

Use Scenarios: A Useful Design Tool For mBusiness

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Abstract

This paper presents use scenarios, derived from user-centred design research and practice, as a useful tool for representing the user in the design of mBusiness technologies. Use scenarios are increasingly being employed as a method for addressing issues facing the mBusiness community such as lack of adoption of technologies and services, usability issues, and the difficulty of designing technologies for a variety of users. Their use in the design of new mobile technologies enhances the likelihood that these technologies will be widely adopted to successfully exploit the wealth generating potential of the mobile wireless market. This paper reviews the place of use scenarios within user-centred design and then considers how scenarios have been used to date within mBusiness. We conclude with a discussion of the differences between empirically derived and fictional use scenarios, arguing for the importance of the former for grounding the design within its context of use.

1. Introduction

The challenges of understanding users and their practices, and how to represent this knowledge in the design process, have been explored by user-centred approaches to IT systems design, including Human Computer Interaction (HCI) and Participatory Design (PD). In particular, use scenarios are one example of design tools discussed within the HCI and PD literature that enable designers to explore the opportunities for, and limitations of, technology by considering technology use within the context in which it will be used. For readers unfamiliar with use scenarios, they are concrete descriptions of activities that users do as part of their work, and can be employed to drive the ongoing design and evaluation of information systems. Scenarios are often used in conjunction with personas. Personas are fictional people with “names, likenesses,

clothes, occupations, families, friends, pets, possessions, and so forth” [9, p. 3]. Like an actor running through a script, personas are then played out through scenarios to validate the design and to reveal design assumptions [7]. Forrester Research identifies scenario design, combined with personas developed from customer interviews, as the key to providing a valuable experience for the user [21].

To date, different types of scenarios have been actively utilized across a number of IT disciplines including strategic planning, human-computer interaction (HCI), and software engineering [8]. Go and Carroll employ the metaphor of blind men touching different parts of an elephant to describe scenario-based design approaches by separate disciplines; each discipline has a different view and understanding of scenario design. In particular, each of these perspectives provides a different context for situating the design focus. For example, HCI provides a user focus, software engineering approaches tend to be system-oriented, and strategic planning considers the organizational or market context. Scenarios within the mBusiness literature tend to take two forms: strategic planning scenarios, for predicting future market trends; and system-oriented scenarios in which the user is represented as an input to the system under design. HCI also provides a third option, use scenarios, that can potentially extend mBusiness approaches by providing a user focus during design to facilitate the development of useful and usable mobile technologies.

The purpose of this paper is to explore the use of scenarios in both the mBusiness and the user-centred design arenas, and to outline the problems inherent in developing and using scenarios that are not grounded upon an understanding of actual users. This paper firstly presents a review of use scenarios within the user-centred design literature and then considers how scenarios have been used to date within the mBusiness literature and in the IT industry. We conclude with a discussion of the differences between empirically

derived and ‘made up’ use scenarios, arguing for the importance of situating the design within the context of use for the design of technologies that are widely adopted and successfully exploit the wealth generating potential of the mobile wireless market.

2. Use Scenarios in the User-Centred Design Literature

Use scenarios initially emerged within the PD literature, as a method for both representing and involving users in the design process. Discussions about design representations and their role in empowering the user involved authors such as Kyng [12], Bodker [2], and Suchman [23]. In particular, Kyng [12] defined the representations of work he used in co-operative design as: descriptions of work situations that describe current practices; and use scenarios that represent future use situations, based upon both current practices and the emerging design. Further work by Bodker recognized the variability in form and definition of use scenarios within the literature and outlined the characteristics that are common to all use scenarios. Use scenarios are: “hypothetical; selective; bound; connected; and assessable, so that they may be judged with respect to their probability and/or desirability” [1, p. 63]. PD also explores the effectiveness of combining use scenarios with other techniques, including dramatization or acting out of scenarios by users and/or designers [3, 22]; low-fidelity prototyping [3, 10, 12]; and use scenarios in the form of video segments that can be viewed by both designers and users [4]. Bodker [1] proposed that caricature be used with use scenarios, along with plus and minus scenarios, in which extreme situations are explored to highlight benefits or pitfalls of the design. Similarly, a number of HCI researchers emphasise the importance of developing a detailed description of the user, for example by combining personas with use scenarios [7, 9], and using character development techniques from film script-writing to develop a rounded description of the user [14].

Use scenarios bring a number of benefits to the design process: they evoke reflection in design, are at once concrete and flexible, afford multiple views of an interaction, can be abstracted and categorized, and promote work-oriented communication among stakeholders [6]. However, two issues that have been identified within the literature regarding scenario use are: firstly, use scenarios can be made up, and as a result, they are not necessarily grounded in genuine human practice [9]; and secondly, the difficulty of developing realistic use scenarios that predict the

actions and goals of the user when nothing is known of the user [14]. Grudin and Pruitt note that use scenarios that are not grounded can tend to rely on over simplified conceptions of, and unrealistic assumptions about, users’ practices, and they can be biased towards justifying particular features of the system under design. The result is that designers who are developing products to be used by an end user must assume that they are also, therefore, designing user behaviour. In practice, however, user behaviour does not necessarily match the idealized and convenient behaviour of made up use scenarios.

3. Scenarios in mBusiness

As stated earlier, scenarios used in the mBusiness literature tend to take two different forms: scenarios as strategic or planning scenarios, e.g. [5, 13, 20]; and system-oriented design scenarios that focus primarily on the system with the user represented as an input to the system, e.g. [11, 17, 25]. Firstly, planning scenarios are used as a tool for analysing future trends and risks facing the industry. Go and Carroll note that strategic planning scenarios differ from use scenarios in that use scenarios describe user tasks whilst planning scenarios describe more abstract artefacts such as future organisational plans [8]. Planning scenarios are, however, generally based upon a detailed analysis of the existing market situation to identify potential risks and major drivers for the future [5].

Secondly, scenarios discussed within mBusiness design tend to be system-oriented, consisting of descriptions of a generalized user. The user described by mBusiness scenarios is generally termed the “customer”, “shopper”, or “user”, interchangeably. The emphasis of the scenario is on the system or features of the system, with little or no description of the user as an actual person who chooses how to, or how not to in the case of bad design, use the system to achieve a goal. For example, an excerpt from a scenario by Kolmel and Porak [11, p. 8]:

When the user comes in range, he will be logged in and identified automatically by the network. Then he receives some advertisements depending on his profile he can update on the web. The system acts in the following way...

It is not apparent from the scenario why, how or if the user would actually want to receive location-based advertising. The user is instead described in terms of how his actions trigger particular system behaviour. In another example, Oinas-Kukkonen and Kurkela [15] describe a user, ‘Brenda’, and possible services that she may want to use and why. For example:

Brenda can also shop with her mobile device. She likes hip-hop music, and so she can access a mobile service that sells music. This service is capable of...

Brenda's scenario describes her interests and the resulting potentials for consumption of services. However, the scenario does not address where and when Brenda will be using this particular service. Furthermore, it is not clear why Brenda would choose to access this service via her mobile device rather than from a fixed computing resource. Without a clear understanding of users, their behaviour, and the context of use, it can be difficult to develop technologies that are successfully adopted by the end user.

Studies of scenario usage by professional system designers within the IT industry reveal that scenarios are frequently employed, e.g. [16, 18, 19]. Pedell and Vetere presented findings from an industry case study of the development of a location sensitive Shopping Assistant running on a PDA. Observation of the design team revealed that scenarios were not grounded in an understanding of situated use; the few descriptions of the use environment within the scenarios were not based upon systematic observation. In their study of the work practices of information architects, Robertson found that scenario use was increasingly becoming accepted practice in the design of web-based and wireless mobile applications. But Robertson's project also found that, in the Australian industry, as the current economic downturn decreased projects budgets, the development of scenarios from actual use became increasingly rare. The result is that the scenarios were created by designers and marketers, and the usability and usefulness of the resulting projects was compromised by the lack of genuine user involvement [18, 19].

4. Discussion

Design representations, including use scenarios, provide a tool for thinking about the design problem in a particular way. They necessarily represent particular, selected aspects of the problem domain, to focus design thinking and to break the design problem into manageable, solvable, components. Moreover, the process of selecting the particular aspects of the problem domain depends upon the perspective and interests of those who generate the representations [23]. Use scenarios, as we have seen, can be empirically derived, or they can be 'made up'. Both types of scenarios are representations that portray particular understandings of the user. The difference in approaches is that an empirically derived use scenario is based upon a grounded understanding of the practices that are being represented whilst a made up

scenario is instead based upon assumptions of an abstracted user. It is the quality of the representations that are employed during the design process that shape the resulting usefulness and usability of the end product. The quality of thinking about any problem depends, in large measure, on the adequacy of the representational artefacts that are available to us to think with [24].

Traditionally technology has been developed for users often conducting a dedicated task using a dedicated device in a single setting. With the emergence of mobile technologies, this design problem has evolved towards moving devices, carried by moving people, who are conducting multiple and often rapidly changing tasks in different environments. The challenge of designing for a complex environment emphasizes the importance of situating design within the constraints and opportunities available within the context of use. This complexity of the situation of use may not initially be apparent to the designer unless the design is purposefully considered within this context. Use scenarios are design tools that open the use context for exploration. As Suchman notes "work has a tendency to disappear at a distance, such that the further removed we are from the work of others, the more simplified, often stereotyped, our view of their work becomes" [23, p. 59]. This remains true for both work and social practices.

Widespread adoption of services and technologies by users is vital for the success of the mBusiness industry and technologies are more likely to be adopted if they are based upon a grounded understanding of the mobile user and their mobile practices. If new developments in ICT, including wireless mobile application are not usable and/or do not work appropriately in the context in which they are used then the successful exploitation of the wealth generating potential of this new technology will be missed. Moreover, the focus of technology development needs to be upon creating useful products as well as usable products, for widespread adoption to take place. When developing mobile wireless technologies and services, the resulting design benefits from embracing both details of the system under design and details of the end user; developers are designing not only products but also products for use. By incorporating user-centred design techniques, in particular empirically derived use scenarios, mBusiness developers can add another tool to their tool-kit that enables them to integrate accurate user representations into the design process.

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6. References

- [1] Bodker, S. 2000, 'Scenarios in user-centred design-- setting the stage for reflection and action', *Interacting with Computers*, vol. 13, no. 1, pp. 61-75.
- [2] Bodker, S. 1998, 'Understanding Representation in Design', *Human-Computer Interaction*, vol. 13, pp. 107-25.
- [3] Brandt, E. & Grunnet, C. 2000, 'Evoking the Future: Drama and Props in User Centred Design', *PDC2000*, New York, NY, USA, pp. 11-20.
- [4] Buur, J., Binder, T. & Brandt, E. 2000, 'Taking Video Beyond 'Hard Data' in User Centred Design', *PDC2000*, New York, NY, USA, pp. 21-9.
- [5] Camponovo, G., Debetaz, S. & Pigneur, Y. 2004, 'A Comparative Analysis of Published Scenarios for M-Business', *ICMB04*, New York.
- [6] Carroll, J.M. 2000, 'Five reasons for scenario-based design', *Interacting with Computers*, vol. 13, no. 1, pp. 43-60.
- [7] Cooper, A. 1999, 'Designing For People', in *The Inmates Are Running The Asylum*, SAMS Publishing, pp. 179-201.
- [8] Go, K. & Carroll, J. 2004, 'The Blind Men and the Elephant: Views of Scenario-Based System Design', *Interactions*, vol. 11, no. 6, pp. 44-53.
- [9] Grudin, J. & Pruitt, J. 2002, 'Personas, Participatory Design and Product Development: An Infrastructure of Engagement', *PDC2002*, Malmo, Sweden, pp. 144-61.
- [10] Howard, S., Carroll, J., Murphy, J. & Peck, J. 2002, 'Using 'Endowed Props' In Scenario-Based Design', *NordiCHI*, Aarhus, Denmark, pp. 1-10.
- [11] Kolmel, B. & Porak, A. 2003, 'Real Life Scenarios of Location Based Advertising', *ICMB03*, Vienna, Austria.
- [12] Kyng, M. 1995, 'Making Representations Work', *Communications of the ACM*, vol. 38, no. 9, pp. 46-55.
- [13] Mylonopoulos, N.A. & Doukidis, G.I. 2003, 'Introduction to the Special Issue: Mobile Business: Technological Pluralism, Social Assimilation, and Growth', *International Journal of Electronic Commerce*, vol. 8, no. 1, pp. 5-22.
- [14] Nielsen, L. 2002, 'From user to character - an investigation into user-descriptions in scenarios', *Designing Interactive Systems 2002*, London, England, pp. 99-104.
- [15] Oinas-Kukkonen, H. & Kurkela, V. 2003, 'Developing Successful Mobile Applications', *International Conference on Computer Science and Technology*, Cancun, Mexico, pp. 50-4.
- [16] Pedell, S. & Vetere, F. 2004, 'Scenario-based Design Methods in Mobile Appliance Development: A Case Study in Industry', *OzCHI04*, Wollongong, Australia.
- [17] Pilioura, T., Tsalgatidou, A. & Hadjiefthymiades, S. 2003, 'Scenarios of using Web Services in M-Commerce', *ACM SIGecom Exchanges*, vol. 3, no. 4, pp. 28-36.
- [18] Robertson, T. 2004, 'Doing technology design and being an information architect', *UStA04*, Edinburgh, Scotland, pp. 40-4.
- [19] Robertson, T. & Hewlett, C. 2004, 'HCI Practices and the Work of Information Architects', *APCHI04*, Rotorua, New Zealand, pp. 369-78.
- [20] Sideris 2002, 'The Use Of Scenario Planning Methodology In Mobile Business As a Learning Tool', *ICMB02*, Athens, Greece, pp. 1-14.
- [21] Sonderegger, P. 2000, *Scenario Design, The Forrester Report*, Forrester Research Inc., USA, viewed Dec 2000.
- [22] Stromberg, H., Pirttila, V. & Ikonen, V. 2004, 'Interactive scenarios - building ubiquitous computing concepts in the spirit of participatory design', *Personal and Ubiquitous Computing*, vol. 8, pp. 200-7.
- [23] Suchman, L. 1995, 'Making Work Visible', *Communications of the ACM*, vol. 38, no. 9, pp. 56-64.
- [24] Suchman, L. 1994, 'Representations of Work: Introduction', *27th Annual Hawaii International Conference on System Sciences*, pp. 818-9.
- [25] Varshney, U. 2003, 'Location management for mobile commerce applications in wireless Internet environment', *ACM Transactions on Internet Technology*, vol. 3, no. 3, pp. 236-55.