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THE RELATIONSHIP BETWEEN PSYCHOLOGICAL OWNERSHIP AND IT-DRIVEN VALUE¹

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Abstract

The concept of psychological ownership is employed in order to enhance our understanding of the relationship between users and information technology professionals and to describe the IT/business process relationship. We use co-ownership to signify a complementary relationship in which users are involved in IT while IT professionals are simultaneously involved in business processes. In an initial study, interviews at four organizations suggest that co-ownership explains information systems' success and top-rated returns from IT investments. In a second study, we are developing a measure of co-ownership and testing its effect on IT value and performance through a large-scale survey.

1. INTRODUCTION

The nature of the relationship between a firm's information technology professionals and the rest of the organization is usually considered a key determinant of success in information systems. Opinions concerning the appropriate form and function of this relationship have evolved substantially over the last 25 years, leading us from participation (Swanson 1974), through involvement (Ives and Olson 1984; Barki and Hartwick 1989) and line leadership (Rockart 1988) to partnership (Henderson 1990). More recently, Hartwick and Barki (1994) clarified our understanding of user participation and the importance of involvement in the use of information systems at the individual level.

We know much less about the relationship between the individuals in the IT function and business processes. We do not even have language to describe this connection beyond labeling it as business knowledge or understanding (Nelson and Coopriider 1996). Nevertheless, there is strong theoretical justification for a relationship in which individuals in the IT function take ownership for business processes and objectives. In other words, IT professionals should possess knowledge about and have an understanding of the business, they should feel responsible for business outcomes, and they should work with the line as equal team members who share common goals. Interviews at four organizations indicated that the sense of ownership experienced by both IT professionals and users may differentiate organizations that continually add value through information technology from those that do not and, consequently, are less successful. We are now testing the relationships between ownership and IT value in a large scale survey. Figure 1 delineates the relationships that we examine in our inquiry.

¹We wish to gratefully acknowledge the financial support provided by the Society for Information Management.

²Both authors contributed equally to this paper.

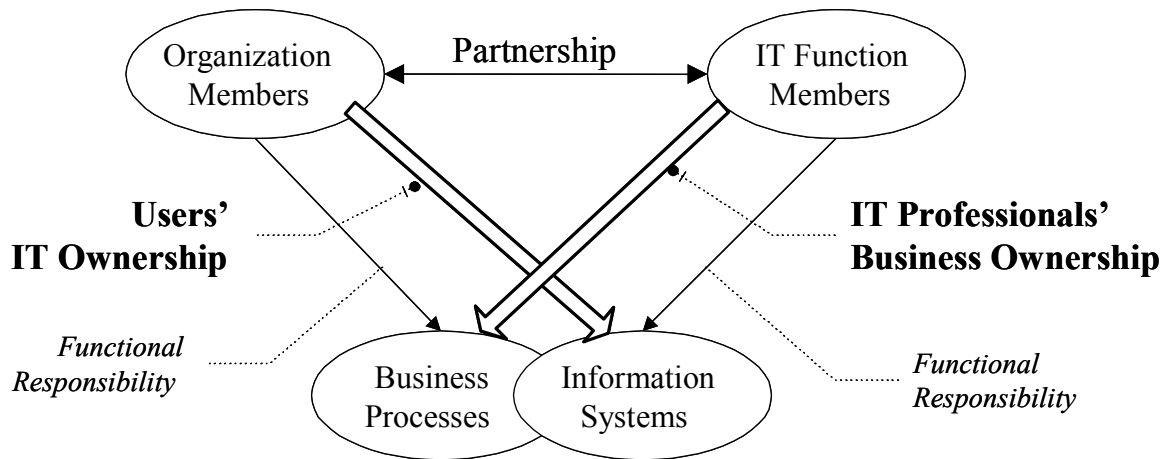


Figure 1. Ownership in the Context of the User-IT Relationship

2. THE RELATIONSHIP BETWEEN THE IT FUNCTION AND THE ORGANIZATION

In the early days of information systems, IT professionals were responsible for the information systems alone and the people in the rest of the organization took care of the business processes and their outcomes. This arrangement was fine for limited transaction processing, but, as we all know, it did not work very well when systems became more tightly connected to business processes. The systems did not meet the needs of the business, and the business did not change to accommodate the new systems.

Swanson (1974) recognized the need for the participation and involvement of users in IT development. Rockart (1988) went further by asking the line to take the leadership role, and Jarvenpaa and Ives (1991) showed that top management commitment is key to successful implementation of information systems. They all argued that significant business understanding is required for systems to meet the strategic objectives of the organization. As a consequence, many IT professionals were demoted from the “Ivory Tower” to the status of order takers. In response, and in an attempt to regain their status, IT professionals reengineered themselves as trusted advisors and started to manage their relationships with the rest of the organization using a “supplier-customer” metaphor. Some researchers stressed the importance of the IT organization and the line working together to develop high value systems (Henderson, 1990). As Nelson and Coopridge (1996) argue, line managers must be actively involved in IT management, and IT managers must be actively involved in business decisions.

While there is a long stream of research, summarized by Hartwick and Barki (1994), supporting user participation and involvement in IT, the literature has very little to say about the relationship between the individuals in the IT community and business processes. It would seem that, if users need to feel responsibility and take action, the corollary should also hold.

Psychological ownership, a widely-used construct in the organizational behavior literature, provides convincing support for the benefit of a strong interconnection between IT professionals and business processes. Individuals who exhibit a strong sense of responsibility and commitment to their workplace experience a feeling of psychological ownership. Ownership in this context does not connote legal rights, but rather implies a sense of empowerment, personal involvement, organizational pride, and shared interests. It minimizes shirking and motivates people to perform at their optimal levels (Pierce et al. 1991).

Psychological ownership can be used to signify both user involvement in IT and IT professional involvement in the business process (Figure 1). Following both Pierce et al. and Hartwick and Barki, we define ownership as a multidimensional construct that comprises *orientation* and *responsibility*. *User IT ownership* consists of the users' *IT orientation* and *IT responsibility*, and *IT professional business ownership* consists of IT professionals' *business orientation* and *business responsibility*. As indicated in previous research, users should be involved with their information systems. This requires them to be familiar with the information flow and the fundamentals of the technology. We call this capacity *IT orientation*. *User IT responsibility* is a psychological state that reflects the “importance and personal relevance” users feel for their information system (Hartwick and Barki 1994). In the same fashion, we define *business orientation* as the extent to which IT professionals understand the business context and are knowledgeable about business processes (Nelson and Coopridge 1996). The *business responsibility* dimension,

taken from both the psychological ownership literature and Hartwick and Barki’s participation construct, indicates that individuals must feel responsible for the business processes and outcomes beyond their day-to-day duties.

3. OWNERSHIP AND IT VALUE: A QUALITATIVE APPROACH (STUDY 1)

From a theoretical perspective, it seems likely that the nature of the relationship between IT professionals and business processes may significantly affect the degree to which technology adds value to an organization. We undertook interviews at four organizations to examine this link empirically. We applied an extreme case methodology (Boyatzis 1982) to examine ownership and its relationship to IT performance. Ownership, or more specifically, *IT ownership* and *user ownership*, were defined and coded through theory-driven thematic analysis (Boyatzis 1998).

Based on expert opinion and reputation, we identified two organizations that were renowned for consistently providing high value through IT and two that were considered to be “run-of-the-mill” in this context. The perceived IT value at the selected organizations was confirmed in our data analysis. All are large companies with significant ongoing investments in IT. They operate in the pharmaceutical, insurance, banking, and automotive industries.

Data were collected through a series of semi-structured critical incident interviews that investigated the extent to which IT added value to the organization and probed into the nature of the relationships between users and IT professionals. A critical incident is defined as a unique activity or situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definitive (Flanagan 1954).

In all, we conducted 18 interviews—ten at renowned and eight at run-of-the-mill organizations. Each lasted approximately one hour and was recorded and transcribed for subsequent analysis. In each organization, we interviewed IT and business people at various levels who were selected from a list provided by our contact person. By interviewing a broad cross-section of individuals, we hoped to uncover significant differences relating to responsibility or position as well as differences in perceptions between users and IT professionals.

Guided by the instrument shown in an abridged version in Table 1, two judges examined the interviews for indications of ownership. Any indication of either *business orientation* or *business responsibility* among the IT professionals was deemed an indication of *IT ownership*. Similarly, any indication of *IT orientation* and *IT responsibility* among the users was coded as *user ownership*.

Table 1. Dimensions of IT Ownership and User Ownership

| Ownership | |
|--|--|
| IT Professionals’ Business Ownership | Users’ IT Ownership |
| <p>Business Orientation: The individuals in the IT function understand the business context and are knowledgeable about the business processes.</p> <p>Business Responsibility: The individuals in the IT function feel responsible for business processes and outcomes beyond their responsibilities for the direct performance of information systems.</p> | <p>IT Orientation: The users understand the technological context and seem knowledgeable about the information systems in the organization.</p> <p>IT Responsibility: The users are concerned with IT, believe that it has a pivotal role in business outcomes, and feel responsible for IT performance.</p> |

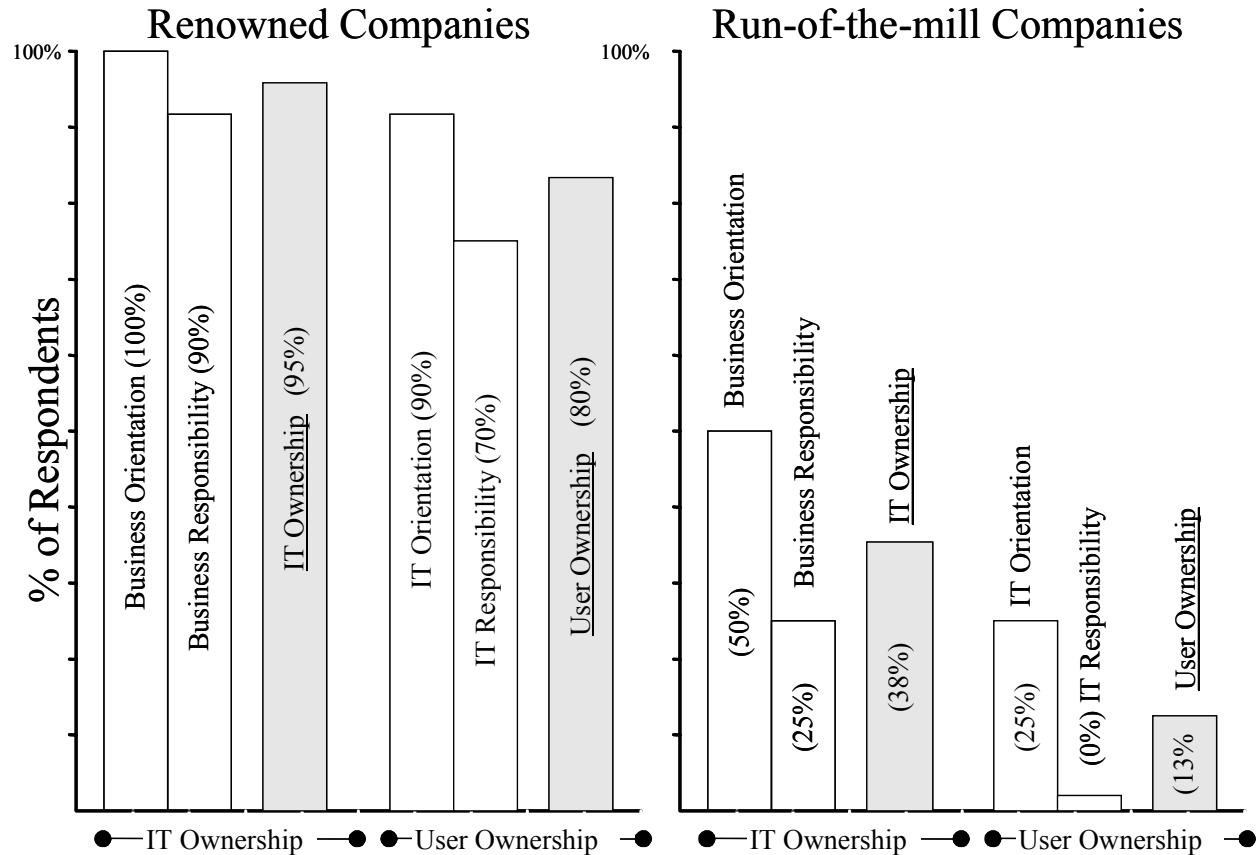


Figure 2. Indications of Ownership Among IT Professionals and IT Users

In order to assure sufficient reliability, we applied a double coding technique (Miles and Huberman 1984) in which the judges independently applied the instrument to the interview transcripts. The nominal inter-rater reliability, which indicates the consistency of judgments, was 82%. The judges achieved 100% agreement after they compared and reconciled their assessments. The final assessment is presented in Figure 2, which provides information about the extent of business orientation and responsibility among IT professionals, and the extent of IT orientation and responsibility among users. For demonstration purposes, ownership is presented here as the average value of the extent of orientation and responsibility.

Our first study revealed a stronger indication of both *IT ownership* and *user ownership* among the renowned organizations. It appeared that *co-ownership* (i.e., the presence of **both** *IT ownership* and *user ownership*), which can be associated with a sense of partnership, was linked to information systems' success and to perceived returns from IT. The study suggested that *co-ownership* is critical, and that neither *IT ownership* nor *user ownership* alone is sufficient to yield top-rated performance. These results encouraged us to initiate a second study which was designed to investigate in more depth whether *co-ownership* leads to greater IT value and performance.

4. OWNERSHIP AND IT VALUE: A QUANTITATIVE APPROACH (STUDY 2)

Armed with the notion that ownership plays a key role in enhancing the return on investments in information technology, we seek to examine the facets of ownership in the context of IT and the relationship between ownership and IT value. We hypothesize that ownership is critical to creating IT value and suggest that the *co-ownership* construct can provide a better and more parsimonious explanation of IT value than *IT ownership* and *user ownership* alone (Figure 3). Our model stems from the following three hypotheses:

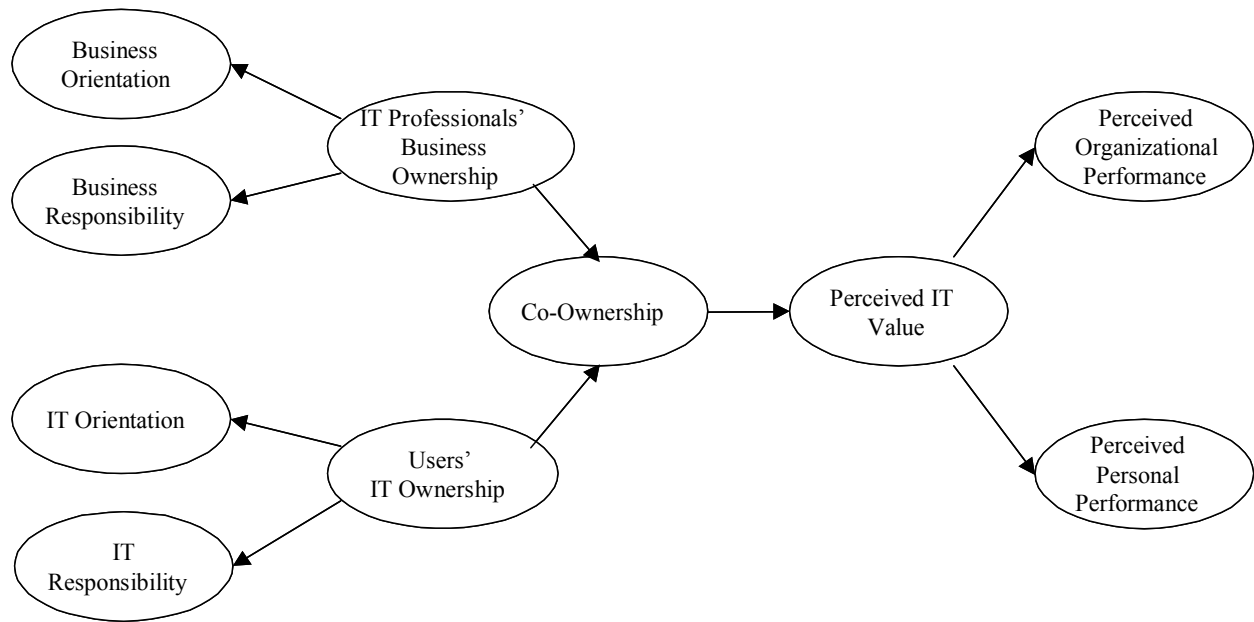


Figure 3. The Relationship Between Ownership and Perceived IT Value

- *Co-ownership* contributes to *IT value*.
- *Co-ownership* is a second-order construct comprised of *IT ownership* and *user ownership*.
- *IT ownership* is indicated by IT professionals' business orientation and responsibility. *User ownership* is indicated by users' IT orientation and responsibility.

In the second study we are (1) developing and validating a measure of co-ownership; (2) testing the validity of the co-ownership construct; and (3) reaffirming the effect of co-ownership on perceived IT value.

4.1 Instrument Development

Based on our *a priori* theoretical understanding described above, *co-ownership* is a second-order construct that can be explained by the following two first-order factors: *IT ownership* and *user ownership* (Figure 3). Following Briggs and Cheek (1986) who advocated that a single scale ought to measure a single construct in order to enhance internal consistency, we opted to develop the sub-scales of *IT ownership* and *user ownership*. Used together, these two sub-scales assess co-ownership. Furthermore, we developed a *perceived IT value* instrument that was adapted in part from Sanders and Courtney (1985). All items were measured using a five-point Likert scale; respondents were also able to enter an N/A response.

We have followed Churchill's (1979) paradigm for scale development in order to develop valid and reliable measures. The specific scale development procedure which includes item generation, reliability testing, validation, and scale refinement, is outlined in Table 2. Domain specifications and construct definitions were formulated and clarified through a literature review and case study interviews (described in Study 1). A pool of items was generated based on face validity. Six experts participated in a sorting exercise and evaluated the items' relevance and clarity vis-a-vis our construct definitions (Table 1). Based on the experts' assessments, we removed or revised ambiguous items. This resulted in an initial 14-item measure of IT ownership, a 13-item measure of user ownership, and a 22-item measure of IT value that is comprised of both organizational and personal performance. The instrument was designed and is being executed as a web-based survey, which reduces response time and overhead costs.

Table 2. Scale Development Procedure

| Churchill's paradigm | Procedures in this research |
|------------------------------|--|
| Specify domain and construct | <ul style="list-style-type: none"> • Conduct literature review • Analyze case study interviews |
| Generate a pool of items | <ul style="list-style-type: none"> • Conduct literature search • Revisit case study interviews • Determine measurement format |
| Develop an initial measure | <ul style="list-style-type: none"> • Perform expert evaluation and item sorting exercise • Craft initial survey and include validation items • Administer the pilot survey |
| Purify measure | <ul style="list-style-type: none"> • Assess reliability (Chronbach's alpha) • Assess correlation matrices and factor loadings • Refine instrument and optimize scale length |
| Collect data | <ul style="list-style-type: none"> • Administer the main survey (10 organizations) |
| Assess reliability | <ul style="list-style-type: none"> • Internal consistency • Chronbach's alpha • Test-retest |
| Assess validity | <ul style="list-style-type: none"> • Item loadings • Convergent and discriminant validity • Nomological validity • Test results on a confirmatory data subset |
| Assess validity | <ul style="list-style-type: none"> • Item loadings • Discriminant validity • Nomological validity • Test results on a hold-back sample |

4.2 Data Collection

The pilot survey, which is currently underway, is comprised of 60 subjects: 30 users and 30 IT professionals from two organizations, one of which is a renowned organization, the other a run-of-the-mill. Selection criteria for organizations and interviewees were similar to those of Study 1. All survey participants rate items relating to both IT professionals and users (e.g., both IT professionals and users rate *IT ownership* in their organizations). Assessment of the data will enable us to further refine our instrument, increase its internal consistency, and optimize its length.

Currently, we are preparing to administer the full-scale survey. The data will be used for additional refinement of the co-ownership measure as well as for construct and structural validation through the use of structural equation modeling. This data set will consist of 300 subjects that include 150 users and 150 IT professionals from 10 large organizations. In order to test reliability and consistency over time (test-retest), we also plan to collect data again from two of these organizations after three months.

4.3 Validity Analysis

We are applying a two-step confirmatory factor analysis to test the factorial validity of the *co-ownership* construct and our instrument. At this stage, the dimensionality of the construct will be tested and the homogeneity of each dimension will be confirmed. Reliability will be verified using Cronbach's alpha. Then, through an evaluation of the model's goodness of fit, we will evaluate whether the co-ownership construct adds to our understanding of the relationships among IT ownership, user

ownership, and perceived IT value. Another critical component of construct validation at this point will be establishing discriminant and convergent validity.

Finally, after we establish that the measurement model is psychometrically sound, we will test the validity and fit of our model's causal structure. At this stage, we plan to apply structural equation modeling to examine and validate the relationship between ownership and IT value.

5. AN INTERIM CONCLUSION

Our investigation has revealed that co-ownership is a key factor in organizations' ability to capitalize on information technology. Beyond the obvious practical insights, this conclusion has a wider consequence with respect to the way researchers and practitioners perceive IT in the organizational context. The immediate and direct utility of ownership focuses our attention on the tangible value of collaboration and cooperation. Our findings are in line with Kumar et al. (1998) who demonstrated that, in some instances, the technical-economic and the socio-political perspectives are insufficient to provide an explanation regarding the underlying processes that lead to IT success or failure, and that a third rationality that focuses on collaboration and cooperation is the key to understanding information technology utilization.

We submit that the ubiquitous focus on personal accountability for deliverables not only causes antagonism in the IT/organization relationship, but also has a detrimental effect on the entire business process and organizational life. Alternatively, we suggest that we view organizational life through a metaphor of "personal ownership," where responsibility is beyond the boundary of the working unit and accountability is focused on that responsibility rather than on specific deliverables. Being responsible goes beyond delivering to the letter of the contract. It implies that we refocus attention from the myopia of the bottom line to positive attitude and intention.

The ownership-focused organization enables a "redundancy of responsibility" that can be best understood as a subclass, or an instance, of Ashby's requisite variety. Redundancy of responsibility is likely to ensure that fewer (if any) issues fall between the cracks. People cover for each other's lapses instead of finding fault and pointing fingers. Redundancy of responsibility does not imply a waste of resources, but rather a second line of defense that jumps into action when the designated unit fails. Yet, an ownership-focused organization does not exist merely to solve problems. Ownership is key to partnership, consensus building, open communication, self-managed dispute settlement, teamwork, learning, innovation, and synergy.

At this point, we are in the midst of study 2. The pilot survey is underway. Given practitioners' enthusiastic response to the concept of co-ownership and its ramifications, we are confident in our ability to gather the necessary data in the next three months and complete this stage of the research.

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