

Modern methods of web applications analysis and design

Moderní metody projektování webových aplikací

P. ZELENKA

Czech University of Agriculture, Prague, Czech Republic

Abstract: This article deals with modern approaches to the web applications analysis and design. Many methodologies specialized on web applications analysis and design have been developed, but have not reached mass usability yet, because differences between conventional and web applications are decreasing and requirements for the methodologies of the web applications analysis and design have been changed radically. The main goal of this article is to classify web applications and describe specific analysis and design requirements for each of these classes.

Key words: web application, methodology, analysis and design

Abstrakt: Příspěvek se věnuje moderním přístupům k projektování webových aplikací. V současné době existuje poměrně velké množství specializovaných metodik určených výhradně pro tvorbu tohoto typu aplikací. Tyto metodiky ale nejsou příliš rozšířené. Jedním z důvodů je postupné stírání rozdílů mezi klasickou a webovou aplikací, jehož důsledkem došlo k zásadní změně požadavků na metodiky určené pro tvorbu webových aplikací. Hlavním cílem tohoto příspěvku je klasifikovat webové aplikace a popsat základní požadavky na metodiku analýzy a návrhu pro každou z definovaných tříd webových aplikací.

Klíčová slova: webová aplikace, metodika, analýza a návrh

Web applications represent a very fast developing area of IT for several years. We can see their application more and more frequently and we can say that they edged the standard desktop client-server applications out of the IT market. Web applications have different philosophy and development from the conventional applications (Zelenka 2004), so specific analysis and design are required. Therefore, many special web methodologies were developed. But we can see a very interesting situation recently, the differences between conventional and web applications are decreasing and requirements for web methodologies are changing. The main goal of this article is to classify web applications and to describe the specific analysis and design requirements for each of these classes. The author presented part of these results also at the Agrarian Perspectives conference 2005 in the applied informatics session.

MATERIAL AND METHODS

Web applications will be classified into several classes at first. Then main specifics oriented mainly on analysis and design will be described for each class and important requirements for methodologies applicable to analysis and design of these classes of applications will be specified. In conclusion, the situation in this area of software development in the Czech Republic will be mentioned.

RESULTS AND DISCUSSION

Web application definition

Talking about methodologies for web applications analysis and design, we must begin first of all with

Supported by the Ministry of Education, Youth and Sports of the Czech Republic (Grant No. MSM 6046070904 – Information and knowledge support of strategic control).

the definition of web application. A broad range of software is denoted as web application – very simple but also complex and large systems. It is very simplifying to talk about web applications and web methodologies, because each class of these applications has different requirements for the software methodology. There will be described three types of web applications in the next three paragraphs. It is not official and common classification but only an author's classification for this article.

Web presentation

Web presentations are typical commercial or non-commercial web pages, which do not contain any difficult application logic. It is important to say that these presentations are not in most cases static HTML pages, but dynamically generated pages based on some technology as PHP, ASP, ASP.NET, JSP or PYTHON. These applications are especially of the presentation and information purposes and design, good navigation and full accessibility of information are of cardinal importance.

Web application

Web application in the strict sense is a non-trivial application, which has some aspects of web presentation. First of all, it is an application destined to the general public. The main user of these applications is not a concrete person or company but these are accessible for all who know the right url. These applications are realized purely as dynamic web pages and contain non-trivial application logic. A typical example of these applications is e-shop, advertisement servers or discussion forums and chats.

Http based information systems

Http based information systems are usually developed for a concrete customer. These systems differ from the conventional information systems only in three tier architecture, where front-end is based on http, HTML and browser.

Right methodology selection

It stands to reason, that each mentioned type of web application makes different demands on software

methodology. Special web methodologies will not be always the right choice.

Methodologies for web presentation

Web presentation development is a very specific area of software development. Their implementation must be usually very quick. Costs on the development are incomparably lower than costs on conventional applications. But on the other hand, these applications are not so difficult to implement.

Internet presentations development is characterized by frequent repeating of the same submission and reusability. Finished components or whole publication systems are reused largely. The main part of analysis and design is the content and navigation analysis, graphical design and specifics compared to the prepared components wanted by the customer. The final implementation includes often only the finished source code assembly and graphical templates development.

The use of conventional methodologies for internet presentations is not in the least suitable. For this type of web applications, there are special web methodologies (WebML, OOHD, RMM) (Atzeni et al. 1998) best-fit. These methodologies are oriented namely at data, navigation and GUI modelling.

Methodologies for web application development

Web applications are more difficult and more advanced systems and require a more detailed and complex analysis and design than web presentations. Their development takes generally a longer time and the costs are higher compared to web presentations, but compared to the conventional application, the development is shorter and cheaper.

Analysis and design of this class of applications is relatively difficult. Web application is accessible to the general public and so the emphasis must be place on GUI and navigation modelling. But conventional methodologies do not have tools for this modelling. Web applications have also a relatively difficult application logic and so e.g. tools for processing modelling are needed.

It can be said that the area of web applications development is the least advanced area of the web application development in a wider sense. We can see attempts to merge the conventional and specialized methodologies (e.g. UML application extension) recently, but none of the existing solutions were successful.

Methodologies for http based information systems development

This type of applications does not differ in anything from the conventional applications and information systems. Only the realization of front-end is based on http. These applications have no special requirements for analysis and design and the conventional methodologies are fully sufficient.

Praxis in CR

What is the situation in the area of analysis and design of web applications in the Czech Republic? It can be said, that it is greatly unsatisfactory. Only the area of http based information systems can be considered as satisfactory, because here conventional methodologies are used.

Web presentation is developed with only minor exceptions with the absence of analysis and design. After the user requirements collection, there follows usually straight the implementation because of time and financial pressure. Big companies try to develop and use their own methodologies, which can be in many cases good-quality but no standard exists.

Web application development is the most burning area of the web development. In difference from web presentations, we cannot work successfully without analysis and design. This type of applications is often developed by companies whose principal activity of business is web presentation development. They do not have any experience with robust methodologies and often use specialized methodologies oriented on

hypertext applications. But these are insufficient. Big companies try to apply robust methodologies such as RUP (Kadlec 2004). It makes the projects longer and very expensive and moreover the results do not come up to expectations.

CONCLUSION

The worst situation is in web applications analysis and design, where specialized methodologies failed and conventional methodologies are too robust, time-consuming and in some areas (GUI and navigation modelling) deficient. The author's ambition is to specify and create methodology for web application analysis and design, which would lighten and also extend the selected conventional methodology in some ways.

REFERENCES

- Atzeni P., Mecca G., Meriardo P. (1998): Design and Maintenance of Data-Intensive Web Sites. Proceedings of Extending Database Technology, Valencia: 436–450.
- Kadlec V. (2004): Agile Programming: Effective Methods of Software Development. Computer Press, Brno.
- Zelenka P. (2004): Methods of web applications analysis and design. Proceedings from doctoral seminar Faculty of Economics and Management, Czech University of Agriculture, Prague.

Arrived on 1st February 2006

Contact address:

Petr Zelenka, Czech University of Agriculture Prague, Kamýcká 129, 165 21 Prague 6-Suchbát, Czech Republic
e-mail: zelenka@pef.czu.cz
