Tools for Working with Guidelines

A CHI '94 Special Interest Group

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Abstract

This article reports on a Special Interest Group meeting held at CHI '94, Boston; to discuss the past, present, and future of "Tools for Working with Guidelines". Though working with guidelines has gained today more common practice than in the past, it is still not always obvious which methods can be effectively used for managing guidelines during the whole development life-cycle of an interactive application. Moreover, it is not clear which kind of tools could be made available to designers for helping them in the process.

This SIG focused on existing and planned tools for working with guidelines and related computer-aided activities involving guidelines: learning, understanding, teaching, illustration, documentation, standard compliance, usability assessment, guidelines evaluation, computer-aided generation of user interfaces explicitly based on guidelines, advice-giving systems.

Goals

Several software tools for working with guidelines emerge today (see table 1 for a relatively complete overview), but it is not clear enough what type of tool they consist of, what kind of help they provide, for what purpose they are made.

The first goal was to systematically describe a sampling of current tools for working with guidelines. Each tool is described according to important topics of discussion:

- type of tool: expert system, hypertext, hypermedia, prototyping tool, visual editor, screen editor by demonstration, automatic user-interface builder, ...
- purpose of tool: on-line documentation, tool support for inspection, computer-aided evaluation, computer-aided usability engineering, automatic generation of user interfaces, graphical user interface designing help, standards, guidelines and styleguides development, checklist verification, metrics evaluation, ...
- computing platform: Apple Macintosh, Microsoft Windows, OSF/Motif, Open Look, NextStep, ...
- audience: user interface designers, programmers, software engineers, interface evaluators, managers in the computing and communications fields, technical writers, human factors specialists, trainers, marketing, ...
- standard compliance: constructor styleguide (e.g. IBM Common User Access), corporate styleguide (e.g. Bellcore styleguide), general standard (e.g. ISO 9241);
- availability: public domain, research product, commercial product, ongoing implementation, ...
- implementation type of guidelines: natural language, object-orientation, production rules, knowledge base, ...
- guidelines facilities: modifiability, expendability by the final user, annotation, exemplification, guideline search by key word, by topic, guidelines gathering, report, ...
- architecture of the tool: components, files, sources, ...

The second goal was to let attendees compare facilities provided by presented tools and their real world.

SIG Highlights

This SIG was the first open meeting supported by an international and informal group of researchers and practitioners (see authors) in the area of "Tools for Working with Guidelines" suggested by Jean Vanderdonckt. The SIG was attended by over 32 people having different backgrounds ranging from people involved in a definition of international or national standards to people working with styleguides.

Technical presentations

To meet the first goal of the SIG, the first part consisted of brief oral presentations by five people who are authors or leaders of the presented tools: DIADES-II (I. Dilli, Univ. at Darmstadt, Germany), EXPOSE (Peter Gorny, Univ. of Oldenburg, Germany), GuideBook (Kaori Ueno, NTT Labs, Japan), IDA (Harald Reiterer, Univ. of Vienna, Austria), SIERRA (Jean Vanderdonckt, Univ. of Namur, Belgium). The short papers of these presentations and the short papers about the other tools were provided to the attendees, but are also electronically available through anonymous FTP at arzach.info.fundp.ac.be [138.48.4.5] in /pub/papers/jvd/Tools_fww_Guidelines.tar.Z. Revised versions of these documents are reproduced in this report.

Questions raised

Which tool is the best suited to my purpose?

The presented tools have different approaches and multiple contents which are heavily context-dependent. DIADES-II basically consists of an architectural approach based on the blackboard metaphor, containing cooperating agents for dynamically helping the designer to build a user interface. EXPOSE seems to put

more accent to the underlying standard compliance with explicit domain consideration. GuideBook is a good example of guidelines developed by and for the users according to user requirements. These guidelines have been first placed in a book that was emphasized by the hypermedia. IDA is more dedicated to be included in a general development environment on top of a UIMS. It would enable a designer to check all guidelines relevant to particular interaction objects (e.g. push buttons, windows, ...). SIERRA is aimed at human factors experts who want to access and gather guidelines related to a particular topic of interest.

How is it possible to know the precise context of the provided guidelines?

A recurrent problem is that guidelines are most of the time excluded from their context: they are written just as if they were task-independent. Nevertheless, some guidelines have been experimentally proved successful in specific contexts. The problem is that this context experience (operational variables, experimental conditions, user population, ...) allowing to characterize the applicability of guidelines is completely lost in the guideline statement. It is sometimes necessary to refer to the original reference of the guideline to keep the conditions in mind. Having this knowledge quickly available could substantially improve the applicability of guidelines by suggesting a taxonomy of behaviors, but requires a lot of work only for providing this context explicitly. Moreover, the level of each guideline is varying according to this context. It is therefore quite difficult to provide a given score for ranking guidelines independently of the context. This problem is rather intrinsic to guidelines themselves, but is highlighted by using them through tools.

How is it possible to maintain guidelines in the different tools?

Guideline databases are rarely frozen: they should evolve with experience. In some cases, the guideline or human factors engineer is responsible for maintaining a consistent knowledge base of guidelines. In other cases, it is possible to automatically generate hypermedia from a styleguide document. Therefore, each styleguide revision would be automatically taken into account by re-generating the hypermedia.

How is it possible to get a customized guideline database?

Some tools provide guidelines based on an existing document or styleguide. Sometimes the same document is accessible across a wide variety of platforms (e.g. the Smith & Mosier standard is the source of several tools such as SAM NaviText, DRUID, HyperSAM, and SIERRA) leading to the question: which system can guarantee the best usability of the same source document. Sometimes multiple documents are available on the same platform, but these documents are not necessarily inter-related, lacking typed links between related topics. It is consequently as hard to customize an existing guideline database as the underlying sources are related and tools are open. But it is possible to define a customized guideline database by referencing previous documents or works.

How is it possible to get specific guidelines for a specific question?

It is widely recognized that specific guidelines are more useful than general principles. The problem is that guidelines are aimed at different people during the com-

Table 1: List of current tools for working with guidelines

Name	Type of tool	Purpose	Platform	Standard Compliance
DIADES-II	Knowledge-based system	interface design with active assessment	Unix	Multiple
EXPOSE	Expert system	user interface design assistant	Unix, OSF/ Motif	OSF/Motif
GuideBook	Design	Guideline	Database	User-centred guidelines documentation
HalCIon	Hypermedia	guideline and principles teaching	Macintosh	Apple
HyperSAM	Hypertext	on-line documentation with browsing, gathering, annotating and searching guidelines facilities	Macintosh	Smith & Mosier
IDA	Design Aid Tools	user interface design assistant	Unix, OSF/ Motif	Multiple
MIL-STK-1472	Hypermedia	on-line documentation with figures, tables and index	Macintosh	MIL_STD-1472
SIERRA	Hypermedia	on-line documentation with search, gathering features	MS-Windows V3.1	Multiple

plete development life cycle. High-level pragmatic guidelines are needed by the project leader (e.g. guidelines related to methodology, management support, systematic use of guidelines), mid-level guidelines are more useful for designers (e.g. guidelines related to the choice of appropriate interaction styles, metaphors, multimodality), low-level guidelines are more dedicated to graphic artists (e.g. guidelines on icons) and programmers (e.g. guidelines related to physical appearance, style, colors). Providing all these different specific guidelines through only one tool is currently unfeasible, partially because the structure of guidelines changes according to the level. However, some tools are very practical for some linguistic levels such as syntactic, lexical. Other levels are more difficult to manage in a computer-aided or automatic way. Nevertheless, a user interface which is compatible with a (low-level) surface guideline does not guarantee any usability: it only supports surface consistency. Helping people working with higher guidelines is more the scope of advice-giving systems, case-base reasoning systems based on a taxonomy of examples or decision support systems. These kind of tools may only appear if there is knowledge enough on the precise use of such guidelines, which is not the case today.

Conclusion

Future efforts can be concentrated on both guidelines and tools for working with guidelines.

Guidelines could be written with a more precise explanatory power, could be validated and based on the interactive task. High-level guidelines, such as guidelines dealing with semantic and pragmatic aspects, could be made more explicit, even if their scope is narrow. Software tools for evaluating guidelines are lacking, mostly because evaluation methods based on guidelines are heuristic, but can be based on a correct interpretation of results obtained with a final user to be compared with the results provided in the reference.

Tools for working with guidelines really need to be

- open in order to accept external guidelines,
- expandable in order to maintain guidelines database or knowledge base
- linkable in order to multiple source documents
- computer-aided in order to reduce time and efforts needed to manage guidelines.

Contact List

To join the informal group on "Tools for Working with Guidelines", send your email address to "jvanderdonckt@info.fundp.ac.be" with a description of your interests.