An Internet for Transactions – A User Perspective to Inform Future Business Models

Professor Emeritus Reg Coutts[#] and Professor Trevor Barr[$]
Smart Internet Technology Cooperative Research Centre

The Pacific Telecommunications Conference, Hawaii January 11-14th January 2003

Professor Emeritus Reg Coutts was Professor of Telecommunications at the University of Adelaide for this research but has recently launched his company Coutts Communications to continue work in the mobility sector.
$ Professor Trevor Barr is Director, Convergent Communications, Swinburne University of Technology

Summary

The Internet has started a revolution but to date it has not lived up to the heady predictions of the late 1990s of a transformation of the way business is transacted particularly for consumers. This growing realisation, coupled with the subsequent industry implosion provided the context for the research over 2 years reported in this paper. The question is not *whether* there is user demand for many innovative new Internet based services but *how* one can better define sustainable business models that realise profitable new service products to users. It is argued that insightful research into the user perspective provides the necessary insights into key perception inhibitors that need to be addressed for future sustainable business models. The first stage developed an understanding of the nature of these bottlenecks from a number of perspectives and the second stage built on these insights to identify *how* to 'move users up the value chain'. A range of methodologies was employed including expert interviews of providers, a large national survey of current internet users and multiple focus groups of both current internet users and potential future users of a wireless internet. The paper summarises the findings in order to explore potential new business models for the Internet.

1. Introduction

The emergent Internet was at the centre of the revolution in the information and communications industry in the late 1990s. At its peak, some commentators claimed that the internet would turn conventional business economics on its head, would undermine the market power of telecommunications carriers and unleash new forces for enhanced democracy. The dotcom crash of April 2000 and the following broader industry crash from which we are still recovering has provided the industry with the opportunity to reflect on this apparent disconnect with market reality. This background is the context for the user-focused research reported in this paper in which it is argued that insightful research into the user perspective provides the necessary understanding into key perception inhibitors which will need to be addressed in future sustainable business models. The question is not *whether* there is user demand for many innovative new Internet based services but *how* one can better define sustainable business models that realise new service products which will deliver profit to providers and value to users.

The research informing this paper was supported by the Smart Internet Technology Cooperative Research Centre (SITCRC)[1] which is a collaborative research entity of Universities and industry partners supported by the Australian government that was formed at the time of the industry peak in 2001. The SITCRC is undertaking a broad technology research program focusing on technologies to enable a next generation Internet. The research also includes a 'user oriented' research program that complements these technology research programs a part of which is reported in this paper. The basic premise behind this research is that the fundamental 'bottleneck' inhibiting greater use of the Internet for transactions is the lack of "trust" by users in the Internet technology platform which is a separate issue from any concerns such as trust in the institutions such as the merchants. To realise the potential for the Internet to be used to undertake high value transactions, such as buying insurance or home loans, a better understanding of these inhibitors is required. These insights can inform new service innovations so that a future Internet can "take users up the value chain" and form the basis for sustainable business models.

The paper outlines the two stages of the research, the distinct research components within the two stages, including what was done and why, through to the major findings. The research explored the user perspective of undertaking transactions on the *current* wired internet as well as the likely user view to transactions on a *future* wireless internet. The first stage project was called "Unlocking User Bottlenecks" and involved three research components undertaken by three distinct research groups aiming to develop an understanding of the nature of these bottlenecks from a number of perspectives. The second stage involving two research components built on these insights and was called "Moving Users up the Value Chain' with the aim to identify how users might increase usage of the Internet: both fixed and future mobile. The paper describes the range of methodologies employed that included expert interviews of providers, multiple focus groups of users and a large national survey of users of the fixed Internet. The paper will conclude with the findings of this two-year research program and explore the ways these findings can be interpreted for developing potential new business models for the future 'smart' Internet.

[1] Information on the Smart Internet CRC can be found at www.smartinternet.com.au

In a sense, one can speculate that the image of the ubiquitous highly meshed ‘internet cloud’, which is at the heart of the power of the internet, is in many ways the source of the heightened user perception of the risk of conducting transactions over the internet compared for example with those conducted over the phone.

2. Context for the Research And Approach

The background motivation for this research (Armstrong, M 2003) was that previous research on the uptake of e-commerce is mostly based on the US experience which had focused on concerns around Internet shopping but had not addressed the broader range of Internet transactions such as share purchasing, banking and negotiating home loans. As well as seeking a better understanding of the barriers to e-commerce in the Australian market as distinct from those operating in the US, the objective was also to understand this dynamic at a more fundamental sociological level building on research done in Australia (Singh 1977) on ‘trust’ as the underlying factor affecting use.

Therefore the primary focus of the research first sought to understand how consumers perceive the risks associated with Internet transactions, what factors inhibit on-line consumers, and to propose the manner in which addressing key behavioural bottlenecks to transactions should be integral to considerations of emerging product innovations for the Smart Internet. The context of the research was the Internet as we now know it today, but some attention was given to a smart Internet as it might be (eg mobile platform for example).

The crash of the industry which began in 2000 reinforced the need to understand the user from a more fundamental perspective than had been attempted previously. With the developments of the mobile platform for a very different Internet experience, notably in Japan with i-Mode, starting to emerge, the aim of the research program was also to gain in-depth insight to how users would perceive the utility of a future Internet platform.

As part of Stage 1 it was recognised that there was a need to look at the regulatory externalities to the growth of transactions on the internet as there was some doubt which was later confirmed that previous forms of consumer protection appropriate for “bricks and mortar” transactions could not be translated to the e-commerce platform. This mismatch would further erode trust in the Internet for transactions. The approach to understanding this aspect was to conduct multiple interviews of ‘experts’ who were in the business of providing on-line services to end-users.

3. The Research Program

The consecutive research projects described in this paper were part of the User Environment Program of the CRC for Smart Internet Technologies and were conducted over two years from late 2001 to 2003.

"Unlocking User Bottlenecks"

The notion of 'bottlenecks' on the part of Internet users emerged as a useful umbrella concept for the first stage research project to categorise a range of impediments to the take up of Internet based transaction services by Australians.

There were three principal strands of research within this project, managed across three Australian Universities. Swinburne University, RMIT (Network Insight) and CTIN[2] (University of Adelaide), together with participation from one of the CRC industry partners, Telstra, at its Telstra Research Laboratories (TRL) in Melbourne. Each of the three University research groups employed different but complementary methodologies revealing different aspects of the problem.

In the work undertaken at Swinburne and Adelaide Universities, focus groups of consumers were the prime methodology used to elicit the views of users about their interaction with the Internet. The Swinburne team considered views of users to the present Internet whereas the Adelaide team focused on user responses to current through to possible new mobile commerce services by using a "technology demonstration" within the focus group methodology. This extension of focus group methodology to elicit views of future[3] technologies had been developed previously (Coutts, 1998). The RMIT (Network Insight) team investigation was conducted from the viewpoint of some of the Internet service providers through in-depth individual interviews as they were confronted directly with the problem of gaining on-line consumer trust with respect to privacy and consumer protection.

The results of this initial work has been reported in summary form in the Telecommunications Journal of Australia (Armstrong 2003) and a more detailed report of the m-commerce work at the Communications Research Forum. (Coutts 2002)

"Moving Users Up the Value Chain"

The follow on research project built on the insights from the earlier research in two distinct parts with first to quantify the relative importance of the identified trust variables and the second to gain deeper insight into the user view of a new mobile Internet platform:

[2] The Centre for Telecommunications Information Networking (CTIN) at the University of Adelaide which was an industry sponsored research centre which closed in May 2002 with the industry down turn

[3] By future here it is meant near future in that they were products that had been developed but users had no prior knowledge of them.

Both parts of this research were reported at the Communications Research Forum in 2003 (Barr at al 2003, Coutts et al 2003) and the findings of this research will only be summarised in the following section.

Nation Wide Survey to "Dimension Trust"

In November/ December 2002, two thousand Internet users were surveyed in an Australia-wide random telephone survey of persons 18 years and over. The aim was to quantify on a national basis the relative importance of the identified parameters of trust and how they impacted users view of transactions over a range of applications. The survey was conducted through a call centre in Melbourne. To reach this number of users required telephone sampling of 3753 persons.

The survey included screening items, demographic items, scales used to assess frequency and type of Internet transactions, likelihood of engaging in these transactions in the next year, perceived barriers to Internet transactions, perceived difficulty of Internet transactions, perceived likelihood of negative outcomes of Internet transactions, knowledge of 'victims' of negative Internet transaction outcomes, perceived seriousness of the range of possible negative outcomes of Internet transactions, perceived trust in the Internet, and knowledge of and evaluation of bank websites.

Most questions in the survey involved the respondent choosing from a range of options in response to a statement about the Internet (closed answer questions) and there were also some open-ended questions about reasons for non-use.

In-depth Focus Groups of Mobile Users to "Differentiate the User Segments"

The focus group enquiry of mobile users was structured into seven groups of around nine participants who had been selected through a partner market research company[4] from their large user database, all of whom were mobile users except for one member of the disability group.

This research segment was designed to test for key variations to likely adoption and use of a mobile Internet platform around the traditional demographic market variables of gender, age or education. Six groups consisted of two focus groups distinguished by gender with other factors distributed, two groups distinguished age (above and below 40) with other factors distributed and two groups distinguished by occupational status (professional/managerial: non professional) with other factors distributed. The seventh group[5] consisted of people with a disability with other factors distributed.

In the demonstration the technologist introduced the participants to the new concept and then gave them devices actual devices to "experience", ranging from a Personal Digital Assistant (PDA) to a Palm Top PC to early commercial 3G terminals with video capability. The devices introduced were:

- Palm IIIC a popular PDA (colour screen) and some of the participants owned one.

[4] McGregor Tan are a commercial market research company that provided interview facilities and an experienced impartial facilitator for the focus groups.

[5] Unlike the other six groups, the selection criterion did not require the user to be a mobile user yet only one participant was not.

- Compaq iPaq Pocket PDA which is a PDA with much greater functionality, colour display running Windows CE and which has communications capabilities including GPRS and Bluetooth.
- KYOCERA mobile phone which integrates the Palm PDA functionality on the phone
- NATE Pocket PC which runs Windows CE and is integrated with a GPRS capable phone
- XDA Pocket PC which runs Windows CE and is integrated with a 1XRT capable phone
- Sony Ericsson "device" which has organiser capabilities, inbuilt camera, integrated with a GPRS capable phone and has many new consumer type features. At the time this had not been released on the Australian market and it neither looks like a phone nor runs Windows CE.
- Mitsubishi 3G[6] phone with video calling capability that was new for users, as Hutchison had not launched their 3G services in Australia at that time.

In describing the various devices, the technologist explained the different uses the phone designers had in mind, noting the difference between those with a consumer focus to those intended for the mobile businessman wanting Windows CE.

A brief before and after questionnaire was given to each participant to fill in. The pre-interview questionnaire asked about the current mobile and Internet usage and the post-interview asked them, after they had and "experienced" the demonstration, their likely interest in an Internet enabled phone asking them what they might use it for along with identifying barriers and enablers to use. The questionnaires were on the whole multiple- choice questions for ease of completion and later analysis. While there was insufficient data from the survey to enable quantitative conclusions to be drawn, the results helped provide clues or reference points for reviewing the focus group discussions.

The focus groups were recorded using a video camera while the researchers observed from a one-way mirror in another room. The focus group recordings were transcribed into text which was then coded using the NUD*IST software program. Researchers were also able to refer back to the video data, which was converted on to DVD format for reference for clarification and checking, and additional data relating to non-verbal inputs.

4. Summary of the Findings

The overall findings of the research are summarised to inform the discussion of the implications for business models and where the more detailed findings can be found in the referenced publications of the work. (Armstrong 2003, Barr et al 2003, Coutts 2002, Coutts et al 2003).

[6] This was an early generation WB CDMA phone developed for the FOMA 3G service in Japan.

"Unlocking User Bottlenecks"

On the evidence of the early phase of the research of current Internet users, there was identified a considerable, multi-dimensional gulf between those Internet users who are comfortable with, and practised in, buying goods and services on line, and those who are not. The dimensions of this gulf appear to be personal, attitudinal, behavioural, cognitive and experiential.

Trust emerged as an important predictor of consumer behaviour. The *perception* that users have of the security of their transactions on the Internet is a major inhibiting factor to the growth of online services. Perception is not necessarily related to the actual level of data. A cluster of trust factors emerged with users expressing major reservations about credit card security, the reputation of merchants, concerns about returns and refunds as well as worries about the proper fulfilment of their orders. Some users saw the Internet as 'a rapacious black hole' or as 'a spiders web' that they did not trust. There were, however, many misconceptions about the possible dangers of engaging in transactions on the Internet and fears had clearly been fuelled by media reports of isolated fraudulent practices.

Interestingly, service providers did not see the complex issues of trust in the same light as users. They drew out a distinction between the consumer senses of trusting the Internet as a medium of communication as opposed to the good-brand 'trusted' reputation of the merchants. Of the providers interviewed (referred to in this paper as 'strategists') almost all stressed the intelligence or 'savvy' of the consumer and were most respectful of the consumer's skill in deciding what he or she wanted. Repeatedly, the strategists pointed to consumers' cleverness in using the Internet in their mix of transaction time or entertainment time (and the consequent need for providers to 'keep ahead' in terms of design of web-based services).

There were several indications that the users of services on computer-based platforms, and those who engage in electronic commerce, differ in important ways from those users who enjoy, and are dependent upon, mobile-based platforms. Mobile users tended to see the mobile telephone as important lifestyle enhancement - and as an extension of themselves. This finding suggested that the transition to new m-commerce services from existing mobile services is likely to be easier than the transition of computer-based services to new forms of electronic commerce.

It is argued that the Internet can be considered as an additional channel of communication rather than a medium that will replace older channels. There are many things people will do most naturally and frequently via telephone (both fixed and mobile), the traditional means of having a conversation. Channel knowledge was also a critical variable in consumers' use of the Internet for purchasing goods and services. The more familiar people are with the Internet (or indeed their mobile), the less likely they are to be inhibited from using it for transactions. The number and variety of purposes for which respondents use the Internet varies more according to channel knowledge, or extent of part use than to other factors such as income, age or location. So encouragingly, consumers who use the Internet for any purpose are likely to increase their usage for specific purposes.

For the strategists, the Internet is not the end in itself, and it does not define what they are doing. It is a means to selling their product or service. They do not assume that the Internet is the only outlet. It is just a channel. For some business sectors, such as airline ticketing or music vendors, the whole transaction might happen on the Internet. For others though, such as real estate or personal finance, the customer might find the merchant via the Internet, but the important part of the transaction will happen in person - face-to-face with a pen and paper! The Internet was perceived by the strategists as one of many possible channels to the consumer, part of their marketing strategy.

"Moving Users Up the Value Chain"

As mentioned earlier, the detailed results of this final stage of the research have been reported in detail at the recent Communications Research Forum (Barr at al 2003, Coutts et al 2003), but the main findings will be repeated in this paper, as they are the basis for the following speculative discussion on the implications of the research for framing future business models.

The survey showed a low level of trust in the current Internet platform for conducting transactions. Against the backdrop of relatively low trust, it is perhaps not surprising that when asked if there was one way they could change the Internet, people mostly opted for changes along the lines of increased security, privacy protection and confidentiality where detailed paper explains how this varies for different groups and the perceived risk against consequence for increased significance of transaction.

Improvement suggested N= 1574	**%**
Increased security/confidentiality/privacy	41
Faster online responses	6
Quicker delivery of goods	3
Wider options of payment/alternatives to credit card payments	3
Better navigation arrangements	2
Better design of sites	2
Better description/more information about goods	2
More user-friendly/easier to understand	2
Wider range of goods	1
More personal contact	1
Confirmation of orders/receipt numbers	1
Customer service/help desk availability	1
Lower prices	1
Reimbursement/ compensation if problems	1
Information on suppliers	1
Easier ordering instructions	1
Less downtime of sites	1
Governing body needed to oversee sites	1
Don't know/Not est.	23

Table 4.1: Participant desire for changes to the Internet (from Barr at al 2003)

A summary result is shown in Table 4.1 above, which lists all categories of response to this item mentioned by 1 or more percent of the sample. Users wanted an increased sense of security and confidence when they use the net. They needed to know or feel

that their privacy would not be violated, and their credit card details protected. If this confidence and security can be offered and accepted, usage may be expected to grow substantially. Gender and education differences were minimal on this item. Those with medium to low channel knowledge were somewhat more concerned about privacy and security than the high channel knowledge users.

The focus groups with mobile users looked at the importance of understanding users and their current use and context as a starting point to realising the take up of the products of convergence on the mobile internet platform. For example WAP[7] was "thrust" upon mobile consumers in the late 1990s on the assumption that the intersection of the Internet and Mobile must be good and they would adopt the product! Apart from the deficiencies in the performance of the technology, there was a lack of understanding that for users this was not "just a PC without wires". Mobile users have a distinctly different value proposition than fixed users for accessing the internet as it springs from their need to enhance their relationships at work, family, social and daily life through the convenience, flexibility and control a mobile device offers.

The reaction of all the groups to the devices was on the whole positive and as was reported from the earlier research (Coutts 2002), there was a feeling of inevitability of these trends though with differing personal immediate relevance. Of all the devices, the Sony Ericsson phone was particularly popular in all the focus groups, because of the multifunction capability as was the 3G phone with video.

The changes in attitude moving from concept to "experience" with the technology demonstration were carefully assessed and are discussed in the detailed research paper (Coutts et al 2003). The focus groups resulted in a source of rich comments from focus group participants across all three segments. The research suggests that the wireless Internet services that users will adopt are those that enhance their relationships through 'always-on' connectivity. The adoption of higher value functionality will be an evolutionary one: adoption will follow a continuum of comfort with using mobile devices for increasing functionality potentially taking users up the value chain to m-commerce. This is much like the 'channel knowledge' trust parameter discussed for the fixed Internet because in a sense the mobile internet is a different channel again to the PC Internet.

Potentially, the internet enabled mobile device has a broader market appeal than the PC as it evolves from the current widespread adoption of mobile phones and the value to be found in its higher value functionality across the age, gender and socio-economic spectrum. Unlike adoption of the fixed Internet, likely adoption of the mobile Internet is not characterised by demographic segmentation but around context of use so that the non-professional who has never used the fixed Internet would potentially use a mobile Internet platform for conducting his skilled tradesman business on the road.

This cultural phenomenon of mobile technology use takes us into the realm of the anthropology of technology consumption (Cutler 2003) where our understanding of

[7] WAP is Wireless Application Protocol which is an industry 'standard' to enable WEB like access from mobile devices developed in 1997 during the hype period.

adoption is placed into the context of societal constructs, values and language. Technology consumption is realised through the three stages of:

- Adoption where the user adopts the technology (e.g. mobile phone) to do current activities more efficiently
- Adaptation where the user "learns" new ways to do things as a result of using the technology
- Transformation where the technology becomes integrated in the way the user interacts with the world!

A comment of one focus group participant was "I would be lost without it" and the focus groups elicited many such comments across all groups. Whilst different users groups were at different points in this process of integration with their life style, users saw the emerging mobile Internet platform as an inevitable reality.

5. Implications for Future Business Models

Findings from this user-focused research have important implications for business models for business – consumer transactions on a future Internet both for the current fixed Internet as well as an emerging mobile Internet. The research supports the view that users view these forms of the Internet quite differently, there are also common elements associated with their lack of trust of this medium for transactions. While the results of the research do not directly inform how business models could be improved, it is argued one can make an informed speculation on these implications based on the insights from the research.

The first major implication for business models for e-commerce arising from this research arises from the broad lack of sufficient trust in the internet platform around security, confidentiality and privacy which acts as a constraint of users "transacting on the net". This barrier is for the most part[8] around users perceptions of the net from second and third order sources (eg stories in the press) rather than any negative direct experience. Further, the very notoriety of the internet around the concept of transacting using "packets over the world wide web of interconnected ubiquitous clouds" increases this perception based "lack of trust". While this is the way the industry differentiates the net from the telephone network, this concept feeds user concern around security, confidentiality and privacy relative to the telephone network[9]. Further, it is contended that for this very reason, the service product design for a mobile internet should look more like a "direct dedicated service connection" rather than an internet like interface. This same approach for the fixed Internet would suggest moving to alternative terminal devices such as the phone or television instead of the PC to create the notion of a dedicated service. Some services might be best with a unique identifiable device for access!

The second implication for business models is that the value proposition for a fixed Internet based service must be framed quite differently to the value proposition for a mobile Internet based service. Services designed for one or other of the platforms *cannot* be migrated to the alternative platform. All of the parameters of cost of

[8] This was not explicitly asked but is inferred from the nature of the responses.
[9] Note this view of greater security over the telephone compared to the Internet came out consistently in focus groups.

provision and value to the user are radically different between the two platforms. Several of these differences to illustrate are:

- Value to the user of a mobile-based service is around context and convenience often when the user is away from usual locations (fixed) or while travelling.
- The user interface for a mobile-based service is far more restricted both for display of information so that only 'critical or timely information' is valued as distinct from 'broad based information' searches appropriate on a broadband fixed Internet with large screen.
- The cost of support (i.e. transmission costs) is VERY different for a mobile service so that any value proposition MUST be much more compelling in terms of convenience alternatives (eg fixed internet at home)

In view of these differences in fixed and mobile, the mobile internet based services are more likely to be families of "niche applications" and but where the research indicates that the mobile internet platform over time is likely to be much broader in market penetration than the current fixed internet. Thus sustainable mobile internet applications will depend on groups of niche applications with a common middle-ware platform.

As stated earlier, these implications are speculations based on the body of rich insights gained from the user-oriented research and would need to be tested against the same user criteria.

6. Conclusions

The Internet is a remarkable communications platform that has experienced faster rates of take up by end users than many of its predecessors. In terms of the supply/demand equation much attention has been given to supply side issues, especially in search of creating successful new applications and services. However if the Internet is to realize its full potential as a medium of global communication much more attention needs to be given to the complex human factors related to demand.

While this study focused on the analysis of behavioural factors related to the take up of different kinds of financial transactions via the Internet in an Australian context – and demonstrated how perceived trust of this new platform remains a critical inhibitor to the take up by end users more broadly than the finance sector. A great deal more social and behavioural research is needed to assist suppliers and developers before the Internet can become the medium of global 'any to any' connectivity. Further, the relative of importance of these behavioural factors is dependent on the country cultural context so that translation to other markets needs further study.

The overall implication for business model design speculated here is that the anarchistic feature of packets leaping between clouds that is so attractive to the technology community perhaps needs to be 'hidden from view' when developing and marketing service products for greater use of the net for consumer transactions.

Further, from the user perspective, the Internet experienced from a fixed broadband connection to a PC is a very different Internet to that experienced from a mobile device albeit with multimedia capability (camera etc) and colour screen and the two

evolution will develop in very different but complementary ways but requiring a different "head set" for service product designers.

7. References

Armstrong, M (2003) "Trust in the Internet: The key bottleneck", M. Armstrong, T. Barr, R. Coutts, P. Coutts, A. Knowles & S. Moore, Telecommunications Journal of Australia, Autumn 2003

Barr et al (2003), "Trust Comes in Many Guises: Australians and Internet Transactions", Barr, T., Knowles, A. and Moore, S, Communications Research Forum (CRF), Canberra, 1-2 October 2003

Cutler (2003) "Eye on the Future", by Terry Cutler, Telecommunications Journal of Australia, Volume 53, No 2, Winter 2003

Christensen (1997) "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail" by Clayton M Christensen, Harvard Business School Press 1997

Coutts (1998) "A User Methodology – Identifying Telecommunications Needs", by P.J. Coutts, Communications Research Forum (CRF), Canberra, September 24-25.

Coutts (2002) "BANKING ON THE MOVE - Characterising user bottlenecks for m-commerce uptake", by P.J. Coutts, Communications Research Forum (CRF), Canberra, October 2-3, 2002

Coutts (2003) "Beyond The Wireless Internet Hype - Re-engaging the User", by P.J. Coutts, K. Alport, R Coutts and D Morrell, Communications Research Forum (CRF), Canberra, October 2-3, 2002

Singh (1977) "Connecting Customers and Providers: A Focus on Electronic Money." Policy Research Paper no. 16, CIRCIT, Melbourne

8. Acknowledgements

The authors gratefully acknowledge the contributions of all the researchers in the University of Adelaide, Swinburne University of Technology and RMIT University who have contributed to this project over the 2 years.

The authors also gratefully acknowledge the funding for two year project by the Smart Internet Technology CRC (www.smartinternet.com.au).

The Adelaide team also acknowledge the partnership with McGregor Tan research in the provision of the facilitator and facilities for the focus groups and to Telstra for the loan of advanced mobile devices for the Stage 2 focus groups.