Association for Information Systems
AIS Electronic Library (AISeL)

AMCIS 2011 Proceedings - All Submissions

8-7-2011

Power Interactions in Enterprise System Assimilation

Andrew Harris
Iowa State University, ajharris@iastate.edu

Brian Mennecke
Iowa State University, mennecke@iastate.edu

Follow this and additional works at: http://aisel.aisnet.org/amcis2011_submissions

Power Interactions in Enterprise System Assimilation

Andrew Harrison
Iowa State University
ajharris@iastate.edu

Brian Mennecke
Iowa State University
mennecke@iastate.edu

ABSTRACT

The assimilation of enterprise systems has extensive influence on power interactions within organizations. Previous assimilation research has typically focused on organizational-level assimilation processes, and the impact of individual characteristics, including personal power, has been overlooked. Social network analysis provides a useful way to empirically examine the changes to personal power during the acceptance, routinization, and infusion stages of the organizational assimilation processes. Enterprise system assimilation involves the empowerment of a firm's employees to utilize the technical capabilities of the system, and the employees' extensive business knowledge, to make effective strategic decisions. Nevertheless, power is multidimensional and the relative prominences of the idiosyncratic bases of power in organizational interactions vary asymmetrically in response to system assimilation. A longitudinal examination of the stages of assimilation using a valued network approach to study the power interactions of individuals within an organization can provide a valuable new perspective inside the assimilation process.

Keywords

Assimilation, Power, Enterprise System, Network, Social Network, Diffusion

INTRODUCTION

The value of an information system cannot be exploited until the system is assimilated into an organization (Armstrong and Sambamurthy, 1999). Users must learn to use a new system in effective ways before the deepest levels of assimilation can occur and strategic processes and decision-making are supported (Liang, Saraf, Hu, Xue, 2007; Liu, Feng, Hu, Huang, 2011). In an organizational assimilation context, power plays an important role in compliance decisions (Marwell and Schmitt, 1967). Social networking theories present a useful perspective on the critical transfer of knowledge in assimilation processes (Borgatti and Foster, 2003; Lane and Lubatkin, 2006).

Organizational assimilation occurs simultaneously with individual assimilation processes within an organization, but the relationship between individual assimilation and organizational assimilation is rarely examined (Liu et al., 2011). Social networking analysis techniques combine individual and organizational levels of analysis (Wasserman, 1994) and appear to be a useful tool for analyzing system assimilation. An examination of social networks within an organization along with the key characteristics of actors and the relationships between them will provide useful insights about organizational assimilation processes.

In this study, we examine the changes to the power dynamics within the social network structures that are affected by enterprise system assimilation. We provide a longitudinal analysis of the structural changes that occur within this power-based value network throughout the stages of system assimilation. We first examine extant literature about system assimilation, the bases of power, and the application of social network theories. Then, we propose a model to measure the changes to network power dynamics, which facilitate system-specific knowledge transfer throughout the assimilation process. Next, we offer predictions about the network power characteristics based on extant descriptions of the stages of system assimilation. Finally, we discuss the implications of the proposed model to theory and practice as well as future research directions.

THEORETICAL DEVELOPMENT

Assimilation Processes

The concept of assimilation as used in this paper consists of both exploratory and exploitative elements (March, 1991), based on the description of Purvis, Sambamurthy, and Zmud (2001), and describes assimilation as "The extent to which the use of technology diffuses across the organizational projects or work processes and becomes routinized in the activities of those projects and processes" (p. 121). There are three key facets of assimilation: volume, diversity, and depth (Liang et al., 2007; Massetti and Zmud, 1996). Our focus will be on depth, which refers to the way in which the technology is used, in contrast to how widespread the use is. Of import is the fact that deeper levels of system assimilation generally lead to improvements in performance (Armstrong and Sambamurthy, 1999).

It is important for us to view system use and assimilation as dynamic processes, and reflect upon the types of changes that occur within the organization as systems are assimilated. Organizations and the technologies they use both undergo adaptation processes; people change their work processes as they gain experience with new systems, and those systems are altered to fit with the needs of the organization (Majchrzak, Rice, Malhotra, King, Ba, 2000). Burton-Jones and Straub (2006) proposed that adapting a system to new exploitative uses leads to improved performance. Individuals reach the deepest levels of system assimilation as they become familiar and engaged with the technology, and these individuals become empowered with the authority and expertise to make higher-level decisions and changes. Assimilation provides value to the firm by empowering the firm's employees with both expertise and authority. As displayed in Figure 1, at deep levels of assimilation, users are engaged in processes that support organizational strategies and decision-making (Liu et al., 2011).

This process-oriented view of assimilation is consistent with Kouki, Poulin, and Pellerin (2007) in describing assimilation as the acceptance, routinization, and infusion phases of the Cooper and Zmud (1990) model of the ERP life cycle (Figure 2). The ERP lifecycle model (Kwon and Zmud, 1987; Lewin, 1948; Zmud and Apple, 1992) includes sequential phases of initiation, adoption, adaptation, acceptance, routinization, and infusion. The early phases of the ERP lifecycle are outside the scope of subsequent assimilation literature, and assimilation is generally considered to start after system implementation. This perspective is also consistent with the "shakedown" and "onward and upward" phases that follow implementation in the Markus and Tanis (2000) description of ERP system experience cycle.
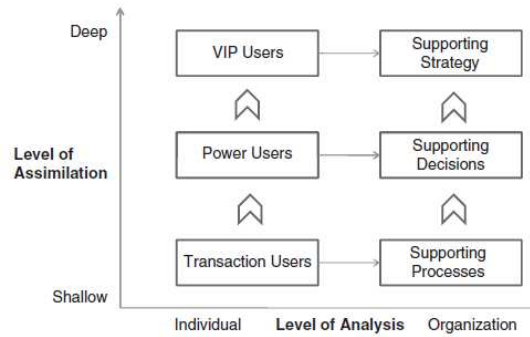
Figure 1. Individual and Organizational Assimilation (Liu et al., 2011)

Stages of Assimilation

Acceptance

After system implementation, an organization attempts to include new systems or processes in its normal operations by altering business practices, changing configurations, upgrading infrastructure, and training users (Markus and Tanis 2000). The network immediately following implementation will contain a small number of people with a fairly high degree of expertise (VIP users) and other network members will be dependent upon them. At this stage, members of the organization are being induced to use the new system (Cooper and Zmud, 1990) and use is not necessarily widespread. Individuals with a large social influence, whether through their formal authority within the organization or their informal influence among a social network, can play a critical role in the acceptance of a new system (Fichman, 2000). Most enterprise systems are modular (Davenport, 2004), and modularity produces clusters of expertise resulting in asymmetric adoption patterns.

Routinization

During the routinization stage, the use of a new system is encouraged as part of normal activity (Cooper and Zmud, 1990) and an organization starts to alter its directives (i.e., rules and policies) in accordance with the new technology. Following implementation the number of people in the network and the expertise of the VIP users increase, as does the dependency of most of the network on the VIPs. During this phase, old routines are phased out and organizations may make significant training expenditures (Markus et al. 2000). Routinization differs from acceptance in that the focus of this phase is on interweaving the new system into business processes.

Infusion

In the infusion phase, knowledge about the new system should be spread throughout the organization (Markus et al., 2000). After the system has been partially assimilated, some users will acquire more expertise and will loosen their dependencies on the VIP users and become power users. Mastery of the system will allow users more authority to make decisions in their respective areas. During infusion, organizations will integrate the new system into many facets of organizational work and structural changes are made that can encompass the entire firm (Cooper and Zmud, 1990). Infusion is different than the preceding stages because the new system is being utilized to a much greater extent and for strategic purposes.
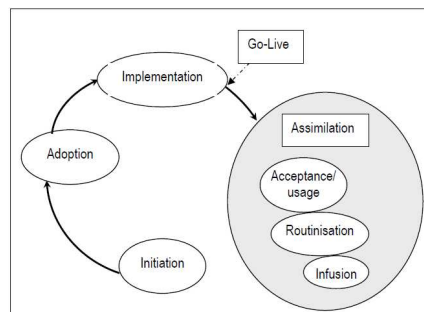

Figure 2. ERP Assimilation Process in Relation to Other Processes (Kouki et al., 2007)

Power Interactions

The examination of power within an organization is critical for understanding technological assimilation because enterprise systems facilitate the flow of information, are complex, and are used to exert control (Markus, 1983). Employees' behaviors change in response to system implementation and assimilation and users evaluate their power in respect to others within the organization (Joshi, 1991; Lapointe and Rivard, 2005). Strategic decision-making occurs at the deepest levels of assimilation and power plays a critical role in strategic decision-making (Child, 1972). Expertise is a form of power that improves problem-solving and strategic decision-making (Yetton and Bottger, 1982). In an organizational context, technological adoption is not usually independent between individuals Fichman (2000) and power plays an important role in compliance (Marwell and Schmitt, 1967). Employees may resist assimilation if they feel that the system will undermine their power (Lapointe and Rivard, 2005; Markus, 1983).

There are numerous forms of power, which can only be understood in specific contexts (Emerson, 1962). Influence, authority, power, and control are sometimes used interchangeably, but have distinct conceptual meanings in regards to organizational control (Tannenbaum, 1962). Table 1 explores the five main forms of social power (French and Raven, 1959). Expertise can refer to business expertise and technical expertise, depending on context (Swan, Newell, Scarbrough, Hislop, 1999). Most other forms of power are considered to be derivative of the five basic forms of social power. The deconstruction of power into these idiosyncratic dimensions is significant because assimilation empowers a firm's employees, but assimilation affects the bases of power in an asymmetric manner.

Form	Description	Example
Referent/Attraction/Prestige	The identification of one person with another.	An employee may use a system to impress a coworker.
Expertise	The perception one person has some special knowledge.	An accountant knows important regulatory rules.
Coercive	The perception that one person has the ability to mediate punishments on another.	An employee wears a hard hat to avoid being fined for safety violations.
Reward	The perception that one person has the ability to mediate rewards on another.	A factory worker is rewarded for improved performance using a system.
Positional/Formal Authority/Legitimate	The perception that a person has a legitimate right to prescribe behavior for another.	A worker uses a system because their boss told them to.
Dependency	The perception that a person aspires to goals where achievement is facilitated by another (Emerson 1962).	Before being able to use a system, an employee must get a login ID number from a member of the IT department.

Table 1. Forms of Power Based on French and Raven (1959).

Referent

Referent power represents social popularity and prestige, and is strongly related to the social networking concept of tie density. It represents the influence a person can have based on the identification others have with them (French and Raven, 1959). Prestige is a form of power that enables benefits derived from a wide range of contacts within and outside a firm (Finkelstein, 1992). In some circumstances, having a wealth of weak social ties can be more effective in diffusion processes (Granovetter, 1973). A popular person has a central position in many contexts and a central network position is considered to be important for accessing and sharing knowledge within a network (Hickson, Hinings, Lee, Schneck, Pennings, 1971; Tsai, 2001). However, in the context of assimilation, where volition is not assumed and ties are represented in the context of a specific system, other forms of power also influence network density. As a result, referent power is represented by the perceived popularity of an actor within the network and can manifest itself in the network structure.
Hypotheses 1: Deeper organizational system assimilation will not significantly change the use of the referent basis of power in intraorganizational interactions.

Expertise

Assimilation evaluates the depth and quality of use of a system, and expertise plays a prominent role during the deepest levels of assimilation. Individuals can wield power well beyond the reach of their formal authority through expertise or control of information (Mechanic, 1962). Enterprise system knowledge is complex and strong network ties are important for transferring complex knowledge (Hansen, 1999). Parties communicating about complex systems need a certain level of expertise to understand the information being communicated (Cohen and Levinthal, 1990; Zahra and George, 2002), and frame that individual's perception of the advantages offered by the technology (Agarwal and Prasad, 1997). Because expertise is context specific, a common practice for appraising expertise in IS contexts is to evaluate both business knowledge and technical knowledge separately. This paper examines the business expertise and technical expertise of actors within the organizational network. Business expertise is defined as knowledge of the underlying business processes associated with the use of the IS system while technical expertise is defined as knowledge of how the IS processes function. Technical expertise generally plays a role throughout the entire assimilation process while business expertise is only relevant to deeper levels of assimilation (i.e., users at the deepest levels will have a high degree of business and technical expertise).

Hypotheses 2A: Deeper organizational system assimilation will increase the use of technical expertise as a basis of power in intraorganizational interactions.

Hypotheses 2B: Deeper organizational system assimilation will increase the use of business expertise as a basis of power in intraorganizational interactions, but to a lesser extent than the increased use of technical expertise.

Coercive

Coercive power is the power to influence behavior through the use of punishment (French and Raven, 1959). Coercive power tends to be a riskier practice because of the potential for retaliation (Molm, 1997; Ireland and Webb, 2007). The process of influence takes place over time as members of a group, in turn, begin to change and influence others (French and Raven, 1959). Because coercive power would be used hesitantly in an organizational context when alternative bases of power are available, coercive power will be less likely to be used during the assimilation processes.

Hypotheses 3: Deeper organizational system assimilation will not significantly change the use of the coercive basis of power in intraorganizational interactions.

Reward

Reward and evaluation structures are important within a firm because it can be used to motivate behaviors. Those who are able to offer greater rewards in an exchange will have greater power (Blau, 1964). This type of power can manifest itself in cronyism when subordinates lack important skills but it can also produce loyalty systems built on cooperation. Within a social structure, loyalty systems use incentives to elicit support and cooperation (Granovetter, 2005) and align the incentives of individuals to create a sense of legitimacy and support for actions. This basis for power is less frequently examined in extant literature, but an implicit expectation is that people will use systems if they are rewarded for the use of that system; however, after rewards motivate initial use, incentives for system adoption are often reduced or discontinued.

Hypotheses 4: Deeper organizational system assimilation will reduce the use of the reward basis of power in intraorganizational interactions.

Positional

Positional power is the power derived from one's position within an organization, where there is a perception that a person has the legitimate authority to prescribe the behaviors of others (French and Raven, 1959). Formal authority within an organization is relevant to assimilation because formal authority addresses volition associated with the use of technology. Formal authority is an alternative source of power to expertise and structural position has a strong influence in a social network (Brass and Burkhardt, 1993). In the context of information systems assimilation, authority must be examined in two distinct contexts, authority over business processes and authority over technical processes (Grimes, 1978). This dual perspective of authority resolves conflicting opinions on the decision-making power provided by formal position within an organization. Top management support has a strong influence (Armstrong and Sambamurthy, 1999) but in many cases authorization processes occur only after diagnostic and evaluative processes, the most important parts of decision-making, are already completed (Mintzberg, Raisinghani, Theoret, 1976). Key network characteristics, such as network centrality and density, exhibit the uneven opportunities to available to network members (Cross and Cummings, 2004). We expect that both business process authority and technical process authority adjust as a result of enterprise system assimilation, with users in the deepest levels of assimilation exerting a high degree of influence in both business processes and technical processes.

Hypotheses 5A: Deeper organizational system assimilation will increase the use of technical-positional based power in intraorganizational interactions.

Hypotheses 5B: Deeper organizational system assimilation will increase the use of business-positional based power in intraorganizational interactions, but to a lesser extent than the increased use of technical-positional based power.

Dependency

Dependency is often considered to be the opposite of power (Emerson, 1962; Hickson et al., 1971); however, the relationship between power and dependency varies in regards to the level of mutual dependency between actors in a network (Casciaro and Piskorski, 2005). For example, the level of interdependency between users affects the use of highly-integrated systems (Gallivan, 2001). In general, power imbalance hinders the exchange relationships among actors (Casciaro and Piskorski, 2005). In addition to these factors, related to the volume facet of assimilation, dependency interactions also affect the depth of assimilation. As individuals migrate to the deepest levels of assimilation, they become empowered to independently support and make strategic decisions (Liu et al., 2011). Therefore it is important to examine how the interdependencies within the organization's social network change as increasing numbers of users become empowered through their use of enterprise systems.

Hypotheses 6: Deeper organizational system assimilation will reduce dependency in intraorganizational interactions.
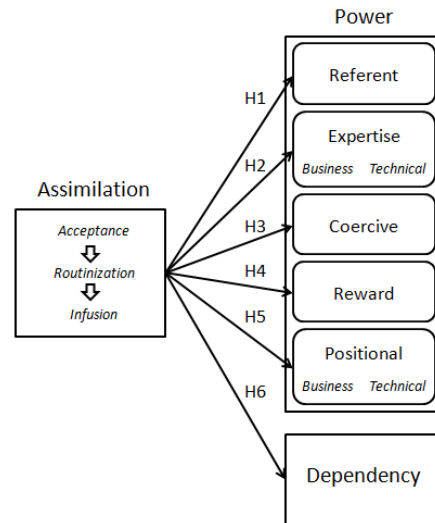

Figure 3. Model of Asymmetric Effects of Assimilation on Organizational Power Dynamics

Social Networks

Social networking theories have shown great promise in adding descriptive power in adoption research by describing important network characteristics within the organization (Sykes et al., 2009). Network characteristics can influence the rate at which a technology and new uses of a technology are adopted within an organization (Argote and Ingram, 2000; Papa, 1990). The measurement of key characteristics of organizational networks can provide empirical support for the changes that accompany organizational assimilation in the systems lifecycle (Cooper and Zmud, 1990; Markus and Tanis, 2000). Social network analysis overcomes constraints of traditional models of technological diffusion and assimilation in integrating multiple levels of analysis together and is useful in the context of assimilation because systems diffuse through the social relationships within the organization. There is an abundance of organizational-level research on assimilation while there is scant research examining the relationship between organizational and individual-level assimilation (Liu et al., 2011). The ability of social network analysis to examine the effects of organizational assimilation on the bases of power, which are individual-level constructs, effectively bridges this gap.

Adoption often occurs in stages, where management makes a consensus-based decision to utilize a new technology, and then dictates that users must adopt the new technology (Gallivan 2001; Zaltman, Duncan, Holbek, 1973). Traditional models of assimilation assume that adoption is not coerced, and do not examine the institutional and environmental pressures of conformity (Fichman, 2000). Recent diffusion and assimilation models (Liang et al., 2007; Liu et al., 2011; Sykes et al., 2009; Venkatesh, Morris, Davis, Davis, 2003) have already examined forms of coercive pressures and social influence to adjust for this issue. Research on the spread of ideas in viral marketing has shown that the diffusion of knowledge in a social network is an asymmetric process (Domingos, 2005). Social ties have idiosyncratic effects on adoption behavior depending on the stage of the decision process (DeBruyn and Lilien, 2004). A network structure is dynamic in nature, and employees reform their organizational networks to fit their functional needs (Majchrzak et al., 2000). An organization's structure

changes as a result of ongoing social interactions accompanying the adaptation of new technologies (DeSanctis and Poole, 1994). The stages of assimilation in the system lifecycle (Cooper and Zmud, 1990; Markus and Tanis, 2000) make natural demarcations in determining changes to the characteristics of the underlying networks. Longitudinal social network analysis allows the structural characteristics of the network and the individual characteristics of actors within the social network to be examined at the various stages in the assimilation process.
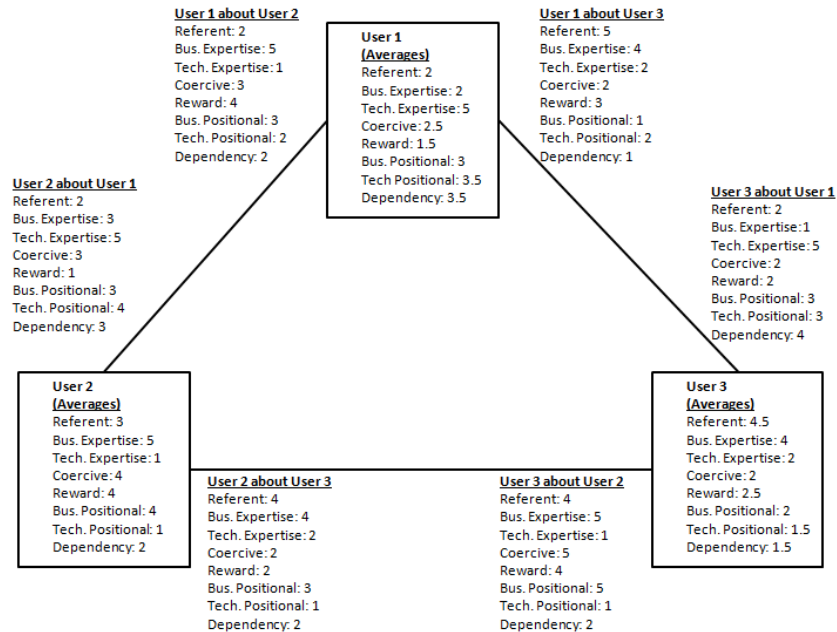

Figure 4: Valued Network Characteristics Example

The threshold model (Granovetter, 1978) and the MAPS model (Sykes et al., 2009) assign weights to specific individuals in accordance with key personal characteristics, and are the basis for the methodology used in this paper (Figure 4). Examining power dynamics in accordance with the acceptance, routinization, and infusion stages of the system lifecycle (Cooper and Zmud, 1990; Kouki et al., 2007), presents a clearer understanding of an organization's assimilation mechanisms. Network analysis is an effective method of conceptualizing organizations that empirically captures dynamic aspects of the organizations over time (Tichy, Tushman, Fombrun, 1979). The MAPS model developed by Sykes et al. (2009) uses a social network with weighted traits to extend user acceptance models based on perceived ease of use and perceived usefulness (Ajzen and Fishbein, 1969; Davis, 1989; Rogers, 1962; Venkatesh et al., 2003). Power-based traits were selected for their relevance to the context of enterprise system assimilation (Borgatti and Cross, 2003), and are used to weight the strength of social ties. This process transforms the proposed model from a conventional organizational communication network into a context-specific network structure for measuring the saliency of power interactions during the assimilation process. In this manner, statistical analysis of the network measures of density and centrality for the bases of power can be compared to the stages of assimilation, which is based on conceptual items proposed in previous assimilation research (Liang et al., 2007; Liu et al., 2011).

Using this model, the valued network density and centrality are calculated from a set of social network matrices, with each matrix representing a different basis of power (Bonacich, 1987; Sykes et al. 2009). Employees with high valued network density and centrality indices represent employees that are the most empowered in respect to the relevant basis of power. The average of valued network density and centrality measures increase for bases of power that become more salient in interactions at deeper levels of organizational assimilation. The valued network density and centrality measures decrease for bases of power that are less salient in interactions at deeper levels of assimilation. This analysis compares groups of variables, with 3 variables representing the stages of assimilation and a set of 8 variables representing the network values for the bases of power, with distinctions between the technical and business dimensions of expertise and positional power. An appropriate methodology for analyzing the relationships between the various valued network densities and centralities is canonical correlation (Johnson and Wichern, 1982). An analysis of canonical factor loadings allows the comparison between these two groups of variables, where the variables with high correlation values with the canonical variates have the most in

common. Following the recommendations of Stevens (1986), the number of cases should exceed 220 for this study. Data will be collected from a medium sized sales firm implementing a new enterprise-wide customer relationship management and business intelligence system. Because enterprise system assimilation is a lengthy process, data will be collected in a series of 6 longitudinal installments that measure employees' use and satisfaction with the new system over a period of 2 years following system implementation.

CONCLUSION

We have discussed how social network theories can be used to examine changes to intraorganizational power dynamics as a result of enterprise systems assimilation. Enterprise systems can be costly endeavors for organizations, and a more thorough understanding of enterprise system assimilation can improve the value organizations derive from these systems. Key characteristics of social networking analysis make it a useful method for expanding traditional models of assimilation. Characteristics of enterprise systems, including the alignment of organizational boundaries with system-specific functional boundaries, simplify the application of social networking theories. A social network model, weighted by power interactions, will improve the accuracy of assimilation process models, and provide empirical data describing organizational changes to power interactions during the acceptance, routinization, and infusion stages of system assimilation. Better understanding of these intraorganizational power interactions may improve an organization's ability to derive value from its enterprise systems.

REFERENCES

1. Agarwal, R. and Prasad, J. (1997) The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies, *Decision Sciences*, 28**,** 3, 557.

2. Ajzen, I. and Fishbein, M. (1969) The prediction of behavioral intentions in a choice situation, *Journal of Experimental Social Psychology,* 5, 400-416.

3. Argote, L. and Ingram, P. (2000) Knowledge Transfer: A Basis for Competitive Advantage in Firms, *Organizational Behavior and Human Decision Processes*, 8, 1, 150-169.

4. Armstrong, C. P. and Sambamurthy, V. (1999) Information technology assimilation in firms: The influence of senior leadership and IT infrastructures, *Information Systems Research*, 10,4, 304.

5. Blau, P. (1964) Power and Exchange in Social Life, Wiley, New York.

6. Borgatti, S. P. and Cross, R. (2003) A Relational View of Information Seeking and Learning in Social Networks, *Management Science*, 49, 4, 432-445.

7. Borgatti, S. P. and Foster, P. C. (2003) The Network Paradigm in Organizational Research: A Review and Typology, *Journal of Management*, 29, 6, 991-1013.

8. Brass, D. J. and Burkhardt, M. E. (1993) Potential Power and Power Use: An Investigation of Structure and Behavior, *The Academy of Management Journal*, 36, 3, 441-470.

9. Burton-Jones, A. and Straub, D. W. (2006) Reconceptualizing system usage: An approach and empirical test, *Information Systems Research*, 17, 3, 228-246.

10. Casciaro, T. and Piskorski, M. J. (2005) Power Imbalance, Mutual Dependence, and Constraint Absorption: A Closer Look at Resource Dependence Theory, *Administrative Science Quarterly*, 50, 2, 167-199.

11. Child, J. (1972) Organizational structure, environment and performance: the role of strategic choice, *Sociology*, 6, 1, 1.

12. Cohen, W. M. and Levinthal, D. A. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, 35, 1, 128-152.

13. Cooper, R. B. and Zmud, R. W. (1990) Information Technology Implementation Research: A Technological Diffusion Approach, *Management Science*, 36, 2, 123-139.

14. Cross, R. and Cummings, J. N. (2004) Tie and Network Correlates of Individual Performance in Knowledge-Intensive Work, *The Academy of Management Journal*, 47,6, 928-937.

15. Davenport, T. H. (2004) Enterprise systems and ongoing process change, *Business Process Management Journal*, 10, 1, 16.

16. Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, 13, 3, 319-340.

17. DeBruyn, A. and Lilien, G. (2004) A multi-stage model of word-of-mouth through electronic referrals, Pennsylvania State University.

18. DeSanctis, G. and Poole, M. S. (1994) Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory *Organization Science*, 5, 2, 121-147.

19. Domingos, P. (2005) Mining social networks for viral marketing, *IEEE intelligent systems*, 20, 1, 80.

20. Emerson, R. M. (1962) Power-Dependence Relations, *American Sociological Review*, 27, 1, 31-41.

21. Fichman, R. (2000) The diffusion and assimilation of information technology innovations, *Framing the Domains of IT Management: Projecting the Future through the Past*, R. W. Zmud, Pinnaflex Publishing, Cincinnati.

22. Finkelstein, S. (1992) Power in Top Management Teams: Dimensions, Measurement, and Validation, *The Academy of Management Journal*, 35, 3, 505-538.

23. French, J. R. P. and Raven, B. (1959) The bases of social power, *Studies in Social Power*, Ed. D. Cartwright, Institute for Social Research, Ann Arbor, 150-167.

24. Gallivan, M. J. (2001) Organizational adoption and assimilation of complex technological innovations: development and application of a new framework, *Database for Advances in Information Systems*, 32, 3, 85.

25. Granovetter, M. (1973) The Strength of Weak Ties, *The American Journal of Sociology,* 78, 6, 1360-1380.

26. Granovetter, M. (1978) Threshold Models of Collective Behavior, *The American Journal of Sociology*, 83, 6, 1420-1443.

27. Granovetter, M. (2005) The Impact of Social Structure on Economic Outcomes, *The Journal of Economic Perspectives*, 19, 1, 33-50.

28. Grimes, A. J. (1978) Authority, Power, Influence and Social Control: A Theoretical Synthesis, *The Academy of Management Review*, 3, 4, 724-735.

29. Hansen, M. T. (1999) The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits, *Administrative Science Quarterly*, 44, 1, 82-111.

30. Hickson, D. J., Hinings, C. R., Lee, C. A., Schneck, R. E., Pennings, J. M. (1971) A Strategic Contingencies' Theory of Intraorganizational Power, *Administrative Science Quarterly*, 16, 2, 216-229.

31. Ireland, R. D. and Webb, J. W. (2007) A multi-theoretic perspective on trust and power in strategic supply chains, *Journal of Operations Management*, 25, 2, 482-497.

32. Johnson, R. A. and Wichern, D. W. (1982) Applied Multivariate Statistical Analysis, Prentice Hall, Englewood Cliffs.

33. Joshi, K. (1991) A Model of Users' Perspective on Change: The Case of Information Systems Technology Implementation, *MIS Quarterly*, 15, 2, 229-242.

34. Kouki, R., Poulin, D., Pellerin, R. (2007) ERP Assimilation Challenge: An Integrative Framework for a Better Post-Implementation Assimilation, *Journal of Operations and Logistics*, 1, 3, V1-V16.

35. Kwon, T. H. and Zmud, R. W. (1987) Unifying the fragmented models of information systems implementation. *Critical issues in information systems research*, John Wiley and Sons, Inc. 227-251.

36. Lane, P. J. and Lubatkin, M. (1998) Relative absorptive capacity and interorganizational learning, *Strategic Management Journal,* 19, 5, 461-477.

37. Lapointe, L. and Rivard, S. (2005) A Multilevel Model of Resistance to Information Technology Implementation *MIS Quarterly*, 29, 3, 461-491.

38. Lewin, K. (1948) Group decision and social change, *Readings in social psychology*, T. M. Newcomb and E. L. Hartley, Henry Holt, New York, 330-341.

39. Liang, H., Saraf, N., Hu, Q., Xue, Y. (2007) Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management, *MIS Quarterly*, 31, 1, 6.

40. Liu, L., Feng, Y., Hu, Q., Huang, X. (2011). From transactional user to VIP: how organizational and cognitive factors affect ERP assimilation at individual level, *European Journal of Information Systems*, 1-16.

41. Majchrzak, A., Rice, R. E., Malhotra, A., King, N., Ba, S. (2000) Technology Adaptation: The Case of a Computer-Supported Inter-Organizational Virtual Team, *MIS Quarterly*, 24, 4, 569-600.

42. March, J. G. (1991) Exploration and Exploitation in Organizational Learning, *Organization Science*, 2, 1, 71-87.

43. Markus, M. L. (1983). Power, politics, and MIS implementation, *Communications of the ACM*, 26, 6, 430-444.

44. Markus, M. L., Axline, S., Petrie, D., Tanis, C. (2000) Learning from adopters experiences with ERP: problems encountered and success achieved, *Journal of Information Technology*, 15, 4, 245.

45. Markus, M. L. and Tanis, C. (2000) The enterprise systems experience-from adoption to success, In *Framing the Domains of IT Management: Projecting the Future Through the Past*, R. W. Zmud**:** 173-207.

46. Marwell, G. and Schmitt, D. R. (1967) Dimensions of Compliance-Gaining Behavior: An Empirical Analysis, *Sociometry*, 30, 4, 350-364.

47. Massetti, B. and Zmud, R. W. (1996) Measuring the Extent of EDI Usage in Complex Organizations: Strategies and Illustrative Examples *MIS Quarterly*, 20, 3, 331-345.

48. Mechanic, D. (1962) Sources of Power of Lower Participants in Complex Organizations, *Administrative Science Quarterly*, 7, 3, 349-364.

49. Mintzberg, H., Raisinghani, D., Theoret, A. (1976) The Structure of "Unstructured" Decision Processes, *Administrative Science Quarterly*, 21, 2, 246-275.

50. Papa, M. J. (1990) Communication network patterns and employee performance with new technology, *Communication research*, 17, 3, 344.

51. Purvis, R. L., Sambamurthy, V., Zmud, R. W. (2001) The Assimilation of Knowledge Platforms in Organizations: An Empirical Investigation *Organization Science*, 12, 2, 117-135.

52. Rogers, E. M. (1962) Diffusion of innovations, The Free Press, New York.

53. Sabherwal, R., and Chan, Y. E. (2001) Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders, *Information Systems Research*, 12, 1, 11.

54. Stevens, J. (1986) Applied multivariate statistics for the social sciences, Erlbaum, Hillsdale.

55. Sykes, T. A., Venkatesh, V., Gosain, S. (2009) Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use, *MIS Quarterly*, 33, 2, 371-393.

56. Swan, J., Newell, S., Scarbrough, H., Hislop, D. (1999) Knowledge management and innovation: networks and networking, *Journal of Knowledge Management*, 3, 4, 262.

57. Tannenbaum, A. S. (1962) Control in Organizations: Individual Adjustment and Organizational Performance, *Administrative Science Quarterly*, 7, 2, 236-257.

58. Tichy, N. M., Tushman, M. L., Fombrun, C. (1979) Social Network Analysis for Organizations, *The Academy of Management Review*, 4, 4, 507-519.

59. Tsai, W. (2001) Knowledge Transfer in Intraorganizational Networks: Effects of Network Position and Absorptive Capacity on Business Unit Innovation and Performance, *The Academy of Management Journal*, 44, 5, 996-1004.

60. Venkatesh, V., Morris, M. G., Davis, G. B., Davis, F. D. (2003) User acceptance of information technology: Toward a unified view, *MIS Quarterly*, 27, 3, 425-478.

61. Wasserman, S. (1994) Social network analysis: Methods and applications, Cambridge University Press, Cambridge.

62. Yetton, P. W. and Bottger, P. C. (1982) Individual versus group problem solving: An empirical test of a best-member strategy, *Organizational Behavior and Human Performance*, 29, 3, 307-321.

63. Zahra, S. A. and George, G. (2002) Absorptive Capacity: A Review, Reconceptualization, and Extension, *The Academy of Management Review,* 27, 2, 185-203.

64. Zaltman, G., Duncan, R., Holbek, J. (1973) Innovations and Organizations, John Wiley & Sons, New York.

65. Zmud, R. W. and Apple, L. E. (1992) Measuring technology incorporation/infusion, *The Journal of Product Innovation Management*, 9, 2, 148.