects to find only jewel-related objects, or subcategories of jewels [7].**

It is clear that this is an important problem to characterize and point out. However, usability analysts should wonder: is this an isolated problem? What happens in the other 15-20 categories? If the expert does not have the time to inspect thoroughly all the categories and all the sub-levels of it (which may take more than expected), “sample” inspection can do the job, meaning that 3-4 categories are randomly chosen and analyzed to verify the pervasiveness of the problem.

Then, when it comes to precisely characterizing the problem, usability experts should carefully describe it as a general problem (if found in one that more categories), pointing to the specific case of the “jewellery” as an example. In other words, the specific case emerged should be described not as “the” problem to solve but as a representative of a class of problems, which may likely occur in other parts of the application. Even if analysts find just one case of the problem (and do not even have the time to do “sample” inspection), then it is recommendable to generalize the problem and quoting the specific example.

Note how the same problem can be characterized according to this guideline:

Collection categories have “foreign objects”, which should not belong that the category that are in. This may lead to a confusing and disorienting browsing of the categories offered.

Examples:

- **Category “Jewels”, which contains the subcategories “handmade jewels” but also “bronze”, “everyday tools”, and “wooden products”.**
- **Category “Painting”, which contains Religious Pieces”, “Masks”...**

“Sample” evaluation can provide insight for usability breakdowns, provided that these findings are not supposed to be neither isolated nor necessarily “extendable” to all other parts of the application. As shown in the example, combining a statement at a middle-level of abstraction with one or more examples can effectively communicate this message.

In this way, once the stakeholder understands the problem and passes it to the designer to look into it, the designer cannot just fix the specific example (because it may be not sufficient), but he is forced to check and fix all the possible occurrences of the general problem.

4.2 Authority: Ground Your Findings

Guideline: Give reason of your findings by drawing to elements which can gain credibility, such as the experience of the analysts, the impact on the user experience and the compliance with the standard and convention.

Authority is a crucial success factor of any effective communication. In communicating usability problems, by authority we mean the *source for credibility of the findings*. Where do usability problems draw their credibility from? We can have three main sources or pillars for usability results to be credible:

- a) **Experience:** the analysts is recognized as knowledgeable and experienced
- b) **Consequences:** usability problems are shown to have an impact on the actual user experience
- c) **Anomalies:** usability problems patently infringed standards, good conventions or common practice in the domain

None of these pillars alone can fully gain the needed authority for usability findings. These elements have to be properly combined, and all have to contribute with different weights to consolidate the credibility of the usability problems. In this way, usability problems can acquire their authority and start to become worth noticing for the stakeholders.

Let us consider the following statement: **“There is information overload of promotional messages on product page”**. Why should this be considered a usability problem? To answer this question, we should start investigating pillar b): is the user actually distracted from her task? If yes, is there any evidence in user testing or in other previous research? What if the user is happier when following a popped-up product that might better meet her need? Even if pillar a) may play an important role, authority is too often delegated solely to the experience of usability gurus, for it is (wrongly) assumed that their indications are “the” usability rules not to be infringed. In this situation, analysts fail to gain full authority since they do not investigate pillar b) and c).

5 Communicating Usability Problems

5.1 Prioritize and Set Importance

Guideline: Communicate your findings in order of importance: according to the circumstances, importance may mean gravity for the user experience or estimated effort needed to fix the problem.

In which order should usability problems be recounted? The actual order is immediately perceived by the stakeholder as an order of importance (say first what is most important). What does importance mean in this context? On one hand, importance may mean the “gravity” of the problem for the user experience (“unclear link labels on the home page” is a more important problem than “having the ‘edit quantity of shopping bag item taking 2 seconds to work”). The first problem may absolutely hinder the location of the content, while the second may have the user wait a bit longer for the operation to be completed.

On the other hand, problem importance might also be interpreted as the amount of “burden” or complexity for the designers to fix it. In this case the above priorities should probably be inverted: a semiotic expert can write clearer labelling for the home page in few hours, whereas having to speed up the “edit quantity” operation may need to reconfigure, reinstall or change the business transaction software behind.

	UX Gravity	Effort to fix
Problem 1	10	0.1 person/month
Problem 2	8	0.4 person/month
Problem n	5	0.2 person/month

Table 2. Reporting the “gravity” of usability problems.

A solution for keeping both priority messages is to communicate to the stakeholders the problems in order of gravity for the user experience (e.g. the completion of crucial scenarios is hindered) and then roughly estimate the effort or expertise required for intervening to fix the problems (see Table 2). The table may be ordered by “gravity for the user experience” or by “effort to fix”, thus enabling stakeholder to gather more elements to decide how to act. In fact, the final message to be perceived by the stakeholder is: “What should I do now”? “What should I focus on first and what can I plan as future activities”?

5.2 Technicality: Avoid “Usability” Jargon

Guideline: Adapt your concepts and wording to the target audience you are communicating with, in such a way that stakeholders should clearly understand the essence of the problems.

The main addresses of the communication of usability problems are not necessarily technical people, or people with a strong computer or usability background. Moreover, we have to abandon the idea that they should know the principles of usability or even the concepts of the methods which experts use. Explaining the problem with plain concepts and wording is an important condition for usability problems to be accepted. The “usability” or “design” jargon must be avoided, and exceptionally used just to convince the stakeholder about the breadth of knowledge of the usability analysts, without compromising the understanding of the key message.

A problem statement like **“Technical heuristics T4 showed that the structural navigation within nodes of the entity type “painting” is inconsistent and not predictable”** is far to be easily understood by a stakeholder, with

the consequence that they may start considering the usability analysis not relevant for them. Such a problem communication may be rephrased as: “**Navigation among the different details of a painting is difficult and disorienting, since links sometimes disappear and their logic is not to easy to understand**”.

A problem like “**iconic information-overload on homepage hinder proper understanding of application topics coverage**” may be translated and explained as “**users may be overwhelmed by the numerous images and graphics on the home page, which pose serious obstacles to catch quickly what the site is about**”. According to whom the problem communication is addressed (designers, information architects, client, developers, web masters, project managers), proper lexicon should be used to convey the problem meaning.

6 Conclusions and Future Work

On the basis of real-life excerpts from usability reports and running websites, the paper have presented some guidelines and recommendations for usability experts that may help in achieving successful and effective description of usability problems. Guidelines support different activities concerning problem description, namely problem analysis, characterization, and communication. The guidelines, which are summarized in Table 3, are extremely relevant for web application usability analysis (especially for content-intensive and complex websites), but are also applicable to a variety of interactive applications. Independently from the specific usability evaluation method used and from the specific communication medium used (a written report, an illustrated presentation or a simple brief), analysts can smoothly integrated these guidelines into their usability practice, improving the overall communication of their findings.

Separation of concerns	Decouple a usability problem into the various design dimensions it is concerned with (content, navigation, semiotics, graphics, ...) and distinguishing between problems which are requirements-independent and problems depending on the requirements of the application (e.g. scenarios supported).
Abstraction level	Describe usability problems keeping a consistent level of granularity, moving from general to specific and without abruptly mixing details with strategic problems.
Extendibility	In case of complex applications, describe each problem as a representative of a class of problems, characterize each problem by providing a general statement pointing to specific examples.
Authority	Give reason of your findings by drawing to elements which can gain credibility, such as the experience of the analysts, the impact on the user experience and the compliance with the standard and convention.
Prioritization	Communicate your findings in order of importance: according to the circumstances, importance may mean gravity for the user experience or estimated effort needed to fix the problem.
Technicality	Adapt your concepts and wording to the target audience you are communicating with, in such a way that stakeholders should clearly understand the essence of the problems.

Table 3. Synopsis of guidelines for describing usability problems.

Future work will consolidate and expand these guidelines according to the growing project experience, and will devise strategies to validate their effectiveness with respect to situations in which problem communication does not consider these recommendations. To this end, experiments will be set up in which with different groups of novice analysts use the same usability method to discover problems, and then are trained differently as to how they can describe those problem (a group using the presented guidelines and the other without any guideline). Effectiveness of the communication to the stakeholders will be verified and compared against the impressions and opinions of the stakeholders themselves.

Acknowledgements

The authors thank all member of the TEC-Lab (www.tec-lab.ch) at the University of Lugano, in particular Luca Triacca and Marco Speroni, for their precious research and project work on usability evaluation methodologies. We warmly thank Paolo Paolini, TEC-Lab scientific coordinator, for his insights, experience and ideas in communicating effectively usability problems. Parts of the application examples reported and used to illustrate usability problems have been elaborated on the basis of the usability analysis produced by students [6][7] of the Master TEC-CH (Technology-Enhanced Communication for Cultural Heritage, www.tec-ch.unisi.ch), an innovative Master Program of the University of Lugano.

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