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1

The New Frontiers of Knowledge Management

Kevin C. Desouza

The text you are about to read is a compilation of writings on the new frontiers of knowledge management. My task, in this introduction, is to set the stage for you to enjoy the deep and thoughtful pieces that follow. In doing so, I would like to focus on two items. First, to share a few words with you on the rationale for the book, and its production process. Second, to introduce the ideas set forth by the various contributors. I am not a person of many words, and equally important, my publisher would not want me to ramble on, so I will try to be crisp, cogent, and brief.

Before starting, let me focus on an important comment. In the next few pages, I am going to share with you my personal opinions and feelings on the new frontiers. In the pages that follow this, each author will do the same. We must be reminded that each view, perspective, argument, rationale, approach, and conclusion is a personal one. Some of the ideas presented here have been tried and tested, others are being developed, and yet others can be considered as speculations. Yet they are interesting, novel, and deserve due attention. There is both an opportunity and a challenge for readers of this book. The opportunity is to recognize the novelty in the material presented, and the challenge is to build on such work or, equally important, challenge and refute it by providing reasonable alternatives. To appreciate novelty, we must sometimes leave our preferred schemas, mental models, languages, and stigmas in favor of the unknown. While reading this book, you should, I hope, be able to respond to the efforts made by the authors to set forth their originality, even if you disagree with them. Each one has provided their thinking to get it documented and codified so that it may be available to interested readers to embrace or criticize, to build on or refute, and above all to share.

What are "New Frontiers"?

According to the dictionary, a frontier may be a new field for exploitative or developmental activity. So if by the term we understand something that is

“new”, why call something the “new frontiers”? My reasoning was simple. Beside the definition just given, a frontier can also be the furthestmost limit of knowledge or achievement in a particular subject or a line of division between different or opposed things. I think this book appreciates all that can be signified by the word frontiers, so adding “new” emphasized that it would seek to bring out the novelty in the frontiers. The new frontiers of knowledge management can be discussed by examining the meanings of the term frontiers.

Furthermost limits of knowledge or achievement in a particular subject

The field of knowledge management, especially in a pragmatic sense, emerged in the early 1990s. Philosophers, sociologists, and economists have been interested in the concept of knowledge since the dawn of time. Their work is the critical grounding on which the business and management sciences built. Since the publishing of seminal books in the 1990s by Ikujiro Nonaka and Hirotaka Takeuchi, Thomas Davenport and Larry Prusak, John-Christopher Spender, Robert Grant, Georg von Krogh, and others, we have seen a slew of academic papers and practitioner reports follow. Each of these has attempted to push the limits of what we know about knowledge management in and around organizations. Yet, in my assessment, I do not think we know as much as we should considering the time we have invested in research and development. We have not reached the furthestmost limits; indeed, could we see the end, I am sure we would say we have not even reached the halfway mark.

While there are many reasons one might postulate for this, I would like to focus on one – the nature of the questions we ask. Most researchers and practitioners, including myself, are not risk-takers, most of the time. We have jobs, families, bills to pay, things to do, futures to consider, and so on. Hence, we often take the path of least friction. As one colleague of mine remarked, “Kevin . . . be sensible . . . stop writing stories and cases about what you see in practice . . . test some theory and do empirical work.” Yes, we all do it. I am not a mature researcher or scholar and hence I am not here to preach, but let us acknowledge the reality. I gratefully took the advice of my colleague and wrote a couple of empirical papers, but have continued with my passion for seeking interesting and novel discoveries (I have been only slightly successful at the latter, but I am learning).

The incentive, whether in academia or in practice, is to keep to the norms, or to put more correctly, keep up appearances. We must do a certain type of research, follow a certain research methodological stance, choose certain theories, and write up our findings a certain way, if we want to get published in a certain journal. In organizations, the challenge is even more severe; we must make our numbers, especially today when economic times are not the best. Companies continue to cut research programs, close down think-tanks, and scrap incubators. Organizations are sacrificing futuristic explorations for meeting present bottom lines, a thinking that is very short-sighted and may will cost the entity dearly in the near future.

This line of thinking and action is good if we want to continuously reinvent the wheel and make incremental improvements to our existing knowledge. It is not appropriate for coming up with radical innovations that one may hope will help move our fields ahead. Coming up with new theories of organizations is risky business, equally risky as trying a new system prototype. It may fail, people may scorn your efforts, and you may suffer economic losses. Yet, it is highly rewarding if successful, and even the effort is rewarding also if not successful. When we embark on the path to find new answers to a question, we open ourselves to new sources of inspiration, knowledge, and feedback. Each of these will enrich our own knowledge stock, and will provide us with a multiplicity of curious avenues for future work. I encourage the readers of this book to be adventurous in how they approach the concept of organizational knowledge management. Being adventurous not only will pay off for you personally, but will also benefit our knowledge management community by rich insights. Knowledge can be discovered with every experiment; there is nothing like a “wrong experiment” or a “failed experiment”. As many have argued and attested, failure and success are in the eyes of the beholder, so rest assured you have discovered something in an experiment with unintended results. As Ronald Kostoff will discuss in the first chapter, we must be more systematic in how knowledge management is conducted in science and technology development. One aspect of his discussion focuses on sharing data, information, and knowledge about so called “failed experiments”, in addition to successes. Doing so will help us better utilize the scientific resources and improve the knowledge generation and dissemination process in scholarly circles. Similar dynamics occur in the practitioner circles. While we all want to harp on “success” stories the “failures” never get publicized, owing to the pressures to seem error-free. As a result, when the failures are made public, these are normally in the form of a bad press, rather than systematic and proactive inquiries into why such events took place and how can we better prepare ourselves for future scenarios.

My first motivation to create this book was to provide an avenue for researchers and practitioners to be adventurous, venture out, and postulate some of their creative thinking. Novelty is all around us and we must seek it out. I made it a point not to favor theory papers over empirical ones, quantitative over qualitative, practitioner over scholar, European over American, or use any other nonsensical segmentation. I asked my reviewers not to be restrictive in how they criticized a chapter, but to focus on one point: Is there novelty in the material presented? I am happy to say that I feel that this goal has been achieved in the chapters that follow.

A line of division between different or opposed things

We all have comfort zones, and favorite tools. For some these represent our disciplines like sociology, information science, economics, or computer sciences. In the context of tools, some of us are better at learning from case

studies, others at conducting survey research, yet others may be apt at action research owing to their background in consulting engagements. It is common for people to give themselves names and affiliations: "I am a strategy researcher," "We are management consultants," "I am a quant guy," "She is a qualitative and ethnographic researcher," and so on. While having affiliations, personal boundaries, or favorite tools helps us identify with others who share similar schemas, it also limits us to our local spaces. Most of the time we operate in our closed quarters and never venture out of them; moreover, we do not allow new ideas to enter these quarters.

It is my belief that we never really create anything new. As Joseph Schumpeter, the renowned economist, and others have remarked, innovation is putting old things in new combinations. As I see it, "things" exist in nature, they may be known or unknown to us, but they exist. If we are more cognizant of our surroundings we may be better at seeking the things out, understanding them, learning from them, and even applying them. Yet too often we do not. It is more economical for us to scan our local spaces (for example literatures that we are familiar with), rather than venture out and read a paper from a discipline we are ignorant on. This behavior has limited value when it comes to discovering new frontiers. We must transcend our local spaces and integrate insights from foreign spaces if we are to reach the furthestmost limits of achievements. Hence, in the current context, we must not accept our local disciplines as "the frontier", an end point or division line, but must eradicate this barrier and embrace other fields.

Doing so will require us to recognize the wisdom in the work of Friedrich August von Hayek, whose work on distributed information and knowledge is nothing short of brilliant. Among the many salient points of Hayek's work, I commend in particular the following: (1) the central economic problem is the utilization of knowledge, which is not given to anyone in its totality – that is knowledge is available to multiple entities in society and we must be adept at integrating and utilizing it towards economic ends; (2) individuals with different specialized knowledge (backgrounds) may evaluate the relevance of a knowledge item differently. Hayek's comments are apt for us to understand what it is that is needed to eradicate the barriers that prevent us from coming up with new frontiers.

We must extend our comfort zones, our arsenal of tools, our local search spaces. We must look to other fields for answers to problems that we face. We must admit that we do not know all the answers and that sometimes even our colleagues may not know them. As Mark Granovetter has argued, we are more likely to get novel information from weak ties than from strong ones. We must seek to construct these weak ties with literatures that are not known to us. This does not mean we each need to be a jack of all trades; but we must make connections to people who are masters of their trades in disciplines that are foreign to us. One aspect of making connections is building a more vibrant interaction space for academia and industry. Too

often each of these thinks of the other as not worthy of their time – academia thinks that consultants are too caught up in telling stories without enough rigor, and consultants have a feeling that what academics write is meant exclusively for other academic. This brings us to the second point of Hayek, namely recognizing and appreciating the difference in how each community evaluates one another's knowledge. Unless we cross this chasm or abyss we are not in a position to come up with novel insights. The first step and most crucial undertaking is that of being humble in how we read one another's work and reading with a mind to learn what is new rather than criticizing the obvious.

The second motivation for this book was to assemble authors who would cross the local spaces and write on knowledge management in an integrated fashion. I can say clearly that every chapter has far exceeded my original expectation on this front. For examples, consider the following. Larry Prusak and Leigh Weiss discuss how we might go about visualizing knowledge by looking at some of the work in graphical techniques and semiotics. Mark Nissen integrates thinking from various domains to better understand the dynamics of knowledge flows. Yukika Awazu and colleagues look at economics to better understand knowledge exchanges in markets. Similarly, Ann Majchrzak and colleagues integrate research streams from various disciplines to better understand emergence in knowledge processes. It is equally interesting to note that some of the chapters have been co-authored by academicians and practitioners; this will undoubtedly have provided you, the reader, with a richer discussion of the topics. Crossing chasms will help us increase our knowledge of our own domains and gain a better appreciation of just how complex a domain knowledge management is.

A new field for exploitative or developmental activity

Knowledge management remains a field that is new, or at least new things are yet to be articulated and identified about how organizations can better engage their knowledge assets. Hence, it is apt to be called a new frontier or a frontier where novelties are yet to be discovered, synthesized, disseminated, and applied. The third and final motivation for this book was to seek out some of the new insights and provide an avenue for them to be presented. At this point I would like to say a few words about the process of constructing this knowledge product.

As I put the proposal for the book together, a priori I did not know what all the new frontiers of knowledge management would be. However, I did know who to ask for answers. So, I opened up my address book and made a few calls, dropped a few emails, and even visited a few offices. Some of the people I spoke to told me that the book would be premature as the field of knowledge management had not made enough real progress to justify talking about new frontiers. Needless to say, I courteously and pleasantly decided not to take their prescriptions too far. At the opposite end of the spectrum, I

was pleased to receive enthusiastic responses from scholars and practitioners, who felt that a book on the new frontiers is direly needed.

Of those who expressed enthusiasm, some were eager to contribute their thoughts gratis, while others were tied by other commitments and were glad to serve as reviewers for the chapters and provide constructive comments. The success of this project can be linked to the successful and eclectic thinkers I could connect with. I thank these individuals for the time they devoted. They provided me with a rich array of insights, criticisms, debates, and pointers to interesting concepts about organizational knowledge management. Each individual had their own perspective on knowledge management, but was in touch with perspectives that were diverse from their own, and sometimes even in conflict with it. Yet they were respectful of these perspectives and even appreciated how they could enhance their work by embracing these various domains. Being curious, I often listen to just about anything, so long as I have respect for the person who is giving the talk. I have the deepest respect for all contributors to this volume, and have equal regard for their works.

Introducing the new frontiers of knowledge management

We begin with a discussion by Ronald Kostoff on the concept of science and technology knowledge management. This chapter is a must read for all engaged in the production and dissemination of scientific knowledge. Scholars are knowledge management engines. We generate new knowledge by reusing existing knowledge, seeking out new data and information, garnering meaning from these observations, and then applying them to our settings. The process of scientific knowledge generation and dissemination is one we all learn in graduate school, and continue to practice and refine. Hence, we get better with experience. While this might be true at the individual level, at the societal level we continue to be plagued by an incomplete, erroneous, and mostly ineffective knowledge management process. For instance, we see timely research get delayed in publication, thus losing the time value of the knowledge, we see scientific studies that have fatal flaws make their way from one journal to the next until they are eventually published, we lack data and information sharing standards that would allow researchers to gain from each other's work and also compare findings across setting. Ronald takes on the challenge of identifying the components of the science and technology knowledge management; he then describes the ideal state of each component, the current state, and what it will take for us to close the gap between the current and the ideal.

Leigh Weiss and Larry Prusak discuss how we can make knowledge more visible in organizations. It is surprising how invisible it is there. We know that it exists; we exchange it, debate it, and even apply it. Yet, we cannot seem to visualize its existence, one outcome of this being that it is

management that also becomes invisible or is conducted in a peripheral manner. Leigh and Larry aim to change that by pointing us to means to illustrate knowledge. The chapter is laden with rich illustrations that are exciting and practical, that help us realize the benefits of visualizing knowledge.

Ann Majchrzak, Ramnath K. Chellappa, and Lynne P. Cooper discuss an important missing ingredient in current knowledge management dialogues – the concept of emergence. Knowledge management programs and technology artifacts that are designed to manage knowledge too often take deterministic approaches. This is unfortunate as knowledge is emergent and needs to evolve based on its particular context. Ann and colleagues discuss challenges associated with personalizing knowledge delivery. Specifically, the four challenges are: knowing the worker, updating knowledge about the worker, addressing personalization versus privacy issues, and deciding what knowledge to inject. An appreciation of the concept of emergence can help us make significant strides in our understanding of knowledge management. Information and data management can for the most part be handled by top-down order mechanisms, for example by directives from top management or by designing rule-based systems. Knowledge, however, is dynamic and fluid, and the ideal management approach or technology system will appreciate this, and work around it rather than trying to curtail it.

Ganesh Vanapalli and I address another missing component of current knowledge management debates, namely the security component. While there are many studies addressing how one should leverage knowledge assets, work on how we can secure our existing knowledge assets and processes is scant. Knowledge resources are the source of competitive advantages for organizations; unless we have proper security measures in place we risk losing them to acts of theft, misuse, espionage, and disasters. Securing knowledge assets is important given the current economic, social, and political conditions, in particular the surge in terrorist and industrial espionage activities. While private sector organizations have long taken knowledge security for granted, this is not the case in the intelligence and defense sectors of the government, especially those involved with issues of national security. We draw on key insights from investigating knowledge security protocols in five such organizations.

Yukika Awazu, Shigetaka Yamakawa, and Masashi Umezawa give an economic perspective to the knowledge management debate. The authors conceptualize and elaborate on the notion of knowledge markets. A knowledge market can be defined as a system where buyers and sellers can trade their know-how by abiding by defined pricing and trading rules. While the technology and humanistic approaches to knowledge management have received their due attention in the literatures, the economic dimension has, for the most part, only received meager attention in critical scholarly and practitioner debates. The authors employ a mathematical orientation to

present their thoughts; this however should not fend off readers who suffer from math phobia, as the chapter is readable and easy to follow. Knowledge markets are an essential part of the debate on new frontiers they help us understand the economic motivations to sharing, pricing, and rewarding knowledge.

Carsten Sørensen discusses the wide assortment of technology artifacts used to enable knowledge management in organizations. Software and software artifacts are omnipresent, pervasive, and ubiquitous in our environments. The chapter focuses on the following question: How can we generally characterize the diversity of software artifact use for the management of information and knowledge? Traditionally software used to manage knowledge emphasizes the database view, which looks at ways to codify knowledge into information documents, and make these accessible to others. Carsten acknowledges the existence of this view, and moves the field of knowledge management ahead by discussing the transaction, interpretation, connection, and collaboration perspectives on software artifacts, and how these contribute to the management of information and knowledge in organizations.

Youngjin Yoo and Kalle Lyytinen analyze the effects of ubiquitous computing in networked organizations. They point to the reality of computing and organizations in the future – characterized by ubiquitous information. Progress in ubiquitous and pervasive computing has been fruitful and is advancing how information and knowledge are processed in and around our organizations. While progress has been made on the technology front, developments on the social side have not been up to par. As Youngjin and Kalle point out, our current knowledge of the impacts of ubiquitous computing environments is meager at best. The authors address this deficiency by providing a framework to evaluate the organizational consequences of ubiquitous information environments. This framework appreciates the complex causality, layered impact models within a multi-level framework, comprehensiveness of performance measures, and lags between impact detection.

David Skyrme takes a practitioner perspective in discussing challenges associated with building the collaborative enterprise. Collaboration has been at the heart of knowledge management since its inception. Today, a changing and uncertain environment and continuous improvements in collaboration technology make it even more crucial and practical. This chapter explores factors that affect the effectiveness of collaboration in knowledge initiatives and outlines a framework for building enhanced collaborative capabilities at all levels, from individual to societal. Following this introduction to collaboration by David, the rest of the chapters take various stances, angles, or perspectives on the notion of knowledge flows in organizations.

Mark Nissen achieves a marvelous feat by integrating the seemingly distinct and sometimes separate literatures in the organizational, technological, and economic sciences to improve our understanding of knowledge flows in organizations. Mark integrates the various elements from the disparate

literatures to propose a multi-dimensional model that is useful in the design of organizations around knowledge flows. The proposed model appreciates much of the work conducted in understanding knowledge flows in organizations to date, but also pushes the field ahead by discussing novel issues such as path-dependent contingency dynamics. This chapter also alludes to the notion of knowledge visualization, and complements the discussion put forth by Leigh and Larry. As noted by Mark, the multi-dimensional visualization of knowledge flows provides a graphic diagnostic tool to identify dynamic knowledge flow problems. The new organizational forms which become apparent, from visualizing knowledge flows, offer an exciting opportunity to study theoretically and evaluate empirically, not to mention implement practically.

Sue Newell, Susan Adams, Marcy Crary, Priscilla Glidden, Vicki LaFarge, and Aaron Nurick look at how knowledge is integrated and synthesized in teams. Besides just making knowledge available between team members, it is important that we ensure that knowledge is integrated and used effectively by the team. The rationale for using project teams in organizations is that by including individuals with different backgrounds, the team will have access to the distributed knowledge and expertise that will be needed to ensure the solutions that are identified are inclusive and creative. However, teams differ significantly in their ability to integrate the diverse knowledge and expertise that is potentially available and relevant to their tasks. The authors investigate the above problem on a team's knowledge integration competency. Specifically they examine how it can be influenced by the human capital available across the team and also explore how reflective learning tool interventions are used by teams to improve their knowledge integration competency.

Roberto Evaristo discusses the role of incentives in facilitating effective knowledge transfers. Too often knowledge flows are taken for granted in organizations. Roberto articulates why we should consider the issues of incentives, goal alignment, costs, and asymmetries when we deal with knowledge flows. Roberto's discussion complements the thoughts of Awazu and colleagues in terms of building incentives that will entice systematic and optimal knowledge flows.

The final chapter is by Mogens Kühn Pedersen and Michael Holm Larsen. Mogens and Michael discuss how to manage distributed knowledge that is innocuous. Innocuous knowledge is enhanced when it is shared with multiple entities, used in a distributed manner, and openly engaged with. This is in contrast to proprietary knowledge that needs to be secured. The authors add to the existing knowledge base on distributed knowledge management by identifying different forms of distributed knowledge networks, developing their value propositions based on resource-based theory, and establishing a set of propositions with regard to their static and dynamic aspects of robustness.

Concluding remarks

I hope this introduction has been interesting, and has done the chapters that follow justice. I cannot overestimate the joy of putting this book in order; it has been a pleasure to assemble. I hope that you find the pages that follow interesting and stimulating. For every chapter that has made its way in the book, there are other, sometimes equally interesting ones that had to be sacrificed and omitted. Hence, there are many more new frontiers that are hidden in our literatures; we must seek these out, nurture them, and cultivate them into full-fledged research and practitioner agendas. The new frontiers of knowledge management is not a static concept – we must continually push the limits of our thinking on this topic. I hope this book has taken the first steps towards arguing for new frontiers in this emergent and exciting field and I am extremely grateful to the contributors, reviewers, and publishers for making this project a knowledge reality.

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