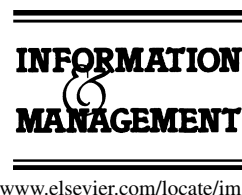




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Management of information systems: Insights from accounting research

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Abstract

This paper advances our knowledge of information systems (IS) management by applying ideas and insights from accounting. An integrative cost–benefit framework is developed and applied to four areas of research: chargeback, outsourcing, decision support, and business process re-engineering and improvement. We show that the accounting literature contributes significantly to scholarship on the management of IS.

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Keywords: Information systems value; IT management; Outsourcing; Chargeback; Decision support systems; Business process re-engineering; Business performance; Performance measurement

1. Introduction

Information systems (IS) are managed at various levels. Enterprise level decisions primarily deal mainly with allocation of resources. Functional level IS decisions include where and when to apply IT, and whether the application should be made or bought. A decision to “make” a new IT application internally will inevitably lead to the initiation of a project that must then be managed.

Important issues related to each of the aforementioned decisions have been considered by both IS and accounting scholars. For example, a steady stream of IS research on outsourcing began to emerge after the landmark decision by Kodak to contract its IS management to IBM. Similarly, accounting research has

examined the initial outsourcing decision. However, a review of the IS literature suggests that other management questions have been addressed inadequately, particularly those involving post-implementation decisions. We address these inadequacies directly by applying an accounting perspective to four specific areas important to both practitioners and researchers [32]: chargeback for IS services, post-contractual management of IS outsourcing, management decision support systems (DSS), and IT-enabled operational process improvement.

The accounting perspective is relevant to many IS issues, but recent advances focus on decisions and management control issues *after* an IS has been implemented. As a result, we show how accounting insights can help the IS profession to manage: (i) the intangible aspects of IT projects, including risk assessment, control, and coordination; (ii) biases that are associated with DSS use, and (iii) the authority and incentive structure of the firm. The next section presents a conceptual framework, which highlights the overlap

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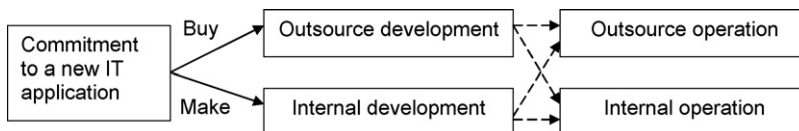


Fig. 1. The process of information technology (IT) application.

between IS and accounting research. We then consider each of the aforementioned areas in turn, to (1) summarize the IS literature, (2) specify how the accounting perspective can augment mainstream knowledge, and (3) identify key issues for further research.

2. Conceptual framework: accounting costs–benefits

By more accurately attributing costs to specific products, services and customers, accounting can greatly improve the quality of information for decision-making. Similarly, by more accurately attributing employee effort to organizational outcomes, accounting can improve the motivation and goal alignment of employee efforts. Both of these efforts enhance the management of IS. Their success ultimately depends on what is measured (e.g., costs, activities, or processes) and how well these objects are measured. Typically, these measurements are translated into monetary terms to evaluate the costs and benefits.

To introduce and relate the four areas of IS management, it is useful to consider the process of IT application as shown in Fig. 1. An organization must decide the extent to which it will develop and operate its

own IS; it may decide to outsource some or all of the activities.

The economic benefits of IS generally take one of two forms: (i) the reduction of operational costs through process improvement (by automating, streamlining or re-engineering capital and labor intensive activities), and (ii) the improvement of resource allocation by providing more accurate and timely information to decision makers. The potential scope of IT applications ranges from the strategic to the operational level. The cost–benefit framework in Fig. 2 shows these two general types of IT benefits and depicts IT costs, which include: (i) initial development and (ii) on-going maintenance costs. The core issues (questions) from an accounting perspective are highlighted, because they drive the relevant part of IS design and thus ultimately affect the effectiveness of the design.

3. Four areas of IS research

3.1. Managing the costs of information systems

A significant concern of an organization is to recover the costs of operating and maintaining the IS: the “chargeback” issue.

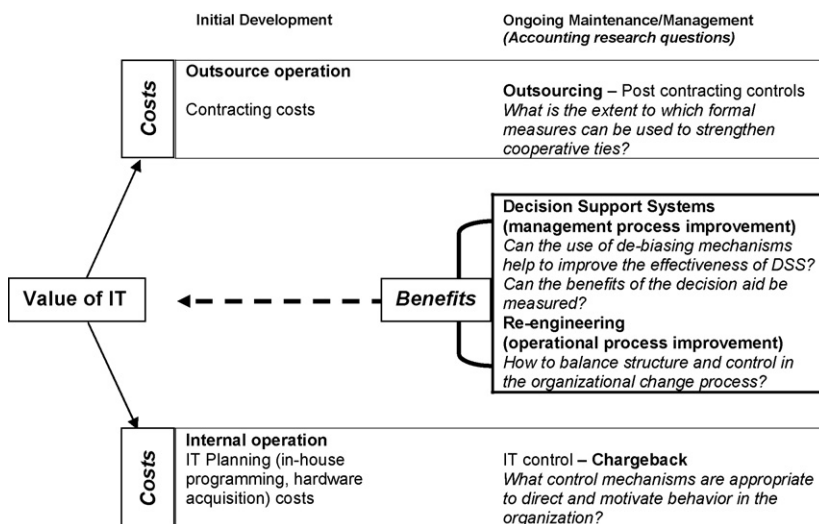


Fig. 2. Information technology (IT) cost–benefit framework.

3.2. Chargeback

A chargeback system normally bills cost centers or user departments for in-house IS services. There are several alternatives, such as cost minimization, flexible pricing (to resolve peak load problems), and setting standard rates based on the elapsed time, estimated fraction of the system used by the job, and a time-adjusting factor that accounts for the job's priority and mix in the system.

The question becomes: What chargeback system would be fair to both providers and users?

Several tradeoffs are shown in Fig. 3. Chargeback helps to create a culture of *accountability* that communicates the cost of IT to users. However, the demand for accountability may have to be tempered by a *flexible* approach that encourages volitional use that is critical to a firm's strategy. Finally, chargeback may be used to manage the *interdependency* between service department capacity and external (non-service) department demand; e.g., service department capacity will influence IS service cost but it depends on external demand. In an uncertain environment, the IT capacity will constantly mirror changes in the interdependency between service and external departments.

The drivers of chargeback have their roots in: (i) management control, (ii) the strategic role of IT, and (iii) the organization's ability to measure costs and performance. Although chargeback practices have not changed significantly, the difficulties of both allocating costs and educating users about using chargeback information have increased. IS effectiveness models have yet to address issues of fairness, equity, responsibility and controllability.

Chargeback studies from the 1980s may have limited relevance in today's IT-intensive environment. The traditional IS service center role has changed as departments acquire their own specialists, though networking and maintenance services remain centralized. The dispersion of IT resources makes determination of costs difficult—in some locations and operations,

computing is becoming an almost free-resource or commodity. The consequences of this are (i) understated IT costs and (ii) duplicated effort (multiple applications run on several platforms). To address these developments, the chargeout framework must consider the IS budget setting process, IS performance management, and communication between IT providers and users to clarify their roles and responsibilities [22].

Similarly, the adoption of new technology involves user effort to achieve the perceived benefits of use but involving steep learning curves and uncertainty about the real costs. As IT adoption and upgrades take place at increasing rates, many organizations are dealing with at least two generations of IT. As this increases the complexity of any chargeback system, a cost–benefit framework should identify the costs *before* a chargeout system is designed [15].

IS researchers have found it difficult to account for the dynamic and dispersed nature of IT applications. They have also failed to fully consider the complementarities and externalities that are associated with IS services.

3.2.1. Accounting perspectives

Two concepts provide guidance in designing and employing an IT chargeback system: *internal cost-resource utilization* within functional areas, and the *effects of externalities* in the cost allocation process. Fairness in charging users for IT services is reasonable, but putting this into practice can be difficult. IT use by one department will influence that of another and ultimately affect service department capacity. A poorly designed chargeback system will result in negative externalities, where costs will be imposed on individuals without their participation in the decision. For example, Zimmerman [40] noted three effects: *Incentive effects* arise when managers over-consume resources; *Information effects* occur when charging systems establish a mutual monitoring relationship that overcomes the asymmetric information between users and suppliers; *Congestion effects* involve the imposition of delays and rationing costs on other users. These result from lack of chargeback for limited resources.

The tradeoff between flexibility and accountability can also stifle volitional use of IT services and resources. There are three ways that accounting methods may aid in reducing this problem:

1. Although it is logical to recoup the cost of IT investment according to a user-pays formula, a balance may be struck between accountability and flexibility. It would be useful to know how lower

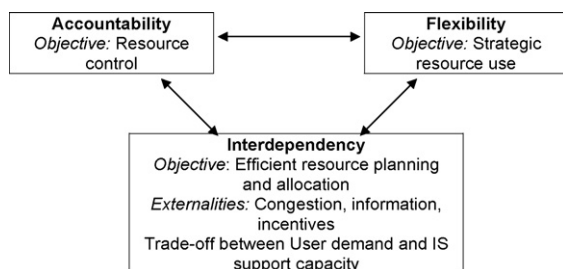


Fig. 3. Drivers of chargeback design.

levels of chargeback increase user awareness of IT services. Too little chargeback results in no self-monitoring and little concern for the resources consumed but too much chargeback stifles the volitional use of the IT services and resources.

2. An accounting perspective acknowledges the need for volitional activity to be encouraged in some areas, such as R&D. However, this does not eliminate the need to evaluate and control the use of a resource, determining and assessing the critical success factors to indicate how well the organization achieves its objectives [24]. Input and behavioral controls are appropriate when an organizational task involves a high degree of technological uncertainty or has outputs that are difficult to measure [30].
3. Because chargeback systems are *not* the only way of guiding and controlling the actions of IS users, other methods could be tried, including incentive systems tailored to the IS and user departments to direct and motivate innovative behavior. The interaction of the type of incentive system with cost allocation can affect profitability, productivity, innovation, and the exchange of information between parts of organizations [9].

An emphasis on economic measurement and value highlights the importance of using chargeback for strategic purposes. More knowledge of how the use of chargeback can support the strategic objectives of IT application is needed. A key challenge is to understand and reconcile the chasm between two sets of conflicting practical views: the need for chargeout, and criticism of it.

Is an unsuccessful chargeback system a precursor to outsourcing? Some economists and accountants have recommended that there should be either no chargeback or marginal cost pricing at the most.

3.3. Outsourcing

IS outsourcing decisions are characterized by their size, complexity, and potential irreversibility. The benefits of such outsourcing include reduced costs due to a vendor's economies of scale, possible access to new technology and expertise, strategic flexibility, and avoidance of obsolescence [23]. The complexity is characterized by its intangible nature, multiple stakeholders, and the need for delivery of the service over time. These factors show the need to consider several (including post-contractual) stages in evaluating success or feasibility of the service. In addition, the post-contractual stages require informal forms of

governance that create a quasi-hierarchical cooperative relationship.

Eastman Kodak's decision to outsource its main-frame computers to IBM was found to have a positive stock market reaction [20]. It later became obvious that successful outsourcing outcomes (such as quality processes and services) include sharing of knowledge, having a formal evaluation process, using shorter-term contracts, and outsourcing IT on a selective basis.

IS researchers have generally applied transaction cost economics such as the avoidance of obsolescence, access to new technology, and vendor economies of scale to explain the value of outsourcing. However, this has inadequately accounted for the costs associated with the management and completion of IS outsourcing projects. The customer and supplier/stakeholder relationship portrayed by transactions cost theory is overly simplistic because of: (1) the expectations of different stakeholders and (2) the existence of six outsourcing phases: scoping, evaluation, negotiation, and transition, middle, and mature phases. Researchers have examined the relationships between strategic factors and the IS outsourcing decision. Gaps found in information quality, IS support quality and IS cost effectiveness, and the strategic orientation of the firm strongly suggest that the outsourcing decision was a means of compensating for resource deficiencies [35]. In contrast, neither cost considerations nor the firm's financial performance were found to affect the outsourcing decision significantly.

Outsourcing varies in terms of the degree of perceived client conflict in contracting relations, which can be explained with agency theory: information asymmetry between the user and the supplier occurs because of the supplier's expertise and the inability of the user to monitor and control the project effectively. Only recently has the post-contract management of outsourcing been studied, with trust [17] and knowledge sharing [18] issues being addressed.

In contrast to the market decision that is associated with the initial stage of outsourcing, the governance of the outsourcing contract relies on the psychological contract and social capital. The aim is to facilitate cooperation between the contracting parties (see Fig. 4). This perspective provides a holistic understanding of the onset of governance, what choices are available, and the consequences. Three theories (transactions costs, embeddedness, and knowledge-based) may be used to model the processes and outcomes. An IS-specific theory is needed due to factors that "constrain and redefine the governance options available and the effects of governance

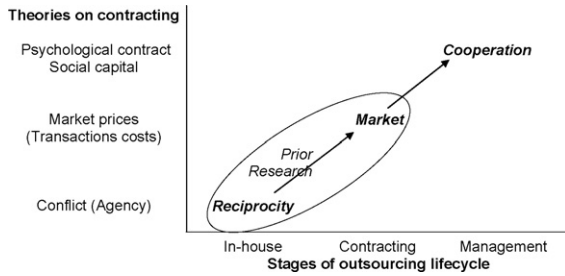


Fig. 4. Outsourcing—areas of prior research.

choices” and weaken the feasibility of the embeddedness perspective [25].

3.3.1. Accounting perspective

Accounting researchers have made concerted efforts to understand the effectiveness of different control and coordination mechanisms in managing the post-contracting stages of outsourcing [37,4]. Three different patterns of inter-firm controls have been identified based on markets (arms length transactions), bureaucracies (formal rules and procedures), and trust (maintaining reputation) [38]. Chalos and O’Connor [5] found that socialization and communication

mechanisms were critical for knowledge and technology transfer within U.S.-Sino alliances. These mechanisms are closely associated with bureaucratic and trust control patterns. Similarly, clan control has been proposed as important for cooperative coordination: for example, the use of boundary spanning workgroups that cut across traditional business functions [28].

Accounting measures provide formal information about each party’s actions, thereby keeping each party honest and strengthening the ties between the contracting parties and leading to open sharing of knowledge and information.

Another stream of research has examined the contexts in which different networks are formed and used this to explain the value of the different types of controls [12]; the type of network was found to determine the information that each party has, creating common understandings and stable relationships.

3.4. Managing the benefits of IS

The provision of measures to facilitate and influence decisions extends to other areas of IS practice: decision

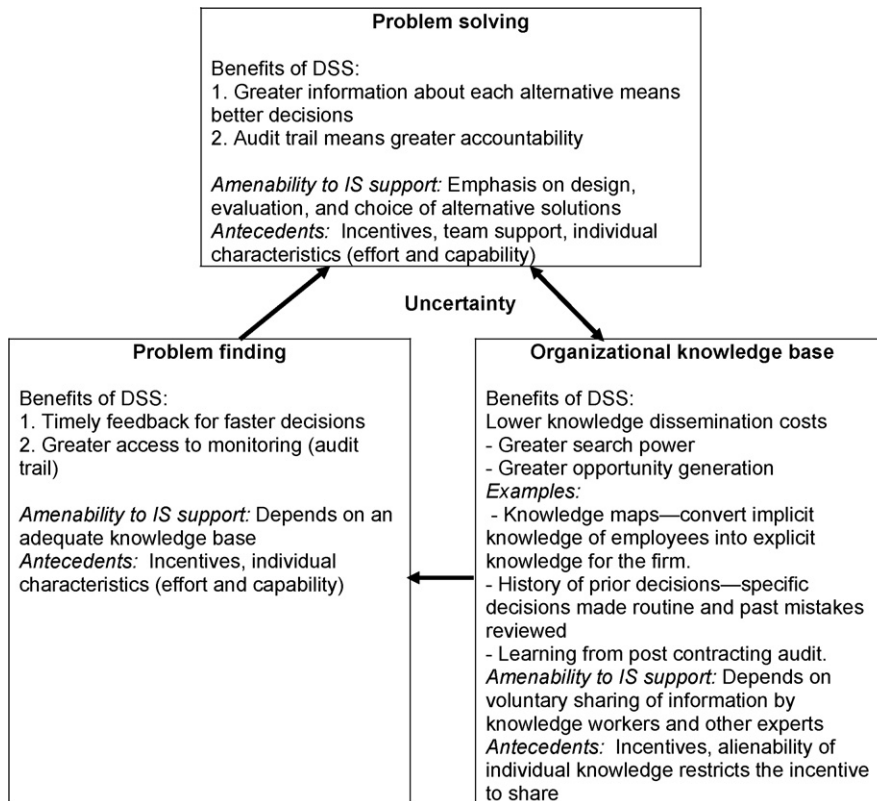


Fig. 5. Decision support system (DSS) typology.

support (at the management level) and process improvement (at the operational level). The planning and development of these types of IS have benefited from work on IS success [7].

3.5. DSS

DSS support one or more phases of the decision making process. IT can support decision making by collecting, manipulating, and disseminating data and information. Better decisions, more accurate and timely, may result from the use of DSS technologies if their information is accurate, complete, flexible, relevant, simple, verifiable, accessible, secure, reliable, timely, and economical.

The integration of such technologies in the form of a knowledge management system is rare due to political factors, such as protecting one’s turf.

While a firm’s capability is a necessary condition for implementing DSS, it is far from sufficient for DSS success. DSS implementation depends on the voluntary commitment of personnel. A DSS is useful for problem finding, problem solving, and knowledge development (see Fig. 5). IS were traditionally viewed as static systems that help routine decision making, and not as dynamic learning systems that can help in organizational learning. A more complete view of the linkages from decision aid, through decision process, to decision-making effectiveness has produced a model in which DSS performance is dependent on DSS strategy, which in turn depends on the interaction of factors such as DSS capability, task, perceived effort, expenditure, and perceived accuracy [36].

Studies have identified key factors that enable or inhibit successful adoption, such as IS interface design,

system functionality, and user lack of aptitude and motivation to learn new skills and roles. For example, a review of 41 IT implementation cases identified six areas of resistance (user, task, development process, system and organizational) and proposed a conceptual model of the relationship between implementation resistance and success [33].

3.5.1. Accounting perspective

Accounting researchers have thoroughly examined the costs and benefits of particular DSS such as activity-based costing (ABC) and multiple performance measurement systems (e.g. balanced scorecard). Table 1 presents a dichotomy of their direct and indirect benefits.

Most present value analyses of IT attempt to quantify the indirect benefits of learning, etc. Such indirect benefits are likely to translate into more tangible returns as they help the firm develop a competitive advantage and innovative capability (e.g., allow faster responses to change). The challenge for management is to quantify these benefits in terms of their links to the indirect benefits of IT investment.

Accounting research can enrich our understanding of the decision aid/benefits of IS in two ways: (i) work on accounting-related judgment and decision-making and (ii) feedback on benefits that can be gained from a DSS.

First, we need to understand the limitations and biases that are associated with storing, searching, and retrieving information, and the use of it in decision-making. Differences in the judgment of managers (e.g., their accuracy) have been attributed to cognitive mechanisms, such as framing and their personal characteristics, such as experience and education [2], and the task, such as type of incentives, feedback [10], time pressure, and the quantity and dimensionality of

Table 1
 Benefits of decision support systems (DSS)

	Quantifying the benefits of DSS	Examples of DSS examined in the accounting literature
Direct	Decision support system a. Problem finding—timeliness (e.g. ABC, balanced scorecard) b. Problem solving—accuracy, informed (e.g. greater information processing capability, more accurate knowledge maps (ABC, balanced scorecard)) c. Knowledge management—reduce knowledge transfer costs (e.g. leveraging span of control through more efficient organizational structure)	1. Strategic cost measurement systems (e.g. activity-based costing and total quality management) 2. Strategic performance measurement systems (e.g. balanced scorecard)
Indirect	Learning (competitive advantage) Transparent culture (innovative capability) Employee morale (decreased turnover)	

information available [34]. Recent studies have examined the cognitive bias associated with the use of multiple performance measurement information, such as that of the balanced scorecard. This has found that managers are prone to biases, such as a tendency to place more weight on common than unique measures [19] and outcome effects [11]. Researchers have examined the effectiveness of de-biasing mechanisms, such as accountability, experience, and counter explanation [16] in an attempt to improve understanding of the biases and to examine the mechanisms that may be effective in reducing them.

Second, there is a limited understanding of DSS value: does DSS use speed up the decision process or result in a superior decision? The large commitment of resources required for the development of an organizational knowledge base requires measures to help management assess IT benefits. Thus, metrics like the degree of access and the time spent in accessing and updating databases can be used to determine the degree of use of an IS and its sharing of information, and also whether this use is growing.

Recent studies of the lead-lag indicators in an organization's business model have highlighted the importance of including speed and magnitude to describe the various cause and effect linkages [14]. Better controls are also needed to provide a feedback loop for organizational learning [21].

3.6. Re-engineering

Information technology has been used in many ways to improve the performance of business operations. The traditional approach was to *automate* the business processes. Business process reengineering or business process change (BPC) has been both lauded and criticized [13]. IT creates an organizational culture that supports change, organizational learning, and external partnering; however, without major restructuring, the introduction of IT may not produce savings that are sufficient to justify the investment. BPC focuses on the networks of relationships both within and outside the organization.

Even if the need for organizational change is accepted, there may be disagreement about the specific changes that should be made and what benefits to expect [3].

IS researchers have proposed analytical models to quantify a variety of organizational issues, but the models tend to focus on understanding why managers initiate BPC [39] and what types of structural changes occur. For example, one decision-making model

combines the virtues of two theories, complexity and information processing, to suggest that tasks could be decomposed to a level at which the (increasing) marginal level of communication, coordination, and failure costs exceed the (decreasing) marginal gains from repetition (reduction in complexity) and savings in human processing and switching costs [27].

3.6.1. Accounting perspective

Effective BPC makes a person perform multiple tasks, but what is its implication for management control systems? Accounting researchers have used the *theory of complements* to help understand these and other problems that arise when organizations undertake major change. It is important to balance several control system choices made by corporate management: delegation, performance measurement, and incentives (see Fig. 6). This begins with the delegation of decision rights to people with private information, thereby boosting organizational adaptation and market responsiveness. Knowledge transfer costs are lower when decision-making rights are moved to individuals who operate at organizational edges [6].

Top management also needs to select its performance measures carefully. For example, objective measures reduce personal gains from influencing activities [29]. The choice of linking rewards to measures is important, especially when information asymmetries associated with delegation make managerial behavior costly or difficult to observe.

Accounting researchers have examined some relationships, such as delegation and incentives [26],

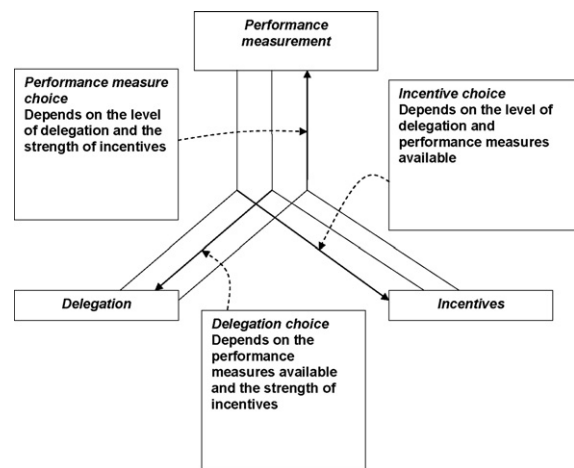


Fig. 6. Three-legged stool—balancing of organizational structure and control components.

Table 2
Information systems (IS) research streams from an accounting perspective

IS area	Problems—key question/s	Antecedents— cost–benefit drivers	Contribution of accounting— possible directions for future research
Chargeback	How can chargeback be used to balance (i) accountability, (ii) flexibility, and (iii) interdependency between IS service capacity/quality and user demand?	Firm strategy and location of innovation activities Information quality Service quality	What control mechanisms are appropriate to direct and motivate behavior in the innovative functions of the organization? Depends on the location of core competencies and the transparency of the underlying processes. For example, those areas that require greater (less) flexibility may need more informal (formal) controls such as behavioral (action or output) controls
Outsourcing	How can service quality be maintained? When and how can an outsourcing contract be structured? How can cooperation be facilitated?	Complexity of outsourcing results from (i) intangible nature, (ii) multiple stakeholders, and (iii) delivery of service over time -Mobility of time -Mobility of space -Reputation -Core competencies	What is the extent to which formal measures can be used to strengthen cooperative ties? What are the determinants of controls in facilitating the management of different networks?
Decision support systems (management process improvement)	How can the judgment and decision-making bias in the use of a DSS be overcome? How can the benefits of knowledge management be gained? How does a firm know when it gains from having a new DSS?	The lack of widespread use and integration of various decision support technologies exist due to (i) lack of appropriate incentive and support structure, and (ii) resistance to change	How can the use of de-biasing mechanisms help to improve the effectiveness of DSS? How can the use of leading performance indicators help to gauge the effectiveness of a DSS? This can help to improve the information provided in the DSS, and help management to understand the benefits (value) of a DSS
Re-engineering (operational process improvement)	How can organizational change be facilitated? How can structure and control in the organizational change process be balanced? There is little agreement about what macro and micro-level changes are needed to take full advantage of BPC	Macro level support structures Micro level support structures	How can the agency costs be balanced with the costs of knowledge transfer (location of authority) in the firm? Theory of complements and the integration of authority, measurement and rewards (i.e. three-legged stool) hold some promise for further research What controls are useful for firms that are undergoing discontinuous change?

delegation and performance measurement [1], and all three components [8]. Recently, work has begun on the effect of separable/inseparable performance measures and type of control system boundary (cooperative or competitive) on organizational strategy towards continuous or discontinuous process change [31].

4. Conclusion

We have applied an accounting perspective to four key areas of IS management: chargeback, outsourcing, DSS, and BPC. Table 2 summarizes the problems, antecedents, and contributions of the accounting literature to the areas.

The four areas represent only part of the overlapping interests between accounting and IS researchers. Since their literatures offer complementary insights on how to manage IT, we encourage accounting and IS researchers to pool their knowledge in order to further advance IS management scholarship.

We found that the existing IS chargeback literature encourages managers to consider outsourcing IS services. In contrast, accounting research highlights the tradeoff between user demand and IS support capacity. Both chargeback and outsourcing share the same conditions for IS success. Achieving this balance is important, but so is knowing when to tip the scale away from efficiency towards flexibility (and strategic value-adding activities). Tipping the scale in turn requires the use of alternative mechanisms to fill the chargeback void.

Meanwhile, the focus of IS outsourcing research has been on the initial decision and the terms of outsourcing contract. The understanding of how to manage the post-contracting stages of outsourcing remains limited. Applying a relationship networking perspective may be helpful to examine non-market based relationships between organizations. Accounting measures in the post-contracting environment can provide signals that help to maintain the psychological contract and to strengthen relational ties between the contracting parties.

With the outsourcing trend expected to continue, it is imperative to first understand its rationale – chargeback issues being one possibility – before trying to understand how it is to be managed or how to measure its effectiveness.

Nevertheless, the measurement and control of IS activities, whether in-house or outsourced, will remain challenging due to their intangible nature and it is critical to determine the right balance of IT investment between tangibles and intangibles.

The intangible nature of IT also affects how the benefits of IT for decision support and re-engineering are assessed. Understanding the lead-lag indicators in the organization's business model is a starting point for the design of DSS. Our review of accounting research on performance measurement showed how such indicators can be used to signal when an organization is benefiting from a new DSS. Ultimately, when a firm can measure the benefits of its DSS, it is better able to plan for investment that supports its continuing improvement.

In contrast to the DSS, BPC involves a significant change in the organization and structuring of activities. As such there is potential for the firm to reconsider its

authority and incentive structure to support the change. We found that accounting researchers have examined such components as a joint package that highlights the need to strike a balance between the delegation of authority, performance evaluation, and incentives. The opportunity to learn how the three components interact in supporting the transition process is yet to be fully explored in either accounting or IS research. For example, we perceive a need to restructure incentives and authority regimes to match the new, broader and more efficient channels of communication flows that are provided by IS. The notion of complementarities between these and other factors appears to be relevant to the successful implementation and use of IT.

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References

- [1] M.A. Abernethy, J. Bouwens, L. van Lent, Determinants of control system design in divisionalized firms, *The Accounting Review* 79 (3), 2004, pp. 545–570.
- [2] R. Ashton, A descriptive study of information evaluation, *Journal of Accounting Research* 19 (1), 1981, pp. 42–61.
- [3] M. Attaran, Exploring the relationship between information technology and business process reengineering, *Information & Management* 41 (5), 2004, pp. 585–596.
- [4] J.G. Birnberg, Control in interfirm co-operation relationships, *Journal of Management Studies* 35 (4), 1998, pp. 421–428.
- [5] P. Chalos, N.G. O'Connor, Determinants of the use of various control mechanisms in U.S.-Chinese Joint Ventures, *Accounting, Organizations and Society* 29 (7), 2004, pp. 591–608.
- [6] A.A. Christie, M.P. Joye, R.L. Watts, Decentralization of the firm: theory and evidence, *Journal of Corporate Finance* 9, 2003, pp. 3–26.
- [7] W.H. Delone, E.R. McLean, Information systems success: the quest for the dependent variable, *Information Systems Research* 3 (1), 1992, pp. 60–95.
- [8] E.A. Demers, M.B. Shackell, S.K. Widener, Performance Measures Across Multiple Management Perspectives in High-Tech Firms, Working Paper, University of Notre Dame, Notre Dame, IA, 2005.
- [9] A.R. Drake, S.F. Haka, S.P. Ravenscroft, Cost system and incentive structure effects on innovation, efficiency and profitability in teams, *The Accounting Review* 74 (3), 1999, pp. 323–346.
- [10] J. Frederickson, S. Pepper, J. Pratt, Performance evaluation judgments: effects of prior experience under different performance evaluation schemes and feedback frequencies, *Journal of Accounting Research* 37 (1), 1999, pp. 151–166.

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- [11] D. Ghosh, R.F. Lusch, Outcome effect, controllability and performance evaluation of managers: some field evidence from multi-outlet businesses, *Accounting, Organizations and Society* 25 (4/5), 2000, pp. 411–425.
- [12] H. Håkansson, J. Lind, Accounting and network coordination, *Accounting, Organizations and Society* 29 (1), 2004, pp. 51–72.
- [13] S. Heusinkveld, J. Benders, Surges and sediments: shaping the reception of reengineering, *Information & Management* 38 (4), 2001, pp. 239–251.
- [14] C.D. Ittner, D.F. Larcker, Assessing empirical research in managerial accounting: a value-based management perspective, *Journal of Accounting and Economics* 32, 2001, pp. 349–410.
- [15] T. Keller, L. Allen, Tipping toward chargeback, *Software Magazine* 13, 1993, pp. 121–122.
- [16] J. Kennedy, Debiasing the curse of knowledge in audit judgment, *The Accounting Review* 70 (2), 1995, pp. 249–273.
- [17] M.C. Lander, R.L. Purvis, C.E. McCray, W. Leigh, Trust-building mechanisms in outsourced IS development projects: a case study, *Information & Management* 41 (4), 2004, pp. 509–523.
- [18] J.N. Lee, The impact of knowledge sharing, organizational capacity and partnership quality in IS outsourcing success, *Information & Management* 38 (5), 2001, pp. 323–335.
- [19] M.G. Lipe, S. Salterio, The balanced scorecard: Judgmental effects of common and unique performance measures, *The Accounting Review* 75 (3), 2000, pp. 283–298.
- [20] L. Loh, N. Venkatraman, Diffusion of information technology outsourcing: influence sources and the Kodak effect, *Information System Research* 3, 1992, pp. 334–358.
- [21] J. Luft, M.D. Shields, Mapping management accounting: graphics and guidelines for theory-consistent empirical research, *Accounting, Organizations and Society* 28 (2–3), 2003, pp. 169–249.
- [22] M.G. Martinsons, R. Davison, D. Tse, The balanced scorecard: a foundation for the strategic management of information systems, *Decision Support Systems* 25 (1), 1999, pp. 71–88.
- [23] M.G. Martinsons, Outsourcing information systems: a strategic partnership with risks, *Long Range Planning* 26 (3), 1993, pp. 18–25.
- [24] M.G. Martinsons, A. Leung, Strategic information systems: a critical success factors model, *International Journal of Services Technology Management* 3 (4), 2002, pp. 398–415.
- [25] S.M. Miranda, C.B. Kavan, Moments of Governance in IS Outsourcing: A Theoretical Model, Working Paper, Florida Atlantic University, 2002.
- [26] V. Nagar, Delegation and incentive compensation, *Accounting Review* 77 (2), 2002, pp. 379–395.
- [27] L.V. Orman, A model management approach to business process reengineering, *Journal of Management Information Systems* 15 (1), 1998, pp. 187–212.
- [28] W.G. Ouchi, Markets, bureaucracies, and clans, *Administrative Science Quarterly* 25 (1), 1980, pp. 129–141.
- [29] C. Prendergast, The provision of incentives in firms, *Journal of Economic Literature* 37, 1999, pp. 7–63.
- [30] H.O. Rockness, M.D. Shields, Organizational control systems in research and development, *Accounting, Organization and Society* 9 (2), 1984, pp. 165–177.
- [31] C. Rowe, J.G. Birnberg, M.D. Shields, Effects of Organizational Process Change on Management Control Systems and Revelations of Managers' Private Knowledge. Working paper, Arizona State University, Phoenix, AZ, 2006.
- [32] J.A. Samuels, J.P. Steinbart, The Journal of Information Systems: a review of the first 15 years, *Journal of Information Systems* 16 (2), 2002, pp. 97–117.
- [33] K. Setzekorn, V. Sugumaran, N. Patnayakuni, A comparison of implementation resistance factors for DMSS versus other information systems, *Information Resources Management Journal* 15 (4), 2002, pp. 48–63.
- [34] M. Shields, Effects of information supply and demand on judgment accuracy: evidence from corporate managers, *The Accounting Review* 58 (2), 1983, pp. 284–303.
- [35] J. Teng, M. Cheon, V. Grover, Decisions to outsource information system functions: testing a strategy-theoretic discrepancy model, *Decision Sciences* 26 (1), 1995, pp. 75–103.
- [36] P. Todd, I. Benbasat, Evaluating the impact of DSS. Cognitive effort, and incentives on strategy selection, *Information Systems Research* 10 (4), 1999, pp. 356–374.
- [37] C. Tomkins, Interdependencies, trust and information in relationships, alliances and networks, *Accounting, Organization and Society* 26 (2), 2001, pp. 161–191.
- [38] J. Van der Meer-Kooistra, E.G.J. Vosselman, Management control of interfirm transactional relationships: the case of industrial renovation and maintenance, *Accounting, Organization and Society* 25 (1), 2000, pp. 51–77.
- [39] L.L. Wu, A model for implementing BPR based on strategic perspectives: an empirical study, *Information & Management* 39 (4), 2002, pp. 313–324.
- [40] J.L. Zimmerman, *Accounting for Decision Making and Control*, Irwin, New York, 1997 (Chapter 7).



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