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Charismatic leadership and user acceptance of information technology

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Abstract
Although there is widespread agreement that leadership has important effects on information technology (IT) acceptance and use, relatively little empirical research to date has explored this phenomenon in detail. This paper integrates the unified theory of acceptance and use of technology (UTAUT) with charismatic leadership theory, and examines the role of project champions influencing user adoption. PLS analysis of survey data collected from 209 employees in seven organizations that had engaged in a large-scale IT implementation revealed that project champion charisma was positively associated with increased performance expectancy, effort expectancy, social influence and facilitating condition perceptions of users. Theoretical and managerial implications are discussed, and suggestions for future research in this area are provided.
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Introduction

IS implementation failure is a shockingly common outcome of organizational information technology (IT) adoption efforts. Empirical studies have revealed that fewer than one-half of large-scale IT project initiatives ever come close to achieving the anticipated results (e.g., Whittaker, 1999; Standish Group International Inc., 2001). Many examples have been reported. Sobeys, the second largest supermarket chain in Canada, abandoned its U.S. $54 million project after a 2-year implementation effort failed (Mearian & Songini, 2002). Hershey's experienced a flawed implementation of its $112 million enterprise system in 1999, which prevented the company from shipping candy orders during the critical Halloween season and led to a 35% drop in share value amidst a booming stock market (Laudon & Laudon, 2004). Telecom New Zealand gave up its customer sales and service project at a cost $58 million (Jackson, 1998). Foxmeyer Drug declared bankruptcy after investing $65 million in its enterprise system (Bulkeley, 1996). These examples are not isolated incidents. KPMG reported in 2003 that among 230 of the largest global companies they surveyed, 57% had to write off at least one IT project in the last 12 months. And of those firms experiencing a failure, only 41% were able to determine how much the failure had cost their organization (the average loss was U.S. $10.4 million) (KPMG, 2003). Meanwhile, annual IT expenditures have exceeded $1 trillion in the United States, and $2.5 trillion globally (Greenwald, 2004).

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Many researchers have argued that senior managers play a crucial role in determining IT implementation success and failure (e.g., Lucas, 1975a; Zmud, 1984; Doll, 1985; Sanders & Courtney, 1985; Beath, 1991; Jarvenpaa & Ives, 1991; Thong *et al*., 1996; Ravichandran, 2000; Wixom & Watson, 2001; Madon, 2005; Irani *et al*., 2005). Today, the need for strong leadership – especially in large-scale IT projects – seems to be accepted wisdom among IS academics and managerial practitioners. And yet empirical results regarding leaders' influence on IT project success have not provided much guidance in terms of specific managerial behaviours that are associated with implementation success (Loonam & McDonagh, 2005). Considering the severity of the IT implementation failure problem, and the potential for excellent leadership to help resolve this problem, the present paper seeks to explore the question: how does perceived leadership behaviour influence the acceptance and use of IT?

Conceptually, we begin with Venkatesh *et al*.'s (2003) unified theory of acceptance and use of technology (UTAUT), which summarizes and rationalizes the user adoption literature to provide a simplified and compelling model to explain behavioural intention and use. We build upon this model by arguing that user perceptions of performance expectancy, effort expectancy, social influence and facilitating conditions (i.e., the antecedents of behavioural intention and use in UTAUT) will be positively impacted by perceptions of a key leadership ingredient: project champion charisma (i.e., inspirational motivation and idealized influence behaviours, as described by charismatic and transformational leadership theories) (Burns, 1978; Bass, 1985; Conger *et al*., 2000).

A variety of qualitative and quantitative research methods could be used to examine the relationships proposed in this model, such as case studies, ethnographies, experiments and surveys. We chose a field survey for this inquiry because it lined up with our research objective of building our understanding by linking a well-established leadership concept (charisma), with well-established user acceptance concepts (e.g., performance expectancy / usefulness, effort expectancy/ease of use, and so on). Although our study links these concepts in an entirely new way, it may be classified as confirmatory or hypothesis-testing research examined using survey methods, because many independent tests of charismatic leadership and user acceptance concepts over time and in a variety of research contexts have revealed consistent patterns of results. In selecting the field survey approach we also took into account practical factors such as quality of available measures, accessibility to research subjects, and likelihood of receiving an adequate response rate (Lyberg & Kasprzyk, 1991), all of which we judged to be excellent.

Unified theory of the acceptance and use of IT

In response to a growing number of competing models explaining user acceptance of IT, Venkatesh *et al*. (2003) proposed and validated UTAUT as a simplified theory integrating the most prominent existing ideas captured in five relationships (see Figure 1). According to this model, behavioural intention is predicted by three antecedents: (1) performance expectancy ('the degree to which an individual believes that using the system will help him or her to attain gains in job performance', Venkatesh *et al*., 2003, p. 447) – variously called perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectations (Davis, 1989; Moore & Benbasat, 1991; Thompson *et al*., 1991; Davis *et al*., 1992; Compeau & Higgins, 1995); (2) effort expectancy ('the degree of ease associated with the use of the system', Venkatesh *et al*., 2003, p. 450) – also referred to as perceived ease of use, complexity, and ease of use (Davis, 1989; Moore & Benbasat, 1991; Thompson *et al*., 1991; Davis *et al*., 1992); and (3) social influence ('the degree to which an individual perceives that important others believe he or she should use the new system', Venkatesh *et al*., 2003, p. 451) – also called subjective norm, social factors, and image (Davis, 1989; Ajzen, 1991; Moore & Benbasat, 1991; Thompson *et al*., 1991). Use is subsequently determined by: (4) facilitating conditions ('the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system', Venkatesh *et al*., 2003, p. 453) – which are closely related to the concepts of perceived behavioural control and compatibility (Ajzen, 1991; Moore & Benbasat, 1991; Thompson *et al*., 1991; Taylor & Todd, 1995a, b); and (5) behavioural intention to adopt (a person's readiness to perform a given behaviour). Venkatesh *et al*. (2003) went on to examine demographic and situational moderators including gender, age, experience, and voluntariness of use.

This integrative theory 'provides a useful tool for managers needing to assess the likelihood for new technology introductions and helps them understand the drivers of acceptance in order to proactively design interventions (including training, marketing, etc.) targeted at populations of users that may be less inclined to adopt and use new systems' (Venkatesh *et al*., 2003, pp. 425–426). UTAUT and related user acceptance models provide an excellent nomological network (Agarwal & Karahanna, 2000) within which to explore large-scale IS implementations such as ERP (e.g., see Bagchi *et al*., 2003;

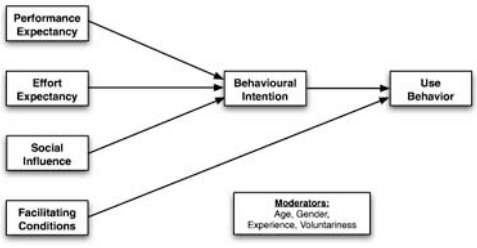

Figure 1 UTAUT (Venkatesh *et al*., 2003).

Hwang, 2005). The foregoing leads to the following five 'baseline' hypothesis:

H1: *Performance expectancy is positively associated with behavioural intention.*
H2: *Effort expectancy is positively associated with behavioural intention.*
H3: *Social influence is positively associated with behavioural intention.*
H4: *Facilitating conditions are positively associated with use.*
H5: *Behavioural intention is positively associated with use.*

Top management support

The notion of top management support, in one form or another, 'has received consistent attention in the literature as an important influence on technology adoption in organizations' (Agarwal, 2000, p. 100). Indeed, many IS adoption studies have attempted to account for the presence of top management. Unfortunately, many of these studies also suffer from diverse and inconsistent conceptual definitions, weak measures, and insufficient theorization.

Among the 24 influential empirical studies identified in Table 1, which have examined top management behaviours and IT implementation outcomes, there are 19 surveys, three case studies, one interview, and one meta-analysis. This representative sample of papers has used a disparate variety of intermixed definitions and inconsistent operationalizations. For example, definitions of *support* have included: the 'perception of the degree to which both general management and his immediate superior support more use' (Lucas, 1975b, p. 913); perceptions that top management 'feels that the time and resources spent on the development of DSS models is wisely invested' and 'is strongly in favor of the concept of DSS' (Sanders & Courtney, 1985, p. 93); 'active engagement of top management with IS implementation' (Thong *et al*., 1996, p. 253); and 'degree to which top management understands the importance of the IS function and the extent to which it is involved in IS activities' (Raghunathan *et al*., 2004, pp. 461–462). *Involvement* has been operationalized as: '… four questions relating to top management's involvement, interest, support and understanding of the importance of the organizational IS function' (Raghunathan & Raghunathan, 1988, p. 18); and '… a CEO's perceptions and attitudes concerning IT – that is, the degree to which a CEO views IT as critical to an organization's success' (Jarvenpaa & Ives, 1991, p. 206). *Commitment* has been described in terms of commitment to the project ('concerns taking those actions necessary to assure that the system is a good one, and provides a solution to the organization's problem') and commitment to change ('concerns the willingness of those involved to make the changes in behaviour, procedures, etc., that are necessary for the system to work') (Ginzberg, 1981a, p. 54); while Delphi subjects 'chose the term ''commitment'' rather than ''support'' to indicate the strong, active role top management must play in the project from initiation through implementation' (Schmidt *et al*., 2001, p. 20).

Outcomes associated with these management behaviours also vary widely and include, among others: *use*, *acceptance*, *adoption* and *assimilation* (Lucas, 1975a; Markus, 1981; Leonard-Barton & Deschamps, 1988; Jarvenpaa & Ives, 1991; Rai & Bajwa, 1997; Gallivan, 2001; Chatterjee *et al*., 2002); *success*, *performance* and *effectiveness* (Anderson & Narasimhan, 1979; Ginzberg, 1981b; Doll, 1985; Sanders & Courtney, 1985; Raghunathan & Raghunathan, 1988; Saunders & Jones, 1992; Steinbart & Nath, 1992; Sharma & Yetton, 2003; Raghunathan *et al*., 2004); and *satisfaction* and *usefulness* (Franz & Robey, 1986; Guimaraes *et al*., 1992; Lawrence & Low, 1993; Thong *et al*., 1996; Lewis *et al*., 2003).

Measures used to capture support, involvement, commitment, and the many different associated outcomes of these behaviours are also inconsistent and generally weak (e.g., some have used a single item to capture top management behaviours). Given that much of this research has not apparently attempted to build upon existing management theory in order to explain how organizational leaders might influence technology implementation, the inconsistency in definitions and measures is not surprising.

What is consistent in this body of literature spanning more than 30 years is the finding that top management behaviour – however it may be manifested or measured – is associated with important outcomes. Schmidt *et al*. (2001) reported in their study of software project risks that 'some panelists referred to it [top management commitment] as a ''fatal'' factor in its own right'.

While this body of research provides compelling evidence that organizational managers play some sort of important role in IT implementation outcomes, it does not sufficiently integrate top management support concepts into existing user adoption theories, nor does it go very far in terms of identifying the specific top management behaviours that are associated with success. We have made little progress in addressing our failure to 'determine if, when, how much, and what type of executive support is likely or organizationally appropriate' (Jarvenpaa & Ives, 1991, p. 206). As Sharma & Yetton (2003, p. 534) observed,

> The empirical literature, while acknowledging the complexity of the relationship between management support and implementation success, typically hypothesizes a simple main effect (Sanders & Courtney, 1985; Leonard-Barton & Deschamps, 1988; Yetton *et al*., 1999). This approach neither reflects the richness of the theory, nor provides a good description or explanation of the relationship. The main-effects model needs to be extended to capture the complexity of the relationship.

This study attempts to address this limitation by studying the effects of one specific set of top management behaviours, charismatic leadership, which has been

Table 1 Empirical studies examining top management support and information technology implementation outcomes

Source	*Informants*	*Relevant concepts and measures*	*Findings*
(Lucas, 1975b)	Survey, 234 sales people in three divisions of one company	Perceptions of high-level management computer support ('respondent's perception of the degree to which both general management and his immediate superior support more use of the computer in sales work', p. 913) predicted high levels of information systems use.	SUPPORT → USE
(Anderson & Narasimhan, 1979)	Survey, 24 middle- and upper-level managers	Top management involvement (1 item, not provided) significantly discriminated between implementation success (high involvement) and implementation failure (low involvement).	INVOLVEMENT → SUCCESS
(Markus, 1981)	Case study, multiple subjects from two manufacturing plants in one company	Political factors were a better explanation for initial acceptance in one plant, and rejection in another, compared with top management support (support was not explicitly defined).	SUPPORT? ACCEPTANCE
(Ginzberg, 1981a)	Survey, 35 users of 27 information systems	Commitment to project (8 items, e.g., 'When special skills were required to aid in developing the system, we tried hard to find the right people in our organization'), and commitment to change (6 items, e.g., 'We would really find it hard to go back to our old way of doing things') differentiated success and failure.	COMMITMENT → SUCCESS
(Doll, 1985)	Survey, 33 MIS managers	Management practices of 20 MIS departments with above average development success were contrasted with the practices of 13 departments with below average development success, and six guidelines were proposed (e.g., employ active steering committee; insist on written plan from MIS director; top management should work directly with MIS managers to develop priorities).	BEHAVIOURS → SUCCESS
(Sanders & Courtney, 1985)	Survey, 124 organizations, 378 users	Top management support (2 items, e.g., 'Top management is strongly in favor of the concept of DSS') was an important correlate of DSS success.	SUPPORT → SUCCESS
(Franz & Robey, 1986)	Survey, 118 user-managers in 34 organizations	MIS managers at higher levels (5 items, e.g., 'Which of the following best describes the position of the senior data-processing manager?') strengthened 'the positive relationship between involvement during design and perceived usefulness' (p. 349).	INVOLVEMENT → USEFULNESS (depending on managerial level)
(Leonard-Barton & Deschamps, 1988)	Survey, 23 salespeople in one organization	Perceived management support (3 items, e.g., 'My sales unit manager supports my using LAYOUT') was associated with use, but only for people who scored low on individual mediators (e.g., low performers).	SUPPORT → USE (for low performers)
(Raghunathan & Raghunathan, 1988)	Survey, 178 (mainly IS executives)	Top management involvement and support (4 items, used to evaluate planning activities of organizations that were high *vs* low in terms of top management involvement in and support of the IS function) was positively associated with planning activities.	INVOLVEMENT, SUPPORT → PLANNING EFFECTIVENESS

Table 1 Continued

Source	*Informants*	*Relevant concepts and measures*	*Findings*
(Jarvenpaa & Ives, 1991)	Survey, 55 matched CEOs and IT managers	Executive participation (6 behavioural items, e.g., 'CEO's personal participation in firm's use of IT') and executive involvement (4 attitudinal items, e.g., 'CEO's prevailing thinking about IT spending') were associated with progressive use of IT within the firm.	PARTICIPATION, INVOLVEMENT → PROGRESSIVE USE
(Sabherwal & King, 1992)	Survey, 81 senior IS executives from global 1000 firms in the U.S.A.	Top management influence (3 items measuring extent to which top management was involved in stages of the decision process) was positively associated with IS function maturity.	INVOLVEMENT → IS MATURITY
(Saunders & Jones, 1992)	Survey (3-round Delphi), 30 IS executives, and 25 heads of business planning	Top management support was ranked as the factor with the highest overall influence on IS performance.	SUPPORT → PERFORMANCE
(Guimaraes *et al.*, 1992)	Survey, 118 DSS users in 85 companies	Top management support (2 items from Sanders & Courtney, 1985) predicted all three criterion variables: overall satisfaction, decision-making satisfaction, and perceived DSS benefits	SUPPORT → SATISFACTION, BENEFITS
(Steinbart & Nath, 1992)	Interviews, IS executives in 5 firms+survey, 186 business executives in different firms	Top management support (2 items, relating to level of top management support and understanding of global network issues) was identified as the most important critical success factor for managing global networks by IS executives, but was not well understood by business executives.	SUPPORT → SUCCESS
(Lawrence & Low, 1993)	Case study, large government corporation implementing two separate IT projects (included surveys from 155 end users)	Top management support (2 items, reflecting 'actual' and ''ideal' level of management support) was positively associated with user satisfaction for both projects.	SUPPORT → SATISFACTION
(Premkumar & Ramamurthy, 1995)	Survey, 201 IS executives from firms using electronic data interchange	Top management support (4 items, e.g., 'Level of top management support for use of EDI in the firm's operations') discriminated between reactive firms (i.e., that used EDI for sales) and proactive firms (i.e., that used EDI for purchasing).	SUPPORT → REACTIVE/PROACTIVE
(Thong *et al.*, 1996)	Survey, 114 small business CEOs	Top management support (5 items, e.g., 'CEO attendance at project meetings'), and external IS expertise (e.g., consultants and vendors), were positively associated with user satisfaction and overall IS effectiveness.	SUPPORT → SATISFACTION, EFFECTIVENESS
(Rai & Bajwa, 1997)	Survey, 210 top and middle-management IS executives	Top management support (6 items, e.g., 'Executive sponsor(s) participation in EIS development') was significantly associated with level of EIS adoption.	SUPPORT → ADOPTION
(Gallivan, 2001)	Longitudinal case study, 53 interviews in four firms across four time periods, inductive analysis to identify implementation process themes	Top-management support for an innovation may facilitate assimilation in both early stages (initiation and adoption) and later stages (adaptation, acceptance, routinization, and infusion).	SUPPORT → ASSIMILATION (multi-stage)
(Schmidt *et al.*, 2001)	Survey panel, (3-round Delphi), 41 project managers in Hong Kong, Finland and the US	Top management commitment was ranked as the most important factor overall for reducing software project risk.	COMMITMENT → RISK REDUCTION

Table 1 Continued

Source	*Informants*	*Relevant concepts and measures*	*Findings*
(Chatterjee *et al*., 2002)	Survey, 62 matched response pairs from senior business executives and IS executives	Top management championship (3 participation items, e.g., 'articulating a vision', and 4 belief items, e.g., 'potential of providing significant business benefits') was positively associated with Web assimilation.	CHAMPIONSHIP→ASSIMILATION
(Sharma & Yetton, 2003)	Meta-analysis of 22 empirical studies published between 1985 and 1995	Management support (as variously defined in the selected set of studies) has a strong influence on implementation success when user task interdependence is high, but not when it is low.	SUPPORT→SUCCESS (moderated by task interdependence)
(Lewis *et al*., 2003)	Survey, 161 academic faculty members from a US university	Top management commitment (5 items, e.g., 'The University is committed to a vision of using course Web sites in teaching') was positively associated with perceived usefulness and ease of use of adopting Internet technologies for teaching.	COMMITMENT→PERCEIVED USEFULNESS, EASE OF USE
(Raghunathan *et al*., 2004)	Survey, 231 IS executives	Top management support (7 items, e.g., 'Top management supports the IS function') was positively related to performance, positioning and management of IS.	SUPPORT→PERFORMANCE, POSITIONING, MANAGEMENT

previously linked with other aspects of organizational performance (Bass, 1985; Conger & Kanungo, 1988, 1998). By examining charismatic leadership in the context of the UTAUT model, we hope to further extend our understanding of what kinds of top management behaviours may be linked with user acceptance and use, and thus project success.

Charismatic leadership

Max Weber (1947) defined charismatic authority as 'resting on devotion to the exceptional sanctity, heroism or exemplary character of an individual person, and of the normative patterns or order revealed or ordained by him' (p. 215). He considered charisma to be something that was attributed to a leader by a set of followers, rather than an objective set of traits. Following the work of House & Shamir (1993), Waldman & Yammarino (1999) further defined charismatic leadership as a relationship between leader and follower, plus favourable attributions from followers, resulting in 'internalized commitment to the vision of the leader, exceptionally strong admiration and respect for the leader, and identification of followers with the leader, the vision, and the collective forged by the leader' (p. 268). Waldman and Yammarino's conceptualization of charisma thus reflects an essentially interactionist perspective – it is not merely a set of individual character traits, nor is it solely reflective of attributions made by followers. Rather, charisma takes shape in the relationships between people. This perspective is shared by Gardner & Avolio (1998). In the words of House *et al.* (1991):

> Because charisma is a relationship and not a personality characteristic of leaders, charisma exists only if followers say it does or followers behave in specific ways. Wilson (1975, p. 7) provided an example: 'If [a] man runs naked down the street proclaiming that he alone can save others from impending doom, and if he immediately wins a following, then he is a charismatic leader: A social relationship has come into being. If he does not win a following, he is simply a lunatic' (p. 366).

Empirical research has since shown that attributions of charismatic leadership are often associated with positive individual and organizational outcomes (Bass, 1985; Conger & Kanungo, 1988; Shamir *et al.*, 1993; Conger *et al.*, 2000). Charismatic leaders inspire others by talking optimistically about the future and about what needs to be accomplished, and instilling in their followers positive ideals that are related to desired outcomes.

The presence of charismatic leadership relationships has been associated with successful implementation of the most dramatic and uncertain organizational changes (Burns, 1978; Bass, 1985; Kirkpatrick, 1985; Yukl, 1994) – and compared with other organizational changes, major IT implementations are often turbulent indeed (Lucas *et al.*, 1990; Davenport, 1998; Markus & Tanis, 2000). Charismatic leadership concepts have provided valuable

insights in the IS research domain – for example, in the areas of quality management (Ravichandran, 2000), electronic meeting environments (Sosik *et al*., 1997), and inter-organizational information systems (Reich & Benbasat, 1990; Kumar & Crook, 1999). Charismatic leadership theory has further been used to explore technology champions (Howell & Higgins, 1990; Beath, 1991; Wixom & Watson, 2001), and we propose that it also has the potential to substantially inform our practical understanding of large-scale IT implementation success and failure, through the lens of user acceptance. Consequently, in this paper we consider the influence of charismatic leadership of project champions on end-user acceptance, in the context of large-scale IT implementation projects.

While prior leadership studies have begun to examine follower (user) effects (e.g., in terms of follower performance, motivation and satisfaction, Bass, 1985; Conger & Kanungo, 1988; Shamir *et al*., 1993), existing work is still very limited (Conger *et al*., 2000; Avolio *et al*., 2004). Conger *et al*. (2000) outlined three research needs regarding the relationship between charismatic leadership and follower outcomes: (1) the need for further empirical studies to validate existing theoretical contentions (e.g., in terms of follower performance, motivation, satisfaction); (2) the need to establish causal links between specific leader behaviours and follower effects; and (3) the need for more research involving field-based managerial samples (in addition to experimental or laboratory-based student or military samples, as in Howell & Frost, 1989; Kirkpatrick & Locke, 1996). This paper takes up this challenge by testing existing theoretical contentions, forging causal links between specific leader behaviours and follower effects, and conducting a field-based research study.

Within the leadership literature, charismatic (and more broadly transformational) leadership behaviours have been repeatedly linked with both individual and organizational performance (Jung & Avolio, 2000). Followers of charismatic leaders tend to perceive higher levels of group and organizational-level performance (Avolio *et al*., 1988; Howell & Avolio, 1993; Barling *et al*., 1996; Conger *et al*., 2000). Similarly, charismatic and transformational leadership have been positively associated with follower-level performance (Howell & Hall-Merenda, 1999; Dvir *et al*., 2002; Towler, 2003). Charismatic leaders inspire followers, arouse their motivations, and increase their achievement-oriented behaviours (Eden, 1992; House & Shamir, 1993). Thus, we anticipate a positive relationship between charisma and follower outcome expectations, as stated in hypothesis 6.

H6: *Charismatic leadership behaviours of project champions will be positively related to followers' performance expectancy.*

Charismatic leaders send strong motivational messages (e.g., brimming with optimism, enthusiasm, and confidence), and model higher-order values (e.g., pride, purpose, altruism, respect, morality, and collective sense). By inviting their followers to accept these messages and to adopt these ideals (Bass, 1985; Conger & Kanungo, 1987), charismatic leaders directly or indirectly stimulate higher levels of follower self-efficacy and empowerment (Kirkpatrick & Locke, 1996; Conger *et al*., 2000; Walumbwa *et al*., 2005). Such follower outcomes are closely related to the notion of effort expectancy, as summarized by Venkatesh *et al*. (2003). Thus, when followers experience charismatic leadership in the form of positive motivational messages and admirable ideals and values, their expectations about their ability to adopt and use an innovation will increase. This leads to the next hypothesis:

H7: *Charismatic leadership behaviours of project champions will be positively related to followers' effort expectancy.*

In order to gain followers' commitment to group-level goals, charismatic leaders seek to tie individual participation of followers into the larger, collective identity of the organization (Shamir *et al*., 1993; Conger *et al*., 2000). In their review paper, Avolio *et al*. (2004) proposed that transformational leaders stimulate their followers' personal identification toward the leader, and their social identification toward the collective, and this in turn has a positive influence on follower attitudes and behaviours. Therefore, we hypothesize that followers of charismatic leaders will be sensitized to go beyond their self-interested motivations and consider the opinions of other individuals who are close to them within their social networks. Therefore,

H8: *Charismatic leadership behaviours of project champions will be positively related to followers' social influence.*

Charismatic leaders may be particularly adept at stimulating resource support and removing barriers to achieving desired objectives. For example, Armstrong & Sambamurthy (1999) reported that leaders play a critical role in assimilation of IT innovations, particularly when CIOs possessed deep business and IT knowledge. From his case-based analysis of electronic commerce adoption in one firm, Montealegre (2002) proposed that effective organizational leaders engage in particular behaviours to develop resource capabilities (e.g., 'Move adroitly to develop, co-opt, and secure the resources required in the formation and implementation of the new strategic initiative', p. 529). Flynn & Staw (2004) reported that charismatic leaders were able to attract higher levels of outside investment, particularly during difficult economic circumstances. Thus,

H9: *Charismatic leadership behaviours of project champions will be positively related to followers' perceived facilitating conditions.*

Research methods

Procedure and research sites

A survey was carried out by searching candidate companies from among *The Globe and Mail* (2002) 'Canada Top 1000' firms (www.globeinvestor.com/series/top1000), and SCOTT, a database of Canadian companies (www.scottsinfo.com). The researchers randomly selected and contacted 800 mid-size-to-large Canadian manufacturing companies (annual revenue ranging from US $17 billion to US $25 billion), seeking firms that had implemented a large-scale enterprise-level system within the past 18 months. We received positive responses from 15 organizations, and finally established research relationships with seven sites in six different firms.

A contextual summary of seven projects implemented in these six organizations is provided in Table 2. Firms were 10–160 years old, had between 185 and 2400 employees, and posted sales revenues ranging from $75 million to $1.4 billion. Two firms were privately held, and the remaining four were public. All projects involved implementation of one or multiple enterprise-level integrated system software modules. In order to investigate user perceptions of leadership behaviours, we asked each organization to identify a 'project champion' – a senior manager who was officially responsible for leading the project in terms of initiating, monitoring and leading the overall planning, adoption and implementation processes. None of the organizations expressed any difficulty or hesitation in identifying this individual (organizational titles of project champions are shown in Table 2).

Sample

A total of 422 paper-based surveys were distributed to users, 239 surveys were returned, and 209 surveys were finally usable. The number of responses per project ranged from 18 to 42 (see Table 2). Of the respondents who reported their gender, 56.3% were male. On average, subjects were 41 years old, 60.7% had completed a college or university degree, and 25.9% had a graduate-level education (completed or in process). These respondents had worked for their organization for 8.3 years, and had held their current position for 5.1 years. On average, subjects had participated in 2.4 previous IT implementation projects. Approximately one-half (44.0%) received formal training for the current project. Roles in project implementation included non-member users (55.2%), part-time members (19.5%), and full-time members (25.3%). Nearly one half of respondents (43.3%) were managers of other people in the firm, while the remainder (56.7%) had no supervisory responsibilities.

Non-response bias was assessed by comparing demographic characteristics of the first surveys received within the first 2 weeks after delivery ($N = 133$), with those received 2 months after ($N = 23$) (Armstrong & Overton, 1977). There were no significant differences in age, work experience, or job tenure (Hotelling's Trace = 1.034, $P = 0.235$), nor any significant discrepancies in gender ($\chi^2_{(1)} = 1.72$, $P = 0.190$), education ($\chi^2_{(5)} = 2.99$, $P = 0.224$) or position ($\chi^2_{(5)} = 1.29$, $P = 0.256$).

Measures

Items were adapted from established scales, and measured using seven-point Likert scale response categories ranging from strongly disagree (1) to strongly agree (7) – see Table 3 for a summary of items used. Perceptions about charismatic leadership behaviour were captured using 10 items from Bass and Avolio's Multifactor Leadership Questionnaire (MLQ Form 5X) (Bass & Avolio, 1995; Avolio *et al*., 1999). Performance expectancy (three items) and effort expectancy (three items) were drawn from Davis (1989). Social influence was captured using four items combined from Davis *et al*. (1989) and Taylor & Todd (1995b). Facilitating conditions, behavioural intention and use (three items each) were measured with items adapted from Klein *et al*. (2001).

Controls

In order to account for variations in individual experience, a control variable was included for prior implementation experience ('How many business system implementations have you personally participated in prior to [this one]?'). This was accomplished by including paths from experience to each endogenous variable in the model. Since user adoption was mandatory in all seven organizations, voluntariness was also naturally controlled for within our study sample.

Data analysis

Relationships contained in the research model were tested using Partial Least Squares (PLS), a structural equation modelling procedure (Fornell & Bookstein, 1982; Wold, 1982). PLS is appropriate for early stage research models where the emphasis is on theory exploration and prediction (Jöreskog & Wold, 1982). It does not require multivariate normality for estimating parameters, is suitable for use with smaller samples (Barclay *et al*., 1995), and is less affected by changes in the distributional properties of the sample from normality (see Wilcox (1998), for a more detailed discussion of some of the shortcomings of standard regression analysis). The path coefficients in a PLS model are standardized regression coefficients, and the loadings of items on the constructs are the same as factor loadings. Statistical significance of structural paths was evaluated using the PLS 3.0 bootstrap procedure, with 200 resamples.

Before considering results from the structural model, we first reviewed the quality of the measurement model. Individual item reliability was evaluated using the standard criterion of factor loadings greater than 0.7. Composite reliability was assessed using Fornell & Larcker's (1981) internal consistency measure, which uses actual/weighted item loadings and thus is considered a better measure of reliability than Cronbach's alpha (Chin & Gopal, 1995). We adopted the generally accepted

Table 2 Research sites

Project	*Project champion title*	*Industry*	*Age (years), # Canadian emp's, $U.S. sales*	*Ownership*	*Type of project*	*# Surveys returned (response rate)*
1	Vice-President of Information Technology	Manufacturing – plastic packaging	50 years, 825 employees, $1.1 billion sales	Public	An enterprise system including manufacturing, human resources, financial and distribution modules	31 of 65 (47.7%)
2	Vice-President and General Manager	Manufacturing – consumer appliance parts	50 years, 185 employees, N/A	Private	An enterprise system including financial, manufacturing and distribution modules	42 of 100 (42.0%)
3	Director, Department of Technology	Manufacturing – power generation equipment	160 years, 1000 employees, $1.4 billion	Public	An enterprise system including financial, human resources, inventory and distribution modules	29 of 40 (72.5 %)
4	Vice-President of Information Technology	Manufacturing – semi conductor equipment	10 years, 300 employees, $75 million	Public	An enterprise system with web presence (e.g., work assignments, recent events and work evaluations)	41 of 70 (58.6%)
5	Director of Sales	Manufacturing – food	120 years, 400 employees, $660 million	Public	An integrated accounting information system linked with financial and inventory modules	29 of 65 (44.6%)
6[a]	Chief Information Officer	Manufacturing – medical devices	48 years, 2400 employees, N/A	Private	A financial information system	18 of 40 (45.0%)
7[a]					An enterprise-wide media system	19 of 41 (46.3%)
Overall						209 of 421 (49.6%)

[a]Projects 6 and 7 were two plants of the same parent company.

Table 3 Measures

Construct	*Items*
Charismatic leadership (CH)	Charismatic leadership of project champions was measured using two sub-scales from the MLQ-5X: idealized influence (6 items), and inspirational motivation (4 items). Items © Bass & Avolio, 1995, available from www.mindgarden.com.
Performance expectancy (PE)	• [The system] will improve my job performance. • [The system] will make it easier for me to do my job. • [The system] will increase my productivity.
Effort expectancy (EE)	• It is easy for me to become a skillful user of [the system]. • Learning to operate [the system] is easy for me. • I find [the system] easy to use.
Social influence (SI)	• My friends in this organization think I should use [the system]. • My colleagues in this organization think I should use [the system]. • People who influence my behaviour think I should use [the system]. • People who are important to me think I should use [the system].
Facilitating conditions (FC)	• Due to lack of technical support, I have found [the system] difficult to use. [reversed] • The current hardware in this organization does not support [the system]. [reversed] • There are several organizational barriers preventing me from using [the system] effectively. [reversed]
Behavioural intention (BI)	• I like to spend time mastering [the system]. • Using [the system] is personally meaningful to me. • I really feel [the system] is my system.
Use (USE)	• When I can avoid using [the system], I do. [reversed] • When given the choice between using or not using [the system] for a task, I usually choose not to use it. [reversed] • When I can do a task using [the system], I will sometimes choose to use other ways to complete the task. [reversed]

criterion score of 0.7 to assess composite reliability (Chin, 1998). Convergent validity was judged by using the average variance extracted score for each construct, which should exceed 0.5 (Fornell & Larcker, 1981). Discriminant validity was evaluated in two ways. First, we examined item loadings and cross-loadings to ensure that items loaded more highly on their associated constructs than on any other constructs. Second, we checked whether the square root of the average variance extracted for each construct exceeded the correlation between constructs (i.e., to ensure that items share more variance within their construct, than between other constructs).

Results

Individual item reliability was acceptable for all but one charismatic leadership item (see Table 4). Because this item loading was very close to the 0.70 cut-off (CH-IM10 = 0.68), and since this was a measure taken from the well-established MLQ-5X instrument, we chose to leave it in the analysis. Composite reliability was strong, with internal consistency scores ranging from 0.83 to 0.95. Convergent validity was also strong, with average variance extracted scores in excess of 0.5 for all constructs. Finally, discriminant validity was acceptable: each item loaded most highly on its intended construct, and the square root of the average variance extracted for each construct (shown on the diagonal in Table 5) was higher than correlations with other constructs.

As shown in Figure 2, the five baseline hypotheses drawn from UTAUT were supported. Performance expectancy had a positive impact on behavioural intention ($\beta = 0.40$, $t_{208} = 5.47$, $P < 0.001$); effort expectancy was positively associated with behavioural intention ($\beta = 0.31$, $t_{208} = 4.83$, $P < 0.001$); social influence positively impacted behavioural intention ($\beta = 0.10$, $t_{208} = 2.04$, $P < 0.05$); facilitating conditions was positively linked with use ($\beta = 0.34$, $t_{208} = 6.25$, $P < 0.001$); and behavioural intention was positively associated with use ($\beta = 0.53$, $t_{208} = 10.11$, $P < 0.001$).

Also as shown in Figure 2, charisma was positively related to all four antecedents of behavioural intention and use. Specifically, charisma was positively associated with performance expectancy ($\beta = 0.40$, $t = 7.20$, $P < 0.001$), effort expectancy ($\beta = 0.30$, $t = 4.44$, $P < 0.001$), social influence ($\beta = 0.35$, $t = 4.71$, $P < 0.001$), and facilitating conditions ($\beta = 0.38$, $t = 7.08$, $P < 0.001$). The model explained 18% of the variance in performance expectancy, 9% for effort expectancy, 13% for social influence, 15% for facilitating conditions, 44% for behavioural intention, and 52% for use. The control variable (prior experience) was unrelated to any of the dependent variables in the model.

We tested for mediation effects using Sobel's (1982) test. To generate the required *t*-test values we ran two independent PLS models. The first model included paths from the independent variable (charisma) to the four mediator variables (performance expectancy, effort

Table 4 Factor and cross-factor loadings ($N = 209$)

	CH	*PE*	*EE*	*SI*	*FC*	*BI*	*USE*
AVE[a]	0.66	0.86	0.80	0.67	0.63	0.62	0.76
Reliability[b]	0.95	0.95	0.92	0.89	0.84	0.83	0.90
CH-II1[c]	**0.83**	0.41	0.28	0.33	0.40	0.38	0.33
CH-II2	**0.84**	0.32	0.24	0.26	0.26	0.32	0.25
CH-II3	**0.85**	0.36	0.29	0.32	0.35	0.23	0.24
CH-II4	**0.88**	0.36	0.25	0.34	0.42	0.19	0.18
CH-II5	**0.80**	0.31	0.17	0.24	0.30	0.23	0.19
CH-II6	**0.82**	0.36	0.29	0.27	0.25	0.34	0.31
CH-IM7	**0.76**	0.30	0.15	0.25	0.25	0.16	0.17
CH-IM8	**0.84**	0.34	0.24	0.26	0.29	0.24	0.26
CH-IM9	**0.80**	0.30	0.26	0.32	0.27	0.36	0.28
CH-IM10	**0.68**	0.28	0.22	0.27	0.25	0.19	0.11
PE1	0.35	**0.93**	0.42	0.39	0.40	0.54	0.50
PE2	0.43	**0.95**	0.44	0.42	0.50	0.57	0.52
PE3	0.38	**0.91**	0.35	0.36	0.47	0.53	0.52
EE1	0.26	0.32	**0.89**	0.21	0.36	0.42	0.41
EE2	0.27	0.38	**0.91**	0.25	0.46	0.42	0.43
EE3	0.26	0.46	**0.88**	0.29	0.47	0.52	0.57
SI1	0.27	0.36	0.26	**0.86**	0.29	0.30	0.26
SI2	0.36	0.35	0.29	**0.85**	0.29	0.27	0.28
SI3	0.29	0.31	0.17	**0.76**	0.29	0.22	0.19
SI4	0.25	0.35	0.19	**0.82**	0.21	0.38	0.29
FC1	0.38	0.47	0.53	0.28	**0.83**	0.38	0.48
FC2	0.32	0.38	0.37	0.26	**0.82**	0.31	0.37
FC3	0.19	0.30	0.21	0.24	**0.72**	0.15	0.39
BI1	0.27	0.37	0.39	0.29	0.29	**0.75**	0.47
BI2	0.32	0.56	0.51	0.34	0.38	**0.85**	0.58
BI3	0.17	0.44	0.28	0.22	0.17	**0.76**	0.47
USE1	0.33	0.57	0.49	0.31	0.51	0.64	**0.90**
USE2	0.26	0.50	0.50	0.28	0.46	0.62	**0.93**
USE3	0.12	0.33	0.38	0.21	0.39	0.39	**0.78**

[a]Average variance extracted.

[b]Fornell and Larcker's internal consistency reliability measure.

[c]Bold numerals represent highest factor loadings.

Table 5 Construct means, standard deviations, and correlations ($N = 209$)

	# Items	*Mean*	*SD*	*CH*	*PE*	*EE*	*SI*	*FC*	*BI*	*USE*
CH-Charisma	10	4.92	1.06	**(0.81)**						
PE-Performance expectancy	3	4.65	1.46	0.42	**(0.93)**					
EE-Effort expectancy	3	4.83	1.21	0.30	0.44	**(0.90)**				
SI-Social influence	4	4.68	1.25	0.35	0.42	0.28	**(0.82)**			
FC-Facilitating conditions	3	3.17	1.28	0.38	0.49	0.48	0.33	**(0.83)**		
BI-Behavioural intention	3	4.03	1.18	0.33	0.59	0.51	0.36	0.36	**(0.79)**	
USE-Use	3	5.24	1.42	0.29	0.55	0.53	0.32	0.53	0.65	**(0.87)**

[a]Bold-faced elements on the diagonal represent the square root of the average variance extracted. Off-diagonal elements are correlations between measures.

expectancy, social influence, and facilitating conditions), and yielded the *t*-test values shown in Table 6. The second model included paths from the mediator variables to behavioural intention and use, as well as paths from charisma to behavioural intention and use, and provided the *t*-test values also shown in Table 6. The Sobel test results led us to conclude that the effects of charisma on behavioural intention was significantly mediated by performance expectancy (Sobel = 4.17, $P < 0.001$) and effort expectancy (Sobel = 3.12, $P < 0.01$), and that the effects of charisma on use were significantly mediated by facilitating conditions (Sobel = 4.44, $P < 0.001$). Social influence was not a significant mediator.

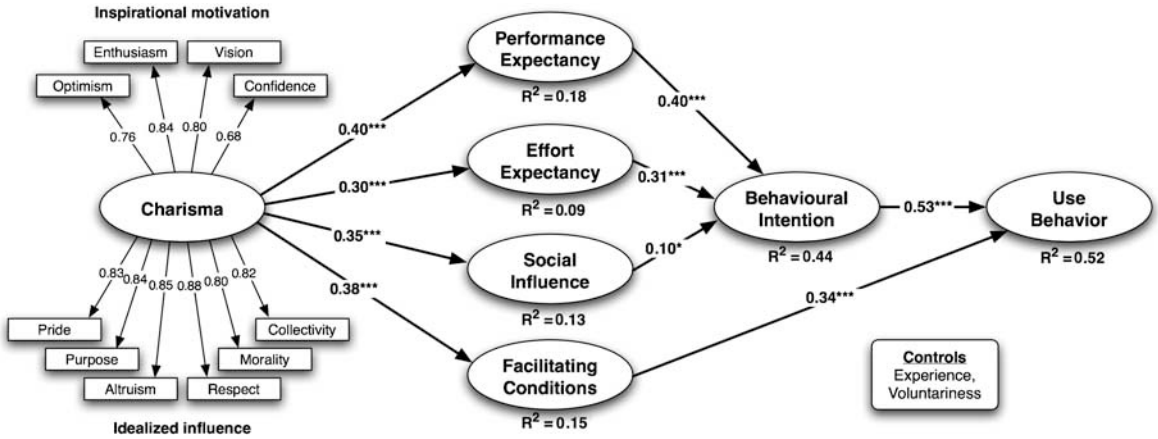

Figure 2 Research model $P<0.05$; ** $P<0.01$; *** $P<0.001$.

Table 6 Mediation results

Model A		*Model B*		*Sobel test*	*P*
Path	*t-value*	*Path*	*t-value*		
Charisma → Performance expectancy	7.2952	Perf expectancy → Behavioural intention	5.0787	4.168	0.00003
Charisma → Effort expectancy	4.4402	Effort expectancy → Behavioural intention	4.3848	3.120	0.00181
Charisma → Social influence	5.3452	Social influence → Behavioural intention	1.9041	1.794	0.07286
Charisma → Facilitating conditions	7.8933	Facilitating conditions → Use	5.3744	4.442	0.00001

Discussion

These results provide a confirmation and extension of the UTAUT model. Users who perceived that their project champion demonstrated inspirational motivation and idealized influence behaviours also expressed higher levels of performance expectancy (i.e., perceived usefulness), effort expectancy (i.e., perceived ease of use), social influence (i.e., perceived norms), and facilitating conditions (i.e., perceived support). As predicted by UTAUT, these four factors subsequently influenced behavioural intention (explaining 44% of the variance) and, directly or indirectly, use (explaining 52% of the variance).

Although explained variance in the four UTAUT variables ranged from a somewhat modest 9 to 18%, we believe that these results are substantive and meaningful for several reasons. First, as summarized in the introduction to this paper, global IT expenditures are massive and growing, while IT implementation failure rates continue to occur unabated. IS researchers have developed a good understanding of the factors influencing behavioural intention and use, as captured by the UTAUT model. Few studies, however, have examined the role of leadership on IT adoption and use – despite the fact that 'leadership' and 'top management support' are often included as critical success factors. Second, these promising early results were based on a single leadership dimension – charisma. Investigation into other perceived leadership behaviours may explain substantially greater variance in both the UTAUT predictor variables, as well as in behavioural intention and use, and provides exciting opportunities for future research. Third, results demonstrated that the influence of charisma on behavioural intention and use were mediated by three of the four UTAUT variables. In other words, attributions of charismatic leadership were enacted 'through' these behavioural constructs – an important finding for leadership researchers investigating IT project implementation. Fourth, this paper offers a test of UTAUT in the context of mandatory system adoption. (Brown *et al.*, 2002, p. 283)

Implications for research

A great deal of research has acknowledged the importance of organizational leadership to IS adoption outcomes (Table 1), yet our conceptualizations and measures of leadership remain fragmented and diverse. In this paper we have attempted to tie together IS adoption theory, with charismatic leadership theory that has been developed and rigorously validated in the applied psychology and organizational behaviour domains over the past 20 years. This work represents an early step: many opportunities exist to further integrate charismatic leadership theory with our best theories, and better understand how leaders can influence adoption and use, and ultimately implementation success.

Full-range leadership theories (Burns, 1978; Bass, 1985) suggest several areas for future research. The full-range typology proposes leadership constructs including

idealized influence and inspirational motivation (which together comprise our focal measure of charisma), as well as intellectual stimulation (e.g., 'suggests different angles', 'suggests new ways'), individualized consideration (e.g., 'focuses your strengths', 'teaches and coaches'), contingent reward (e.g., 'recognizes your achievement', 'clarifies reward'), active management-by-exception ('concentrates on failures', 'tracks your mistakes'), and passive/avoidant leadership ('reacts to problems, if chronic', 'reacts to failure') (Avolio *et al*., 1999, p. 450). Do project champions tend to exhibit particular behavioural patterns in leading IT projects? Are certain styles or combinations of these leadership behaviours more or less appropriate for different types of information systems implementations? What role do situational factors play (e.g., project size or scope, clarity of project goals, degree of individual and organizational experience with similar projects, project stage, voluntariness, etc.)?

Other paradigms and perspectives may lend further insight. For example, cognitive resource theory (Fiedler, 1986) contends that leadership success depends on factors such as cognitive abilities of the leader (e.g., planning and decision-making), intelligence, experience, task difficulty, and stress. The contingent cognitive style perspective (Baile & Igalens, 2006) suggests that technology users' beliefs regarding a technology (i.e., perceptions of usefulness and ease of use) depend on their individual cognitive styles (i.e., learning, decision-making, and problem-solving styles).

Some initial research has also appeared examining the impacts of social and physical distance on leadership and follower outcomes (e.g., Yagil, 1998; Howell & Hall-Merenda, 1999; Howell *et al*., 2005), and this work could be naturally extended into the IT implementation domain (e.g., to examine the effects of remote *vs* up-close top management support). Another research area relates to the development of leader–follower trust (e.g., Graen & Uhl Bien, 1995; Conger *et al*., 2000; Jung & Avolio, 2000; Avolio & Kahai, 2003), which could be extended into the context of IT implementation projects. There are important questions relating to the appropriate leadership level and organizational function from which different kinds of IT implementation leadership behaviours should originate. Future research might also explore leadership and power dynamics (e.g., what are the implications for this model of leaders who possess different sources of power, such as legitimate (e.g., hierarchical level), referent power (e.g., charismatic influence), expert power (e.g., unique skills), and so on?) (French & Raven, 1959). Numerous additional avenues are suggested in the summary of prior top management studies (Table 1).

Implications for practice

Consistent with prior research examining top management support, the findings from this study further underscore the relevance and importance of leadership to IT implementation outcomes. However, this paper goes a step further by identifying specific, validated charismatic leadership behaviours that are related to inspirational motivation (i.e., optimism, enthusiasm, vision, and confidence) and idealized influence (i.e., pride, purpose, altruism, respect, morality, and collectivity). Organizational and IS leaders may benefit by thinking carefully about how they go about conveying messages to their followers, and whether the appropriate ideals are being consistently modelled over time.

Future research directions

This study established relevant links between charismatic leadership theory and IT adoption and use theories (as summarized in the UTAUT model). Future research might examine the influence of other dimensions of transformational leadership on IT adoption and use. By exploring the kind of alternative paradigms and perspectives as described above (e.g., full-range leadership theory, cognitive resource theory, contingent cognitive styles, social distance, power, trust, etc.), we hope that other researchers will extend the basic theoretical model, increase explained variance, and ultimately advance our understanding of how leaders influence technology implementation processes. For example: does a leader's use of intellectual stimulation impact followers' behavioural intention or use behaviours? How do the most effective leaders coach employees, and how do these mentoring behaviours influence adoption and use? How do transformational leaders of IT projects influence adoption and use differently than transactional leaders? How is adoption and use influenced by project champion power (e.g., their legitimate, referent, expert, reward and/or coercive power, French & Raven (1959))?

In addition to furthering this line of research by examining new and different constructs, new methods and methodologies are also encouraged – from more quantitative replication, extension and meta-analytic studies, to qualitative and interpretive analyses, to more critical reviews. The scope and impact of IT implementation failure demands a great deal more research attention.

Limitations and conclusion

This research was subject to three important limitations. First, it was difficult to measure behavioural intention to adopt in this research context. All of our study sites had adopted enterprise-level systems that were being implemented in stages, over a long-term time horizon (and considering the continuous upgrade strategy used by most software vendors, implementation would arguably never be 'finished' in any of these firms). Since subjects were already using at least one core module at the point when we conducted our survey, using the standard behavioural intention items (i.e., asking about future intended behaviour) would have been problematic. Therefore we have used a proxy measure. Future research would benefit from longitudinal research approaches, which would allow the researcher to examine pre-implementation behavioural intention, and post-implementation use.

Second, data analyses for this study were based on 209 end-user attributions of charisma of six project champions. Following charismatic leadership theory, our position is that charisma exists in the individual relationships between leader and follower – in other words, the essential unit of analysis is neither the follower nor the leader, but the relationship that emerges between them. Nonetheless, it would be very interesting to conduct a multi-level study of charismatic leadership in the IS implementation context – for example, to explore whether project champion self-perceptions of leadership are consistent with end-user perceptions, or the extent of agreement between end users of a particular champion. This could serve to further integrate and align charismatic and transformational leadership theories with user acceptance theories.

Third, questions arose in the process of conducting this research that we were unable to explore with cross-sectional surveys. For example, were there any idiosyncratic behaviours that project champions engaged in that were not overtly related to leadership, yet may have influenced project success? What major project events (roadblocks, stimulants, etc.) occurred along the way, and how did the project champions respond to these? Did any other organizational leaders play an important role in the project? To answer these sorts of questions, we would encourage more in-depth case-based research, which would allow the researchers to more broadly explore the influences of leadership on user acceptance. Our best available approach in this study was to include a control for source organization (and indeed, our results indicated that unknown organizational factors were associated with user adoption).

The available literature on top management support provides abundant evidence that leadership behaviour is an important factor, and perhaps the single most important factor, related to IT implementation success and failure. Yet, the continuing high rate of IT implementation failure, and the massive direct and indirect costs associated with that failure, make clear that more research is needed to further understand the nature and impact of specific, practicable, effective leadership behaviours. This study is among the first to establish a link between particular leadership behaviours, and the critical antecedents of behavioural intention and use in information system implementation projects. More research is needed, using a variety of methods, to replicate this study and to extend our knowledge of effective leadership behaviours.

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