



Can Web Design Methodologies (Actually) Help Practitioners?

Tanya Linden

Department of Information Systems, University of Melbourne, Vic 3010, Australia, tanyal@unimelb.edu.au

Jacod L. Cybulski

School of Information Systems, Faculty of Business and Law, Deakin University, 221 Burwood Highway, Vic 3125, Australia, jlcybul@deakin.edu.au

ABSTRACT

There exist many web design methodologies and the new ones are constantly being added to the pool of those offered to practitioners. However as previous research shows, practitioners either do not know, do not use or even do not care for these development approaches. This paper examines web design practice, and the design of visual aspects in particular, in order to establish whether any of the existing methodologies would actually address the practitioners concerns. Through grounded theory analysis, it transpires that from amongst several examined approaches, IS-based web design methods are dealing with great many practical issues which designers perceive as most pressing.

INTRODUCTION

Plethora of novel software tools, such as Adobe or Macromedia development suites, are being developed in support of various aspects of designing interactive multimedia for the web (here called web-media)¹, however, generated web-media products still greatly suffer from easily avoidable problems, which range from such simple aspects as poorly designed user interface and navigation down to misuse of the available technology (Johnson and Nemetz 1998). Some lay the blame for these problems on the use of ad hoc approaches to web development (Koch 1999; Lang 2002). Others imply the wide-spread lack of developers' awareness and/or experience in web systems design and evaluation of web-media development results (Barry and Lang 2001). At the same time, many successful models, methods and practices used in web-media sister fields, such as software engineering and information systems development, can be successfully transferred to web application development (Nanard and Nanard 1995). Upon such methodological transition, the web development life-cycle would commonly resemble the traditional stages of software systems development, to include analysis, design, implementation, testing, evaluation and maintenance. However, each of these life-cycle phases would consequently be conducted with special attention paid to the peculiarities of web-media products rather than features commonly found in the software systems (Garzotto et al. 1995; Standing 2002a).

We believe that web-media development has quite distinct developmental requirements. Firstly, development of web-media products commonly calls upon the expertise drawn from a variety of fields such as publishing and marketing, video production and art design, software development, operating system configuration and hardware interfacing. Secondly, due to the fact that web-media products blend together software and data, the user workflows within a typical web system can be highly dynamic, unpredictable and non-linear, which may increase the risk of confusing the user and the user feeling of "being lost in hyperspace". Thirdly, aesthetic and cognitive aspects of web-media products also play an important role in their development. Finally, web-media products are often deployed in vibrant, dynamic, global, multi-lingual and multi-cultural application domains, thus demanding continual updates and significant maintenance effort. Due to all these complexities web-media development cannot be done on ad hoc basis.

Considering these problems and challenges, we have undertaken the exploration of web design processes as perceived by practitioners. This being the crux of this paper is discussed first. In the later sections, we also review and classify some of the better-known web and multimedia design methodologies and we analyse their ability to address some of the concerns commonly shared by web design practitioners. Since in our work, we focus primarily on practitioners' concerns and their experiences, thus, we took an interpretive research approach where the formalised guidelines for web design could inductively emerge from the collected data.

EMPIRICAL WORK

Web design is a creative problem-solving activity, thus, it relies on a designer's unique insight into a larger social and business context for their work, individual needs of their clients, designer's personal style, his or her biases and preferences. Individualism and uniqueness of web design tasks does not preclude developers from sharing experience in dealing with similar problems in the design process and in the use of the available technology. In this study, we thus aimed to understand and document these common problem situations, their recurrence within certain context and decision-making in web development.

As any other design activity, web-media design may be considered from two vantage points (Nanard and Nanard 1995), i.e.:

- prescribing design techniques and then following them, so the resulting product is developed by conformance to a formal design model;
- observing practical work to determine how developers actually design products.

We took the latter approach.

In our empirical work we interviewed 9 web-media designers with different expertise in multimedia or web development, i.e. graphic designers, web programmers, multimedia developers, multimedia producers, educational designers, and other types of web developers. For the purpose of triangulation (Fontana and Frey 2000), we also observed some of them in the process of project development in their everyday work environment (Adler and Adler 1994).

In our study, we asked each subject to talk about a project of his/her choice and to elaborate on the design process, versions of the product, problems faced and decisions made, and to reflect on their best practices. By allowing practitioners to freely discuss their work, the researchers encouraged them to focus on the issues that were of particular concern to them personally. This facilitated identification of design aspects that, in the opinion of practitioners, were not adequately supported by the tools and methods available to their disposal.

Since we collected large amounts of transcript data, we needed an appropriate method of splitting it into manageable chunks, then coding the data with a view to identify their meaning and to support data classification into a consistent system of categories, which would finally

be examined for relevance to the emerging theory of web-media practice, firmly grounded in our observation data. With this data examination process in mind we chose the grounded theory approach for data analysis and concepts building (Glaser and Strauss 1967; Strauss and Corbin 1994).

Grounded theory is a research method that prescribes systematic guidelines for iterative data collection and analysis focusing consecutive data collection with the purpose of inductive building of a framework explaining the collected data (Charmaz 2000).

PRACTITIONERS' CONCERNS

After the interview transcripts were coded, analysed and compared, some important web development concepts and their themes, also known as grounded theory categories, emerged. These categories reflected design tasks that were actually performed during project development, e.g. home page design, menu design, selecting colour schemes, implementing navigation, etc. While examining the task-related categories, the researchers also identified problems recurring across design tasks. Some of these problems and their solutions are commonly discussed in various web and multimedia design methodologies, others provide novel insights into web development practice. To illustrate the type of categories that emerged in the process, a small subset of practitioners' concerns, as exemplified by their direct comments, follow.

1. Technology issues - Web developers create their products for non-homogenous community of web users. Potential users access websites from different platforms through different browsers and with display devices that greatly vary in their resolution.

Concerns related to browsers' compatibility:

"...we're still finding a lot of people are using browsers 4.7, hopefully not older than that".

"Every single browser you come across treats your... treats what you see on the screen completely differently and this causes all sorts of hassle."

Concerns related to screen resolution:

"Basically we know that most of their clients have 800 by 600 screens... this is a technical specification but it's really important to take this thing into account."

"...what I've done here is to limit myself to only using up to 625 pixels on the screen. And that means, that somebody using the smallest screen resolution of 640 X 480 would still be able to see all of the content on this page."

Concerns related to cross-platform reliability:

"So you can run this little function over your site and it tells you what browser versions your site's going to fail on and whether or not the failure is just going to be your rollover won't work or your whole site's just going to go pth [noise] and die and the user's going to be left with a blank screen."

2. Standards compliance and accessibility issues - Every user should, as indicated by standards and laws, be able to access and perceive the presented information in a similar way.

Concerns related to accessibility:

"I should also mention that we allow for accessibility issues by adding alt tags to all the graphics in Dreamweaver."

"...at the bottom, a list of text links for people that have graphics turned off and also because on some pages where it's longer it means that then you don't have to go all the way back to the top of the page to find the links."

Concerns related to standard compliance:

"In Dreamweaver I also downloaded one of the extensions from exchange, which is about ensuring that you have w3c compliance. And it goes through and it makes sure that all of your images have alt tags,

that all of your tables are set up properly for text readers and that sort of thing and tells you just where the problems are."

3. Colour and font issues - Colour schemes and fonts of the future web site are often imposed by existing corporate stationary and business cards. However, colours may not belong to the web-safe palette and fonts may be outside the list of default fonts installed on users' computers. These issues force developers to find most close match for colours, replace fonts or use images of text with the client preferred corporate font.

Concerns related to the selection of colour scheme:

"The colours came from their corporate colours, the blue and the red and we kept with that, rather than introducing too many extra colours."

"The colours are significant to the industry that she's in basically and she wanted those colours to be reflected throughout the site."

Concerns related to font selection:

"This was actually made into a graphic because this is the, I suppose you could say, the corporate heading, this is what appears on the business cards and the letterheads themselves, so we couldn't run the risk of having a user who didn't have the font installed and would see it in something else." (About the font for the header of the web page)

"...with this actual text here being Sans-Serif and then Serif and being bold and then quite sort of light, I was also given that as a pre-existing design element."

4. Navigation design - Navigation choices should be clear to users. The user should be able to navigate backward and forward and see clearly the followed path and how to come back. The user should not feel "lost" in the cyberspace of a site.

Concerns related to the representation of navigation choices:

"...what about something looking like palm pilot... that could work because people are already aware of how something like a palm pilot operates." (about how the menu should look like)

Concerns related to awareness of location in cyberspace:

"...it's a pretty simple concept, you follow the tree out to get to some information that you're interested in and you can find your own way back in this way."

Concerns related to access to navigational facilities:

"...the little menu is added just here, just to jump people to main parts of the site."

5. Other developers' concerns touched upon great many issues, related to design aspects of navigation, user interfacing, useability and accessibility, component design, their interaction and layout, information channels, their consistency and synchronisations, user requirements and their volatility, corporate image, branding, etc.

The identified design issues, as illustrated by the examples, represent those web design aspects which are of greatest concern to the interviewed practitioners. We noted with interest that the practitioners' attention focuses not only on the design task itself but also on a much broader design context, i.e. technological shifts, standards and method compliance, corporate image and brand consistency, user expectations, trends and preferences. This observation strongly confirms the claims laid by the most recently proposed web development methodologies, e.g. ICDM (Standing 2002a; Standing 2002b), Multiview 2 (Avison et al. 1998) and WISDM (Vidgen 2002a; Vidgen 2002b), that a wider developmental context is of great importance to web projects.

CONCERNS VS. METHODOLOGIES

Over the years various hypermedia and web design methodologies have emerged, for example, the Dexter model (Halasz and Schwartz

1994) and AHM (Hardman et al. 1994) based on hypertext model; HDM (Garzotto et al. 1993) and RMM (Isakowitz et al. 1995) based on hypertext model and database design methodology; OOHDM (Schwabe and Rossi 1995) and ZyX (Boll and Klas 1999) based on object-oriented paradigm; and ICDM (Standing 2002a; Standing 2002b), Multiview 2 (Avison et al. 1998) and WISDM (Vidgen 2002a; Vidgen 2002b) based on information systems (IS) approaches and frameworks.

An important observation about these methodologies is that the first six (from Dexter to ZyX) only cover the technical aspects of systems development whereas the more recent ones (namely ICDM, Multiview 2 and WISDM) address not only technical aspects of development but also some of the contextual issues within an organisation, e.g. business, strategic, and managerial aspects, organisational culture and ability to adapt to change.

All technical methodologies that we have thoroughly studied cover conceptual and navigational aspects of web design. Some of them also mention abstract interface design. As our empirical data shows, practitioners deal with these aspects of web design without major difficulties and with no or little methodological support. Instead, their attention is sharply focussed on issues of user interface design (as motivated by client and organisational demands) and perceived web product's global operating context (which includes its delivery platforms and future users). The latter aspects of web design are hardly ever covered by the technically inclined web design methods.

The IS-based web development methods, on the other hand, do address these contextual issues to the extent that they urge web designers to develop web systems with a clear customer focus, with the emphasis on organisational collaboration, and by taking into account wider trends in business and social context (Standing 2002a; Vidgen 2002a). As it is quite evident from the excerpts listed in the previous section, web designers are aware of the inter-relatedness of both social and technical dimensions of their work, e.g. by linking the selection of web colour scheme to the corporate colour palette, by having the font selection based on the pre-existing design elements, or by relying on existing user knowledge in selecting the navigational metaphor. The technical aspects of their work are also not limited to the manipulation of mere design elements but they recognise the importance of internet standards and guidelines, the impact of the global technological environment, as defined by the available technology to support existing web browsers, and the implication of their design decisions on the perceived and actual performance of delivered web systems.

It should be noted that practitioners are not relying on any formal methods in dealing with either technical or contextual aspects of web design (Barry and Lang 2001). However as we observed, in contrast to the technical tasks, which practitioners perform unassistedly without any major difficulty, the socio-technical issues seem of major concern to them. This is where IS-based methodologies could provide some support to their work, if only such methodologies were known and used by them.

Previous studies, as exemplified by Lang (2002), show that the majority of multimedia and web practitioners have very little awareness of methodologies applicable to their work. The main reasons for this situation, also indicated by Lang, can be explained by poor accessibility to methodology documentation, its high cost (in case of commercialised products), its immaturity (while still in research), and inadequate tool support. Barry and Lang (2001) also note that multimedia methodologies put more emphasis on design representation rather than on the support for the design process. This further highlights the discrepancy between methodological recommendations and the development in practice.

CONCLUSIONS

Research into web design indicates that web development practices are often amethodical (Baskerville et al. 1992; Whitley 1998) and that intuition and experience of web developers plays more significant role than knowledge of methodologies (Lang 2002). Our findings largely confirm these assertions, however, the reported study also shows that the more recent web development methodologies (ICDM, Multiview2 and WISDM), which take into consideration broad IS context have a

potential to address various design issues of great concern to practitioners. Other methodologies will have to be adjusted to be relevant and used.

"Hypermedia design methods are unlikely to be used merely for their own sake, so it shall be necessary to collate empirical data based on experiences in real projects." (Lang 2002, p 888). This is what this paper aspired to...

ENDNOTES

¹ Web-media focus on the front-end design aspects. Other web design issues which are not directly related to web-media design such as database design, server and software design, are specifically excluded from the scope of this paper, although the authors consider them very important.

REFERENCES

1. Adler, P.A. and P. Adler (1994): "Observational Techniques," in *Handbook of Qualitative Research*, N.K. Denzin and Y.S. Lincoln, Editors. Sage Publications: Thousand Oaks, CA. p. 377-392.
2. Avison, D., T. Wood-Harper, R. Vidgen, and B. Wood (1998): "A Further Exploration into Information Systems Development: the Evolution of Multiview2". *Information Technology and People*. **11**(2): p. 124-139.
3. Barry, C. and M. Lang (2001): "A Survey of Multimedia and Web Development Techniques and Methodology Usage". *IEEE Multimedia*. **8**(2): p. 52-60.
4. Baskerville, R., J. Travis, and D. Truex (1992): "Systems without Method: The Impact of New Technologies on Information Systems Development Projects," in *The Impact of Computer Supported Technologies on Information Systems Development*, K.E.e.a. Kendall, Editor. Elsevier Science Publishers B.V.: North-Holland. p. 241-269.
5. Boll, S. and W. Klas (1999): "ZYX - A Semantic Model for Multimedia Documents and Presentations", in proceedings of *8th IFIP Conference on Data Semantics (DS-8): Semantic Issues in Multimedia Systems*. Rotorua, New Zealand.
6. Charmaz, K. (2000): "Grounded Theory. Objectivist and Constructivist Methods," in *The Handbook of Qualitative Research*, N.K. Denzin and Y.S. Lincoln, Editors. Sage Publications: Thousand Oaks, CA. p. 509-535.
7. Fontana, A. and J.H. Frey (2000): "The Interview. From Structured Questions to Negotiated Text", in *The Handbook of Qualitative Research*, N.K. Denzin and Y.S. Lincoln, Editors. Sage Publications: Thousand Oaks, CA. p. 645-672.
8. Garzotto, F., L. Mainetti, and P. Paolini (1995): "Hypermedia Application Design: A Structured Approach," in *Designing User Interfaces for Hypermedia*, W. Schuler, J. Hannemann, and N. Streitz, Editors. Springer: Berlin. p. 5-17.
9. Garzotto, F., P. Paolini, and D. Schwabe (1993): "HDM - a Model-Based Approach to Hypertext Application Design". *ACM Transactions on Information Systems*. **11**(1): p. 1-26.
10. Glaser, B. and A. Strauss (1967): "The Discovery of Grounded Theory: Strategies for Qualitative Research." New York: Aldine de Gruyter.
11. Halasz, F. and M. Schwartz (1994): "The Dexter Hypertext Reference Model". *Communications of the ACM*. **37**(2): p. 30-39.
12. Hardman, L., D.C.A. Bulterman, and G.van Rossum (1994): "The Amsterdam Hypermedia Model: Adding Time and Context to the Dexter Model". *Communications of the ACM*. **37**(2): p. 50-63.
13. Isakowitz, T., E.A. Stohr, and P. Balasubramanian (1995): "RMM: A Methodology for Structured Hypermedia Design". *Communications of the ACM*. **38**(8): p. 34-40.
14. Johnson, P. and F. Nemetz (1998): "Towards Principles for the Design and Evaluation of Multimedia Systems", in proceedings of *Human - Computer Interaction (HCI'98)*. Sheffield, England: Springer-Verlag.
15. Koch, N. (1999): "A Comparative Study of Methods for Hypermedia Development." Technical 9905, Ludwig-Maximilians-Universität München: Munich, Germany.

16. Lang, M. (2002): "Hypermedia Systems Development: Do We Really Need New Methods?" in proceedings of *Informing Science + IT Education Conference*. Cork, Ireland: InformingScience.org ISSN 1535-0703, p. 883-891.
17. Nanard, J. and M. Nanard (1995): "Hypertext Design Environments and the Hypertext Design Process". *Communications of the ACM*. **38**(8): p. 49-56.
18. Schwabe, D. and G. Rossi (1995): "The Object-Oriented Hypermedia Design Model". *Communications of the ACM*. **38**(8): p. 45-46.
19. Standing, C. (2002a): "Methodologies for Developing Web Applications". *Information and Software Technology*. **44**(3): p. 151-159.
20. Standing, C. (2002b): "The Requirements of Methodologies for Developing Web Applications", in proceedings of *The 9th European Conference on Information Systems (ECIS 2001)*. Bled, Slovenia, p. 548-557.
21. Strauss, A. and J. Corbin (1994): "Grounded Theory Methodology - An Overview," in *Handbook of Qualitative Research*, N.K. Denzin and Y.S. Lincoln, Editors. Sage Publications: Thousand Oaks, CA, USA. p. 273-285.
22. Vidgen, R. (2002a): "Constructing a Web Information System Development Methodology". *Information Systems Journal*. **12**(3): p. 247-261.
23. Vidgen, R. (2002b): "What's So Different About Developing Web-based Information Systems?" in proceedings of *European Conference in Information Systems (ECIS 2002)*. Gdansk, Poland, p. 262-271.
24. Whitley, E.A. (1998): "Method-ism in Practice: Investigating the Relationship between Method and Understanding in Web Page Design", in proceedings of *Nineteenth Annual International Conference on Information Systems*. Helsinki, Finland, p. 68-75.

0 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/proceeding-paper/can-web-design-methodologies-actually/32325

Related Content

Design, Manufacture, and Selection of Ankle-Foot-Orthoses

Hasan Kemal Surmen, Nazif Ekin Akalanand Yunus Ziya Arslan (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 298-313).

www.irma-international.org/chapter/design-manufacture-and-selection-of-ankle-foot-orthoses/183744

Design and Implementation of an Intelligent Metro Project Investment Decision Support System

Qinjian Zhangand Chuanchuan Zeng (2024). *International Journal of Information Technologies and Systems Approach* (pp. 1-15).

www.irma-international.org/article/design-and-implementation-of-an-intelligent-metro-project-investment-decision-support-system/342855

Probability Based Most Informative Gene Selection From Microarray Data

Sunanda Dasand Asit Kumar Das (2018). *International Journal of Rough Sets and Data Analysis* (pp. 1-12).

www.irma-international.org/article/probability-based-most-informative-gene-selection-from-microarray-data/190887

A Maturity Model for Digital Literacies and Sustainable Development

Ravi S. Sharma, Lin G. Malone, Chong Guanand Ambica Dattakumar (2018). *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 2280-2291).

www.irma-international.org/chapter/a-maturity-model-for-digital-literacies-and-sustainable-development/183940

Performance of Peer-Assisted File Distribution

Cristina Carbuaruand Yong Meng Teo (2015). *Encyclopedia of Information Science and Technology, Third Edition* (pp. 4661-4671).

www.irma-international.org/chapter/performance-of-peer-assisted-file-distribution/112908