

# Optimizing Screen ‘Real Estate’ at a B2C e-commerce site: Design and Analysis of a 7-dimensional Field Experiment

*Nick Lenten, Otto Koppius and Ralf van der Lans*

Dept. of Decision and Information Sciences, Rotterdam School of Management, Erasmus University, PO Box 1738, 3000 DR Rotterdam, The Netherlands, [okoppius@rsm.nl](mailto:okoppius@rsm.nl)

## Abstract

The growth of e-commerce has resulted in a vast amount of practical and academic research as to how to best design and employ an online channel. Scholars have gathered insight into for instance the importance of trust (Lim et al., 2006), familiarity (Gefen, 2000), reputation (Belanger, Hiller, & Smith, 2002), decision aids (Haubl & Trifts, 2000), the fun in online shopping (Shang, Chen, & Shen, 2005), and the ‘bricks’ in ‘clicks & bricks’ (Steinfeld, Bouwman, & Adelaar, 2002).

However, many of the challenges in web page design involve the limited amount of space and the limited amount of human attention. While the length and width of the page can be indefinite, only a limited portion of it is displayed, depending on the screen resolution of the visitor’s and the size of the browser program. This space is commonly defined as above the fold, a term borrowed from the printing industry. While many users do scroll further down the page (Nielsen, 1997), this space provides the first impression of the site. Therefore, web designers face the difficult task of cramming all the important information on it without distracting the user. A page trying to attract a user’s attention to everything at the same time, usually ends up attracting no attention at all.

This makes that many of these previous studies are difficult to translate into actual web site improvements. For instance, trust-building strategies like adding reassuring statements on your web site can be effective (Lim, Sia, Lee, & Benbasat, 2006), but are they more important for your conversion rate than showing an ‘intelligent sales agent’ on the same spot (Haubl & Trifts, 2000)? Similarly, showing a lot of relevant accessories on a product page may increase cross-selling, but when does too it start to hinder making a choice (Iyengar & Lepper, 2000)? Or what should get the most prominent position on screen: the add-to-cart button, or a set of customer reviews? Thus, this research is aimed at answering the question: *How can we optimize the limited real estate of a browser screen to achieve maximal conversion?*

In this study we focus on 7 prominent design variables for the product landing page of a B2C e-commerce website that can affect the conversion rate:

- Image gallery (Hong, Thong & Tam, 2004)
- Presence of a physical pickup location (Forman, Ghose & Goldfarb, 2008)
- Trust-building statements (Lim et al. 2006)
- Size of the product accessory set (Iyengar & Lepper, 2000)
- Amount of product information presented (Lurie, 2004)
- Availability of consumer product reviews (Clemons et al., 2006)
- Prominence of the add-to-cart-button (Eisenberg, 2008)

We test the effects of these variables through an online field experiment (Kohavi et al. 2009) with the web shops of the Dutch e-commerce firm Coolblue. This 7-year-old company exploits more than 20 shops, each specialized in a single consumer electronics product group. From PDAshop.nl to MP3shop.nl, the group sells a wide range of products and a ‘long tail’ in suitable accessories. It is one of the largest online retailers in the Benelux, with over 70 million euro in revenue (2008), 190 employees and physical outlets in Rotterdam, Eindhoven, Groningen and Antwerp. The same experiment will be conducted with the 12 largest product sites simultaneously. The strict separation of product sites has the additional benefit of being able to assess any potential moderating effects of product characteristics on the optimal website design

(for instance, an image gallery may be more important for products where design/aesthetic consideration are important, or trust-building statement may be more influential for more expensive products).

Since our starting point is that there is limited screen real estate, we are not so much interested in the main effects of each variable, as these are already fairly well-established in the literature. Rather we are interested in the higher-order interaction effects among the variables as these represent the tradeoffs in optimizing website design. While a full factorial design would be ideal, the total number of experimental conditions is  $3^6 \times 2 = 1458$  (6 variables have three levels, the accessory variable has two levels), which makes a full factorial design impractical, despite the large number of site visitors each day. We thus use a high-resolution fractional factorial experimental design (resolution 7) that allows the identification of all three-way interaction effects and some four-way interaction effects.

The full experiment is currently underway, but the results from a pilot experiment involving 140,463 visitors in a limited set of experimental conditions (27 conditions, roughly 5,000 visitors in each condition) showed promising results: there was substantial variation in conversion rates across experimental condition, with the best and worst design differing by as much as 69% and the best design showing a 41% improvement over the current design, of which improved prominence of the add-to-cart button alone accounted for 21% of that improvement, as well as several two-way interaction being significant and substantial. Results of the full experiment will be ready mid-April, in order to be presented at SCECR at the end of May.

## References

- Belanger, F., Hiller, J., & Smith, W. (2002). Trustworthiness in electronic commerce: the role of privacy, security, and site attributes. *Journal of Strategic Information Systems* (11), 245-270.
- Clemons, E.K., Gao, G. G., and Hitt, L.M., 2006. When Online Reviews Meet Hyperdifferentiation, *Journal of Management Information Systems* (23:2), p. 149-171.
- Forman, C., Ghose, A. & Goldfarb, A. (forthcoming) Competition Between Local and Electronic Markets: How the Benefit of Buying Online Depends on Where You Live. *Management Science*.
- Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega* (28), 725-737.
- Häubl, G., & Trifts, V. (2000). Consumer Decision Making in Online Shopping Environments: The Effects of Interactive Decision Aids. *Marketing Science* (19-1), 4-21.
- Hong, W., Thong, J., & Tam, K. (2004). Designing product listing pages on e-commerce websites: an examination of presentation mode and information format. *International Journal of Human-Computer Studies* (61), 481-503.
- Iyengar, S. S., & Lepper, M. R. (2000). When Choice is Demotivating: Can One Desire Too Much of a Good Thing. *Journal of Personality and Social Psychology* (79-6), 995-1006.
- Kohavi, R., Longbotham, R., Sommerfield, D., & Henne, R.M. 2009. Controlled experiments on the web: survey and practical guide. *Data Mining and Knowledge Discovery*. 18. 140-181.
- Lim, K., Sia, C., Lee, M., & Benbasat, I. (2006). Do I Trust You Online, and If So, Will I Buy? An Empirical Study of Two Trust-Building Strategies. *Journal of Management Information Systems* (23-2), 233-266.
- Lurie, N.H. 2004. Decision Making in Information-Rich Environments: The Role of Information Structure. *Journal of Consumer Research*. 30(March), 473-486.
- Nielsen, J. (1997, December 1). Changes in Web Usability Since 1994. Retrieved January 28, 2008, from Useit.com: <http://www.useit.com/alertbox/9712a.html>
- Shang, R., Chen, Y., & Shen, L. (2005). Extrinsic versus intrinsic motivations for customers to shop online. *Information & Management* (42), 401-413.
- Steinfeld, C., Bouwman, H., & Adelaar, T. (2002). The dynamics of click-and-mortar electronic commerce: opportunities and management strategies. *International Journal of Electronic Commerce* (7-1), 93-119.