Evaluation & Use of Metaphor in Advanced Interface Design

CA1034A: e-Business Challenges

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1 INTRODUCTION

In some cases it is difficult to express nonliteral comparisons. This can however be done using metaphors (Gentner, Falkenhainer and Skorstad, 1987). Consciencely or sub-consciencely, metaphors are used in many different sciences such as poetics, linguistics or any other cognitive science (Szabó, 1995, section 2). Since the beginning of graphical user interfaces such as todays desktop applications, metaphors also started playing an important role in human computer interaction. Their main task is to improve the usability of interfaces.

Some metaphors used in user interfaces are however not intuitive and mislead the users, especially when they are novices and not familiar with frequently used metaphors of the information technology world. Therefore, effective use of metaphors, ought not only to prevent confusion, but is more than ever essential for the commercial success of a graphical user interface. Metaphors should enhance the interface in a way, which makes it easy for a novice to quickly become acquainted with the latter, without the need of long training or help (Marcus, 1998a, p. 129).

Since metaphors are widely used in web-based interfaces, this paper will discuss the use of the latter on the basis of a specific e-commerce website. At the end of the evaluation, it should be clear, which metaphors enhance the use of the website and which one mislead the user.

2 USE OF METAPHORS IN A WEB-BASED INTERFACE

The analysed e-commerce website is a German online hardware shop ran by *Mindfactory*. It can be accessed at www.mindfactory.de. Figure 1 on page 2 shows the homepage of the e-commerce shop.

2.1 Metaphors Used for the Layout

The website's structure is realised through HTML frames. Figure 2 shows a diagram of the five different sections of the website:

(1) Top frame: General menu

(2) Left frame: Product categories

(3) Middle frame: Content

(4) Right frame: Shopping basket and advertisements
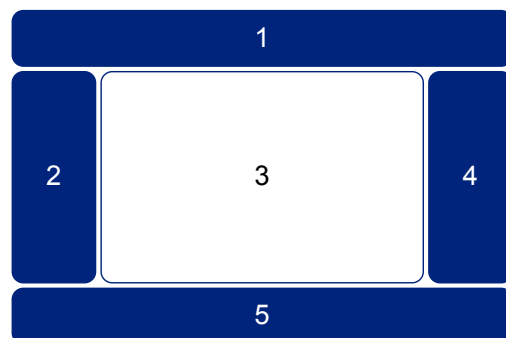
(5) Bottom frame: Disclaimer and contact information

Figure 2: Standard layout of website content

Figure 1: Homepage Screenshot of www.mindfactory.de

The outer blue frames (1, 2, 4 and 5) give the impression of a real frame used to frame a painting or a picture. Because the inner frame (3) has a white background, it can easily be distinguished from the outer blue frames. The visitor's eyes are therefore focused on the inner frame, which contains the actual content.

The content of the middle frame is further structured using invisible HTML tables with blue borders. This way it is easier for the user to quickly see the different contents. Professional website developers use the terms *portal* and *portlet* to describe areas of a website (Patil, 2005). The portal is actually the entire website consisting of the five frames. Portlets however are the sub-structures of the portal. The term 'portal' is interesting at this point, because it is used as a metaphor: It can be interpreted as a portal for the user to access the offered products, or as a portal for the website holder to be open for new business opportunities in the internet.

It can be noticed that the website makes use of 2 dimensional elements only. One might argue that the future lies in 3 dimensional environment. However in term of spatial memory, a 2 dimensional layout can be remembered more easily according to Cockburn and McKenzie (2002). The better a user remembers the layout of the website, the faster she can use the interface for her needs. Some pseudo 3D buttons are however used in the top menu. The latter enhance the interface by giving a more realistic impression of a button that can be clicked.

At the right borders of each frame (2, 3 and 4) there are scroll bars to scroll the frame screen up and down. (Szabó, 1995, section 3) explains that the user tries to understand a new environment by fitting it into something she is familiar with. In this case the user would already know the slide bars from the daily work with desktop applications. The desktop metaphor and the slide bars were originally introduced by Apple (Szabó, 1995, section 3–4) and are very intuitive for non-novice users.

When the user selects a product, she gets an overview of the latter in the middle frame (see figure 3). Many metaphors are used in this overview. In this section of the paper, only the tab panels will be discussed.

Figure 3: Screenshot of product details screen

The tab panels in the middle of the product overview enhance the menu offered to the user. The menu should remind of index cards known from the real world. This metaphor is already widely used in web-based interfaces and can be found on almost every website. The tab panels tell which menu item is currently selected by highlighting it (in the screenshot: 'Infos'); the content for the latter is then displayed below the menu. At this point it can be argued that the second part of the overview could have had another background color, in order to distinguish it more easily from the upper part of the product overview. The light blue background color of the selected menu item could have been chosen for this purpose. This would have made it even more obvious that the content belongs to the currently selected menu item.

2.2 The Shop Metaphor

As in a real shop, there are different categories of products one can buy. The categories of the online shop are however displayed in a tree view as shown in figure 4. Plus (⊞), minus (⊟) and empty (☐) boxes signal the user that she can get more (plus box) or less (minus box) categories, or that she arrived at the end of a category

(empty box). The user should instinctly be able to use the boxes, because she will recognise the boxes from her desktop experience, for instance when using the Explorer in Microsoft Windows. However, novice users will have to guess the meaning of the signs, and that they are offered the possibility to click on the boxes to expand or collapse categories.

Figure 4: The categories (collapsed and expanded)

Another interesting metaphor is the use of color codes to display a product's availability. For every product this availability is displayed in form of a rectangular icon. In figure 3 this icon is displayed in the top right corner. There are three different statuses: 'stocked' (green), 'ordered' (yellow) and 'will be ordered' (orange) (see figure 5). The color were chosen according to the colors of a traffic light. Green signals that the product is available and that the user can 'go' for it. A red icon, on the other hand, means, that the user will have to wait, as it is the case for a red light.

Figure 5: Availability of products expressed in colors (Text: 'stocked; ordered; will be ordered')

A classical metaphor for an e-commerce website is with no doubt the shopping basket. By clicking on a basket icon (see figure 6 on page 4), the user can place the selected product into the shopping basket. The visitor should have the impression that he is shopping with a basket where he can place the products he wants to buy. The shopping basket is displayed at all time at the top of the right frame. It displays the number of article, the total price and a link to go to the checkout. Figure 7 on page 4 shows how the shopping basket display looks like.

It is also possible to have a detailed view of the shopping cart. At any time the user can remove items from the cart in this detailed view. This is done by clicking on a recycle bin icon. The recycle bin icon

Figure 6: Screenshot of the basket icon (Text: 'Add to Shopping Basket')

Figure 7: The shopping cart, empty and filled (Text: 'Your Shopping Basket; Articles; Total; Checkout'

has been introduced by Apple (Szabó, 1995, section 4) and is since then a widely used metaphor to delete or remove something. The user might however wonder why the unwanted item is placed into a recycle bin. This behaviour would not have been acceptable in a real shop.

As in a real shop, there is a checkout in the online version. The point where this checkout differs from a real shop, is that the user has to go through some steps, where she needs to fill out her postal address and choose payment and shipping options.

A useful feature, missing in most e-commerce shop, is that Mindfactory offers the possibility to ask for information live via the website. In a real shop, the user would have to find a employee of the shop. In the online shop of mindfactory this is possible through the Livechat button in the top frame's menu. At any time the user can get advice by clicking this button. A new window opens (see figure 8), allowing the user to interact with an employee. The mataphor of asking for information has been implemented as chat.

2.3 Other Metaphors

In the top frame, there is a search field enabling the user to find a specific article. The search button is implemented as magnifying glass (see figure 1 on page 2). In the real world one might use a magnifier glass to see something, normally too small to recognise. The metaphor is used in the online shop, to make it clear to the user that she can find something using that tool.

Another metaphor is used to express the level of customer complaints for a selected product. This is implemented in form of thumbs pictures (see figure 3).

Figure 8: Screenshot of the Live Chat window

Thumbs up obviously means, that there are almost no returns for the product, whereas thumbs down signify that the product was returned often.
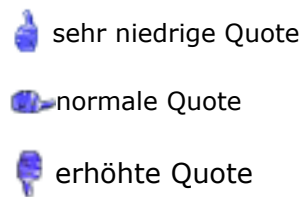

Figure 9: Screenshot of product returns (Text: 'very low return rate; normal return rate; high return rate'

It is also possible to see a product rating. Figure 10 on page 5 shows the metaphor used to express a product rating. The rating is done with 6 small men icons (and). The more blue men ( ), the better the rating. To make it clear to the user that 6 is a better rating then 1, some minus ( ) and plus ( ) icons has been added at each end. As for the product availability, these icons have the traffic light colors 'green' and 'red'. Again, the user will do an association with something she already knows (Szabó, 1995, section 3): She will associate a green light with something positive, and a red light with something negative. The metaphor is therefore appropriately used in this case. There are however high chances that the user is already familiar with this rating system, because it is used on many websites. Most of the time five stars are used instead of six small men icons.
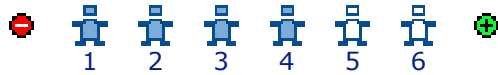
Figure 10: Screenshot of product rating

3 ANALYSIS OF THE METAPHORS AND GENERAL OBSERVATIONS

No real misuse of metaphor is noticeable. Constantine (2000) has analysed some examples of misleading metaphor use. One of the problem Constantine is criticising, is that 'objects in the everyday world' are usually 'persistent', but not when used as a metaphor in the virtual world. Constantine (2000, p. 5) cite the shopping basket as an example. Mindfactory, however, proves Constantine wrong: They display the shopping basket at all time in the right frame.

Hamilton (2000) is another author who intensively researched on the use of metaphors. Hamilton (2000, p. 245–249) especially concentrated her work on the use of metaphors in human-computer interfaces. One of the points she noticed, is that users have certain expectations of what a metaphor should stand for (Hamilton, 2000; Marcus, 1994). An unfulfilled expectation leads to what Hamilton (2000, p. 246) calls a *mismatch*, which in return leads to a user being 'quite seriously bothered'. The different metaphors analysed in section 2 however meet the user's expectations. This is at least the case for an non-novice desktop user.

In general the use of metaphors in this e-commerce shop enhance the use of the shop. According to Marcus (1998*a*, p. 172 et seq) and Marx (1994, p. 379), the strength of metaphors lies in their easy and fast comprehension of complicated operations. They should also enable the user to quickly remember information. All evaluated metaphors seem to ease the understanding of the shop functionalities.

Furthermore Knutslien (2001, section 2) explains that there are two fundamental principles for a good website design:

1. making it easy for the user to find out what to do, and

2. give the user feedback on what is going on by making things visible.

Both are well implemented in the Mindfactory shop: Regarding the first principle, a standard website design was chosen that is already well known to the user (see figure 2 on page 1). Many metaphors are used in form of small icons, this paper covered the recycle bin icon to delete items; the magnifying glass to search for a product; the plus (⊞), minus (⊟) and empty (□) boxes to collapse or expand the categories menu; and the small blue men icons (⚇) to rate a product. Regarding the second principle citet by Knutslien, the shopping basket is a good example: It gives feedback to the user on the already acquired products.

Additionally, Knutslien has written a detailed study of attitudes toward metaphor among human computer interaction researchers. Some of the most relevant arguments for a good user interface, are, that the interface should use metaphors the user is familiar with and that a real-world analogy is the best metaphor choice (Knutslien, 2001, p.491 et seq). Almost all metaphors mentioned in this paper are metaphors the user would have already seen on another website, or metaphors that could easily be understood by making an analogy to the real-world.

Finally, most of the used metaphors are so-called relational metaphors (Gentner, Falkenhainer and Skorstad, 1987, p .177). They are founded on analogies and 1-to-1 object mapping. For the user this kind of metaphor is the easiest to interpret.

4 FUTURE OF METAPHOR USE

It is now interesting to discuss if the introduction of new technologies could influence the use of metaphors in the analysed e-commerce shop.

Currently, an e-commerce website will always be accessible through the world wide web with a classical web browser. It is however imaginable, that the site could also be accessed with other technologies in the near future. Any portable device, such as a PDA, could be used for this purpose. New devices, means new interfaces and therefore new possibilities of metaphor uses. An interesting part of new portable devices is the introduction of touch screen sensible to finger gestures. New devices from Apple, such as the iPhone, already support the use of finger gestures to scroll through menus or enlarge images in a gallery application. These

gestures could also be used in an advanced e-shop front-end, to drag-and-drop items in the shopping basket for instance, or to turn a product around in a 360° animation.

There are also many other hypes of future user interfaces, as explained by Knutslien (2001). According to Knutslien, an innovation could come from the use of all senses (Knutslien, 2001, section 3). Such an innovation is for example a tangible interface, as the one where interaction is made possible through finger gestures. Knutslien (2001, section 4) cites many more examples of possible interfaces realised with object interaction. Thus these examples seem very interesting, they are neither requested nor needed by the customers, and especially not for an e-commerce shop.

In a interview with Brenda Laurel, expert in interface design, it turns out, that the current interaction is 'just a quaint little historical artifact that will go away' and that computer will 'vanish into the environments' in a not so far future (Marcus, 1994, p 51 et seq). This theory is very realistic, since the current interfaces make the user loose a lot of time. In fact, using the keyboard and mouse to interact with the computer is very time consuming. An imaginable future interface will probably be able to talk and understand voice commands. This way, a user could buy on the e-commerce shop just by asking for a particular product. With new kind of interfaces, new metaphors will also be created, as the use of metaphors is a process which change over time, according to what can be expected from a user.

5 CONCLUSION

An effective user interface design should communicate clearly, faster and more intuitive. By using appropriate metaphors the user interface can drastically be enhanced. A good metaphor is characterised by being easily interpretable and remembered by the user. This can best be achieved by using a metaphor that the user is familiar with, or by using an obvious analogy to a real-world metaphor. In any case it is important that the metaphor meets the user's expectation.

Many different metaphors of the Mindfactory e-commerce shop ave been analysed and seem to meet all the criteria of well implemented metaphors. The website's design and e-business functionality is therefore greatly enhanced.

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