

Organizational Factors Affecting Knowledge Sharing Capabilities in E-Government: An Empirical Study

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Introduction

E-government, a concept that emerged in the late 1990s, is facing challenging opportunities for improving public service delivery to individual citizens. The Internet, the World Wide Web, and other digital tools are transforming the ways in which business, the public, and government communicate, and altering citizen demand for government service delivery (Council for Excellence in Government [CEG], 2000; Stowers, 2002; Strover & Straubhaar, 2000). Public expectations for fast and convenient service delivery and institutional needs for efficiency are motivating agencies to experiment with e-government ventures (CEG, 2000; Center for Technology in Government [CTG], 1999; National Electronic Commerce Coordinating Council [NECCC], 2000a). Modesitt (2002) and Greeves (2000) are among a growing number of researchers taking note of government use of the Internet, Geographic Information Systems (GIS), and Web technologies to establish external collaboration, civic engagement, networking, and customer service. E-government services are clearly expanding and will continue to do so; the speed at which the expansion occurs will be limited only by the speed at which technical and financial capacities evolve and organizational/managerial philosophies emerge.

There is an increasing emphasis on the importance of knowledge management beyond information system management in both the private and public sectors (Barquin, Bennet & Remez, 2001; Davenport, Long & Beers, 1998; Davenport & Prusak, 1999; Gold, Malhotra & Segars, 2001; Ruggles, 1998; Quigley & Debons, 1999; Thurow, 1999). Specifically, the application of advanced information technology to public service has brought new attention to the ability of government agencies to coordinate and enable the creation, integration, management, sharing, and transfer of information within agencies and in governmental networks. The importance of knowledge sharing in e-government has been emphasized in public administration along with the emerging discourse of network governance and network management. However, despite considerable research emphasis on information management and e-government, there has been little research pertaining to a systematic analysis of the organizational factors affecting knowledge sharing capabilities in the public sector.

The purpose of this paper is to analyze how organizational structure, culture, and information technology influence knowledge sharing capabilities in public organizations. To enhance our understanding of the organizational factors affecting knowledge sharing in public organizations, survey questionnaires were sent to employees in five national government agencies in South Korea to elicit their opinions on how organizational structure, culture, and information technology influence knowledge sharing capabilities. The five government agencies selected for this exploratory study have established knowledge management systems as well as information technology infrastructures for e-government services. According to a United Nation (UN) survey of e-government projects in 2001, South Korea ranked 15th among 98 nations working to expand their e-government capacities (UN and American Society for Public Administration, 2001). This is an important trend in that country, since the percentage of South Korean citizens with Internet access has expanded from 6.8 in 1998 to 51.5 in 2001 (Gang, 2002). Since 1987, the Korean government has established an information technology infrastructure that includes 3 national, 16 metropolitan and provincial, and 232 city, county, and district government networks. Following the development of this IT infrastructure, the South Korean legislature passed a 2001 law promoting the establishment of e-government services.

The results from a multiple regression analysis of the collected data will be presented, followed by a discussion of the major findings and their implications for knowledge sharing capabilities in government. The paper concludes with several suggestions for improving knowledge management in e-government and future research.

Literature Review and Research Model

Knowledge Sharing Capabilities and Organizational Factors

Davenport and Prusak (1999) define knowledge as a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. They note that in organization, knowledge often becomes embedded not only in documents but also in organizational routines, processes, practices, and norms. As knowledge is a central resource of government service, effective knowledge sharing in the public sector is a significant public management challenge for providing excellence in public service. Particularly, knowledge-sharing capabilities are considered key to the success of e-government to meet the needs and demands of constituencies in all levels of government. The creation of knowledge sharing capabilities in public organizations requires dissemination of individual employees' work-related experiences and collaboration between individuals and between subsystems of the organization. In addition, collaboration with other agencies and stakeholders is the basis for improving knowledge sharing capabilities (Dyer, 1997; Inkpen & Beamish, 1997) in the public sector. Several researchers (Davenport & Klahr, 1998; Grant, 1996) suggest that combining or integrating knowledge in different parts of the organization reduces redundancy, enhances consistent representation, and improves efficiency by eliminating excess volume.

This paper explores how three organizational factors as independent variables influence knowledge sharing capabilities in public organizations (see Figure 1). These three variables are organizational culture (vision and goals, trust, and social networks), organizational structure (centralization, formalization, and performance-based reward systems), and information technology (IT application usage and end-user focus).

Organizational Culture: Scholars indicate that organizational culture is central to an organization's ability to manage its knowledge more effectively (Davenport & Klahr, 1998; Davenport, DeLong, & Beers, 1998; DeLong, 1997). Three components of organizational culture receiving consistent attention related to effective knowledge management include clear organizational vision and goals (Leonard, 1995; Kanter, Stein, & Jock, 1992), trust (Von Krogh, 1998; O'Dell, & Grayson, 1998; Kanter, Stein, & Jock, 1992) and social networks (Leonard & Sensiper 1998; O'Dell & Grayson, 1998). As noted by Leonard (1995), an important component of culture is organizational vision. Several scholars also note that the overall vision generates a clear organizational purpose so that it can achieve its desired future goals (Kanter, Stein, & Jock, 1992). Clear organizational vision and goals are also important to engender a sense of involvement and contribution among employees (Davenport, Jarvenpaa, & Beers, 1996; O'Dell & Grayson, 1998).

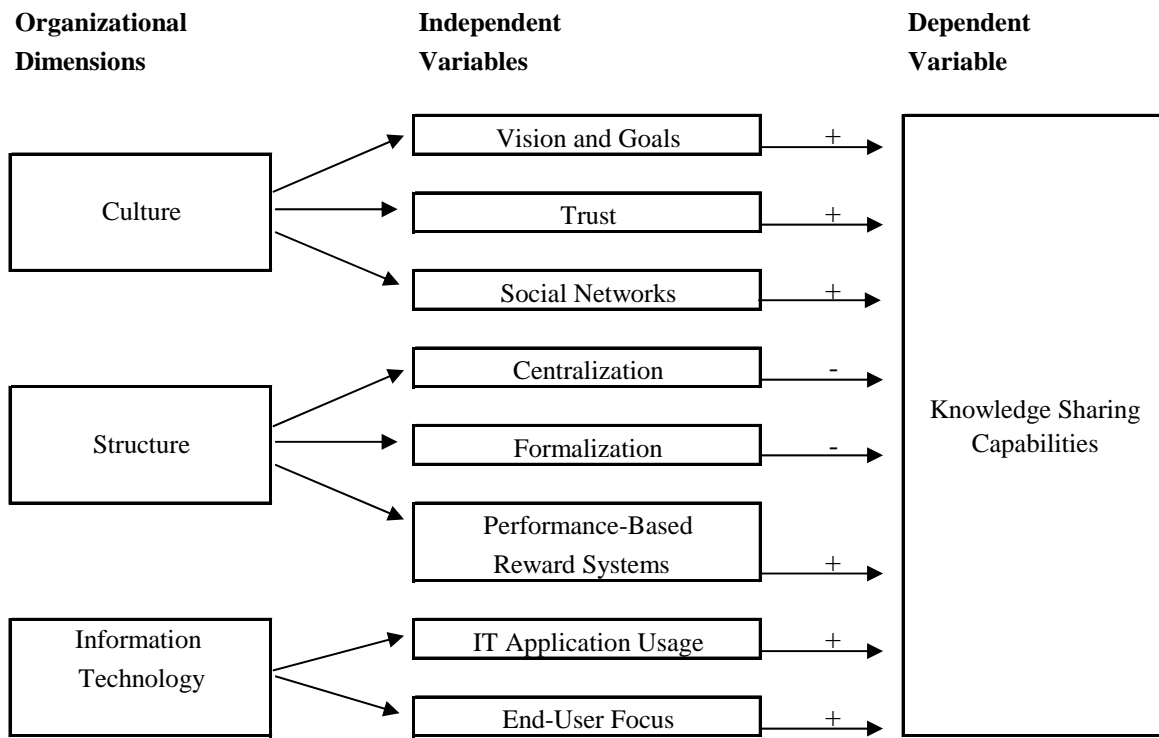
Along with clear organizational vision and goals, Von Krogh (1998) suggests that trust and openness in organizational culture promote employees' active knowledge management behaviors. Scholars and practitioners also indicate that communications, dialogue, and interaction between individuals or groups are important to support and to encourage employees' knowledge-related activities (Leonard & Sensiper, 1998; Levinthal & March, 1993; O'Dell & Grayson, 1998). Especially, formal and informal relationships and contacts are important for sharing different perspectives and knowledge in organizations (O'Dell & Grayson, 1998). In this

study we explored how organizational culture, including vision and goals, trust, and social networks affect employee's knowledge sharing activities.

Organizational Structure: The present study includes three variables of organizational structure dimension, including centralization, formalization, and performance-based reward systems. Organizational structure has often had the unintended consequence of inhibiting collaboration and sharing of knowledge across internal organizational boundaries (O'Dell & Grayson, 1998). Creed and Miles (1996) also note that a hierarchical structure in government limits active knowledge sharing activities and communication between employees or between employees and supervisors. O'Dell and Grayson (1998) agree that organizational structures should be designed for flexibility (as opposed to rigidity) to encourage sharing and collaboration across boundaries within the organization and across the supply chain. However, this effect can also be achieved by maintaining the formal hierarchical structure while adding the dimension of flexibility (Nonaka & Takeuchi, 1995). Nonaka and Takeuchi (1995) indicate that a combination of a formal organizational structure and a non-hierarchical, self-organizing organizational structure would improve knowledge creation and sharing capabilities. Another important variable related to organizational structure dimension in which this study is interested is a performance-based reward system. Leonard (1995) argues that organizational reward systems can determine how knowledge is accessed and how it flows in organizations. Several scholars note that incentive systems should be in place to promote employees' motivation for taking the time to generate new knowledge (i.e., learn), share their knowledge, and help others outside their own divisions or functions (Argote & Epple 1990; O'Dell & Grayson, 1998). In this present study we explored how the degree of organizational centralization, formalization, and performance-based reward systems affect employee's knowledge sharing capabilities.

Information Technology: Scholars also emphasize information technology infrastructure as an element crucial to the linkage of information and knowledge integration in organizations (Argyris & Schon, 1978; Duncan, 1972; Teece, 1998). In order to build knowledge sharing capabilities, the organization must develop a comprehensive infrastructure that facilitates the various types of knowledge and communication. Several dimensions of the technology infrastructure analyzed by Grant (1996) and Leonard (1995) include business intelligence, collaboration, distributed learning, knowledge discovery, knowledge mapping, opportunity generation, and security. Specifically, Leonard (1995) notes that knowledge mapping technologies allow an organization to track its sources of internal and external knowledge so that individuals in need of a specific type of knowledge know where it resides. As the five government agencies selected for this exploratory study have established knowledge management systems and information technology infrastructures for e-government services, the present study analyzed how employees' usage of IT application affects their KS activities in the organization. Another important component of information technology related to knowledge sharing is the level of end-user focus of information system development. In order to improve knowledge management capabilities in organizations, information systems and software should be developed to promote easy use and application by end-users (King, 1999; Branscomb & Thomas, 1984). This study explored the impact of end-user friendly information systems on employees' knowledge sharing capabilities.

Figure 1. Research Model



Research Method

Sample Selection and Survey Administration

The study incorporated data from a 2003 survey of public employees working in five national government agencies in South Korea: Ministry of Government Affairs and Administration, Ministry of Information and Telecommunication, Ministry of Justice, Ministry of Science and Technology, and Ministry of Culture and Tourism. A reason for the selection of these five agencies was that these government agencies have adopted knowledge management systems and information technology infrastructures for e-government services. All of the survey respondents indicated that their agency has established Internet based e-government services, Intranet, electronic data management systems, and knowledge management systems.

The authors sent letters to each organization explaining the purpose of the study and requesting assistance in distributing the survey. Survey samples were constructed from information provided by our contacts at each organization, who helped us select 40 employees representing a diverse range of positions and age groups. Surveys were hand-delivered to the five government agencies in August, 2003 by one of the authors. From the total sample of 200 survey questionnaires, 167 completed questionnaires were returned; 5 were discarded as being incomplete. Hence, the final number of usable questionnaires was 162—a response rate of 81 percent.

Survey Measures and Items

The self-administered survey instrument was designed to elicit information on employee perceptions of organizational culture, structure, information technology, and knowledge sharing capabilities, as well as demographic information. In order to measure knowledge sharing activities, three sub-dimensions of knowledge sharing were developed: a) knowledge sharing between employees; b) ease of employee access to documents, information, and knowledge held by other divisions; and c) KS among groups and teams within the same organization. To assess the validity of our research model, measures of the three sub-dimensions of organizational structure (centralization, formalization, and reward systems), three sub-dimensions of culture (vision and goals, trust, and social networks), and two sub-dimensions of information technology (IT application usage and end-user focus) were developed. Multiple-item measures were used for all of the variables to improve the reliability and validity of the measures. These measures are largely derived from the literature on knowledge management. In addition, responses were recorded using a seven-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree).

Coefficient alpha reliability estimates for all of the variables were arranged from .75 (formalization) to .93 (vision and goals). All of the coefficient alpha reliability estimates are included in Table 1 below. The three demographic information questions included in the survey were years of work, position, and education.

Findings

The majority of respondents (68.5 %) worked in administration positions. There were 32 employees (19.8%) reporting themselves as information technology professionals. Only 22 respondents (13.6%) were female. In terms of age, the sample ranged from the twenties to over fifty, but more than thirty percent of respondents were over forty years old (33.3%). The distribution for work experience in the current department was: less than 5 year: 15.5 %; 5-10 years: 22.3 %; 11-15 years: 32 %; 16-20 years: 16 %; and 21 years or more: 14.2 %. The majority of respondents reported having a college degree, with 18.5 percent holding graduate or professional degrees. Position levels ranged as follows: lower level (Grade 9-8): 13.5 %; middle level (Grade 7-6): 51.8 %; and higher level (Grade 5-4): 34.6 %.

Descriptive statistics and correlation coefficients indicate that the majority of the zero-order correlations were statistically significant at $p < 0.01$. All of the measures appeared to be relatively distinct; the largest correlation (between organizational vision and performance-based reward systems) was .52. Mean scores for visions and goals (4.50), trust (4.95), formality (4.51), IT application utilization (4.98), and end-user focus (4.53) were relatively high, but scores for social networks (3.93), centralization (3.93), performance-based reward systems (3.30), and knowledge sharing activities (3.82) were relatively low.

Table 1. Descriptive Statistics, Reliabilities, and Correlations

	Mean (s.d)	1	2	3	4	5	6	7	8	9	
1. Visions & goals	4.50 (1.20)	1.0	(.93)								
2. Trust	4.95 (1.0)	.48**	1.0	(.81)							
3. Social network	3.93 (1.11)	.46**	.46**	1.0	(.85)						
4. Centralization	3.93 (1.21)	-.41**	-.32**	-.28**	1.0	(.85)					
5. Formalization	4.51 (0.94)	-.03	-.04	.09	.45**	1.0	(.75)				
6. Performance based reward systems	3.30 (0.87)	.52**	.26**	.50**	-.30**	-.05	1.0	(.83)			
7. IT application usage	4.98 (1.49)	.18*	.28**	.21**	-.15	.04	.04	1.0	(.86)		
8. End-user focus	4.53 (1.11)	.37**	.47**	.45**	-.25**	.14	.34**	.36**	1.0	(.82)	
9. Knowledge sharing	3.82 (1.20)	.32**	.24**	.45**	-.30**	-.06	.43**	.38**	.40**	1.0	(.89)

N=162; * $p < .05$, ** $p < .001$

Multivariate Analysis

Results from an ordinary-least square (OLS) multiple regression analysis for the five organizations appear in Table 2. The equation achieved statistical significance at the .001 level. Among the variables of organizational culture, the variable of social networks was positively associated with high levels of knowledge sharing activities: the results showed that employees who perceived high degrees of social networks reported higher levels of knowledge sharing capabilities than employees who did not ($p < .01$). Statistical support was also found for organizational structure dimension. Government employees who perceive a high level of performance-based reward systems are more likely to express higher levels of knowledge sharing activities ($p < .01$). Moreover, the regression analysis results showed that employees who perceive a high level of IT application utilization are more likely to express their capabilities of knowledge sharing at a statistically significant level ($p < .001$). However, end-user focus was not significantly associated with employees' knowledge sharing activities when three control variables were included in the regression model (Table 2)

The report provided no statistical support for some other variables. Clear vision, goals, and trust were not significantly associated with employees' knowledge sharing capabilities in this study. Nor were centralization and formalization significantly associated with knowledge sharing capabilities. Among the control variables, the data showed that the surveyed employees who had been working in their present departments for longer periods of time were more likely to express high levels of knowledge sharing activities (see Table 2).

Table 2. Results of Regression Analysis

Organizational Dimensions	Variables	Regression Coefficient (β)	Standard error	<i>t</i>
Culture	Vision & goals	-.02	.08	-.30
	Trust	-.08	.09	-1.08
Structure	Social networks	.23**	.08	2.80
	Centralization	-.07	.08	-.85
	Formalization	-.08	.10	-1.08
	Performance-based reward systems	.25**	.11	3.11
Information Technology	IT application usage	.27***	.05	3.96
	End-user focus	.12	.08	1.51
Demographic information	Years of work	.17*	.05	2.57
	Position	-.04	.07	-.63
	Education	.01	.24	.01
<i>R</i> ²		.471		
<i>Adjusted R</i> ²		.374		
F		9.745***		

N= 162; * $p < .05$; ** $p < .01$; *** $p < .001$

Implications and Future Research

The results of this study evince that social networks, performance-based reward systems, and IT application utilization are all significant variables affecting knowledge sharing capabilities in e-government. The data strongly suggest that executive leaders, public managers, and managers of e-government need to acknowledge these factors when addressing the issues of effective knowledge management and capabilities of knowledge sharing for government service.

The findings also suggest several strategies for consideration by government agencies interested in enhancing employees' capabilities for knowledge sharing. The first consists of conducting employee assessments regarding internal and external social networks. The employee assessments should focus on communications, contacts, and interactions between employees and between work divisions and agencies. Performing such assessments can be a first step in giving employees the perception that their departments are interested in their network environment, informal networks, communication flow among teams, and access to information among divisions, all of which are significantly associated with knowledge sharing capabilities. Managers and supervisors can also develop a plan of action to improve knowledge sharing capabilities. For example, executive leaders and managers can develop incentive and reward systems for recognizing excellent knowledge sharing abilities of employees. Fair and objective performance-based reward systems may promote employees' motivation for taking the time to generate new knowledge, share their knowledge, and help others outside their own divisions or functions (Argote & Epple 1990; O'Dell & Grayson, 1998).

The study results show that organizational investment on information technology infrastructure and knowledge management systems is an important factor affecting knowledge sharing capabilities through employees' usage and application of these information systems. Accordingly, executive leaders and managers need to create workforce technology environments

in which individual employees perceive a supportive interest in their knowledge sharing activities. All of these suggestions for improving the knowledge sharing capabilities of employees in e-government require organization leaders to commit to promoting informal and formal networks and knowledge-oriented management practices. Especially considering the emergent emphasis on national security and e-government, agency leaders, IT managers, and human resource managers must collaboratively respond to fundamental environmental changes in order to encourage employees' commitment to knowledge sharing activities and organizational performance.

An important implication of this study for future research is that researchers may wish to examine the variance of knowledge sharing capabilities in e-government in terms of social networks and performance-based reward systems. The findings of this study indicate that social networks and performance-based reward systems can be significant organizational factors affecting employees' knowledge sharing capacities. A summary of the intersection of the social network and performance-based reward system variables and how they affect KS capabilities is presented in Table 3. According to this typology, all of the organizations represented in the four cells are assumed to have upgraded their IT infrastructures and established IT applications. The organizations in cell B have a high number of active employee social networks and strong performance-based reward systems; those in cell C have neither. The organizations in cells A and D are strong in one area and weak in the other. According to our findings, cell B organizations will have the highest degree of KS capabilities and cell C organizations the lowest—even if they have established IT infrastructures and IT applications. Confirming or refuting these relationships requires further empirical evidence.

Table 3. Knowledge Sharing Capabilities in Public Organizations-Social Networks and Reward Systems

A <i>High: social networks</i> <i>Low: reward systems</i>	B <i>High: social networks</i> <i>High: reward systems</i> High: KSC
C <i>Low: social networks</i> <i>Low: reward systems</i> Low: KSC	D <i>High: reward systems</i> <i>Low: social networks</i>

Conclusion

The associations among organizational culture, structure, information technology and public employees' knowledge sharing capabilities explored in this study can also be the subjects of research with other nations' public employees. An assessment of the validity of the findings presented in this paper would be especially valuable. Future projects should also focus on: a)

associations among the level of e-government development, knowledge acquisition, knowledge preservation, and knowledge application beyond knowledge sharing abilities; and b) comparative studies of private and public sector knowledge sharing capabilities.

Several limitations to this research should be noted. First, the measures used here were perceptual rather than objective; a more complete analysis would require additional data from interviews of employees and longitudinal studies of the dynamics and patterns of knowledge sharing abilities through e-government transformation. Second, while the response rate for the survey was high, the sample size was small. In conclusion, the results suggest that organizational culture, structure, and information technology all exert significant forces on knowledge sharing capabilities among South Korean government employees. The findings imply a need for intensified organizational and managerial commitment to knowledge sharing capabilities through promoting informal and formal networks, reward systems for knowledge sharing abilities, and enhancing information technology as well as end-user support for government employees.

References

- Argote, L., and D. Epple. 1990. Learning Curves In Manufacturing. *Science* 247(23): 920-924.
- Argyris, C., and D. Schon. 1978. *Organizational Learning: A Theory Of Action Approach*. Reading, MA: Addison Wesley.
- Barquin, R.C., Bennet, A., and S.G. Remez. 2001. *Building Knowledge Management Environments for Electronic Government*. Managementconcepts: Vienna, Virginia.
- Branscomb, L. M. and J.C. Thomas. 1984. Ease Of Use: A System Design Challenge. *IBM Systems Journal* (23): Pp.224-235.
- Center For Technology In Government. 1999. Some Assembly Required: Building A Digital Government For The 21st Century. Report Of A Multidisciplinary Workshop Held In October 1998. Online. Available At: <http://www.Ctg.Albany.Edu/Resources/Abstract/Abdgfinalreport.Html>. Accessed March 1, 2001.
- Cook, J. and T. Wall. 1980. New Work Attitude Measure Of Trust, Organizational Commitment And Personal Need Fulfillment. *Journal Of Occupational Psychology* 53: 39-52.
- Council For Excellence In Government. 2000. E-Government: The Next American Revolution. Available At: <http://www.Excelgov.Org>. Accessed March 2001.
- Creed, W. E. and R. E. Miles. 1996. Trust In Organizations: A Conceptual Framework Linking Organizational Forms, Managerial Philosophies, And The Opportunity Costs Of Controls. In Kramer, R. M. & Tyler, T. R. (Ed.), *Trust In Organizations: Frontiers Of Theory And Research*, 16-38. Thousand Oaks, CA: Sage.
- Davenport, T., D. DeLong, and M. Beers. 1998. Successful Knowledge Management Projects. *Sloan Management Review* 39(Winter): 43-57.
- Davenport, T., S. Jarvenpaa, and M. Beers. 1996. Improving Knowledge Work Processes. *Sloan Management Review* 37(Summer): 53-65.
- Davenport, T., and L. Prusak. 1999. *Working Knowledge: How Organizations Manage What They Know*. Boston: Harvard Business School.
- Davenport, T., and P. Klahr. 1998. Managing Customer Support Knowledge. *California Management Review* 40(3): 195-208.
- DeLong, D. 1997. *Building The Knowledge-Based Organization: How Culture Drives Knowledge Behaviors*. Working Paper, Ernst & Young's Center For Business Innovation. Boston.
- Duncan, R. 1972. Characteristics Of Organizational Environments And Perceived Environmental Uncertainty. *Administrative Science Quarterly* 17(3): 313-327.
- Dyer, J. 1997. Effective Interfirm Collaboration: How Firms Minimize Transaction Costs And Maximize Transaction Value. *Strategic Management Journal* 18(7): 535-556.
- Gang, E. 2002. Access To The Internet In Asia. *Chosun Daily Newspaper in South Korea*, July 24th. Available At <http://www.Chosun.Co.Kr/W21data/Html/News/200207/200207240028.Html>. Assessed July 2002.
- Gold, A., A. Malhotra, and A. Segars. 2001. Knowledge Management: An Organizational Capabilities Perspective. *Journal Of Management Information Systems* 18(1): 185-214.

- Grant, R. 1996. Toward A Knowledge Based Theory Of The Firm. *Strategic Management Journal* 17(Winter): 109-122.
- Greeves, R. 2000. The Penultimate Mile: Local And State Government Collaborating To Serve Citizens Through Information Technology, Council Of Excellence In Government. Available at <http://www.excelgov.org/techcon/>. Accessed July 2002.
- Hage, J. and M. Aiken. 1967. Relationship Of Centralization To Other Structural Properties. *Administrative Science Quarterly* (June): 79-80.
- Inkpen, A., and P. Beamish. 1997. Knowledge, Bargaining Power, And The Instability Of International Joint Ventures. *Academy Of Management Review* 22(1): 177-202.
- Kanter, R., B. Stein, and T. Jock. 1992. *The Challenge Of Organizational Change: How Companies Experience It And Leaders Guide It*. New York: The Free Press.
- Kim, S. and D. Kim. 2003. South Korean Public Officials' Perceptions Of Values, Failure, And Consequences Of Failure In E-Government Leadership. *Public Performance And Management Review* 26(4): 360-375.
- King, W. 1999. Integrating Knowledge Management Into IS Strategy. *Information Systems Management* 16(4): 70-72.
- Leonard, D. 1995. *Wellsprings Of Knowledge: Building And Sustaining The Source Of Innovation*. Boston: Harvard Business School Press.
- Leonard, D., and S. Sensiper. 1998. The Role Of Tacit Knowledge In Group Innovation. *California Management Review* 40(3): 112-132.
- Mcdermott, R. A. 1999. Why Information Technology Inspired But Cannot Deliver Knowledge Management. *California Management Review* 41(4): 108.
- Modesitt, C. 2002. *Bridging The Gap Between Citizens And Local Government With Information Technology: Concepts And Case Studies*. National Civic League.
- Nonaka, I., and H. Takeuchi. 1995. *The Knowledge Creating Company: How Japanese Companies Create The Dynamics Of Innovation*. New York: Oxford University Press.
- O'Dell, C., and C. Grayson. 1998. If Only We Knew What We Know: Identification And Transfer Of Internal Best Practices. *California Management Review* 40(3): 154-174.
- Quigley, E. J. and A. Debons. 1999. Interrogative Theory Of Information And Knowledge, In *Proceedings Of SIGCPR '99*, 4-10. New Orleans, LA.: ACM Press.
- Ruggles, R. 1998. The State Of The Notion: Knowledge Management In Practice, *California Management Review* 40(3).
- Strover, S. and J.D. Straubhaar. 2000. Assessing Citizen Utilization Of E-Government Services: A Survey Of Issues And Attitudes In Texas. *Government Finance Review* 16 (5): 27.
- Teece, D. 1998. Capturing Value From Knowledge Assets: The New Economy, Markets For Knowhow And Intangible Assets. *California Management Review* 40(3): 55-79.
- Teigland, R. 2000. Communities of Practice At An Internet Firm: Netovation Vs. On-Time Performance. In Lesser, E. L., M.A. Fontaine and J.A. Slusher (Eds), *Knowledge And Communities*, 151-178. Butterworth Beinemann.
- Thurow, L. C. 1999. *Building Wealth: The New Rules for Individuals, Companies, And Nations In A Knowledge-Based Economy*, Harper Business.
- United Nations and American Society For Public Administration. 2001. *Global Survey Of E-Government*. Available At <http://www.Unpan.Org/Egovernment2.Asp>. Accessed December 2002.
- Von Krogh, G. 1998. Care In Knowledge Creation. *California Management Review* 40(3): 133-153.
- Wenger, E. 1999. Knowledge Directions, *The Journal Of The Institute For Knowledge Management* 1(Fall): 48-63.

