Journal of
Print and Media Technology Research

2-2016

June–July 2016

Special issue
Audience, design, technology and business factors in new media innovation

Guest Editors
David M. Frohlich & John Mills

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David M. Frohlich & John Mills

E-mail: d.frohlich@surrey.ac.uk/jmills@uclan.ac.uk/journal@iarigai.org

Introduction to special issue:
Audience, design, technology and business factors in new media innovation

The print and media industries have been going through significant and prolonged change in recent years due to the digitization of media content. As with many innovations, the earliest phase of change involved a kind of replication of existing services with new technological processes. Hence the replacement of analogue with digital printing machines simply allowed print media to be produced more flexibly and efficiently. This resembled the motorized carriage design of early cars, echoing the horse drawn carriages they were replacing. More recently, print itself is being threatened by screen-displayed content, which can not only reproduce the printed word and image, but go beyond this by packaging multiple pages in a highly portable and convenient e-book form, providing instant access to multiple sources of web-based content, and integrating other media such as sound, video and interactive games. Similar things could be said about the digital broadcasting of radio and TV content, which is now ready for more radical integration with paper and the web.

In this special issue, we examine some of the factors involved in new media innovation within this context of media digitization and convergence. In particular, we consider the future of print media in relation to screen-based media, and some possibilities for combining them in different ways. The papers were invited from presentations at the IARIGAI 2015 conference on Advances in Printing and Media Technology in Helsinki from the 6th–9th September last year. Furthermore, four out of the five papers were submissions from members of the EU COST network FP1104 on '*New possibilities for print and packaging: Combining print and digital*'. The non-FP1104 paper was a related keynote paper on digitization and service business model innovation by Viljakainen, Toivonen & Seisto. The COST network is comprised of 140 academic and company members from 29 countries across Europe, and has been meeting for four years to share and generate new research on augmented print and packaging: http://www.cost.eu/COST_Actions/fps/FP1104. It also held the *Paper Evolutions* exhibition of new product concepts in the area at the IARIGAI 2015 conference (Seisto et al., 2015). The selected papers are a small window on the discussions of the network regarding the future of paper, and the need to think about its innovation from an interdisciplinary point of view.

Those points of view broadly echo the disciplinary orientation of the work packages of the COST network. They consider audience, design, technology and business factors in new media innovation. These ingredients need to come together in any new business opportunity so as to provide media content and experiences people enjoy and are willing to pay for at a sustainable price, through an appropriate design of the right technology. Research however, often provides insights into these factors separately, through the methods and languages of each contributing discipline. This is largely true of the selected papers that approach their subjects from sociological, psychological, technological, economic, and management perspectives respectively. Nevertheless, together they begin to point to bigger themes which the reader may appreciate by reading them as a set, and hopefully to stimulate cross-disciplinary discussion out of which new ideas may come.

Hence the first paper relates to **audience factors** and is by Vincent, on '*Students' use of paper and pen versus digital media in university environments for writing and reading – a cross-cultural exploration'*. This summarises a new cross-cultural study of students' current attitudes to reading and writing on paper and screens. The study involved data collection from 12 countries, made possible by collaboration within the COST network, and involved the administration of questionnaires with multiple choice and free text questions about students' use of pen and paper, keyboard and screen for both learning and leisure purposes. Perhaps surprisingly, given the ubiquity of screen-based technologies in European universities and homes, students still reported use of pen and paper for reading and writing of certain kinds. This is the beginning of a general theme about the complexity of preferences for print and screen media, and their relationship to individual, group and cultural differences as well as the tasks and content to which they relate.

This theme is taken further in the second paper of the issue. This relates to **design factors** and is by Laine and Leppänen, on *'Experimental comparison of user experiences of different digital and printed newspaper versions'*. The paper reports an experimental comparison of reading experiences with five different versions of a Helsinki newspaper; the Helsingin Sanomat. One version was the printed newspaper while four versions were different e-book versions displayed on an Apple iPad 4 tablet. Participants browsed each version in randomized order whilst wearing glasses that tracked their eye movements, and later rated and discussed their experiences for each version of the newspaper. Different questionnaire statements were more closely associated with one version than another, but there was no overall winner in terms of preference. In fact preferences differed within and between participants, despite the fact that the content was identical across versions. This shows the role of content and interaction *design* as well as medium, in shaping reading experiences and preferences. The author also reports a consistent split in the group between those who preferred a conventional

bounded collection of news, as in a traditional newspaper, and those who were more open to a continuous changing stream of news, as in an evolving webpage. This points to the importance of *audience* factors again, and the emergence of new audiences willing and able to deviate from conventional formats and expectations, irrespective of medium.

The role of **technology factors** in creating new formats and combinations of media is addressed in the third paper. This is by Fedorovskaya, Hickerson, Desai & Cheng, on *'The RocReadaR – A system for transmedia news publishing using augmented reality'*. The authors describe a novel system for what they call transmedia publishing of print-and-digital content. Essentially this is an app running on an Android Nexus 5 smart phone which can display associated content linked to a printed magazine on 'Research at RIT" (Rochester Institute of Technology). Holding the phone over the magazine brings up related content options which users can select from on-screen icons replicating printed icons on the magazine. While many of the features of the app were rated positively, there was no clear preference over paper alone. In fact the experiment threw up new design issues relating to which type of content to associate with what type of article, and how to cue and control this while reading the paper. In parts, the associated information could add interest, information and fun to the reading experience, and make it easier to remember. But there were also concerns that it could distract from reading and understanding the printed article. Unlike the Laine paper, there was also no third condition of e-magazine alone to contrast with the paper and augmented paper versions. The AR technology and approach therefore appears to demonstrate promise in the context of paper documents, but requires time for further development and design experimentation.

Business factors are covered in the last two papers of the special issue. In the fourth paper, Viljakainen, Toivonen & Seisto discuss '*Digitalisation and service business model innovation in media*'. This begins with a review of literature on the trend from product to service design in the printing industry, where print products are seen as carriers for content-based services rather than ends in their own right. A related shift is said to involve a new relationship with customers as co-creators of content rather than mere 'consumers'. The second part of the paper reports on the findings of an interview survey of 50 staff from media firms across three Nordic countries, extending the literature review for this population. Service thinking is recommended as a route to business model innovation, which for some printing companies may mean diversification into content delivery over other channels.

The openness of the printing industry to print and digital innovation is examined in the fifth paper of this issue. This is by Tiekstra, Držková, Miranda, Isaías, Vehmas & Seisto, and is entitled *'Attitudes of the European print industry towards innovative combinations of print and digital'*. The study gathers perspectives on 'innovative printing' – a term which encompasses printed

electronics, printed intelligence, augmented reality and QR codes, many of which seek to embed or connect with digital interactions and experiences. Taking a pan-European approach, the cross-cultural study surveyed 217 companies from 10 European countries via a common questionnaire. It asked about their size and characteristics, involvement with universities and gathered industry perspectives on these various new forms of printing and packaging. Although the survey data suggests the print industry has a complex series of views and varying degrees of engagement with 'innovative printing', a number of key findings begin to emerge. The authors discovered a consistently held desire within the sector to learn more about these innovations. The paper also suggests that cross-disciplinary collaboration and greater links between industry and academia could foster a more effective environment for innovative printing.

Taken together, the papers in this special issue illustrate the diversity of approaches to new media innovation in the print and publishing industry. It is often said in this industry that 'content is king', implying that if the media content is interesting enough to audiences, then they will pay for its delivery irrespective of the way it is packaged or sold. This does not appear to be true from the papers just described. Audiences are very sensitive to the form in which content is delivered, whether it be printed or screen-displayed according to Vincent, or laid out as a conventional newspaper or evolving webpage according to Laine & Leppänen. Furthermore, new technology such as the transmedia publishing system shown by Fedoravskaya and colleagues, can open up new possibilities for authoring content differently to be split between paper and screen. This has subsequent implications for the user experience of reading and watching content of different kinds concurrently. Whether content is sold as a product or service also affects the economics of its value, according to Viljakainen and colleagues.

This is not to say that media content itself is unimportant to new media initiatives. Bad content can never be attractive or commercially viable, however well it is designed and delivered. Rather, content is not the only factor to be considered within a media ecosystem, especially one in the current state of change and flux. As the Tiekstra et al. survey data suggests, a multi-stakeholder and cross-disciplinary approach is perceived by companies to be a key component in creating innovative responses to market conditions. We have adopted such an approach here, and suggest that the richness provided by multiple research disciplines and their varied approaches, is necessary to identifying coherent new business opportunities which have the right combination of audience, technology, design and business factors.

Seisto A., van Beurden, H., Egglestone, P. and Mills, J. 2015. Paper evolutions: Exploring digital and physical paper futures. *COST action FP1104 – New possibilities for print and packaging*. EU Framework Programme Horizon 2020.

Students' use of paper and pen versus digital media in university environments for writing and reading – a cross-cultural exploration

Jane Vincent

Digital World Research Centre,
Faculty of Arts and Human Sciences, University of Surrey
Stag Hill, Guildford, Surrey GU2 7XH

E-mail: j.vincent@surrey.ac.uk

Abstract

This paper offers a summative cross cultural analysis of qualitative survey data collected to investigate the impact of digital media on writing and reading within universities from different countries. It addresses the particular aspect of the student's experiences of paper and pen versus digital media. This study is based on the results of individual qualitative research conducted in 10 countries in two continents by members of the COST Action FP1104, Work Group 1 – Customers and Users. The methodological approach used is qualitative content analysis of the reported research and analysis of the individual country surveys. The survey was conducted in the national language of each country using the same research questions. Various survey methods were deployed – online questionnaire; questionnaire and interviews or hand written essays. The principal results show that there are many similarities between the countries studied but that some use pen and paper less whereas others are more prepared to use hand writing, this may link to the availability and use of digital technologies as well as to personal preferences. Reading and writing competencies are changing with the use of digital technologies but students still see benefits of reading and writing with paper which they continue to use, especially to convey private emotions and intimate feelings. This study provides new learning about the contrasting use of paper and digital media within an educational rather than business setting. These surveys provided the basis for the design and analysis of a follow up quantitative study (not examined in this paper) and for further exploration of this important research topic within the countries surveyed, particularly in social sciences and pedagogical studies.

Keywords: computer, education, keyboard, paper, reading, writing

Experimental comparison of the user experiences of different digital and printed newspaper versions

Janne S. Laine, Tapio Leppänen

VTT Technical Research Centre of Finland Ltd,
Tietotie 3, Espoo, P.O. Box 1000, FI−02044 VTT, Finland

E-mail: janne.laine@vtt.fi
tapio.leppanen@vtt.fi

Abstract

A laboratory experiment comparing the user experiences elicited by five different newspaper publication versions (four digital versions and the printed tabloid format newspaper) was carried out. The study had the parallel goals of testing and developing user experience measures for evaluating news reading experiences evoked by different publication designs and to learn of the different styles of news reading and reader preferences regarding the design and layout of the content. The results show considerable differences between the user experiences evoked by all five publications versions, and provide information on the usefulness of different measures in measuring relevant aspects of news reading experiences. The participants could be roughly divided into two main clusters based on their preferences of different publication versions. The most significant difference between the two groups seems to be the attitude towards reading news articles in the form of continuous streams as often found on different web sites. One group preferred the printed newspaper and digital versions that can be understood to stem from the tradition of the printed newspaper. The other group preferred the web style of news presentation and saw no need for digital versions mimicking the printed paper.

Keywords: user experience, news reading, questionnaire, experience mapping, eye tracking

The RocReadaR – a system for transmedia news publishing using augmented reality

Elena Fedorovskaya[1], Andrea Hickerson[2], Saunil Desai[3], Fanyi Cheng[1]

[1] Rochester Institute of Technology, School of Media Sciences,
  39 Lomb Memorial Drive, Rochester, NY 14623, USA
[2] Rochester Institute of Technology, School of Communication,
  92 Lomb Memorial Drive, Rochester, NY 14623, USA
[3] Rochester Institute of Technology, College of Science,
  102 Lomb Memorial Drive, Rochester, NY 14623, USA

E-mail: elena.fedorovskaya@rit.edu
        aahgpt@rit.edu
        saunildesai@gmail.com
        fc2332@rit.edu

Abstract

We designed and tested a prototype of a system for collaborative publishing across different media platforms in the form of an application for smart personal Android-based devices. This system includes and uses a printed document (e.g. a magazine publication) as an entry point. The printed document is seamlessly linked to digital web-based material and collaboratively augmented by the users in an interactive fashion using personal computing devices. While the printed document stays the same, the associated virtual digital multimedia part is updated by the community of authors and readers and discovered by using image-based tags embedded in the printed document via augmented reality technology. We call this method of publishing transmedia publishing, since it has similar characteristics to transmedia storytelling. To demonstrate the feasibility and utility of the system we conducted a laboratory study where we asked student participants to use the system while reading a printed magazine and provide their evaluation of the quality of experience. The results of the experiments demonstrate that users on average preferred transmedia publishing over the regular printed magazine for its ability to provide compelling user experience and rich media content. They also emphasized an integration with social media and an option for uploading additional content as important advantages compared to print. The findings can be used to formulate design recommendations for implementing transmedia publishing system in practical real-life applications and to improve our prototype.

Keywords: transmedia, news publishing, print media, augmented reality technology

Digitalisation and service business model innovation in media

Anna Viljakainen, Marja Toivonen and Anu Seisto

VTT Technical Research Centre of Finland Ltd,
P.O. Box 1000, 02044 VTT, Finland

E-mail: anna.viljakainen@vtt.fi

Abstract

The traditional business of newspaper and magazine media is stagnating largely because of digitalisation, increasingly challenging business environment, and the resulting commoditization of mass media products. Creating new value to customers and partners with services is an increasing phenomenon in the media sector to enable growth and differentiation. Adapting to service-thinking however necessitates some fundamental changes in managerial mind-sets, strategies, and practices. It also requires for business model innovation. This study offers the service-logic business model framework to explore and explain the transformations taking place when media business is geared towards service(s).

Keywords: business model; business transformation; media management; servitization; service management

Attitudes of the European printing industry towards innovative combinations of print and digital

Sanne Tiekstra¹, Markéta Držková², Paula Miranda³, Pedro Isaías³, Kaisa Vehmas⁴, Anu Seisto⁴

¹ Bumaga BV,
  IJsselburcht 3, 6825 BS Arnhem, The Netherlands
² Department of Graphic Arts and Photophysics,
  Faculty of Chemical Technology, University of Pardubice,
  Studentská 95, 532 10 Pardubice, Czech Republic
³ IADIS, Rua de São Sebastião da Pedreira 100-3, 1050-209 Lisbon, Portugal
⁴ VTT Technical Research Centre of Finland Ltd, P.O. Box 1000, FI-02044 VTT, Finland

E-mail: s.tiekstra@bumaga.nl
marketa.drzkova@upce.cz

Abstract

The present study reports a European industry survey of the state and future of innovative printing. In this study, we have defined innovative printing as printed electronics, printed intelligence, printed functionalities, combining print with digital (e.g. providing digital solutions for Quick Response codes or augmented reality), and similar products and services. Experiences and inputs from industry representatives were collected through a survey to provide viewpoints on how print media and packaging could be developed and used in the future and how the industry can utilize this knowledge from the academia for the benefit of their customers and the consumers. Based on the results, it may be concluded that (1) European printing companies do see a possible future in innovative printing, (2) besides the possibility of increased costs, the lack of market demand is the most important factor preventing companies embracing this technology, and (3) in general the approach and vision of the industry is similar across all of Europe. However, Western European printing houses appear to be more active in the field of innovative printing as defined here, whilst in Eastern Europe the technology is currently focusing on special effects and personalized printing, suggesting a possible delay in the implementation of innovative printing technologies as a whole.

Keywords: innovation, printing, Europe, prospective study