DEFINING PREREQUISITES FOR BANKING WEB SITE DESIGN: THE WOW! APPROACH

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ABSTRACT

Being involved in the development of a high standing Web site without having the necessary amount of money, we came to the idea of creating a set of basic features that Web sites should inevitably have in order to meet customers quality basic expectations.
The paper reports on the development of the methodology created to face the research question. The result is an innovative methodology called WoW!-Welcome on the Web!.
The theoretical framework traces back to Herberg's motivation-hygiene theory and to the Kano model. They both propose that products and services should meet a set of basic quality features of customers. These are the "features that provide basic quality, such as preconditions or antecedents for user satisfaction to occur" (Zhang and Von Dran 2002).
As the main characteristics of hygienic and basic quality expectations is unconsciousness, we thought to observe the actions performed by users so that we could deduce what are such factors.
The developed methodology considers five main user actions when surfing a Web site: direct access; indirect access; home page visualization; surfing; personal data submission. Starting from them indicators and measurement criteria were deduced so that the prerequisites could be observed.

1. INTRODUCTION

January 2002 the top management of a little direct bank called Banca Idea (the virtual bank of Gruppo Banca Popolare di Vicenza) came up to ask us, if we would have taken part to their project that aimed at developing their new Web site. We had not any particular reasons to accept such a proposition but they really insisted because, they said, it was an unusual project: they pretended to obtain a high standing Web site without having the necessary budget. In such a situation, the challenge was interesting. Our contribution, of course, could not involve the commercial aspects of the project: we were neither able to obtain more favourable commercial conditions from Web developers nor able to involve the best Web designers. Something new needed to be found.

The Web is a more democratic market (Afuah et al. 2002, pp. 32 – 37,) than the "real" one. On the Internet simple and absolutely cheap e-commerce Web sites coexist with other ones that are extremely expansive (Fisher 2001). Of course this depends on the problems related to the integration with the back office information system of the firm and the security of payment, but it is also due to the high number of professionals that are usually involved in such projects. In this connection, some examples can be found within the banking sector. A great relevance in the Italian specialised press had the news announcing the fact that the development of Xelion's Web site (the direct bank of Unicredito, one of the main banking group in Italy) cost ten times more than the project for the development of Fineco's site (the most successful direct bank in Italy) (Carignani 2000).

The extremely high costs of some projects are not due to the technologies adopted but are essentially related to the different kinds of consultancies that were requested. The main reason that makes the expenses raise so much is in fact the costs for the personnel involved. In the development of an e-banking or e-commerce Web site different professionalisms take part to the project. In the main initiatives not only technical personnel is involved but also a wide range of different advisors who are in charge of examining and evaluating the perception of the users visiting the new Web site. These are people like ergonomics experts, psychologists, design evaluators, etc. Their contribution is important in order to obtain a successful presence on the Web but, at the same time, it makes the expenses rise considerably. Starting from this reasoning we found an area for our contribution to the project.

As the challenge was to obtain a high quality Web site that could compete with the ones of the main banking groups without having the sufficient amount of money, we intended to develop a methodology in order to determine a set of basic characteristics that a Web site should observe in order to have the opportunity to become a "good" Web site. In other words, the aim of our contribution was to elaborate a group of prerequisites for a potential good Web site, a sort of basic ground from which the advisors can start giving their contribution.

In this paper we report on the framework we developed in order to determine the basic features that decisively impact the effectiveness of Web sites. In section 2 we present the literature that was considered to build the context of our contribution. In section 3 the research framework is described. The rest of the paper is given over to the development of the methodology we called WoW! (Welcome on the Web!). In the final part of the paper we consider some further applications the methodology could have as well as some more issues that could be developed.

2. LITERATURE REVIEW

With regard to the literature review on the subject, we found that the references about Web sites can be parted in:

a. works that propose suggestions for good Web site design (among others: Nielsen 2000, Bianchi et al. 1999, Visciola 2000);

b. academic efforts that have addressed technological issues;

c. researches about the kind of services provided by the web sites (among others: Hawking and Fisher 2002, Fisher 2002);

d. contributions that focuses on the end users' perceptions and evaluations of the quality of a Web site (among others: Christ et al. 2002, Zhang P. & Von Dran G. 2000 - 2002, Zhang P. et al. 1999, Novak T. P. et al. 2000).

In relation to effective Web site design, the main factor to consider are (Fisher 2002):

- the kind and characteristics of the information provided by the site (Abels et al. 1998, Reynolds 1996, Barnes & Vidgen 2000 - 2001);
- the display, that is the main graphic elements (White and Manning, Nielsen 1999);
- the ease of use, within which there are the contributions about the usability (Gefen & Straub 2000, Bellman et al. 1999, Silker & Gurak 1996).

On the other hand, the last group includes all the researches that take into account the feelings and the opinion of users about different characteristics of the Web site (ex. accessibility, completeness, consistency, ease of manipulation, interpretability and understandability) (Kopcso et al. 2001).

In the examined contributions design and quality of the Web sites are not univocally defined. Some aspects (such as the kind, the accuracy and the completeness of information) are in fact contemporarily considered part of the design as well as of the quality of a Web site. What is sure is that design and quality are the widest concepts concerning the study of Web sites.

This contribution contemporary takes elements from the first and the last group of researches. In fact it considers the users with his tasks as the reference of the scheme and, on the other hand, it looks at some basic features of the Web sites that can be lead to the design domain. In the developed research framework the observation of the surfers' behaviour allows to determine some features that should be present in each Web site. This is a relevant difference from the other contributions that involve the users by asking them to express their personal evaluation on some features of the site.

As far as the aspects considered, most of them cannot be traced back to the design issue investigated in the other contributions. As already mentioned they are in fact a sort of preliminary characteristics from which evaluating the quality of the Web site.

3. RESEARCH FRAMEWORK

The rapid development and the large number of applications of the Web during the last decade has provided a wide ground for academic contributions.

Most of the researches concerning different aspects of Web sites, however, do not propose a theoretical framework as foundation. Many contributions concerning the Web usability simply recommend applying traditional usability criteria to the Internet environment (Schneiderman 1998, Mayhew 1992). Others have developed specific criteria for the Web (Nielsen 1999 - 2000).

On the other hand articles analysing the Web site quality often propose conceptual discussions of what should be evaluated and how to do it (Instone, Nielsen "Alertbox"). Other contributions on this matter suggest heuristics or checklists for the Web evaluation (among others: Fisher 2002, Zhang and Von Dran 2000).

On the contrary more recent efforts adopt theories from other disciplines trying to adapt them to the Internet domain. The aim should be to obtain a strong theory or performance model so that the set of plausible alternatives could be reduced to a manageable number for testing (Baeker et al. 1995).

Among this kind of contributions, we refer to the works of Zhang et al. (Zhang & Von Dran 2000 - 2002, Zhang et al. 1999 - 2000), who try to find theories and frameworks developed for different organizational contexts that could be applied to the Web environment. In such a way they intended to contribute to the study of the customer satisfaction with Web design and e-commerce services. In particular, we considered elements of both the theories analysed in such articles: the Herzberg's motivation-hygiene theory and the Kano model.

Herzberg conceptualized that satisfaction and dissatisfaction are distinct constructs rather than two values of the same dimension. Therefore he proposed a distinction between features that increase customers satisfaction (motivational) and those that reduce their dissatisfaction (hygienic) (Herzberg 1996, 1968). In some of their contributions Zhang et al. adopted such a categorization to differentiate hygiene and motivator features of Web sites (Zhang and Von Dran 2000, Zhang et al. 1999 and 2000).

Kano created a model concerning the customer expectations for product and service quality. He proposed a distinction among: (1) *basic*, (2) *performance* and (3) *exciting* qualitative features that businesses must meet in order to succeed. *Basic* quality is the minimum level and refers to characteristics that customers take for granted. The presence of such features goes unnoticed but their absence will generate complaints. On the other hand *performance* quality expectations take into consideration features of the products or services that are consciously requested in order to meet specific needs. Their absence is felt as a disappointment or a disadvantage. *Exciting* quality components are unexpected therefore make customers happy and inspire loyalty. They increase the quality perception of products or services but, as the consumers do not have a conscious need for such features, they will not miss them, when they are not provided. Another important assumption of the Kano model is time. It assumes in fact that with time and mutual imitation exciting factors turn into performance expectations, whereas performance quality features gradually become basic expectations.

In their article Zhang and Von Dran (2000 - 2002) explain the reasons why this model can be applied to the Web environment and then describe the study they performed. The research aims at systematically examine the features commonly used in Web site design (Zhang and Von Dran 2002).

Starting from these theoretical schemes, we focused on hygienic as well as basic and a part of performance quality features that the Web side of Banca Idea should have. In fact we tried to identify the "features that provide basic quality, such as preconditions or antecedents for user satisfaction to occur" (Zhang and Von Dran 2002). Speaking the Herzberg's language this was the same as saying that we were looking for hygienic features of the bank's Web site. These are the design features that allow to increase the efficiency and efficacy of the action performed by the users or simply to make them easier. Therefore it was necessary to investigate the behaviour of the people surfing Banca Idea's Web site, whatever was the aim of their "visit".

As all the articles concerning the user perceptions of the Web site's quality, the surfers were considered the focus of the analysis. But on the contrary of the heuristic approach generally adopted[1], we did not decide to identify a representative sample of users and ask them to express their impression by answering a questionnaire. As the main characteristics of hygienic and basic quality expectations is unconsciousness, we thought we should have considered the actions performed by users so that we could figure out what are such factors. Moreover as our aim was to trace out the prerequisites that fit the skills and the requirements of all the users, we alternatively decided to observe the behaviour of people visiting the Web site so that we could have deduced the features and the functional characters that were considered as basic by all the categories of users. Therefore we did not single out different categories of subjects. We observed instead the path and the actions performed

[1] "The term heuristic evaluation describes a method in which a small set of evaluators examine a user interface and look for problems that violate some of the general principles of good user interface design", Dumas and Redish (1994).

by all the visitors during a fixed period of time, thus deducing what were the design and functional characteristics that would have best simplified such activities.

4. RESEARCH FIELD

The observation of the users behaviour was performed through the analysis of Web server log files. A log is a file where server's transactions are logged (Murray & Costanzo 1999): server log files are records of Web server activity or server activity for any digital medium (Romanò & Sutto 2001). Log files provide details about file requests to a server and the server response to those requests (Romanò & Sutto 2001): they include such information as the date of the transaction, the IP number of the computer requesting the file or the IP number of the ISP gateway and the name and size of the transferred files. Logs may also include information about the user's browser and the previous site visited (Murray & Costanzo 1999). Briefly, the collection and the analysis of these files can provide:

- Information about Web site visitors;
- What information they requested;
- Their navigation and behaviour (Romanò & Sutto 2001).

In detail, an ideal log file for traffic analysis should contain the following data:

- *Information about the Web site visitors*. If Web administrators can identify the visitor, it will be possible to know whether he/she is returning to the site;
- *The visitors path taken through Web site pages*. By analysing the sequence of pages a visitor viewed, it is possible to identify trends in how visitors navigate through the pages of the Web site and which elements (links, icons) a visitor clicked on each page to go to the next one;
- *Time spent by visitors on each page*. With knowledge of lengthy viewing time on a page, the Web administrator can guess the level of usability of the page;
- *Where visitors leave the site.* The last page a visitor viewed before leaving the site might be a logical place to end the visit, or it might be a place where the visitor abandon it .
- *The success of users' experiences at the site*. Purchases transacted, downloads completed, and information viewed are concrete indicators of tasks accomplished (Romanò & Sutto 2001).

Log file analysis is commonly used to track site usage, but today site administrators will also use these data to draw conclusions about the usability of some pages of the Web site. (Murray & Costanzo 1999). For this reason, we decided to apply this type of analysis to our research project: our aim was to create a methodology for the analysis, the investigation and the evaluation of prerequisites increasing the Web site quality. From the amount of data coming from log file analysis, we were interested in the ones who could provide us information about the navigation and the behaviour of people surfing the Web site. Therefore the data we considered were the ones related to: the path visitors had taken through Web site pages, the point where visitors had left the site, the success of users' experience of the site. By this way we pointed out at defining the main actions of the user when surfing a Web site.

Deeper in details, to follow a user's path through a Web site, it is necessary to know:

- Where the user entered the site;
- The sequence of pages the user followed;
- How the user moved from one page to the next;
- Data the user supplied as part of interacting with the site;
- Files the user downloaded from the site;
- Where the user left the site.

Since the log file records all user behaviour as it occurs, lines representing one visitor's interaction with the site are interspersed among lines for all other visitors when were active during the same time. If each line provides enough data so that it is possible to distinguish one user from another, the observer can track a *user's behaviour*.

4.1 Other Tracking-Related Data

In order to track the user's experience on the site, the log file must also contain:

- A transmitted byte count (always logged) that can be used to detect searches that return no contents;
- The contents of entries made by users in forms, both fill-in and multiple-choice type entries. This information helps both to analyze what users are attempting to search for and identify usability problems. For example, misspelling may be an issue;
- Logging error and information about transmissions that are "stopped";
- Information about referring pages;
- Information about browser configurations. In some cases, it is possible to get not only the version of the browser is being used but also such details as whether the browser accepts the cookies and what type of Java or ActiveX programming it accepts. Although usability problems normally are identified from other data in the log file, browser-related information can give some more information to better understand the surfers behaviour (Murray & Costanzo 1999).

4.2 Limits

Anyway, while there are some valid uses of log files, the data can also be highly misleading: a considerable percentage of logged transactions is often the result of the Web spiders, that explore sites for pages to index, usually for search engines. Therefore these actions cannot be considered representative of human behaviour. Anyway if properly configured, a Web server is able to detect spider visits and allow the observer to not consider this logs in the Web log analysis ((Romanò & Sutto 2001, Murray & Costanzo 1999).

5. METHODOLOGY

In order to deduce the basic quality features we were looking for, we analysed the data of Banca Idea's Web server log files gathered from March to August 2002. From this kind of analysis and considering the limits we mentioned, we deduced the five main user actions when surfing a Web site:

1. Direct access;
2. Indirect access;

3. Home Page Visualization;
4. Surfing;
5. Personal data submission.

Starting from this assumption, we developed a methodology, called WOW! – Welcome on the Web!-, that considers the main categories of actions that a Web surfer does since when he/she is looking for the Web site to when he/she surfs inside it. The methodology is composed of classes of actions, indicators and measurement criteria and it uses some survey tools (Carignani, Gemmo & Bissola 2002) (figura 1).

As said, the classes of actions refer to the main activities of the user when surfing a Web site. The indicators stand for the description of the action and they can directly be controlled by the site administrator.

The remaining elements that contribute to create the methodology are the measurement criteria: they are objective elements that allow t quantify the weight of each single indicator and take shape of practical questions. All criteria are grouped according to the indicators to which they are referred to and are contained in survey forms (Carignani, Gemmo & Bissola 2002).. The criteria used for the site analysis have been carefully selected according to study of the literature on usability and Web site quality perception (among others: Nielsen 1999 – 2000, Christ et al. 2002, Zhang P. & Von Dran G. 2000 - 2002, Zhang P. et al. 1999, Novak T. P. et al. 2000).

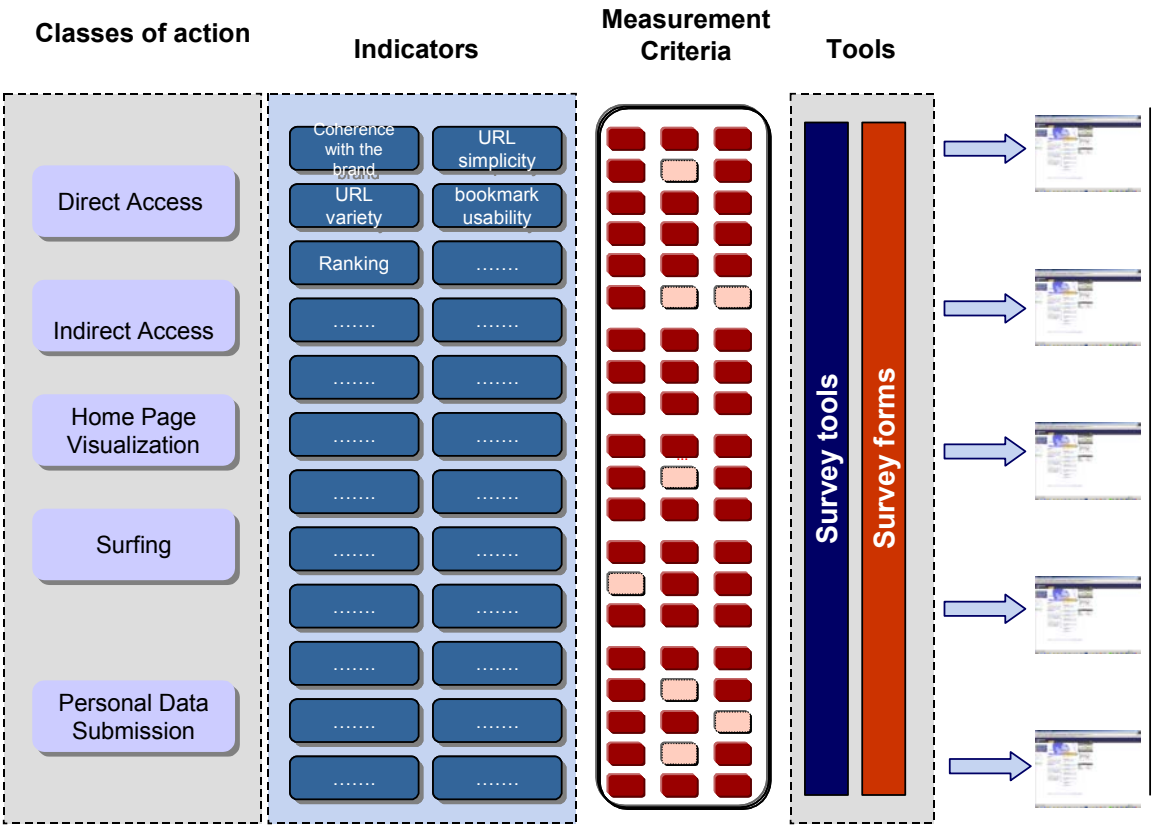

Figure 1. The WoW! methodology

In the following part of the article, we present the main actions that constitute the methodology, along with the meaning of their indicators.

5.1 Direct Access

Through this variable, we aim at analyzing the degree of simplicity of the Web site to be found by the user that writes the URL in order to enter the site. The main indicators we consider are:

- **Coherence with the organization brand**

  In order to enable the user to easily find the Web site, we deem necessary that the URL is as much as possible similar and corresponding to the brand or the information received by the media.

- **The URL simplicity**

  The URL should be simple, immediate and not deceptive; therefore URL should not contain peculiar or strange marks that are difficult to remember or that can confuse the Web surfer.

- **The URL variety**

  The existence of various first and second level domains and possible defensive domains facilitate the user in the Web site identification. It would be therefore useful that the Web site is registered with more first level domains such as: .com, .biz, .net, .tv, in addition to the usual ".it".

  Furthermore the registering of .tv domain is particularly outstanding if related to the next diffusion of services based on interactive tv.

- **The bookmark usability**

  In order to increase the visibility of the Web site after the first visit, it should facilitate the user in registering the URL inside the bookmark folder.

  To the purpose it would be useful to have a linker in the pre-home or in the home-page and the opportunity of registering the site in the "Preferred folder" through the visualization of the bank complete name.

5.2 Indirect Access

The variable "Indirect Access" verifies the attention of the bank to the registration of its own Web site in the major italian and international research engines. The main indicator we consider is ranking.

- **Ranking**

  In order that a Web site can be easily found by the final user, it has to be registered in the main national and international research engines with the bank name and the key words representing the core business of the company. For example, if the bank "xy" considers the loan its core business and wants to be identified and found in relation to this business, it is necessary that the site administrator registers the bank in the directories of the various research engines with the name "xy" as well as with the key-word "loan". This is particularly valid for the research engines known as Web Directories that are based on "user submission".

5.3 Home Page Visualization

The variable "Home Page Visualization" analyses the home page usability characteristics through the collection of the general features and the graphic coherence of the site in relation to colours, images, animations and links used. The main indicators are:

- **Intro-page and pop-up**

  The existence of an intro-page or pop-up should not be intrusive in order to avoid an early abandoning by the user. For this reason, in case of intro-page, it would be useful to have a "skip" button.

- **Possible redirect page (in case URL is changed)**

  In case URL is changed it is not convenient to simply show an error page. On the contrary, it is advisable to show a page that automatically re-direct to the new address or a page containing a link to the new URL.

- ***Screen dimensions***

  The best visualization of a home page is obtained when it is possible to see all the contents of the page without scrolling. The vertical and horizontal scrolling allows the user to see all the contents of a page but often it is unwillingly used by the user, thus causing the loss of important information contained in the Web site.

- **Up-date**

  The existence of a date on the home page or in other pages of the Web site provides a clear indication that the content of the Web site is up-dated.

- **Web site under construction**

  If the Web site is under construction, it is recommended to show and informative page, possibly personalized with the bank logo and colours. Its is also advisable to indicate when the Web site will be online. An e-mail address to get in touch for further information or a link to another Web pages which contains information about the bank could also be useful.

5.4 Surfing

This variable aims at verifying how the structure of the Web site can help the user to understand where the services and documents are placed and the way to achieve them in a direct way.

- **Link usability**

  The setting out of the Web site according to correct usability criteria suggests to show in the home page the links to the main sections of the Web site such as, for instance, the bank introduction pages, the advertising pages related to products and services, the services offered to all visitors (i.e. press review, estimate of loans interest etc.), the restricted areas, the assistance sections. Furthermore it is advisable that such links are grouped in macro-categories. It is also important that they are shown in a combination of texts and images that highlights their meaning; moreover they should be associated to a link title.

- **Surfing support tools**

  Such tools improve the effectiveness and the quality of the surfing experience in the Web site. The menu (located in an horizontal or vertical bar), for instance, should be situated in the same position in the home page as well as in the section pages: such a choice increases the inner degree of consistency of the Web site and reduces the possibility of creating a sensation of confusion in the surfer. Other support tools that improve the surfing experience are: a map

of the Web site, a demo, a research engine, an "help" area, a FAQ area, a news section, "contacts" page, a forum and a back button to the home page.

Moreover, inside pages with long text, it is recommend to supply surfing aids such as "table of contents" and the buttons "previous" and "next".

- **Visual Language**

  In case of graphic icons for the description of some elements of the Web site, their use should be consistent in every part of the Web site.

- **Multi-language option**

  In relation to the users target the bank wants to achieve (national or international), it is suggested to propose alternative versions of the Web site in different languages.

- **Access to fundamental information**

  In order to provide the surfer with some information about the bank and relevant products / services offered, the Web site should contain informative sections related to the presentation, the history and economic trend of the bank, the head office, possible branches and the characteristics and pricing of the products and services offered.

5.5 Submission Personal Data

The variable aims at analysing the services and supports supplied to the users during the submission of personal data. The main indicators considered are:

Pre-Submission Area

- **Achievable advantages and explanatory notes**

  The e-user who has to submit his/her personal data has to be informed, before the submission, of the advantages he/she can obtain by recording his/her data. Moreover in order to enable the user to easily fill in the form, it is recommended to supply him/her with explanatory notes, possibly completed with schemes, graphic representations, demo etc.

- **Compliance with privacy law**

  Due to the Italian law, it is essential to show the message referred to the treatment of personal data according to the Law N. 675 of December 31st, 1996.

Submission Area

- **Typology of requested information**

  In order to avoid the inhibition of the e-user while filling in the form, the information requested should be consistent with the purpose of the submission.

- **Support to the user**

  It is important that inside the submission area support tools are available (i.e., Help, Contact Center, FAQ, Forum, etc) as well as the possibility to send e-mail messages for the e-user who has some difficulties.

- **Control on entered data**

Mechanisms that control entered data are useful to avoid that e-user send erroneous forms or containing non-correct data. In order to help the e-user filling in the forms, it is convenient to create accuracy verification for each record (i.e., the record "name" should not contain numbers, etc.). A

message containing information about the errors should simultaneously appear when wrong data are entered.

6. CONCLUSION

The team in charge of developing the new Web site considered our methodology while developing the new site. Because of terms of contracts concerning the protection of the privacy, we did not had the opportunity of analysing the path of the customers within the personal area.

WoW! considers components of the design that could appear simple and not so important. Nevertheless we noticed that some of the more expansive and well known Italian banking Web sites do not meet such simple expectations.

At the moment we are applying the methodology to the Web sites of a sample of small saving banks (what we call in Italy banche popolari). In this case we are also allowed to observe the customers while visiting the personal pages. Therefore we are currently trying to extend and complete the methodology considering the prerequisites related to the reserved area.

A further limitation of the methodology is the changing nature of quality expectations. As the Kano model highlights, users always become more and more sophisticated and exigent. The number of basic features will consequently increase as well as the variables to consider. Therefore the methodology can not be considered a static scheme, but should evolve along with the customers expectations.

Next step will be the analysis of accessibility and services for disabled people. This is a recent area in the Web site quality field that can be considered as an example of an exciting component which is rapidly becoming a basic feature. Our intention is to extend the methodology and consider also this kind of functionalities. We are currently analysing studies and literature on this matter.

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