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Intranet portals: Marketing and managing individuals' acceptance and use

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ABSTRACT

With increasing pressure on businesses to digitalize and integrate their internal communications, intranet portals are becoming popular as knowledge banks that distribute tailored information throughout organizations. However, user acceptance of intranet portals is often an issue that could lead to failure of core business functions. This study provides increased understanding of the uptake of intranet portals by developing and testing an intranet portal usage (IPU) model containing antecedents to user acceptance of a recently introduced intranet portal. SEM was used to test the relationships between prior experience, Internet self-efficacy, perceived usefulness, perceived ease of use, intention to use and usage. Results from a survey of university students indicate that internal marketing communications focused on portal experience and functionality provides the greatest value to the acceptance and use of intranet portals within organizations, while Internet self-efficacy leveraged through portal experience provides a complex relationship to perceived usefulness. Ongoing collaboration between marketing and IT departments benefits the perceived usefulness of portals as users gain familiarity

1. Introduction

Intranet portals are at the forward edge of increasingly pervasive information communication technology (ICT). Organizations are continually faced with the challenges and promised rewards of technology, however implementation issues are common. Economic realities, business re-alignment, and increasing competition are providing pressure for departments that were once autonomous business units to become progressively more collaborative. Of particular note, marketing's increasing use of technology in its activities has led to a dependence on ICT professionals and the systems they implement (Ling and Yen, 2001; Pires and Aisbett, 2003). As organizations implement fully integrated information systems such as intranet portals, employees and stakeholders are expected to quickly and readily accept and adopt ICT.

Intranet portals provide organizations and institutions with a single electronic access point to a large and diverse array of internal web-based information for authorized end users (Schubert and Hausler, 2001). Implementation of intranet portals allows for shared information workspaces that extend and transmit organizational knowledge (Li and Wood, 2005). However, Kakumanu and Mezzacca (2005) noted that issues of design consistency and a lack of extensive research has hampered the acceptance and use of intranet portals. Consistency issues relate to poor conversion of raw information and data into accessible systems that match the practices and navigation needs of end users (Detlor, 2000). Despite the best efforts of information technology (IT) departments, the user implementation stage of intranet portals remains the most detrimental stumbling block (Damsgaard and Scheepers, 2000).

Ironically, the implementation of intranet portals uncover and highlight issues such as employee IT sabotage and espionage (Band et al., 2006), and what some authors define as a digital divide where an individual's use of technology is hindered by their lack of confidence, competence and prior knowledge (Chinn and Fairlie, 2007; Henning and Van Der Westhuizen, 2004). Poorly implemented intranet portals, and poor subsequent management, have been found to limit dissemination of organizational knowledge, create misinformed or disenchanted employees, inhibit internal and external communication and permit ineffectual customer relationships (Agarwal and Prasad, 1997; Butler, 2003; Stenmark, 2003).

This study aims to increase understanding of the problems and acceptance of intranet portals in organizations from a marketing perspective by extending the technology acceptance model (TAM) to include two external constructs, prior experience and Internet self-efficacy (Davis, 1989).

2. Review of the literature

Pickett and Hamre (2002, p. 39) describe an intranet portal as a dynamic and personalized "gateway to network-accessible

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resources" that belongs exclusively to a organization. Also known as corporate portals, enterprise portals, and employees portals, intranet portals evolved from web search engines to customizable, synchronized and real-time repositories of organization's intellectual capital (Benbya et al., 2004). Intranet portals are generally accessed via a web interface (World Wide Web (WWW)) and allow users to customize the information feeds they receive, as well as the location and visual appearance of this information on a browser page. Advanced intranet portals enable collaboration between users in multiple interactive ways that streamline work efficiencies (Detlor, 2000).

Dias (2001), in an extensive review of the literature, identifies several positive characteristics of intranet portals including; enhanced information life cycle management, greater pin-pointing of organization experts in particular fields, ability to better meet individual user's information needs, and the fostering of information exchange between employees, suppliers, resellers and customers. Intranet portals are also intrinsically linked to the development of organization knowledge management strategies (Cloete and Snyman, 2003). In addition, the reduction of information overload and the increase in shared organizational knowledge are among the most anticipated benefits of intranet portal implementation (Daniel and Ward, 2005).

However, marketing researchers have yet to address the relationship between intranet portals and organizational impact, often deferring responsibilities in this area to IT professionals who lack marketing and customer focused experience (Clarke and Flaherty, 2003). While several marketing studies address areas such as portal service quality (Bauer et al., 2005; Gounaris and Dimitriadis, 2003), marketing implications for portal acceptance within organizations need development.

The emerging role of intranet portals as the communication centre of many organizations intensifies the importance of research surrounding the use and management of portals (Jacko et al., 2002). Inefficiencies and poor return on investment in intranet portal technology is frequently attributed to a critical mass of employees who are unwilling to accept the new information system(s) (Benbya et al., 2004), "Understanding what motivates people to apply their expertise is key to avoiding the trap of building technology marvels that no one uses."

The technology acceptance model (TAM) is an empirically validated measure of information technology acceptance (Davis et al., 1989) and is considered a "robust, powerful and parsimonious model for predicting user acceptance" (Gentry and Calantone, 2002; Pagani, 2004; Venkatesh, 1999; Venkatesh and Davis, 2000, p. 187). However, while a growing number of studies use TAM to investigate the acceptance of the WWW (Agarwal and Prasad, 1997; Selim, 2003), marketing discussion of acceptance in the context of alternative Internet based applications and their impact on internal organizational communication is absent.

Prior experience is an adequate predictor of IT usage for both experienced and inexperienced users, with inexperienced users placing a different emphasis on the antecedents of intention and usage (Dishaw and Strong, 1999; Jackson et al., 1997; Taylor and Todd, 1995). However, Brown and Muchira (2004) find that victims of accidental or deliberate personal data tampering were less likely to purchase products online, suggesting that prior experience does not necessarily have a positive effect on technology use. Bettman and Park (1980) find individuals who possess low levels of prior experience with a task are more likely to find the task difficult and tend to give up in favour of an easier resolution. The authors explain this lack of motivation as a result of little prior knowledge and lack of ability to interpret data. However, Bettman and Park note that individuals with high levels of prior experience possess the necessary ability and knowledge, but are de-motivated to process information or complete tasks because they rely on rote solutions. The authors conclude that individuals with moderate prior experience are most likely to complete a task given their balanced level of ability, knowledge and motivation.

Prior experience alone is unlikely to adequately explain user's perceptions of their ability and knowledge (Davis et al., 1989; Venkatesh, 2000). Internet self-efficacy, which taps the cognitive aspect of ability and knowledge, appears to complement prior experience in helping to explain user behaviour. The prior experience used in this study is considered as the "knowledge accumulated from past experiences" with an intranet portal (Ramayah, 2005, p. 11).

The term self-efficacy originates from the study of psychology and concerns the "judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122). Studies indicate that people who hold their abilities with computers in low esteem are less likely to use computers and vice versa (Chau, 2001; Igbaria and IIvari, 1995; Igbaria et al., 1997; Olivier and Shapiro, 1993; Venkatesh, 2000; Venkatesh and Davis, 1996; Yi and Hwang, 2003).

Computer self-efficacy is conceptualized in this study as a general measure of Internet self-efficacy: "the self-perception held by individuals of their ability to interact with the Internet" (Torkzadeh and Van Dyke, 2001, p. 275). Tsai and Tsai (2003) find that students with high Internet self-efficacy have greater online information searching strategies and are more effective learners in web-based environments, indicating that Internet self-efficacy is a significant predictor of technology use in conjunction with the TAM model. Roca et al. (2006) investigate e-learning continuation and find Internet self-efficacy to be a significant predictor of perceived ease of use, where intention is increased by developing user's beliefs of how the technology under investigation can improve performance and effectiveness.

2.1. Intranet portals, prior experience, Internet self-efficacy & TAM

The use of prior experience and Internet self-efficacy as external variables to TAM is well documented (Fenech, 1998; Lederer et al., 1998, 2000; Ramayah et al., 2005; Selim, 2003). Chang (2004) finds prior experience and age to be significant predictors of general Internet use, but non-significant regarding the use of intranet portals. Horton et al. (2001) successfully demonstrate the ability for TAM to detect user acceptance of intranet. When measuring usage of intranet portals the authors note that actual usage data, when available, provides superior results to self-reported usage. They suggest that future investigations should consider testing the validity of TAM in different intranet contexts.

Masrek et al. (2008) find prior experience and Internet self-efficacy are significant contributing factors to decision support, knowledge sharing and different modes of organizational communication in the context of corporate intranets. While these authors suggests that intranet portals aid the flow of information between departments such as marketing and R&D, other marketing communication using intranet portals, such as the flow of information between marketing and internal or external clients, remain uninvestigated (Egan, 2007).

Marketing communication is used to initiate and build relationships; mediate ideas, thoughts and feelings, transfer information, solve problems and simply connect people (Bordia, 1997; Rix et al., 2001). Communications research encompasses the transfer of meaning, as well as the transfer of data, and the use of channels of communication (e.g., technology mediated communication (TMC)) (Eunson, 2005; Rogers and Albritton, 1995). Communication effectiveness is defined as the sharing of meaningful and timely information, with timeliness impacting perceived communication quality, satisfaction and trust (Moorman et al., 1993; Sharma and Patterson, 1999).

Communication openness is used to reflect the formal and informal sharing of plans, goals, expectations, motives and evaluation criteria (Anderson and Weitz, 1989; Anderson and Narus, 1984; Smith and Barclay, 1997). Some view communications as the glue which hold relationships together (Mohr and Nevin, 1990), and that relationships are impossible without good communication (Duncan and Moriarty, 1998). Others simply conclude that "communication is the exchange of information between supplier and customer" requiring an open dialog to maintain the relationship and trust (Selnes, 1998, p. 310).

Effective communication is reliant on both sender and receiver being familiar with a particular communication medium; specifically its codes and conventions (Belch and Belch, 2007). Consequently, marketing communications and relationship building activities in organizations that implement intranet portals are implicitly linked and largely dependent on employee and key stakeholder acceptance and adoption of intranet portal technology as a communication medium (Clarke and Flaherty, 2003).

2.2. Summary and research gaps

The literature provides support for application of the TAM model to the study of intranet portals in conjunction with the external variables of prior experience and Internet self-efficacy. A shortage of marketing based studies focused on intranet applications presents a significant research opportunity to expand the current marketing knowledge base. Marketing insight into the relationship between technology deployment and acceptance within organizations is an important area of investigation, given the impact of intranet portals and information technologies on marketing communication efforts and relationship building. The current study aims to clarify user acceptance of an intranet portal and develop discussion on ways that marketing efforts can be focused to manage the success and use of intranet portals.

2.3. Model development and hypotheses

To better understand the relationship between intranet portal acceptance and use, an intranet portal usage (IPU) model is developed and shown in Fig. 1. Firstly, prior experience is included as one of two external variables and relates to an individual's previous exposure and experience with intranet portals. Prior experience negatively influences perceived task difficulty and positively impacts intention to revisit a service (Bettman and Park, 1980; Rust et al., 1999). Prior experience has also been found to positively influence perceived usefulness and perceived ease of use (Agarwal and Prasad, 1999; Hackbarth et al., 2003; Stoel and Lee, 2003; Taylor and Todd, 1995).

A person with little prior experience of intranet portals may be sufficiently inexperienced to elicit surprise and bewilderment upon discovering applications of the technology. At the other end of this continuum, a person with extensive prior experience is more likely to be a proficient user of intranet portals with sufficient experience to be aware of advanced features such as personalization (Pickett and Hamre, 2002). Consequently a person with high levels of prior experience with an intranet portal will perceive the portal to be useful and easy to use.

H_1: Prior experience positively influences the perceived usefulness of an intranet portal.

H_2: Prior experience positively influences the perceived ease of use of an intranet portal.

Internet self-efficacy evaluates performance expectancy and a user's motivation to use an online system (Igbaria and Ilvari, 1995). Venkatesh (2000) notes that self-efficacy is a measure of internal control, meaning that different users adjust and measure their abilities on a subjective dimension. Given the relative newness and technical features of intranet portals, the relationship between Internet self-efficacy and perceived usefulness is most likely to reflect feelings of inadequacy or discomfort which may lead to de-motivated users who cannot see the benefits in using the technology.

H_3: Internet self-efficacy positively influences the perceived usefulness of an intranet portal.

Similarly, a user's feelings of unmanageable complexity and loss of control are likely to be reflected in negative reactions about their ability to use intranet portals. This can be represented by a relationship between Internet self-efficacy and the perceived ease of use of an intranet portal (Lee et al., 2003; Yi and Hwang, 2003). Conversely, those users with high Internet self-efficacy (greater confidence in their abilities) are more likely to find intranet portals easy to use.

H_4: Internet self-efficacy positively influences the perceived ease of use of an intranet portal.

Perceived ease of use of a technology increases the perceived usefulness of that technology (Adams et al., 1992; Lin and Lu, 2000; Selim, 2003). Conceptually, the easier a user finds an intranet portal to use the more able they will be to utilize the portal features and find the portal useful. Similarly, an increase in the perceived usefulness of a technology leads to greater behavioural intention to use that technology (Venkatesh, 2000; Venkatesh and Davis, 2000). Thus, the more useful a user finds an intranet portal the more likely they are to want to use the portal in the future.

H_5: Perceived ease of use positively influences the perceived usefulness of an intranet portal.

H_6: Perceived usefulness positively influences the behavioural intention to use an intranet portal.

Perceptions of technology ease of use may also create variation in intentions to use a technology. Empirical support for the direct and indirect relationship between perceived ease of use and behavioural intentions to use a technology system is well established (Jackson et al., 1997; Venkatesh, 1999). Conceptually the more a user finds an intranet portal easy to use, the greater the inclination to use the portal in future. The indirect relationship that occurs via the mediating variable of perceived usefulness is also proposed as a significant contributor to intentions to use an intranet portal (Venkatesh and Davis, 2000).

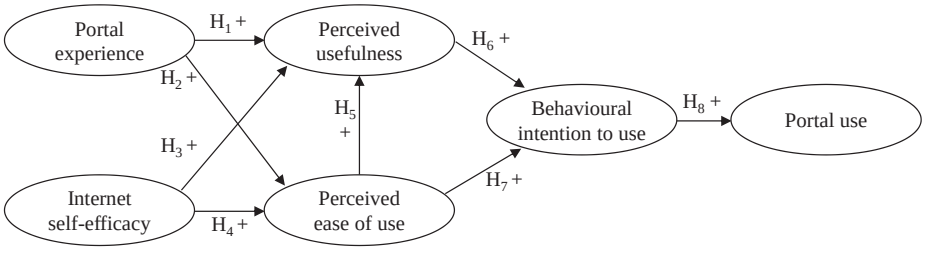


Fig. 1. Intranet portal usage (IPU) model and hypotheses.

H_7: Perceived ease of use positively influences behavioural intention to use an intranet portal.

The final relationship in the model is between a user's behavioural intention to use a technology and their actual use of that technology. Conceptually this relationship tests the consistency between user's intentions and their subsequent actions (Davis et al., 1989). In the case of intranet portal actual use, scenarios are likely to differ greatly due to the personalized nature of user's portal pages (Pickett and Hamre, 2002). However the logging on process remains standardized for all users and is used in this study as an indication of system usage. Several authors have found that if a user states they intend to use a technology then they are in fact significantly more likely to actually use the technology (Fenech, 1998; Lee et al., 2003; Moon and Kim, 2001).

H_8: Behavioural intention to use an intranet portal positively influences intranet portal use.

2.4. Research method

A cross-sectional field study using an online questionnaire was conducted to test the conceptual relationships in the IPU model. The focus of the study was an intranet portal (MyVictoria) introduced to a New Zealand University in 2007. The portal had been available to staff and students of the University for approximately four months prior to this study taking place. The online questionnaire was designed using open source survey software (NSurvey) and hosted on a secure server (Zumbrunn, 2005).

Results of the pre-test conducted with 163 undergraduate students showed strong reliability for the measures of Internet self-efficacy, perceived usefulness, perceived ease of use and behavioural intentions in the context of intranet portals (Cronbach's alpha = 0.86, 0.97, 0.94, 0.94, respectively). As a result of the pre-test existing prior experience scales, adapted from Hackbarth et al. (2003) and Stoel and Lee (2003), showed low correlation with intranet portal acceptance. Therefore three items were developed in the context of intranet portals (see Appendix A). A fourth item, adapted from a study by Dishaw and Strong (1999), was added to the prior experience scale, asking participants to rate their experience with intranet portals.

Moon and Kim's (2001) two item measure of system use was also adapted and a third item added that asked subjects "*on average, how long do you spend logged on or using MyVictoria*?" This item addressed the issue that while some technologies are used directly, the case of intranet portals carries a certain amount of indirect use, which is not accounted for by traditional measures of technology use. Indirect use of an intranet portal occurs when a user logs into the system in order to access another part of the intranet. Not only are intranet portals a hub of information, Jarvis (2004) suggests they can also act as information protection systems by requiring a user to verify identification checks. This is the case with the MyVictoria intranet portal.

Following the pre-test the online questionnaire was made available to staff and students in the Commerce and Humanities faculties of the University for a total of three weeks. (See Appendix A for the complete questionnaire.) Staff received an invitation e-mail explaining the research and its importance. Reminder e-mails were sent to all staff one week later. Student participation was solicited through a short advertisement on course web pages. A prize draw incentive was available to both staff and students to encourage participation.

Exploratory factor analysis (EFA), using SPSS 16.0, was conducted on the prior experience and intranet portal use constructs. AMOS 6 was used for confirmatory factor analysis (CFA) on the remaining four constructs to determine convergent and discriminant validity (Cavana et al., 2001; Hair et al., 1995; Kline, 2005). The complete IPU model was then tested as a structural equation model (SEM) using AMOS 6 (Byrne, 2001).

3. Results

A total of 275 responses were received, 123 staff represented an 18.7% response rate, while 152 student responses represented a response rate of 7.6%. The data collected exhibited a normal distribution with regards to skewness and kurtosis (Kline, 2005). The demographic data is summarized in Table 1. Results contained a high level of staff participation and included a higher percentage of female respondents. Association time with the University was evenly spread and a significantly greater proportion of respondents were members of the Commerce and Administration faculty.

3.1. Measurement model

Intranet portal use demonstrated acceptable convergent and discriminant validity. One item, "*my experience with intranet portals is very extensive*" (EXP4), measuring prior experience did not meet acceptable communality (0.38) and was deleted; see Appendix B. The resulting measure of prior experience exhibited acceptable convergent and discriminant validity. To eliminate multicollinearity two items were deleted from the model PU2 and INT2 based on their high VIF (>10) and low path regression weights, see Appendix C (Kleinbaum et al., 2008).

The encryption/decryption factor, encoding and decoding email, was less important in the context of intranet portals (NFI = 0.82, CFI = 0.83, RMSEA = 0.19) and was therefore deleted (Byrne, 2001). The browsing factor also presented poor measurement results and was deleted.

Results of the revised Internet self-efficacy construct showed improved validity and model fit to an acceptable level (Browne and Cudeck, 1993). Internet self-efficacy, perceived usefulness, perceived ease of use, and behavioural intention to use CFA results indicate acceptable goodness of fit measures, RMSEA <0.10, NFI >0.95, and CFI >0.90 (Browne and Cudeck, 1993; Byrne, 2001). All six constructs in the IPU model show acceptable convergent validity (loadings >.50) and internal consistency, with composite reliability values ranging from 0.82 to 0.94 (Nunnally, 1967), see Appendix D. Discriminant validity was demonstrated by comparing the square root of the average variance extracted (AVE) with the corresponding correlations using the AVE method suggested by Fornell and Larcker (1981). The results in Table 2 indicate acceptable discriminant validity for each construct in this study.

The final overall measurement model fit indices achieved acceptable levels, RMSEA = .057, CFI = .96, NFI = .92 and the structural model was used to test the research hypotheses.

Table 1
Demographic profile of study sample.

	Frequency	Percentage
Association type: Student	152	55.3
Staff	123	44.7
Total	275	100.0
Gender: Male	108	39.3
Female	167	60.7
Total	275	100.0
Association time: 1st year	47	17.1
2nd year	59	21.5
3rd year	41	14.9
4th year	31	11.3
4 + years	97	35.3
Total	275	100.0
Faculty: Commerce & administration	166	60.4
Humanities	109	39.6
Total	275	100.0

3.2. IPU model

The original IPU structural model did not meet acceptable goodness of fit criteria (RMSEA = .070, CFI = .94, NFI = .89, CMIN/DF = 1.89) and had a two non-significant path coefficients with respect to the research hypotheses. To analyse potential improvements of model fit to the collected data, the IPU model was re-specified using Anderson and Gerbing's (1988) iterative process guidelines. Fig. 2 shows the re-specified IPU model including path coefficients and the significant and non-significant hypotheses. Modification indices (MI's) were used to re-specify the model which resulted in strong support for a relationship between prior experience and Internet self-efficacy, consistent with findings by Eastin and LaRose (2000). Deletion of non-significant paths resulted in the removal of the path between Internet self-efficacy and perceived ease of use ($\beta = .05$, $p = .404$), contrary to the results of other studies (Chung and Nam, 2007; Hsu and Chiu, 2004; Monsuwe et al., 2004). The path between perceived ease of use and intention to use ($\beta = .09$, $p = .149$) was also removed which is consistent with previous studies (Davis, 1989; Lin and Lu, 2000; Selim, 2003).

The re-specified IPU model showed improved goodness of fit measures; RMSEA = .059, CFI = .96, NFI = .91, CMIN/DF = 1.95 and is considered an acceptable and adequate measure of model fit (Browne and Cudeck, 1993).

Hypotheses one (H_1) and two (H_2) were significant ($p < 0.001$), confirming the relationship between prior experience and perceived usefulness, and prior experience and perceived ease of use. Hypothesis three (H_3) was found to be significant at the $p < 0.05$ level but negative, indicating that Internet self-efficacy negatively influences perceived usefulness. This result indicates that those users reporting high Internet self-efficacy do not perceive portals as useful as those users with low Internet self-efficacy. This finding is mitigated by the significant positive indirect effect of Internet self-efficacy on perceived usefulness through portal experience, ($\beta = .18$, $p = .01$).

Hypothesis four (H_4) was non-significant ($p > 0.05$) indicating that a participant's self-efficacy did not influence their perceptions of an intranet portal being easy to use. However there is a significant indirect effect of Internet self-efficacy on perceived ease of use working through prior experience ($\beta = .17$, $p = .01$). The two significant indirect effects of Internet self-efficacy indicate that Internet self-efficacy positively manifests itself through portal experience. One interpretation of these results is that users with high Internet self-efficacy (e.g., considerable Internet expertise) may consider portals as hindering their ability to access information. The lack of a significant direct effect may be explained by variance in the participant's subjective interpretations of the intranet portal implementation and interface usability and should be investigated further.

The findings for hypothesis five (H_5) were significant ($p < 0.001$) indicating that subjects perceived ease of use of an intranet portal is positively related to their perception of its usefulness. Hypothesis six (H_6) was also significant at the $p < 0.001$ level and confirms that users perceived usefulness of an intranet portal is positively associated with their behavioural intention to use the portal.

The relationship between perceived ease of use and behavioural intention to use an intranet portal (H_7) was non-significant ($p > 0.05$). This result provides support for Szajna (1996) who identified perceived usefulness as a mediating variable that indirectly accounted for effect of ease of use on intentions to use. Venkatesh and Davis (1996) also report ease of use and intentions to be a significant relationship, but state that greater amounts of variance are explained through the indirect relationship formed by perceived usefulness.

The findings for hypothesis eight (H_8) are significant ($p < 0.001$) and suggests that subjects behavioural intention to use an intranet portal is significantly and positively associated with their actual use of the portal. Further analysis of indirect and total effects in the IPU model resulted in a significant relationship between a portal experience and Internet self-efficacy ($\beta = .31$, $p = .001$). This relationship indicates that Internet self-efficacy, a reflection of an individual's perceptions of their ability, positively influences portal experience (Bandura, 1982).

4. Discussion

Several practical implications arise from these results with regards to the management of intranet portals, including the impact of marketing activities and communications to increase the acceptance and use of intranet portals.

Positive framing of individual's prior experience significantly influences perceptions of an intranet portal being useful and easy to use. From a communications perspective users have a greater appreciation for usefulness and ease of use if they have prerequisite knowledge and experience of the intranet portal medium prior to system use. For example, the ability to comprehend information about intranet portal usefulness and ease of use requires knowledge of the codes, conventions and terminology associated with the specific technology (Belch and Belch, 2007; Egan, 2007). Marketing communications preceding the introduction of an intranet portal have a better chance of success if they cultivate positive experiences with intranet portals, highlight the key benefits of the portal, introduce and explain the portal's usefulness and focus on ease of use (Levin and Gaeth, 1988).

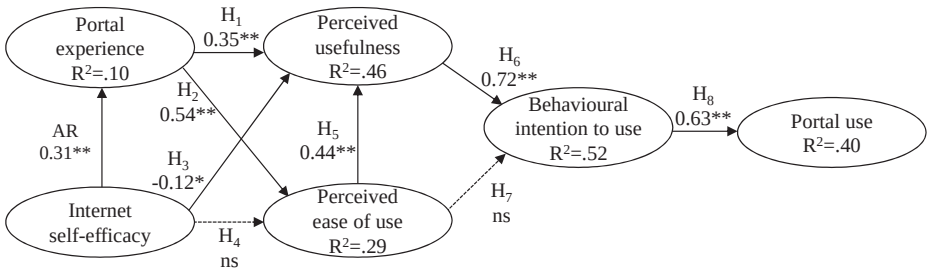
Users with prior positive knowledge or training are more likely to believe in their ability to use an intranet portal (Internet self-efficacy) (Bandura, 1982; Eastin and LaRose, 2000). Accordingly, an important implication for managers is to understand the knowledge generation and training system that users employ to develop positive experience with an intranet portal, and determine how this process could be replicated and communicated to other users who lack the same level of experience.

The negative relationship between Internet self-efficacy and perceived usefulness (H_3) appears to contradict the extant Internet acceptance literature (Fenech, 1998; Igbaria and Ilvari, 1995; Yi and Hwang, 2003). One interpretation is that users with high levels

Table 2
Discriminant validity results.

	Internet self-efficacy	Ease of use	Prior experience	Intention to use	Portal use	Usefulness
AVE	0.50	0.75	0.60	0.83	0.65	0.84
Internet self-efficacy	**0.705**					
Ease of use	0.187	**0.864**				
Prior experience	0.314	0.545	**0.772**			
Intention to use	−0.008	0.512	0.494	**0.912**		
Portal use	−0.013	0.320	0.494	0.625	**0.807**	
Usefulness	0.088	0.624	0.572	0.724	0.552	**0.919**

The square root of the AVEs are shown in the diagonals (bold).
Correlations for each construct in the mode are in the lower half of the table.
All construct correlations are less than the corresponding square root of the AVEs.



**p<0.001, *p<0.05, ns = non-significant,
AR = additional relationship found through re-specification

Fig. 2. Re-specified IPU model path coefficients and hypotheses.

of Internet self-efficacy perceive portals less useful, since these users are competent enough using the Internet to find the information (or more detailed information) independently. For these individuals portals may be viewed as initially limiting their choices and the level of information detail, and therefore not helpful. These high self-efficacy users may have technology expectations that are not met by unsophisticated intranet portals and hence consider portals not useful (Chau, 2001; Damsgaard and Scheepers, 2000). On the other hand, those individuals with little Internet competence find portals useful, since they can easily find the information that is available; they may be considered naïve users, and trust that portals provide useful, appropriate, correct and complete information. In particular advanced users may view portals as simply offering homogenised pre-recorded data; constraining or limiting their ability to access pertinent or more detailed data and information. In either case experience positively leverages Internet self-efficacy. Managers need to identify individuals with extensive intranet portal and Internet experience, collect meaningful intranet portal design feedback from them that is likely to increase individual's intentions and use of intranet portals, and manage their expectations.

In addition, internal (marketing) communications that focus on usefulness benefits, together with sufficient hands-on training, may aid in countering negative intranet portal perceptions (Venkatesh et al., 2002).

Although perceptions of intranet portal ease of use are not directly influenced by Internet self-efficacy in this study, there is a significant indirect effect through portal experience. General self-efficacy is considered to have a significant influence on perceived technology ease of use when the efficacy measure and the technology under investigation are the same (Agarwal et al., 2000; Roca et al., 2006; Venkatesh and Davis, 1996).

An alternative explanation of the self-efficacy – ease of use relationship may exist in the underlying conceptualization of Internet self-efficacy. Bandura (1986, p. 391) referring to social cognitive theory, writes that individual self-efficacy is "concerned not with the skills one has but with the judgments of what one can do with whatever skills one possesses". Measures of self-efficacy are developed in relation to the magnitude, strength, and generality of individuals' perceptions towards an ability to complete a specific action of task (Bandura, 1977; Compeau and Higgins, 1995; Torkzadeh and Van Dyke, 2002). Accordingly, self-efficacy is often described as being more aligned to perceived usefulness; the extent to which a system enhances job performance, than perceived ease of use; the extent to which a system is perceived as being free of effort (Agarwal and Prasad, 1999; Davis, 1989). Results from the present study indicate that when individuals consider their ability to use the Internet they place greater emphasis on the usefulness of an intranet portal rather than the usability or ease of use of and intranet portal. The reported discrepancy may be due to the lack of a parsimonious and reliable intranet portal self-efficacy scale linked to intranet technology ease of use although it is more likely that Internet self-efficacy is leveraged through experience.

Unsolicited email communications received from several participants, following data collection, indicate another explanation of the Internet self-efficacy – ease of use relationship. These participants felt the MyVictoria intranet portal was less intuitive and required greater effort to use than the previous non-intranet portal system. This feedback provides support of the negative relationship between Internet self-efficacy and perceived usefulness. It is only through experience that Internet self-efficacy positively influences perceived usefulness. In addition they described feeling unprepared and having little input into the technology change. This reinforces the view of a digital divide in which employees feel de-motivated and unwilling to use new technology as a consequence of negative prior experience or a lack of perceived confidence and competence (Henning and Van Der Westhuizen, 2004).

The H_5, H_6 and H_7 results provide support for the close relationship between perceived ease of use and perceived usefulness with respect to intention to use in the context of intranet portals (Horton et al., 2001; Lin and Lu, 2000; Szajna, 1996; Venkatesh and Davis, 2000). The indirect path coefficient between perceived ease of use and intention to use is 0.30 and is significant ($p < 0.001$). Ease of use has no direct or significant impact on user's intentions to use an intranet portal (Keil et al., 1995). This suggests an individual's feelings about intranet portal ease of use are tied to their perceptions of how useful the portal is to their job or studies. Ease of use is therefore only linked to intentions to use if an individual can recognize the usefulness of the intranet portal as well.

The final relationship between behavioural intention to use an intranet portal and actual use is significant indicating that a person with positive intention to use an intranet portal is significantly likely to become a user (Fenech, 1998; Lee et al., 2003; Moon and Kim, 2001). If return on intranet portal investment is related to the percentage of users actively using the portal system, then positive experience is the significant external influencer of portal acceptance and use.

5. Limitations and future research

One of the limitations relates to the use of self-reported usage data (Dishaw and Strong, 1999; Lederer et al., 1998, 2000). Self-reported usage can lead to distortion of the relationships between independent and dependent variables and common method bias (Lee et al., 2003). Direct comparison of actual usage data with the self-reported measures for each subject is likely to gain greater transparency in understanding system use (Devaraj and Kohli, 2003). However, this method relies on access to the usage data, which in many cases is restricted due to privacy legislation or organizational protocols. In support of the use of self-reported measures, Moon and Kim (2001) find no significant difference between actual and self-reported use data in their WWW study.

The cross-sectional design is a second limitation of the study. User's attitudes are likely to be affected over time; as consumers learn to use a system they will perceive the system as being more useful and easy to use. Presently, user's attitudes are taken into account via the trait-based measure of Internet self-efficacy that theoretically taps a user's stable set of feelings and perceptions (Hsu and Chiu, 2004). While the use of this type of Internet self-efficacy is most appropriate with a cross-sectional design, other types of Internet self-efficacy cognitions are possible and may provide greater measurement accuracy. For example, Hsu and Chiu find that state-based self-efficacy, only activated immediately before completing a task, is limited when combined with cross-sectional designs or self-reported usage, but may have its advantages in future studies that cross reference longitudinal and actual system usage data.

A particular merit of this study is the inclusion of both staff and students who can be considered internal and external clients respectively. Results of this study indicate no significant differences in responses between staff and students, indicating that similar communication campaigns to increase portal acceptance could be readily interchanged between internal and external clients. Further testing outside an institutional environment and in other industries and organizations will provide greater external validity.

6. Conclusion

As intranet portals become more commonplace in organizations and institutions, the need to understand the critical success factors of portal acceptance and use has emerged as a key managerial imperative. This investigation concludes that the acceptance and use of intranet portals can be aided through the consideration of appropriate internal and external marketing communications that address portal experience, Internet self-efficacy, perceived ease of use, and usefulness.

The findings suggest that strategies to bolster user's portal experience substantially affect intranet portal acceptance; developing initial positive experiences with intranet portals is likely to increase perceptions of usefulness and ease of use, and improve intentions to use intranet portals. Improving user intentions to use intranet portals is also likely to augment organizational communication to be more consistent, efficient and effective in addressing issues such as knowledge dissemination and management (Bose and Sugumaran, 2003; Gold, 2001; Lee and Choi, 2003), as well as maintenance of internal and external relationships (Baglieri et al., 2007; Butler, 2003; Peppard, 2000).

Developing prior portal experience with potential intranet portal users requires tactful marketing communications to address issues of Internet self-efficacy. Results suggest that high Internet self-efficacy users without adequate experience with intranet portals focus on and are inclined to identify system limitations. Increasing collaboration between marketing and IT departments to conduct, interpret, and respond to internal as well as external client requirements should lessen the effect of negative perceptions about the usefulness of an intranet portal. Providing experience with, and developing knowledge about, intranet portals will stimulate actual use.

The benefits of ease of use on intentions to use occur indirectly through perceived usefulness, gained primarily through experience. Accordingly, intranet portal design, management, and communication should focus attention first on perceived system usefulness to target users and second, on gaining user experience. In addition, portal design should allow extensive customisation of information searches and data links in order to appeal to confident users, not just provide generic cosmetic customisation, and ensure the information how to customise links and searches (internal and external) available and obvious. Managers should focus their efforts on programs that promote the usefulness of an intranet portal to complete a job or project.

Importantly, managers and marketers of intranet portals need to carefully consider communications to potential users with particular focus on the expected performance outcomes and generality of individual's Internet skills to aid in completing intranet portal actions. Specific attention should be given to consultation periods, notification systems and strategies, and the identification of technological laggards that may perpetuate the effects of a digital divide between technology and internal and external clients (Davis and Marc, 2007; Mattila et al., 2003).

This study proposes that managers and marketers of intranet portals can increase intranet portal acceptance via careful consideration of internal and external clients, inclusive on-going market research, close collaboration with IT, and targeted marketing communications focused on functionality and practice. In the implementation of Intranets it is more important to sell the usefulness of the portal and to provide opportunities for users to gain experience through use.

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Appendix A. Measurement items used

Prior experience:
EXP 1: I am familiar with MyVictoria to the extent that I have customized the way I interact with MyVictoria services and the content I access.
EXP 2: My knowledge of what all the buttons and features of MyVictoria do is extensive.
EXP 3: Overall, I am very inexperienced with MyVictoria (i.e. I don't know what the buttons and features are for or what they can do) (rc).
EXP 4: My previous experience with Intranet portals is very extensive.
Internet self-efficacy:
Factor 1: Browsing.
ISE 1: I feel confident browsing the World Wide Web (WWW).
ISE 2: I feel confident surfing the World Wide Web (WWW).
ISE 15: I feel confident finding information on the World Wide Web (WWW).
Factor 2: Encryption/decryption.
ISE 3: I feel confident encrypting my email messages.
ISE 4: I feel confident encrypting my email messages before sending them over the Internet.
ISE 5: I feel confident decrypting email messages I receive.
ISE 6: I feel confident decrypting email messages.
Factor 3: System Manipulation.

ISE 7: I feel confident creating a homepage for the World Wide Web (WWW).
ISE 8: I feel confident making changes to a home page.
ISE 9: I feel confident downloading from another computer.
ISE 10: I feel confident scanning pictures to save on the computer.
ISE 11: I feel confident sending a fax via the computer.
ISE 12: I feel confident receiving a fax via the computer.
ISE 13: I feel confident recovering a file I accidentally deleted.
ISE 14: I feel confident editing (size, colour) a scanned picture.

Perceived usefulness:
PU 1: Using MyVictoria improves my performance in my studies or job.
PU 2: Using MyVictoria in my studies of job increases my productivity.
PU 2: Using MyVictoria enhances my effectiveness in my studies or job.
PU 4: I find MyVictoria to be useful in my studies or job.

Perceived ease of use:
PEOU 1: My interaction with MyVictoria is clear and understandable.
PEOU 2: Interacting with MyVictoria does not require a lot of my mental effort.
PEOU 3: I find MyVictoria easy to use.
PEOU 4: I find it easy to get MyVictoria to do what I want it to do.

Behavioural intention to use:
INT 1: I will use MyVictoria on a regular basis in the future.
INT 2: I will frequently use MyVictoria in the future.
INT 3: I will strongly recommend others to use MyVictoria.
INT 4: I intend to use MyVictoria in the future.

System use:
USE 1: How many times do you use MyVictoria each week?
USE 2: On average, how many hours (hrs) per week do you use MyVictoria?
USE 3: On average, how long do you spend logged-onto MyVictoria?

Appendix B. Exploratory factor analysis results

	Items	Communalities	Factor loading	Variance explained
Prior Experience	EXP1	0.66	0.784	59.5%
	EXP2	0.81	0.884	
	EXP3	0.56	0.689	
	EXP4	0.38	0.620	
Prior Experience after deletion of EXP4	EXP1	0.70	0.791	64.8%
	EXP2	0.81	0.858	
	EXP3	0.65	0.710	
Intranet Portal Use	USE1	0.79	0.857	77.3%
	USE2	0.72	0.835	
	USE3	0.82	0.901	

Appendix C. Collinearity statistics

		Tolerance	VIF	Action
EXP1	I am familiar with MyVictoria to the extent that I have customized the way I interact	.494	2.026	
EXP2	My knowledge of what all the buttons and features do is extensive	.366	2.732	
EXP3	Overall I am very in experienced with MyVictoria	.526	1.901	
EXP4	My previous experience with Intranet portals is extensive	.601	1.665	
PU1	Using MyVictoria improves my performance	.124	8.081	
PU2	Using MyVictoria increases my productivity	.087	11.490	Deleted
PU3	Using MyVictoria enhances my effectiveness	.076	13.083	
PU4	I find MyVictoria to be useful in my studies or job	.208	4.797	
EOU1	My interaction with MyVictoria is clear and understandable	.332	3.010	

Appendix C. (*continued*)

		Tolerance	VIF	Action
EOU2	Interacting with MyVictoria does not require a lot of effort	.312	3.203	
EOU3	I find MyVictoria easy to use	.163	6.151	
EOU4	I find it easy to get to MyVictoria to do what I want it to do	.239	4.192	
ISE1	Browsing the World Wide Web (WWW)	.103	9.677	
ISE2	Surfing the World Wide Web (WWW)	.110	9.055	
ISE3	Encrypting my email messages	.028	35.937	Deleted: poor
ISE4	Encrypting my email messages over the Internet	.023	44.053	overall
ISE5	Decrypting email messages that I receive	.003	382.384	measurement fit &
ISE6	Decrypting email messages	.003	349.658	VIF >10
ISE7	Creating a homepage for the World Wide Web	.172	5.804	
ISE8	Making changes on a home page	.162	6.185	
ISE9	Downloading from another computer	.362	2.764	
ISE10	Scanning pictures to save on the computer	.306	3.263	
ISE11	Sending a fax via the computer	.181	5.523	
ISE12	Receiving a fax on my computer	.183	5.452	
ISE13	Recovering a file I accidentally deleted	.458	2.182	
ISE14	Editing (size, colour) a scanned picture	.331	3.022	
ISE15	Finding information on the World Wide Web	.275	3.632	
INT1	I will use MyVictoria on a regular basis in the future	.084	11.943	
INT2	I will frequently use MyVictoria in the future	.095	10.525	Deleted
INT3	I will strongly recommend others to use MyVictoria	.320	3.128	
INT4	I intend to use MyVictoria in the future	.272	3.676	

Appendix D. Convergent validity, factor loadings

	Internet self-efficacy	Ease of use	Prior experience	Intention to use	Portal use	Usefulness
ISE14	0.816					
ISE10	0.808					
ISE9	0.777					
ISE8	0.708					
ISE13	0.691					
ISE7	0.673					
ISE11	0.569					
ISE12	0.547					
EOU3		0.956				
EOU4		0.886				
EOU2		0.815				
EOU1		0.789				
EXP2			0.860			
EXP1			0.754			
EXP3			0.694			
INT1				0.951		
INT4				0.855		
INT3				0.803		
USE1					0.911	
USE3					0.787	
USE2					0.708	
U3						0.952
U1						0.928
U4						0.875
Construct reliability	0.89	0.92	0.82	0.90	0.85	0.94

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