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Abstract

It has been said that there is only one opportunity to make a first impression. In the competitive world of e-commerce, attracting customers to a Web site is expensive; keeping them is a business imperative. The utility of the Web site from the user perspective is critical to success, and evidence suggests that an unrewarding initial experience will thwart further interaction with the site. Throughout the literature since the 1960's, a commonly cited factor pertaining to system success has been user involvement in the systems development process. Among other things this is likely to lead to increased user satisfaction and the perceived usefulness of the application.

The study examines e-commerce application developments at a number of organisations, and reports on the role of users in the development process. Despite the business need for remote, untrained users to quickly feel comfortable and satisfied in an e-commerce site encounter, it appears that organisations are making very little effort to engage users in any e-commerce site developmental activities.

Keywords

User participation, electronic commerce, systems development

INTRODUCTION

Since the 1960's it has been generally acknowledged that user participation in the Information Systems (IS) development process increases the likelihood of project success (Barki and Hartwick 1994; Foster and Franz 1999). Put another way, lack of communication between users and developers has been a common theme in the well-documented reasons for failures in IS implementations (Bussen and Myers, 1997). User involvement is likely to result in increased user satisfaction (Garceau et al. 1993), and the perceived usefulness of the application (Foster and Franz, 1999; Franz and Robey, 1986; McKeen et al., 1994). Foster and Franz (1999) emphasise the need for user involvement, most importantly in the early stages of development, concluding, "managers should actively seek user involvement in systems development activities" (p.345).

The portfolio of applications being developed today has changed with the emergence of the E-Commerce (EC) business paradigm. Organisations are capitalising on the potential of new technologies such as the Internet, Intranets and the World Wide Web to improve communications and transaction efficiency, reduce operation costs and increase market share. This paradigm shift in business has been supported by applications with a different focus. While organizations continue to implement IS for internal use and to integrate with known business partners, the focus of this paper is business-to-customer (B2C) applications that are available for universal use.

The literature to date regarding user involvement in IS development has not differentiated between applications designed for traditional environments or for B2C. In comparing the two domains. Fraternali (1999) states:

> "Applications for the Internet in such domains as electronic commerce, digital libraries and distance learning are characterized by an unprecedented mix of features that makes them radically different from previous applications of information technology" (p. 227).

However the underlying process for developing applications is addressed by Yourdon (2000), who questions whether e-business/Internet projects are really that different by suggesting "E-business projects face the same demands pressures and risks as any other kind of IT development project, but to a greater degree". This added pressure comes from not only squeezed timeframes for delivery, but also from the necessity to change accompanying business processes. He suggests also that "the e-business phenomenon is much more fundamental because it creates a much more intimate connection with customers, vendors and suppliers".

One feature of B2C systems that differentiates them from traditional or closed applications is the identity of the "user". Closed systems are developed for a clearly defined set of known users either in-house or business partners. The development may be undertaken in-house or by external parties, but either way, the user

community are clearly identifiable. They are often championing the project and possibly funding it from their budget. Likewise off-the-shelf packages allow organisations to see what they are getting before software purchase. Customisation of the package to meet the organisations needs can then precede implementation. Again the known, distinguishable in-house user community is able to be involved in decisions regarding the adoption and adaptation of the product.

In the global business environment of today, a B2C application is inviting the consideration of the world at large. Rather than serving a known user group, B2C sites may target the world at large. Potential users are diverse in all respects, ethnically, culturally as well as geographically. They are also diverse in their computing skills as noted by Fraternali (1999),

> "Universal access by individuals with limited or no skills in the use of computer applications introduces the need of new man-machine interfaces capable of capturing the customer's attention and facilitating access to information" (p.227).

The ability to have representative end-user participation in B2C IS development is radically different from obtaining user involvement in closed systems. The question is "are potential B2C end-users being included in the development process?"

This paper investigates the extent and relevance of user involvement in B2C IS developments. Project leaders from five organisations involved in substantial B2C developments were interviewed regarding methodologies used, and in particular the role of users throughout the development lifecycle. The results from these mini-cases are presented.

USERS AND USER INVOLVEMENT

The term "user" is open to ambiguity. Land and Hirschheim (1983) acknowledge the existence of different types of user: senior management who bear ultimate responsibility for the organisation's well-being and who may use outputs of IS developments; middle management who are responsible for the operational staff using the IS, and finally those staff who regularly interact with the system. From project conception, through the development lifecycle each of these users may contribute or participate in IS development activities. The term "user" is not generally defined specifically in the many studies published in literature, beyond the Ives and Olson (1984) definition of them as "representatives of the target user group" (p. 587).

User involvement has traditionally been referred to as participation in the system development process measured as a set of activities that users or their representatives have performed (Baroudi et al., 1986; Doll and Torkzadeh, 1989; Ives and Olsen, 1984). Barki and Hartwick (1994) proposed a clearer definition for user involvement, distinguishing it from user participation as in other disciplines. They define user participation as a "the assignments, activities and behaviours that users or their representatives perform during the systems development process" (p. 60). User involvement refers to the "subjective psychological state reflecting the importance and personal relevance that a user attaches to a given system" (p. 60). These definitions appear to have been generally accepted in the ensuing literature (Hunton and Beeler, 1997; McKeen and Guimaraes, 1997) as they are in this paper.

The literature has not found the identity of the users or their representatives to be a contentious point. Often all of the three user types above are domiciled in the same workplace and are identifiable to IS development project managers. Their involvement in for example, problem definition, specification of requirements, design and testing could be mandated within the organisation. So the users involved in IS projects are clearly identifiable to practitioners and to researchers.

Figure 1 synthesises the literature in relation to user involvement and participation in systems development. Whilst this framework may not adequately reflect the nature of EC development it does address the factors related to user involvement and participation, contingency factors and various aspects of system success that have been seen as significant.

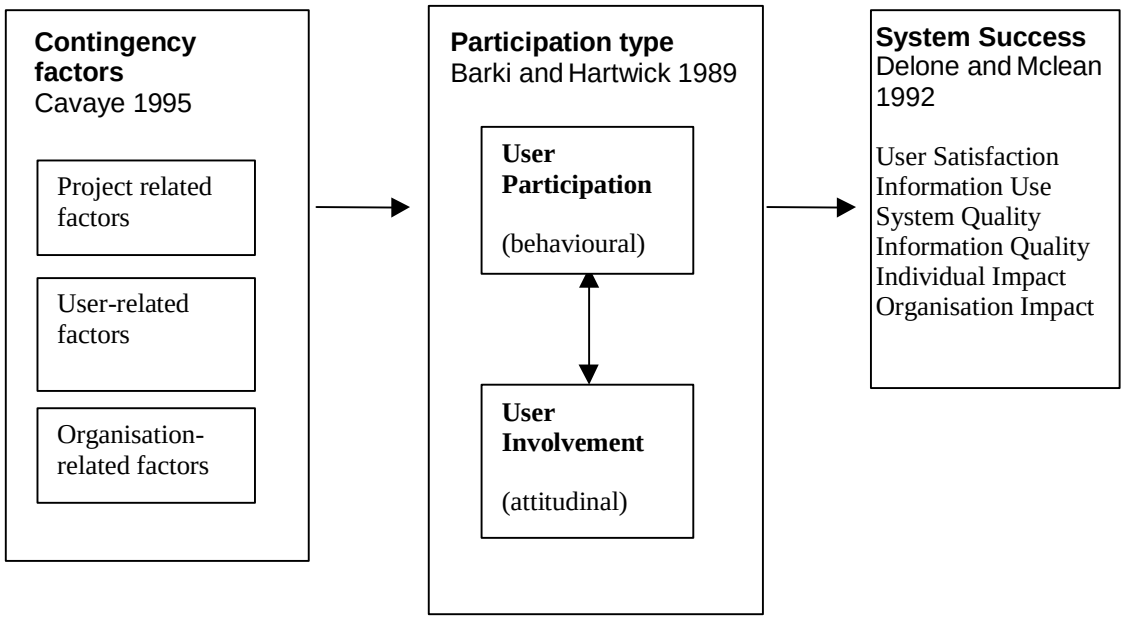

Figure 1: The Relationship Between User Participation and System Success

Identifying the user community in B2C systems development is more difficult than for closed systems. The three user types identified by Land and Hirschheim (1983) still exist. Senior management involvement in the conceptualisation of a system is particularly important given the structural business change that will need to accompany the introduction of EC. While middle management is not as prevalent in the workforce, this group covers expert users who will have essential input developing requirements and design. Organisations will also have operational staff interacting with the system. However another user type has emerged. B2C transactions involve remote customers who may not be known to the organisation. They are the ultimate end-users, but are beyond the accepted definition of users above. They are not staff and do not fall under the control structures of the organisation. Business success is based on their acceptance and usage of the system. However their participation cannot be mandated. Likewise their involvement or attitudinal disposition to the system. We will call this group of users "customer-users".

USER SATISFACTION

While there is no direct measure for the success of an Information System, (see DeLone and McLean, 1992), empirical researchers have commonly used user satisfaction as the dependent variable (Doll and Torkzadeh, 1990; Franz and Robey, 1986; McKeen and Guimaraes, 1997; Powers and Dickson, 1973). Prominent among the independent variables studied for their influence on this measure, are user involvement or participation in the system development process.

Although the efficacy of user involvement in information systems development leading to system success has been the subject of much research, it has not been studied in the context of B2C systems development. However, the concept of system success as measured by user satisfaction may be more relevant to B2C developments than to closed systems. Ensuring a system is successful from a user perspective is related to:

1) Meeting Requirements

For a system to be useful to users it should provide appropriate functionality. This may include providing relevant information, entertainment, downloads, or transaction capabilities.

2) Usability

There are many aspects of information systems design that impact on usability including: the design of the user interface, ease of navigation, online and offline help, system performance and error handling (Fisher 1999). With no compulsion to visit and interact with a site, an Internet user needs to feel comfortable with a site's usability – and quickly. If not they can and do take their trade to another site. Shopping cart abandonment rates of 20 to 60 percent per transaction reported by Schwarz (2001), are testament to dissatisfied customers.

It has been said that there is only one chance to make a first impression. In the Internet world it may be better to have no site than an unintuitive one that is unlikely to be revisited. Furthermore customer-users are not availed of

the training in application use that closed system users expect. User support is also not likely to be as readily available. So there is a need for EC developers to be particularly sensitive to usability issues.

RESEARCH METHODOLOGY

To determine the extent of user contribution to EC projects a series of mini-cases were used (Yin, 1994). Interviews were conducted with experienced managers of B2C development projects at five organisations in Perth, Western Australia. The organisations were chosen through a convenience sample of substantial EC developments recently or nearly completed. The aim of the case studies was to seek an understanding of the development practices used for non-trivial B2C projects with specific reference to customer-user participation. A range of open and closed questions were asked in relation to recent development projects undertaken, the methodologies used, and the role of the customer-user. The interviews lasted between 45 and 60 minutes each. The transcripts were analysed by the two authors to confirm the findings.

Before considering the extent of customer-user participation, the formality of the process used by project leaders was examined. For example they were asked,

- what methodology they use to guide the development process?
- whether it was prescriptive and structured, a loose framework or ad hoc?

It was considered that prescriptive methodologies would be more likely to stipulate the nature of external participation throughout the lifecycle. Some methodologies, for example Rapid Application Development (RAD), Joint Application Design (JAD), and lifecycle models such as the Spiral Model, prescribe user participation as a fundamental tenet.

CASE 1

This organisation is a major chartered accountant with a substantial IT Consultancy division. We spoke with a senior manager in that division who is currently involved in a web-based processing system for the customers of a State government authority.

Methodology

The organisation has an in-house methodology for software development. It was developed for non e-commerce applications, but "what we're finding at the end of the day is that we don't believe the software development lifecycle changes radically when you're developing e-business applications; you still have to go through the same stages; define requirements, acceptance testing, system testing etc." They consider that while many of the principles are the same, some of the technology such as application development tools, has changed. A key difference was considered to be the required timebox for system delivery. "The time frames are shorter for development and time to market; with a lot more pressure". Environmental analysis to try to understand and anticipate where site 'hits' would come from is considered important but often rushed in the pressure to meet deadlines.

Customer-user participation

This is seen as substantially greater challenge in the current development environment with the user community no longer distinct and accessible. "If you're going to use acceptance testing how are you going to effectively do it with such a large group? This is not something we have got on top of". Setting up user groups to get involved with the testing has been considered but not actioned. "You haven't got a clue just who is going to use your site". Other issues also introduce added complexity. "When you're talking about multi-jurisdiction, you have tax and legal issues which really should be built into your design. Everyone's grappling with this as you have to consider your liability".

CASE 2

The organisation is a Software House, with the project leader we spoke to currently working on refinements to an implemented web-based share trading system.

Methodology

EC projects are considered to navigate "basically the same phases as for non e-commerce projects". The methodology employed is considered to be a loose framework rather than prescriptive so there are going to be different approaches to projects depending on the project leadership. There has been a change in project team make-up from traditional systems, with a Creative Director position being added, with responsibility for the

graphical look and feel. The projects are very time driven. The organisation considers one lapsed year to be equal to two Internet years. In other words, to keep the product from looking dated, it needs a revamp every six months "We don't have versions as such, rather constant redevelopment, constant work in progress". It is believed that continual change is necessary to keep customers happy. "It's hard enough to get the client in the first place so you need to keep them".

Customer-user participation

There was been no formal contact with potential users throughout the development. Rather it was a case of finding similar successful sites and using their best features. "Initially we didn't really consult with the eventual end-users. It was more a case of seeing what the equivalent sites in the United States were doing. They were perceived to be the leaders in the field so we looked at what they did and took the good bits. If the site's successful, its assumed the users like it and people are happy with the navigation, and the way the data is presented, so why do it differently? You just put your look and feel on it".

CASE 3

The organisation is a Financial Services House. We spoke with the project manager in charge of a project developing a secure Extranet for Financial brokers.

Methodology

The organisation does not consider itself process-driven, more outcome focused. "We have identified only the "crucial" documents required but undergo most steps of the standard project development life cycle". They rely more on prototyping, with less paperwork and a security ("how else could we expect anyone to use it") and usability focus. This approach is driven by a need for speed to market. "Technology makes prototyping easier and users are external. It is sometimes harder to gauge customer requirements. Scope creep is almost always a necessity as you are not necessarily dealing with expert users as you would be for legacy or back-end systems – you must listen to user feedback as there is no scope for manual workarounds!

Customer-user participation

There is less user involvement than with traditional systems development for in-house systems. Generally this is elicited "just at the requirements refining stage". The importance of having some mechanism for users to feed-back their issues / requirements was stressed. "This can be difficult when they are external so it is essential to very pro-actively manage it. However the end users of the financial products developed are a defined group we know a lot about, and who can only access the system with a username/password. End users are formally involved in the evaluation and potential enhancement of an implemented system, only if they are part of a pilot rollout. "Otherwise if they are heard from, it is just their being pro-active".

CASE 4

The organisation is a large wholesaler/retailer. We interviewed the project leader of a web-based online ordering system.

Methodology

It appears that each project leader follows the methodology of their choice. The interviewee prefers a loose framework. "I've tried to follow traditional SDLC processes, but, as we all know it's a completely different kettle of fish". Most projects at the organisation follow a sequential waterfall lifecycle. However in this case "I've found that is too rigid and doesn't work for web development so I've developed a hybrid method using the organisation's established project management guidelines. Basically it involves a lot of prototyping. When developing for the web you can't be rigid, you've got to be flexible and able to take on a new direction or approach in a new manner, rather than staying on one single path and being dogmatic about it".

Customer-user participation

The current project has been developer-driven. "We haven't included the customer perspective in the design. What tends to happen, as far as the website goes, it's decided what we should provide the customers. There's no insight into the customer or consumer point of view. We haven't gone out and done a survey or anything. We just decide what we want to give them, or provide them".

Some limited acceptance testing by two small to medium size customers had been planned before the site went live. "The problem we had was the sales manager organizing the customers to test it, didn't actually tell them

they were going to be testing it. He just said someone from IS would be coming out. They're all fairly major customers and the website was targeted more towards the smaller end of the market". The system was not well received by the potential users. There was ongoing conflict between the information's systems department and marketing department over control of the website, or control of the development "and I really feel the project was a casualty in the interdepartmental rivalry".

CASE 5

The organisation is a substantial software house. We spoke with the Project Leader for the development of a Governmental Authority EC Portal.

Methodology

The methodology used for web-based projects is described as "a basic process, as these projects tend to be very dynamic". This can be more or less, depending on the project timeframe. "For projects with a fast turnaround required we use more senior engineers and let the project manager decide the level of formality required". Throughout the organisation project managers make a decision and use what is appropriate for the project. "A very prescriptive one will tie you down and at the end of the day you wouldn't get anything out it". However it is interesting to note that for non e-commerce projects "or projects where we don't have to move too quickly we have a much more rigorous process".

Customer-user participation

There are a number of user types for this system from other Government departments to the general public. Getting appropriate people from all the diverse groups is not seen to be practical. "It is a black art to get the appropriate people". There appears to be a considerable amount of dialogue with the Governmental people especially early in the project. These people represent one group of users of the system that are driving the project and want some control. However there is another group of potential users, the general public who will be able to transact their business with this Authority over the Web instead of through the mail or going to an office. "The business tries to make a first guess at what the public end user may want. We don't get the public involved at all until we have something for them to try out. Then we may get one of the team's mum or brother to have a play with it and see what they think".

DISCUSSION

A summary of the mini cases with particular respect to customer-user participation is shown in table 1. The extent of customer-user participation is subjectively defined on the following scale: nil, negligible, moderate, significant. The same scale has been user for developer perception of customer-user participation on system success.

The mini-cases show that overall there was a very low level of customer-user participation in the EC applications. Because no customer-users were interviewed where there was some participation, it is impossible to assess their involvement, (or their psychological feelings or attitude) to the system. We suggest that customer user involvement (psychological) will be generally low with B2C applications and is perhaps much less relevant than in the traditional IS research models of user participation and involvement.

The generally accepted traditional view that some user participation is going to impact user satisfaction is not seen to be particularly relevant to EC developers. End-user input to design and acceptance testing has been moved outside the development lifecycle to post-implementation. In other words it takes the form of customer feedback after the system has been implemented. This opportunity for customer feedback would not then impinge on the tight timeframe for development.

Overall, developers of the projects, thought that lack of customer-user involvement and participation had not adversely impacted on system. It seems possible that in B2C IS development, project managers do not generally consider end-user involvement is relevant. This is despite the fact that these users are more mobile. If dissatisfied, they can exit the site at any time, and not return.

The results of the study would seem to imply that many of the lessons learnt from developing information systems seem to have been disregarded in the EC world. Possible explanations from the mini-cases for not involving users more in the EC development are:

- EC applications are perceived as being so different to IS applications that the 'old' rules and methods are thought not to apply;

- The time pressures related to EC development have led to cutting corners in relation to user participation and involvement;
- The nature of customer-users who are external to the organisation presents a problem for developers. They may not be clear on who and where potential users are. Methods and techniques for user participation are not established for dealing with this;
- Customer-user participation and involvement is not seen as being useful or important in EC applications development.

	Case 1	Case 2	Case 3	Case 4	Case 5
Developer/ Integrator	IT Consultancy	Software House	Internal IT	Internal IT	Software House
Client Organisation	Educational Institution	Share Broker	Financial Institution	Wholesaler	Government Department
Type of project	Educational enrolment	Share trading system	Finance projects	On-line ordering	Government Portal
Customer-User participation	nil	nil	moderate	nil	negligible
Developer perception of customer-user participation on system success	negligible	nil	moderate	moderate	negligible
Main constraints	Organisational - time User - too difficult	Organisational - time	Organisational - resources	Project -methodology Organisational -politics	User - too difficult

Table 1: A Comparison of the Results from the Mini-Cases

CONCLUSIONS

Although EC developments have features that are different from traditional IS, the two have much in common. Eric Singleton, director of Electronic Business at Raytheon Co. in Lexington, Mass. has suggested that "people claim they're flying by the seat of the pants and really being creative, saying this a whole different world and we have to make it up as we go along. But that's the oldest argument in the world, and it's been proven wrong time and time again". If user participation and involvement are accepted inputs to traditional IS success does it follow that because customer-users are less easily identifiable, that their influence is less important?

This research is of an exploratory nature and not generalisable. The five projects are substantial but may not be representative of the development population. However the findings of the mini-cases have motivated a further more comprehensive study that is now progressing.

Myers et al (1996) state that "users expect highly efficient and easy-to-learn interfaces and developers now realize the crucial role the interface plays" (p. 794). We question whether developers have maintained this realisation in the EC world with less tangible customer-users from whom to seek input.

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