

Structuring Design Guidelines for Electronic Commerce Web Sites

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Abstract: *Designing and evaluating the usability of electronic commerce web sites is a rather complex activity that involves design knowledge. One particular form of this knowledge consists of design guidelines, which can ensure some minimal form of usability. However, these guidelines are widespread throughout the literature and expressed in various forms. This paper attempts to provide a framework for structuring guidelines, exemplifying it for electronic commerce web sites.*

Keywords: *Computer-human interaction, web sites, design, guidelines.*

1 Introduction

A design guideline for an interactive system consists of a widely accepted principle that ensures some form of usability of the user interface (UI) of this system. For more than fifteen years, guidelines helped designers to improve the UIs by relying on the statement of these guidelines. However, guidelines suffer from drawbacks such as [1]: widespread throughout literature, inconsistent vocabularies, homogeneousness of sources and disciplines, potential conflict, and lack of structure. In this paper, we attempt to improve the structure of design guidelines by reporting on a template for structuring guidelines and by exemplifying it on electronic commerce web sites. It is expected that guidelines structured according to this approach will be more easily communicated to de-

signers, understood by developers, and propagated throughout the interested organisations.

2. Template for structuring guidelines

The proposed template for structuring guidelines consists of a list of attributes (table 1) based on a general guideline model refined by trial and error [3] and expanded to consider modern guidelines. A subset of these attributes are defined afterwards.

The guideline identifier is an alphanumeric identifier denoting the position of the guideline in the section guide. It is not known at the moment when guidelines are collected. However, if the collection is structured in sections, the number of the guideline within the section should be provided.

Table 1. Template for structuring design guidelines

No	Attribute name	Definition
1	GuidelineID	An alphanumeric identifier denoting the position of the guideline in the section guide; introduced after the guidelines organisation.
2	Title	A brief and representative sentence using an active verb
3	Statement	A complete statement written in a natural language
4	Rationale	One or two phrases justifying the guideline
5	Exception	One or many exception cases with negative / positive examples
6	Comment	More information about the guideline
7	References	A list of bibliographic references quoting the guideline (author(s), year, title)
8	Ergonomic criteria	The evaluation ergonomic criteria respected by the guideline; use one of the elementary criteria

9	LingLevel	Linguistic Level in which is situated the guideline
10	Negative example(s)	A negative example depicting a UI violating the guideline: textual explanation; picture; reference; original web address; local directory / file
11	Positive example(s)	A positive example depicting a UI respecting the guideline: textual explanation; picture; reference; original web address; local directory / file
12	Relationship	Relationship established with other guideline according to a link topology
13	Key words	Keywords to index the guidelines
14	EvalMethod	Methods for the evaluation of the guideline
15	UI types	The user interface type for which the guideline is valid: web, textual, graphical, vocal, tactile, virtual;
16	Development phases	A set of phases to whom it might concern: requirements specification, design, implementation, evaluation, training (education) ;
17	Activity domains	The activity domains the interface are targeted to and which may benefit from the guideline;
18	Tasks	User's tasks that benefit from the guideline; tasks are meaningful in the activity domain;

The guideline title is a brief and representative sentence using an active verb. It is strongly recommended to be as short as possible provided that the guideline meaning is preserved. Examples of titles are: *Provide on-line shopping carts..*

The statement describes the principle that should be followed when designing the interface, for instance: *Provide means to create on-line shopping carts that help users to keep track of what they already bought.*

For each guideline a list of bibliographic references quoting the guideline should be provided. The reference specifies the author name and the year, for instance: [IBM00-2] IBM ease of use: "Web design guidelines" section: e-commerce topics. Product information. http://www3.ibm.com/ibm/easy/eou_ext.nsf/Publish/615

According to Nielsen [2], the linguistic level to which the guideline is applied can be *one of* the following: goal, pragmatic, semantic, syntactic, lexical, alphabetical, physical. The linguistic level refers to levels of decomposition of a task.

The complete list of ergonomic criteria adopted for this template is based on the report of Bastien & Scapin [2]. Additionally an elementary criterion – adaptability – was added to adaptability criteria group. Also, the last criteria – compatibility – was expanded in three elementary criteria: task compatibility, user compatibility, envi-

ronment compatibility. Root ergonomic criteria are: guidance, workload, explicit control, adaptability, error management, consistency, significance of codes, and compatibility. Only elementary criteria should be used. There are 21 elementary criteria in this set. For example, *Significance of codes* concerns the relationship between a term and /or a sign and its reference. Codes and names are significant to the users when there is a strong semantic relationship between the codes and the items or actions they refer to.

The rationale consists of one-two phrases justifying the guideline. For example, **Guideline:** Use hypertext to structure the content space into a starting page that provides an overview and several secondary pages that each focus on a specific topic. **Rationale:** The goal is to allow users to avoid wasting time on those subtopics that don't concern them.

A negative example is a reference to a UI violating the guideline. A positive example is a reference to a UI respecting the guideline. For each example, we have:

- a textual description that explains why or how the guideline was violated; if possible indicate the right solution;
- a picture that illustrates and documents the explanation;
- the reference where the example was found;
- original web address;
- a local directory / file name where the

example is saved for a future use.

Both the original location and the saved page should be kept because the original site could change in time thus leaving the web address and/or the example obsolete.

Guideline statement: Preserve previous at-

Original address:

<http://www.bluefly.com/list/catg.asp?zone=mens&sort=fresh&brand=&catg=ls&min=0&max=0&color=&listview=brand&sid=V0U9VC68P1S92LTA00A3HJBDN59B2EBA&mapsz=M>

Local address: D:\Guidelines\Examples\bluefly\list\catg.asp

tribute values as selected by the user

Negative example: The Bluefly e-store does not preserve the size setting when choosing a product to examine it in more detail (fig. 1).



Figure 1. Example of a guideline which is not respected in an electronic commerce web site

One or more cases when the guideline does not apply, with negative and positive examples. A set of relationships established with other guidelines according to a link topology. It can be one or many of the following: related-to, conflicting-with,...

The user interface type for which the guideline is valid. It can be one or many of the following: Graphical User Interface, Character User Interfaces, web, virtual reality, tactile, audio,...

A set of phases to whom it might concern. It can be one or more of the following: re-

quirements specification, design, implementation, evaluation, training, education.

The activity domains the interface are targeted to and which may benefit from the guideline. It can be one or more of the following: e-commerce, e-banking, e-documents, CAD,...

The user's tasks that benefit from the guideline. The tasks are meaningful in the activity domain. It can be more than one task for which the guideline applies. For an e-commerce web sites the task could be classified within following cate-

gories: *user support* (i.e., knowing the site, understanding return policies, understanding shipping conditions, contacting, looking for help), *product navigation* (choosing a store, choosing a product category, choosing a brand or a designer, specifying a display, product examination, detailed product examination), *product picking* (add to wish list, examining the wish list, add to shopping cart, examining the shopping cart), and *checking out* (checking the order, specify payment details, tracking an order).

Under the keywords section are classified other attribute values that might be relevant for the guideline organisation.

5. Conclusion

In this paper, we introduced a template for structuring design guidelines for the UI of interactive computer-based systems. This template is currently being used to input design guidelines into knowledge bases of the MetroWeb project. This software is a Web-based tool for working with guidelines: any user may input a guideline, submit it for revision to developers or human factors expert, and validate it. Once guidelines are accepted in a knowledge base, they can be accessed through the web.

For instance, a user interested to know usability guidelines applicable to mobile devices, such as WML-compliant cellular phones, may access the guideline base for mobiles devices. In this base, the user can select any subset of guidelines and retrieve them from the base to form his/her own working base. Examples can then be added, along with annotations. Guidelines for which some possibility for automated or computer-aided evaluation are considered for an extension of this tool.

Acknowledgement

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References

- 1 Bastien, C.J.M. and Scapin, D., *Ergonomic Criteria for the Evaluation of Human Computer Interfaces*, Technical Report No.156, INRIA, 1993.
- 2 Nielsen, J., "A virtual Protocol Model for Computer-Human Interaction", *International Journal of Man-Machine Studies*, Vol.24, No.3, 1986, pp.301-312.
- 3 Vanderdonckt, J., "Development Milestones Towards a Tool for Working with Guidelines", *Interacting with Computers*, Vol.12, No.2, 1999, pp.81-118.