Encyclopedia of Portal Technologies and Applications

Arthur Tatnall
Victoria University, Australia

Information Science REFERENCE

INFORMATION SCIENCE REFERENCE
Hershey · New York

Acquisitions Editor: Kristin Klinger
Development Editor: Kristin Roth
Senior Managing Editor: Jennifer Neidig
Managing Editor: Sara Reed
Assistant Managing Editor: Diane Huskinson
Copy Editors: Lanette Ehrhardt, April Schmidt, Katie Smalley, Angela Thor, and Larissa Vinci
Typesetter: Diane Huskinson and Laurie Ridge
Cover Design: Lisa Tosheff
Printed at: Yurchak Printing Inc.

Published in the United States of America by
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue, Suite 200
Hershey PA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@idea-group.com
Web site: http://www.info-sci-ref.com

and in the United Kingdom by
Information Science Reference (an imprint of IGI Global)
3 Henrietta Street
Covent Garden
London WC2E 8LU
Tel: 44 20 7240 0856
Fax: 44 20 7379 0609
Web site: http://www.eurospanonline.com

Library of Congress Cataloging-in-Publication Data

Encyclopedia of portal technologies and applications / Arthur Tatnall, editor.
p. cm.
Summary: "This book offers complete coverage of the nature, characteristics, advantages, limitations, design, and evolution of Web portals. Other topics include semantic portals, philosophical portal issues, and personal portals. This authoritative encyclopedia encompasses the economics of setting up and using personal portals, knowledge management, strategic planning, user acceptance, security and the law"--Provided by publisher.
Includes bibliographical references and index.
ISBN 978-1-59140-989-2 (hardcover) -- ISBN 978-1-59140-990-8 (ebook)
1. Web portals--Encyclopedias. 2. World Wide Web--Encyclopedias. 3. Knowledge management--Encyclopedias. 4. Online information services--Encyclopedias. 5. Computer network resources--Encyclopedias. I. Tatnall, Arthur.
ZA4201.E53 2007
025.0403--dc22
2007007262

British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

Portals for Development and Use of Guidelines and Standards

N. Partarakis
Institute of Computer Science,
Foundation for Research and Technology – Hellas (FORTH), Greece

D. Grammenos
Institute of Computer Science,
Foundation for Research and Technology – Hellas (FORTH), Greece

A. Mourouzis
Institute of Computer Science,
Foundation for Research and Technology – Hellas (FORTH), Greece

C. Stephanidis
Institute of Computer Science,
Foundation for Research and Technology – Hellas (FORTH), Greece

INTRODUCTION

Nowadays, guidelines and standards play a key role in the adoption of (computer) technologies by industries and society. In essence, they constitute a rapidly evolving medium for transferring established and de facto knowledge to various interested parties. For instance, designers and developers, in various application domains, require guidelines and standards in order to achieve consistency and user-friendliness of user interfaces, especially in cases where complex and rapidly evolving technologies are employed. Despite the indisputable value and importance of such knowledge, several studies investigating the use of guidelines and standards by designers and developers (e.g., Wandke & Hüttner, 2001) have concluded that they are frequently ignored. This is attributed partly to the fact that such knowledge is not easily exploitable (Tetzlaff & Schwartz, 1991), and partly to their incarnation medium (i.e., paper based-manuals) that usually raises issues of ineffectiveness and lack of user-friendliness (e.g., Bevan & Macleod, 1994).

These limitations, in combination with the emerging need for interactive tools to support development activities, have given rise to a new generation of tools, which are usually referred to as tools for working with guidelines (TFWWGs). TFWWG are interactive software applications or services that offer support for the use and integration of guidelines-related knowledge at any stage of an IT product development lifecycle. In this direction, preliminary efforts were targeted to the integration of guidelines into hypertext-based tools, which allow software designers to access design guidelines organized either as a database or hypertext (e.g., Perlman, 1987; Vanderdonckt, 1995) or using a digital library that facilitates design time assistance, such as I-dove (Karampelas et al., 2003). Furthermore, TFWWGs, such as Sherlock (Grammenos, Akoumianakis & Stephanidis, 2000), were designed to assist the user interface usability inspection process and therefore provide active support to various phases of the development process. Nonetheless, R&D efforts in the field of TFWWGs have mainly focused on the effective and efficient delivery of such knowledge to potentially interested parties, paying limited attention to the process of its development. For instance, guidelines and standards are meant to represent a level of know-how and technology which renders the inclusion of industry in its preparation cycle indispensable.

Under the light of these efforts, portals technologies can potentially be employed in order to overcome the limitations mentioned and of significant support in working with guidelines. The main advantage of portals over other alternatives is that due to their nature they can facilitate the collaborative development of such knowledge by multidisciplinary teams, and contribute to avoiding under-utilization and regeneration of existing knowledge, bridging the gap between knowledge developers and knowledge consumers, and initiating and promoting rapidly guidance and standardization activities in various application domains.

This article describes a portal structure in the form of functional requirements to serve as an advanced, Web-based environment for enabling one the one hand the cooperative development of guidelines and standards—at the knowledge developers' site, and on the other hand the practical use of guidelines and standards—at the knowledge consumers' sites. Overall, depending on the needs and constraints (market, time, etc.), there is a number of available guidelines and

standards-type document than can be produced and exploited by means of the proposed portal structure, including: (1) (recommendations for) standards, (2) design/development/use guides, (3) technical reports and specifications and (4) collections of guidelines.

KEY STAKEHOLDERS

For the establishment of a portal structure aiming at supporting the development and practical use of guidelines and standards, a thorough analysis of the key stakeholders involved and their functional requirements is necessary. Such an analysis is intended to support identifying the appropriate structure, in terms of functionality, that will facilitate the work of a wide range of portal end users. An initial overview of the target user population can provide an initial classification of users. More specifically, two basic groups of stakeholders can be identified, namely knowledge developers and knowledge users.

Knowledge Developers

Research and development of guidelines and standards covering a large area can be organized into general *thematic areas* in order to allow coherent coordination, planning, and programming of all activities. The responsibilities and characteristics of each stakeholder involved in the knowledge development process are briefly analyzed below. Knowledge developers can be further subdivided into the following subgroups that participate having different roles in process of knowledge development:

- **Thematic Area Members:** These are persons or organizations with expertise or direct interest in a specific field and who can potentially participate in activities regarding the development of knowledge. These stakeholders are also responsible for conducting, in a collaborative manner, analysis of the state of the art within the thematic area in question, and brainstorm ideas for new knowledge development activities.
- **Coordinator of Activities within a Thematic Area:** This is a person or organization delegated to moderate (invite, accept, etc.) the thematic area members, as well as co-ordinate technically all knowledge development activities.
- **Originator:** This is a person or organization proposing the initiation of a new knowledge development activity.
- **Editor:** This is typically the same person or organization with the originator and is responsible for drafting the new set of knowledge in cooperation with a number of authors. To this end, the editor is also responsible for coordinating the work of all involved authors.
- **Authors:** Authors are members of the team of experts (i.e., persons or organizations) who will participate in the process of drafting new knowledge.
- **Coordinators of Knowledge Development Activities:** This is a group of persons or organizations who are responsible for the operational work issues and general decisions. The responsibilities of this group include:
  - The overall management of the thematic areas structure
  - The establishment and dissolution of thematic areas
  - The delineation of thematic area's scope
  - Coordination issues
- **External Experts:** These are external persons or organizations with technical expertise that are willing to review and provide comments upon (draft versions of) knowledge.
- **Liaisons with Industry:** Persons or organizations who represent the target market for the knowledge under development in the context of a particular thematic area. Interested Parties are offered the right to vote and comment upon knowledge that is currently under development.
- **Guidelines and Standardization Specialists:** These are persons or organizations with expertise in procedural and normative matters. They are mainly responsible for the quality of the knowledge delivered by editors.

Knowledge Consumers

Knowledge users include anyone that wishes to gain access to the developed knowledge for several purposes. More specifically, knowledge users can be further subdivided into:

- **Decision Makers:** *Decision makers* are the individuals or organizations that are responsible for providing a high-level specification of a new application, or leading the overall development process. For example, their tasks might include decision making regarding whether an application should be developed for a particular task, the technology (h/w & s/w) that will be acquired/used, as well as functionality and usability characteristics of the future system.
- **Designers:** *Designers* are responsible for collecting and analyzing all relevant requirements for the creation of a particular application, and translating them into a concrete design.
- **Developers/Engineers:** *Developers/Engineers* have the task to instantiate the design of an application by implementing the envisaged system.

- **Test/Evaluation Experts:** *Test/Evaluation experts* have the task to review and evaluate the instantiation of an application, assess its compliance against an agreed/selected set of guidelines or a standard, assess the extent to which it serves the pre-defined users' needs and requirements, and identify possible usability problems and propose improvements, etc.
- **End Users:** *End users* are all those people who use an application. Their primary concerns are directed towards how they can make best use of the application, and how they can use the application without any possible threat to their health and safety. Users of this group are also identified as *served users*. They are not served directly by the portal, but are very much affected by its use (by others, e.g., a designer that used the portal in order to create the end product. Therefore, in designing the portal, their needs (not as direct users of the tool but as served users) are also considered.
- **Academic Users:** The notion of *academic users* refers to all those who might be using the tool as a library-like pool of information, and as a learning/teaching tool.

THE PROCESS

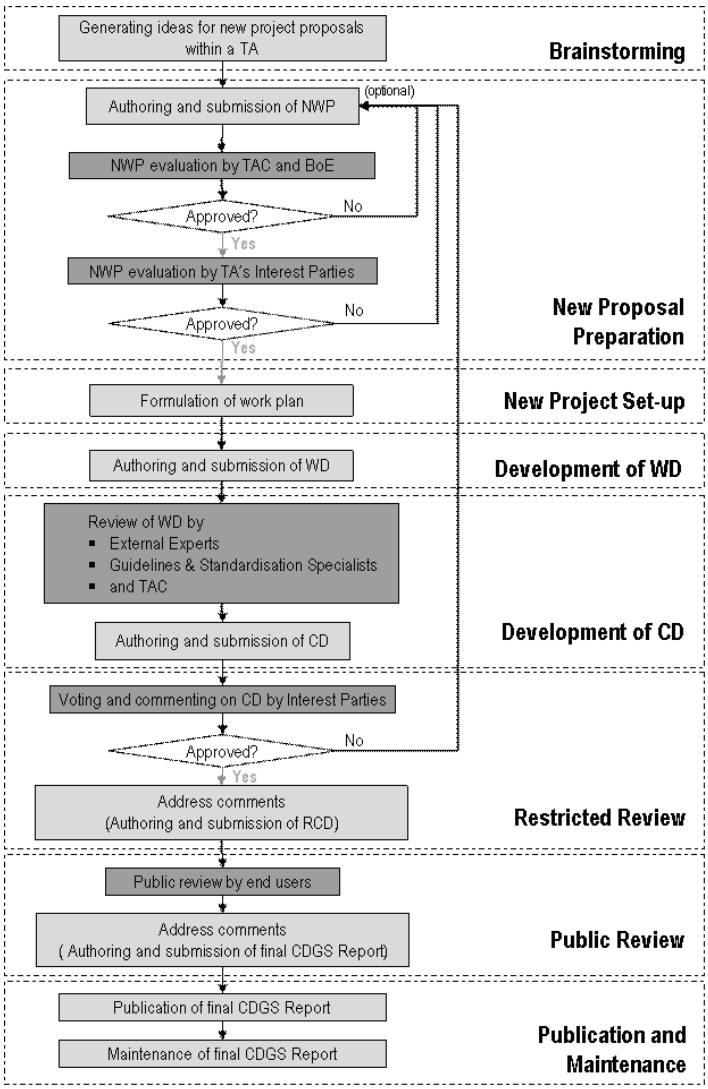
This section provides a brief overview of steps involved in the process for development and use of guidelines and standards (see Figure 1):

1. **Brainstorming:** During this first phase of the process, the members of a thematic area participate to special interest discussions that focus on reviewing the state of the art within the corresponding themati area (in terms of requirements for guidelines and/ or standards) and thereby brainstorm ideas for new proposals.
2. **New Proposal Preparation:** Once a new concept for a project has been formed by an originator, the preparation of the corresponding new work proposal is initiated:
   a. First, the originator drafts a new work proposal and submits it to the thematic area coordinator of a relevant thematic area. The new work proposal must specify the editor and the author(s) for the new project.
   b. Then, the new work proposal is assessed by the corresponding thematic area coordinator and the coordinators of knowledge development activities.
   c. Finally, upon approval by the corresponding thematic area coordinator, the new work proposal is also assessed by interested parties.
3. **New Project Set-Up:** Upon approval of a new work proposal by the interested parties, the thematic area coordinator announces the launch of new project. At this phase, the editor, in communication with the authors, formulate an appropriate work plan (i.e., tasks, deliverables and deadlines).
4. **Development of Working Draft:** The editor along with authors are responsible for developing and submitting for review, the first draft of the report, namely the *working draft*.
5. **Development of Consensus Draft:** In this phase, the working draft will undergo a review by external experts, guidelines & standardization specialists and the relevant thematic area coordinator. The comments of these people are then addressed leading (through a number of iterations) to the *consensus draft*.
6. **Restricted Review:** In this phase, the *consensus draft* is put to the ballot among Interest Parties gathering their comments. The outcome of this phase is the *revised consensus draft*.
7. **Public Review:** At this stage, the *revised consensus draft* is made publicly available (e.g., to industrial users) for gathering further comments and proceed to the creation of the *final report*.
8. **Publication and Maintenance:** The final stage of the process is that of publication and maintenance of the final report. Publication is concerned with making the final report available for public use, and -if appropriate- submitting it to external standardization body (-ies). At this stage, only minor editorial changes, if and where necessary, are introduced into the final text. On the other hand, maintenance is concerned with keeping a final report up-to-date. A published final report should not be considered to be closed in terms of content and applicability, as guidelines and standards in the field of computer science are often revised in order to address new needs or are withdrawn as not applicable. To this end, final reports should be often evaluated (e.g., annually). Depending on the results of (annual) evaluations, one of the following processes can be initiated:
   a. **Collaborative Revision of Guidelines and Standards:** This process aims at revising rather than developing a report and is very similar to the initial process.
   b. **Withdrawal:** This involves archiving and removal from public view/use.

FUNCTIONAL REQUIREMENTS

This section presents the functional requirements of an advanced, Web-based portal to serve as an environment for enabling (a) the cooperative development of guidelines and

Figure 1. Overview of the process



standards by knowledge developers, and (b) the practical use of guidelines and standards by knowledge consumers.

Functional Requirements for Knowledge Developers

- **Online Communities:** Online communities that offer virtual communication and collaboration facilities (Preece & Maloney- Krichar, 2003), such as message boards, chat, Web-mail, and documents area can be used to support the *thematic areas* and therefore to host brainstorming sessions, and offer the functionality needed to initiate new knowledge development activities.
- **Reviews:** The process of knowledge development entails the need of formal and informal reviewing of the developed documents to achieve quality and consensus. A reviewing mechanism is therefore required that is flexible enough to be used in various occasions and for various purposes. This can be achieved by incorporating a dynamic questionnaire facility that enables the development of questionnaires that can be subsequently used in the context of review sessions. Additionally, appropriate functions are required to produce collective results of the review sessions to be used by knowledge development stakeholders to make decisions for further action.

- **Project Administration:** Editors and authors should cooperatively develop the knowledge stemming from a thematic area. To achieve this goal, a mechanism facilitating the administration of projects is required (e.g., see Jurison, 1999; Kerzner 1989). This mechanism enables the editor to divide a knowledge development activity into tasks, as well as assign tasks to authors and deadlines to tasks. Furthermore, the project administration functionality should provide the means for project members to cooperate in order to receive and address comments, to inform editor about the completion of tasks, to deliver task results etc.
- **Voting:** Consensus in the context of a thematic area can be achieved through voting sessions. These should be facilitated by a voting mechanism that enables members of a thematic area to express their opinions regarding specific topics.
- **Notifications:** In order for the knowledge development process to be completed successfully, many steps have to be made that require intense interaction and actions by various stakeholders. The aforementioned aspects entail the need for a mechanism that will notify participants about results of processes such as voting sessions, or about actions that have to be performed. This can be achieved with the help of a notification facility that sends personal messages to each member of the process regarding the member's role.
- **Knowledge Development Activities Overview:** The coordinators of activities play a very important role, and their actions are very critical for the successful development of knowledge (e.g., see Eales, 2004). In order for these stakeholders to have an overview of the process, a specialized task manager mechanism is required. This mechanism should provide evidence about the status of the each development process and the steps that must be subsequently performed.

Functional Requirements for Knowledge Consumers

- **Digital Library:** Knowledge users wish to gain access to the knowledge developed within the thematic areas. One of the most effective ways to organize knowledge in the context of a Web portal is the provision of a digital library (Anderson, 1997; Fox et al., 1995). A digital library based on facilities such as browse, search, rating, and bookmark functionality can provide quick access and use of the stored guidelines and standards, and additionally enables users to create and maintain well-structured personal views of the available knowledge.
- **Knowledge Profiles:** Knowledge users can use this mechanism to create personal profiles of interests to be used when performing knowledge retrieval operations in the digital library (e.g., Kim & Chan 2003; Sugiyama, Hatano, & Yoshikawa 2004). More specifically, these profiles are used to filter all the results retrieved by user actions.
- **Online Communities:** Online communities (see previous section) to support knowledge consumers in their task of seeking information and knowledge by a wide range of sources.
- **Courses:** Users that wish to use the stored guidelines and standards as reference material for academic or general purposes will particularly appreciate the provision of a course mechanism. The functionality provided by this mechanism enables users to organize knowledge into a hierarchy of chapters and ultimately access interactive or printable versions of their artifacts.

CONCLUSION

This article has briefly described the main categories of stakeholders involved in the development and use of guidelines and standards, and has provided an overview of the required portal structure in the form of functional requirements to serve as an advanced, Web-based environment for enabling (a) the cooperative development of guidelines and standards by knowledge developers, and (b) the practical use of guidelines and standards by knowledge consumers.

REFERENCES

Anderson, W.L. (1997). Digital libraries: a brief introduction. *ACM SIGGROUP Bulletin Special issue: enterprise modelling: notations and frameworks, ontologies and logics, tools and techniques*, *18*(2),4-5.

Bevan, N. & Macleod, N. (1994). Usability measurement. *Context, Behavior and Information Technology, 13*(1&2), 132-145.

Eales, R.T.J.(2004). A knowledge management approach to user support. In.A. Cockburn (Ed.), *Proceedings of the 5th Australasian User Interface Conference (AUIC2004)* Vol. 28 (pp. 33-38). New Zealand: Darlinghurst, Australia Computer Society, Inc.

Fox E.A., Akscyn, R.M., Furuta, R.K., & Leggett, J.J. (1995). Digital libraries. *Communications of the ACM, 38*(4), 22-28.

Grammenos, D., Akoumianakis, D., & Stephanidis, C. (2000). Sherlock: A tool towards computer-aided usability inspection. In J. Vanderdonckt & C. Farenc (Eds.), *Proceedings of the Scientific Workshop on "Tools for Working with Guidelines" (TFWWG 2000)*, (pp. 87-97). London: Springer-Verlag.

Jurison J. (1999). Software project management: The manager's view. *Communications of the Association for Information Systems*.

Karampelas, P., Grammenos, D., Mourouzis, A., & Stephanidis, C. (2003). Towards i-dove, an interactive support tool for building and using virtual environments with guidelines. In D. Harris, V. Duffy, M. Smith, & C. Stephanidis (Eds.), Proceedings of the 10th International Conference on Human-Computer Interaction (HCI International 2003)*Human - Centred Computing: Cognitive, Social and Ergonomic Aspects*, *Vol. 3* (pp. 1411-1415). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Kerzner, H. (1989). *Project management*. *Third Edition*. New York: Van Nostrand Reinhold.

Kim, H. R., & Chan, P. K. (2003). *Learning implicit user interest hierarchy for context in personalization*. In Proc. of IUI03.

Perlman, G. (1987). *An overview of SAM: A Hypertext Interface of Smith&Mosier's guidelines for designing User Interface Software*, Washington Inst. of Graduate Studies, WI-TR-87-09.

Preece J., Maloney-Krichar D. (2003). Online communities: Focusing on sociability and usability. In Jacko, J. & Sears, A. (Eds.), *The Human-Computer Interaction Handbook—Fundamentals, Evolving Technologies and Emerging Applications* (pp. 596-620). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Sugiyama, K., Hatano, K., Yoshikawa, M. (2004). Adaptive Web Search Based on User Profile Construction without Any Effort from Users. In *Proceedings of the 13th Inter Conference on World Wide Web* (pp. 675-684). New York.

Tetzlaff, L., & Schwartz, D., (1991): The use of guidelines in interface design. *CHI'91 Conference Proceedings*, (pp. 329-333). Human Factors in Computing Systems, New Orleans, Louisiana.

Vanderdonckt, J. (1995). Accessing Guidelines Information with Sierra. In *Proceedings. of IFIP Conference. on Human-Computer Interaction Interact '95* (pp. 311-316). London: Chapman & Hall.

Wandke, H., & Hüttner, J. (2001). Completing human factor guidelines by interactive examples. In J. Vanderdonckt & C. Farenc (Eds.), *Tools For Working With Guidelines. Annual Meeting of the Special Interest Group*, (pp.99-106). London: Springer-Verlang London Ltd.

KEY TERMS

Guidelines: Directives to people in order to perform certain tasks effectively and efficiently, and can help to provide a framework that can guide designers and developers towards making appropriate decisions.

Knowledge Consumers: Anyone that wishes to gain access to knowledge related to guidelines and standards for any purpose.

Knowledge Developers: Anyone who plays a role in the process of collaborative development of knowledge for guidelines and standards.

Standards: A stricter form of guidelines in terms of preparation, presentation and use, and aim at transforming values criteria such as quality, ecology, safety, economy, reliability, compatibility, interoperability, efficiency, and effectiveness into real attributes of products and services that are manufactured, delivered, bought, used at work or home, or at play.

Tools for Working with Guidelines (TFWWG): An interactive software application or service that offers support for the use and integration of guidelines-related knowledge at any stage of an IT product development life-cycle.