

An Approach to Predicting Customer Behaviour across Channels and across Cultures

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Abstract: The objective of Predicting Customer Behaviour across Channels and across Cultures is to develop a predictive model across existing and new customer channels which will allow the management of customer traffic, sales, and service fulfilment. The experimental research is being undertaken with users in UK, Japan and Malaysia. Grounded Theory is being used to generate and define concepts and their relationships. Factor analysis and multiple regression techniques are applied for statistical validation. The validated concepts, relationships and their values are then mapped onto a predictive systems dynamics model. Current results suggest two original contributions: the use of grounded theory to support the development and validation of a systems dynamics model; and the discovery of cultural concepts not found in the US/Euro centric literature.

1 Introduction.

Any improvement, even incremental, in the capability to predict customer behaviour is necessary for at least three reasons.

1. eCRM is in crisis: On-line channels are notoriously difficult to use – 67% people using on-line ordering don't complete the sale [1]; The introduction of new channels can produce huge unanticipated cross channel tidal waves of traffic particularly into call centres - 1000% increase in share dealing call centres [2]; Back end systems fail to deliver the goods - 25% failure to deliver during 1999 eChristmas [3].
2. There are two further potentially immense challenges: 3G – potentially introducing orders of magnitude more traffic as it's always on and always available; Peer-to-peer networking - in which customers will be communicating with other customers with no central point.
3. The 'worrying possibility': that western excitement about wireless internet services may be founded on several i-mode myths and in particular the Japanese environment and culture differences which may limit the global transportability of the i-mode success [4].

Accordingly, the research question I am studying is: What are the key variables which predict customer usage behaviour within and across customer channels from the physical to Internet to 3G?

The next sections describe the overall methodology, the two steps so far undertaken (Literature Review and Conceptual Framework validation), an example of how the model might be used, and next steps.

2 Methodology.

The experimental research is being undertaken with users in UK, Japan and Malaysia. A five-part methodology is taken:

1. A literature search and grounded theory are used to define concepts and their relationships.
2. This conceptual framework is then qualitatively validated against users and service experts.
3. Questionnaires are used to determine dependent variables (individual and relative importance) and independent variables (culture, age, sex, social economic group).
4. Experimentation using simulated services is then used to test the above including factor analysis and multiple regression techniques applied for statistical validation.
5. The validated concepts, relationships and their values are then mapped onto a predictive systems dynamics model.

3 Literature Review.

Because the research is addressing a future including 3G and peer to peer - for which theory and data does not yet exist, I take a 'What's Different?' approach: Callaghan [5] took existing IT literature both as a guide to research and also as a theoretical framework to then extrapolate to the then new area of Intranets and Extranets by asking 'What's Different?' I take the same approach to the literature review and analysis. The review examines a number of relevant areas to predicting customer behaviour. It embraces sources from pre-Internet days, current day Internet and also imode/3G. In doing so, it tries to tease out what is applicable across all channels and what appears to be truly different. As an example, I take existing theory on the physical world (Diffusion of Innovations) [6], SERVQUAL [7], the virtual world (Increasing Returns) [8] and physical/virtual world interplay (Dynamic Strategy) [9], in order to extrapolate up to and including the 3G world.

In addition, the review considers methodological issues. Due to the overlap, contradictions and newness/absence of data in the literature, the approach of 'grounded theory' [10] is chosen to develop concepts and relationships to drive a systems dynamics predictive model described below. The experimental process is to: 1 Generate concepts via a technique called open coding; 2 Put them together in a structure: axial coding; 3 Boil them down into a theory: selective coding, including the time factor and coding for process; 4 Look for data which confirms or contradicts the theory: theoretical sampling. Accordingly, the literature research was used to undertake items 1-3 and provide the conceptual framework as described in the next section. Then I used questionnaires, one-to-one interviews and focus groups for item 4. This latter activity is described in section 6.

4 Conceptual Framework.

The conceptual framework manifests itself in a predictive model. A systems dynamics approach is adopted using the iThink modelling tool [11]. The current model can be seen in figure 1.

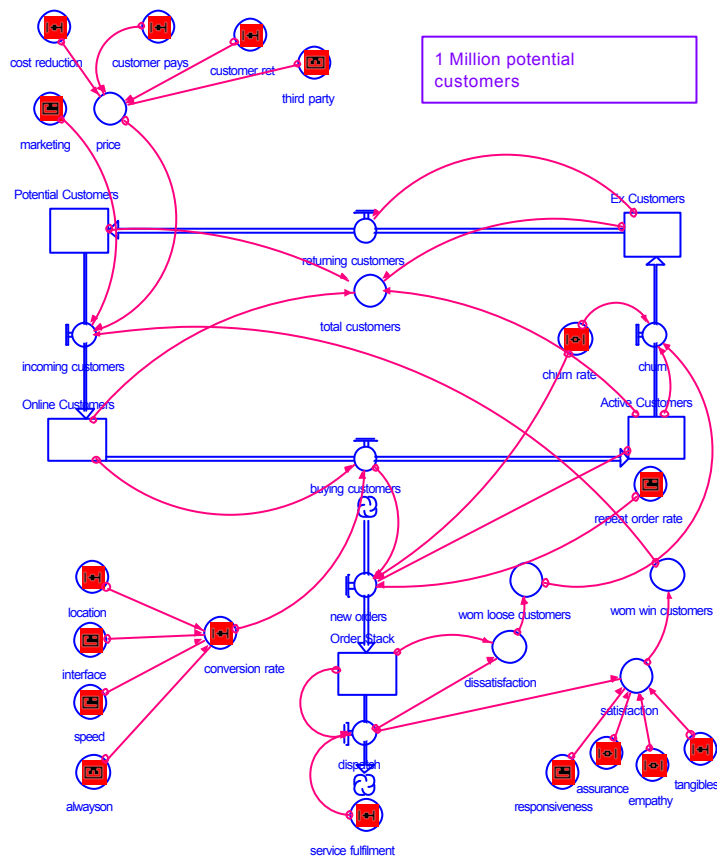


Figure 1: Systems Dynamics Predictive Model and Conceptual Framework

The flow from potential to online to active to ex customers can be seen in the top half of the model. Variables related to the conversion rate can be observed on the left hand side. Customer service variables based on SERVQUAL can be seen in the bottom right part of the model. 'Word of mouth' variables (WOM win customers) and (WOM loose customers) can be seen just above.

5 Qualitative Validation of the Conceptual Framework.

The objective of the validation is to determine whether the variables are appropriate to cover the range of users and channels.

The approach was to undertake in depth interviews/discussions and questionnaires with 24 users of different cultures, sex, age, social economic class and attitude towards technology.

In line with the grounded theory approach described in section 3 [10], the objective was to look for data which confirms or contradicts, and extends or limits the theory.

Results indeed suggested concept enhancements and new concepts.

Required concept enhancements included, for example:

- User friendly - means different things in different channels: change to 'ease of use'
- Customer service - users are not aware of or do not think of 'customer service' in certain channels
- Responsiveness - means different things in different channels and to different users - sometimes it has a 'human' element, sometimes a speed element
- Responsiveness, 'ease of use' and speed - are interdependent.

More importantly, new concepts or variants thereof were discovered which do not seem to appear in US/Euro centric literature: the concepts below do not appear for example in Brynjolfsson's work on consumer choice behavior, the same authors' comparison of Internet and conventional retailers [13], nor in Smith's wide ranging Understanding Digital Markets: Review and Assessment [14]. The new concepts were:

- Bargaining – this is very important to many Malaysians. It has two components: 'Fun' and 'Real Price' the price one might expect to pay after taking out the bargaining component.
- Trust & Security– in addition to security concerns around the Internet per se, there is a stated additional distrust of large financial organisation and expected dishonesty in shops.
- Availability (lack of) – Malaysians state that the major reason for Internet purchase is when the offering is not available elsewhere.
- Internet price – whereas low price may be a Western reason for internet purchase, the Malaysian perception is the reverse with components such as 'no leeway for bargaining', shipment, US dollar exchange and tax costs all contributing to a perceived high 'all in' price.

These findings will be incorporated into the next version of the model.

6. Exploitation & Delivery Example.

The evolving model together with algorithms and data obtained can be used to predict customer behaviour per se for a number of purposes: Management of customer traffic, sales, and service fulfilment (the original objective of the research); Market segmentation, business model and definition & prediction of new service (the Kuala Lumpur objective); Cultural requirements for revenue generation and churn reduction for cost savings (the Japanese objective)

As an example of how it might be used to analyse service fulfilment capability, the current working model can be run and scenarios compared and contrasted by using the slide bar user interface of the iThink tool. For example, different levels of marketing can be seen to affect order stack levels and ability (or not) to fulfil orders. Also, a multi stage run illustrates how order stack can be predicted and service fulfilment capability periodically increased to manage the stack.

7. Conclusions and Future Directions.

The literature review and conceptual framework, together with current work on its validation with users in UK, Japan and Malaysia suggest two original contributions:

- Use of grounded theory to support the development and validation of a systems dynamics model.
- Discovery of cultural concepts not found in the US/Euro centric literature.

Future work will extend to extensive questionnaire activity, experimentation and simulation including factor analysis and multiple regression techniques for statistical validation. The validated concepts, relationships and their values are then mapped onto the model. More fundamentally, other models will be examined and specific task and customer scenarios defined.

8. Acknowledgments.

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9 References.

- [1] E Fosbrook CRM Presentation June 2000
- [2] Barclays Stockbrokers Presentation March 2000
- [3] A Orr Reuters December 1999
- [4] Financial Times 6 December 2000
- [5] J Callaghan The Implementation and Operation of Intranets and Extranets October 1999
- [6] E Rogers and K Scott The Diffusion of Innovations Model and Outreach from the National Network of Libraries of Medicine to Native American Communities Draft Paper December 10 1997
- [7] J Mosley-Matchett The Effects of Internet-Based Interactive Marketing on Consumer Impressions of Service Quality University of Texas at Arlington 1996
- [8] A Brian Increasing Returns and the New World of Business Harvard Business Review July-August 1996
- [9] K Warren The Dynamics of Strategy Business Strategy Review Volume 10 Issue 3 1999
- [10] A Strauss & J Corbin Basics of Qualitative Research 2nd edition Sage Publications 1998
- [11] iThink mm High Performance Systems Incorporated 2001
- [12]. E Brynjolfsson and M Smith The Great Equalizer? Consumer Choice Behavior at Internet Shopbots July 2000
- [13] E Brynjolfsson & M Smith A Comparison of Internet and Conventional Retailers Management Science (volume 46 number 4) pages 563-585 April 2000
- [14] M Smith, J Bailey & E Brynjolfsson Understanding Digital Markets: Review and Assessment in Erik Brynjolfsson and Brian Kahin, eds, Understanding the Digital Economy MIT Press 1999