The positioning of web design elements should reflect the average user’s mental models in order to improve a web site’s usability – but how to assess these expectations? As early as 2001, two different approaches were proposed to deal with this issue. While Michael L. Bernard [1] chose a survey-based method to measure user expectations in order to derive design recommendations for web designers, Jakob Nielsen and Marie Tahir [2] used their 14 years of web usability experience to specify standard UI design conventions that were supposed to shape the user’s mental models in the first place. In the study described here, both approaches were compared and updated to the present situation, in order to identify benefits and limitations and to correlate them with current changes in professional web design.

RESULTS
WEB LAYOUT TRENDS
Since 2001, the websites described by Nielsen & Tahir have changed significantly. Higher screen resolutions, HTML 5 and CSS 3, mobile, responsive or flat design led to several redesigns, so that hardly any major website today has the same look and feel as it had in 2001. 39 of the 50 web layouts analyzed by Nielsen & Tahir have changed considerably during the period from 2001 to 2016. Only two of them remained almost unchanged, five still show certain similarities, and the last four were no longer accessible.

- Web page titles which inform users about the aim of the website they are currently visiting, have disappeared almost completely in 2016. The positioning of logos in the upper left corner remained largely unchanged. This aspect is also reflected in the user expectations.
- The search item, which used to be either centered at the top or in the left and the right upper corners in 2001, is now mostly located in the upper right. This increase in consistency coincides with a higher homogeneity of the user expectations as far as the search position is concerned.
- The navigation maintained its typical position on the upper or the lower end of the website. However, secondary navigations on the left hand side (which are typical of the classic top-down navigation) were less frequent in 2016 (probably due to an improved browser support for dropdown menus and centered responsive web layouts which tend to reserve the full screen width for content elements).
- In sum, the positioning of search and navigation seems to have become more uniform and consistent today in comparison to 2001.
- Commercials positioned on the left hand side became less popular. Advertisements can nowadays be found in the upper or rightmost corners, although sometimes also in central positions. In sum, the number of advertisements above the fold has decreased perceptibly, although those that remain tend to be bigger and more conspicuous (cf. figure 03).
- Web content is increasingly presented in a dynamic form. Especially above the fold (i.e., in the area of the web page that is visible without further scrolling), plain text is often replaced by banners and slideshows. The linking of web elements has become truly ubiquitous.

METHOD
USER EXPECTATIONS REVISITED
The survey-based method that was developed by Michael L. Bernard in 2001, was also used in this study. 235 participants had to specify the expected position of seven web elements: logo, homepage link, web title, search engine, internal links, external links and advertisements. Bernard’s 8x7 matrix was used, although the survey was now computer-based instead of using paper and cardboard templates. The results were presented both using Bernard’s matrix (cf. figure 04, left) and with a scatterplot (cf. figure 04, right) indicating the precise click positions. Thus, the users’ click points could be located with a higher precision, which, amongst other things, helped to identify selections near the grid lines.

DISCUSSION
The influence of real world web layout patterns on user expectations is discernible especially for well-known, clearly identifiable and consistently positioned web objects like the logo, the homepage link or the search function. Furthermore, web layout patterns are subject to a slow but steady temporal change. All in all, the layout of web objects changed with respect to the frequency of occurrence (emission of web titles, addition of social media links) and the positioning (the web search moved to the upper right corner, layouts became more centered and links are increasingly dispersed). Furthermore, almost all images and text elements are nowadays linked, thus also serving as control elements.

REFERENCES