

Refereed Journal Publications and Book Chapters

(1) Exploring the role of key organizational factors in knowledge transfer and technology transfer. Accepted for Publication at **IEEE Transactions in Engineering Management, 2003 (In Press)**

Authors : **Gopalakrishnan, S.,** & Santoro, M.

Abstract

Knowledge transfer and technology transfer are often used interchangeably in the literature causing confusion. While both knowledge transfer and technology transfer are highly interactive activities, we contend that knowledge and technology are distinct constructs that anchor two ends of a knowledge continuum. Specifically we argue that knowledge transfer implies a broader, more inclusive construct that is directed more toward understanding the "whys" for change. In contrast, technology transfer is narrower and a more specific construct that usually embodies certain tools for changing the environment.

In this study we attempt to clarify this debate by empirically analyzing these two constructs and examining the impact certain organizational factors have on them. Grounding our work in the 7-S framework the organizational factors included here are the firm's structure, culture, trust, and university policies for intellectual property rights (IPR), patent ownership, and licensing. In focusing on relationships between university research centers and industrial firms, survey data for this study were collected from 189 industrial firms from a large number of diverse industrial sectors. Our results show that there are differences in the types of firm structures, cultures and university policies for IPR, patent ownership, and licensing that facilitated knowledge transfer activities compared to those that facilitated technology transfer activities. We conclude this paper by discussing the implications of our findings on future research and management practice.

(2) A multi-level analysis of factors influencing the adoption of internet banking. Accepted for publication in the Special Issue in **IEEE Transactions in Engineering Management, 2003. (In Press)**

Authors : **Gopalakrishnan, S.,** Wischnevsky, D., & Damanpour, F.

Abstract

We consider the Internet as a major enabling technology that has spurred changes in various user industries. We develop a three-level theoretical framework—technological environment, industry, and organizational levels—to study the application of the Internet technology in a user industry. Using the commercial banking industry as an example, we analyze the process by which Internet technology has diffused within the industry, the factors that have influenced it, and the related strategic and organizational changes adopted by commercial banks.

(3) The Vasa Syndrome: Insights from a 17th Century New Product Disaster. **Academy of Management Executive**, 2001. Vol. 15, 80-91.

Authors :Kessler, E.H., Bierly, P., **Gopalakrishnan, S.**

Abstract

The Swedish ship Vasa was one of the most spectacular warships ever built. After going less than a mile on its maiden voyage, the vessel keeled over and sank 110 feet to the bottom of the Stockholm harbor. Approximately 50 of its crew went down with the ship. It was truly a disaster...and an excellent example of a failure in the new product development process. In this paper, we show how insights from the Vasa and contemporary organizations are relevant. We also provide guidance on how to avoid falling prey to the "Vasa Syndrome" - a complex set of problems that, when taken together, overwhelms the organization's capabilities. Seven specific and interrelated problems in new product development are examined. Each problem is used to develop a managers' competencies for (a) understanding the underlying issues in each problem area, (b) linking these problems and issues to failures in the Vasa case and contemporary organizations, and (c) providing insights on how to avoid and minimize these problems in the new product development process. Our use of the Vasa case and contemporary organizations demonstrate how history continues to repeat itself in the process of new product development.

(4) Analyzing innovation adoption using a knowledge based typology. **Journal of Engineering and Technology Management,2001. 27, 1-25.**

Authors : **Gopalakrishnan, S., & Bierly, P.**

Abstract

We propose a new typology of organizational innovation based on the integration of theories of organizational learning and theories of knowledge. The three dimensions that we use to construct our typology of innovations are: tacit-explicit, systemic-autonomous and simple-complex. We, then, analyze the impact of these different types of innovations on the method of sourcing, cost of implementation, and innovation effectiveness. We propose that as innovations become more tacit, systemic and complex, they tend to be more internally sourced, more costly to implement, and more effective.

We test the hypotheses using innovations from the commercial banking industry. Data for this study were collected from multiple sources. The innovations were categorized into different types by a panel of experts. Data on method of sourcing, cost and effectiveness were collected from a sample of 101 banks. Our results showed that autonomous innovations were less likely to be internally sourced than systemic innovations; autonomous and complex innovations were more costly to implement than systemic and simple innovations. Explicit innovations were seen as more effective than implicit innovations. Implications for theory and practice are discussed.

(5) Dynamics of the adoption of product and process innovations in organizations. **Journal of Management Studies,2001. 38: 1, 45-65.**

Authors : Damanpour, F. & **Gopalakrishnan, S.**

Abstract

While many researchers have fruitfully explored the patterns of adoption of product and process innovations across industries, few have studied these same patterns within individual firms. In this study we address this issue, examining the dynamics that govern the adoption of product and process innovations at the firm level over time. We examine questions such as: Which type of innovation is more readily adopted? Does the adoption of one type of innovation lead or lag the adoption of the other type? And, would the pattern of adoption of innovation types have an effect on organizational performance? Using data on the innovations introduced between 1982-1993 by a sample of 101 commercial banks in the United States, we find that: (1) product innovations are adopted at a greater rate and speed than process innovations; (2) a product-process pattern of adoption is more likely than a process-product pattern; (3) the adoption of product innovations is positively associated with the adoption of process innovations; and (4) high-performance banks adopt product and process innovations more evenly than low-performance banks.

(6) Relationship dynamics between university research centers and industrial firms: Their impact on technology transfer activities. **Journal of Technology Transfer, 2000, 26, 163-171.**

Authors: Santoro, M., & Gopalakrishnan, S.

Abstract

In this study we focus on relationship-oriented factors such as trust, geographic proximity, communication, and university policies for intellectual property rights (IPR), patents and licenses and examine how these factors influence the technology transfer process between university research centers and their industrial partners. Data for this study were collected from 189 industrial firms working with 21 research centers affiliated with prominent research-oriented universities in the US. Our results showed that trust, geographic proximity, and flexible university policies for IPR, patents, and licenses were strongly associated with greater technology transfer activities. The implications for both researchers and practitioners are discussed.

(7) Unraveling the links between dimensions of innovation and organizational performance. **Journal of High Technology Management Research, 2000, 11, 1, 137-153.**

Author: Gopalakrishnan, S.

Abstract

Economists typically define innovation as a process or practice that is new to an industry; thus they emphasize a firm's speed of innovation relative to other firms in the industry. Organizational theorists, on the other hand, usually focus on the number of products or processes that are new to the firm; hence, they emphasize innovation magnitude. This study builds a bridge between these two approaches by exploring the link between two dimensions of innovation – speed and magnitude-- and two measures of a firm's performance – objective financial reports and executive ratings of perceived effectiveness. We propose that each dimension of innovation will be associated with a different measure of firm performance. Using data from the commercial banking industry, we find interesting results that partially support our predictions based on the theory that different dimensions are indeed linked to different measures of performance.

(8) Analyzing innovation adoption using a knowledge based typology. **Journal of Engineering and Technology Management, 2001, 27, 1-25.**

Authors: Gopalakrishnan, S., & Bierly, P.

Abstract

We propose a new typology of organizational innovation based on the integration of theories of organizational learning and theories of knowledge. The three dimensions that we use to construct our typology of innovations are: tacit-explicit, systemic-autonomous and simple-complex. We, then, analyze the impact of these different types

of innovations on the method of sourcing, cost of implementation, and innovation effectiveness. We propose that as innovations become more tacit, systemic and complex, they tend to be more internally sourced, more costly to implement, and more effective. We test the hypotheses using innovations from the commercial banking industry. Data for this study were collected from multiple sources. The innovations were categorized into different types by a panel of experts. Data on method of sourcing, cost and effectiveness were collected from a sample of 101 banks. Our results showed that autonomous innovations were less likely to be internally sourced than systemic innovations; autonomous and complex innovations were more costly to implement than systemic and simple innovations. Explicit innovations were seen as more effective than implicit innovations. Implications for theory and practice are discussed

(9) The Institutionalization of knowledge transfer activities within industry-university collaborative ventures. **Journal of Engineering and Technology Management. Special Issue on Technological Learning, Firm Growth and Performance, 2000. 17, 299-319.**

Authors: Santoro, M., & Gopalakrishnan, S.

Abstract

Due to faster technological development, shorter product life-cycles, and more intense global competition, organizations must focus even more on an active program of knowledge acquisition to advance new technologies necessary for the firm's long-term success and survival. This study examines the institutionalization of knowledge transfer activities in collaborative ventures between industrial firms and university research centers. Data for this study were collected from 189 industrial firms participating in collaborative initiatives with twenty-one university research centers affiliated with prominent research-oriented universities in the US. Results show that knowledge transfer activities are facilitated when industrial firms have more mechanistic structures, cultures that are more stable and direction-oriented, and when the firm is more trusting of its university research center partner. The implications of these findings for both industry and universities, including their possible effect on firm performance, are discussed.

(10) The impact of organizational context on innovation adoption in commercial banks. **IEEE Transactions in Engineering Management, 2000. 47, 1, 1-13.**

Authors: Gopalakrishnan, S., & Damanpour, F.

Abstract

This study examines the linkages between non-structural factors in an organization's context and dimensions of innovation adoption in organizations. Elements of an organization's context included in this study are size, geographic scope, and product scope; dimensions of innovation are magnitude and speed of adoption, and product and process types of innovation. The relationships among these variables are examined by a sampling of empirical data culled from 101 commercial banks in the four states of New York, New Jersey, Connecticut and Massachusetts. We found that: (1) organization size and geographic scope have a stronger association with magnitude

than the speed of adoption; while product scope is more strongly linked to the speed of adoption; (2) geographic and product scope influence the propensity to adopt product and process innovations differently; and (3) the pattern of innovation adoption differs among various types of banks.

(11) Internal vs. external learning in new product development: effects on innovation speed, costs and competitive advantage. **R&D Management, 2000, 30: 3, 213-223.**

Authors: Kessler, E.H., Bierly, P. & **Gopalakrishnan, S.**

Abstract

The purpose of this study was to investigate how different technology sourcing strategies throughout the new product development process influenced innovation speed, development costs, and competitive advantage. We studied 75 new product development projects from ten large, U.S. -based companies in several industries. Results indicated that: (1) more external sourcing during the early (i.e., idea generation) stage was related with lower competitive success; (2) more external sourcing during the later (i.e., technological development) stage was related with slower innovation speed; and (3) development costs tended to rise with greater reliance on external sources of technology, but this result was not statistically significant.

(12) Determinants of information technology adoption: an extension of existing models to firms in a developing country. **Journal of Global Information Management, 1999, 7, 3: 30-40.**

Authors: Dasgupta, S., Agarwal, D., Ionnidis, A., & **Gopalakrishnan, S.**

Abstract

Advances in new information technology and changes in the global environment have made it increasingly difficult for organizations to make decisions regarding information technology adoption. Moreover, information systems in a global environment are influenced by different cultures, laws, information technology infrastructure, and the availability and role of skilled personnel. Information systems research has traditionally focused on organizations in US and UK without considering how these frameworks and models can be applied and extended to developing countries. In this study of 46 firms we examine the determinants of process-based information technology adoption in the Indian manufacturing sector. Although there are many differences like the type of organizations, and the technology available, between developing and developed countries, we found that factors that influence information technology adoption are similar. Our results showed that organizational factors like a firm's culture and size, and environmental factors like competition faced by firms, government policies, and market forces like exchange rates and computer prices, have a significant impact on information technology adoption decisions made by firms. We also found that the role of management information systems personnel has a negative impact on adoption.

(13) A reexamination of product and process innovations using a knowledge-based view. **Journal of High Technology Management Research, 1999.10, 1, 147-166.**

Authors: **Gopalakrishnan, S.**, and Bierly, P., & Kessler, E.H.

Abstract

Using knowledge- based dimensions, we reexamine the characteristics of product and process innovations and their strategic implications. We find that process innovations are more systemic and complex than product innovations. Also, process innovations tend to be more internally sourced, more costly to implement, and more effective than product innovations.

(14) Strategic choice versus determinism - A debate revisited. **International Journal of Organizational Analysis, 1998. 6: 2, 146-164.**

Authors: **Gopalakrishnan, S.**, & Dugal, M.

Abstract

This paper revisits the debate between environmental determinism and strategic choice. It compares the two theories on their philosophical underpinnings, their view of decision making, and the environment. Although we argue that the theory of strategic choice generally prevails, we recognize that there are factors that restrict the choice and discretion of managers. Here we look at three types of factors- industry related factors (extent of regulation and stage of life cycle), organization related factors (characteristics of top management and organization size), and time related factors and explain how each of these factors either inhibit or enhance managerial discretion. Implications for theory and practice and discussed.

(15) Theories of organizational structure and innovation adoption: the role of environmental change. **Journal of Engineering and Technology Management, 1998, 15: 1-24.**

Authors: Damanpour, F. & **Gopalakrishnan, S.**

Abstract

Innovation scholars face an enduring research problem: how to make models that are testable, yet reflect the complexity of real business environments. Typically, researchers of organizational innovation define their research by focusing on one dimension of innovation- type of innovation, radicalness of innovation, or state of innovation- at a time. In reality, these dimensions overlap, which partly explains why past theories of the relationships between organizational structure and innovation have produced inconsistent results. In this paper, we develop a more complex model for structure - innovation relationships. First, we define four environmental conditions, using stability and predictability variables of environmental change. Second, we articulate organizational structure and innovation characteristics that would hold for firms under each of our four sets of conditions. This basic framework allows us to compare and subsequently to extend, the three theories of structure and innovation that address the dimensions of innovation mentioned above. Finally, we advance a series of propositions to predict the structural characteristics that facilitate adoption of innovations of different types at different stages, under four conditions of environmental change.

(16) A Review of Innovation Research in Economics, Sociology and Technology Management. **Omega- International Journal of Management Science, 1997, 25, 1: 15-28.**

Authors: **Gopalakrishnan, S.** & Damanpour, F.

Abstract

In this paper we review the extant innovation research from three fields -- economics, organizational sociology, and technology management -- in order to find points at which the fields' approaches and assumptions overlap. By comparing research methods and approaches along three dimensions -- stage of adoption, level of analysis, and type of innovation-- we found first that studies from the three fields can be re-mapped into five more specific groups. We then illustrate how research from different groups can be cross-fertilized to help management of innovation in organizations. The paper suggests that knowing the ways in which different groups of studies differ from each other may lead to a more accurate understanding of the relative value of innovation research from each group for both theorists and managers.

(18) Patterns of Generation and Adoption of Innovation in Organizations: Contingency Models of Innovation Attributes. **Journal of Engineering and Technology Management, 1994, 11: 95-116.**

Authors: **Gopalakrishnan, S.** & Damanpour, F.

Abstract

This study addresses the debate over the occurrence and the applicability of unitary sequence and multiple sequence patterns in the innovation process in organizations. Our general argument is that each pattern's explanatory power hinges on identifiable contingencies. These influencing factors can and should be taken into account by both theorists and managers. Focusing on two types of innovation processes, generation and adoption, we use two innovation attributes- complexity and type - to determine the suitability of each pattern to a specific innovation process. It is proposed that generation and adoption of simple innovations, generation of technical innovations, and adoption of administrative innovations is adequately explained by the unitary sequence pattern. However, generation and adoption of complex innovations, generation of administrative innovations, and adoption of technical innovations is better described by the multiple sequence pattern. Implications for theory development and management practice are then discussed.