

Preface

In 2005, two of the authors of this book attended to the 4th International Conference on the Hospital of the Future at Aalborg, Denmark. We took this opportunity to discuss the idea of a collaborative work concerning the application of knowledge management (KM) to various aspects of healthcare sector. We believed then and today are convinced that it is essential for healthcare globally to embrace the tools, techniques, technologies and tactics of KM to effect superior healthcare operations and we trust that this book helps to convey to our readers not only the importance of KM, but why it is so integral in redesigning innovative healthcare operations.

In coping with the current complex and dynamic situation in the healthcare field, it is imperative for the creation of new ideas and values to foster an innovative workplace that enables an organization's most critical resource, its knowledge workers to collaborate across and within disciplines. This can only be possible by embracing a socio-technical systems methodology (Emery and Trist, 1965, Miller, 1999), new pluralism and a multi-paradigm intervention (Habermas, 1978, Drucker, 1992, Jackson, 2000), which combine psycho-social, cognitive-psychological perspectives with physical/mechanical and information technology perspectives. In such an integrated approach, enterprise visions and the responsibility necessary to propel organizational strategy are shared and strengthened, and individual value consciousness is aligned with a collective one. In contrast, cognitive misfits between the internal and external world in individuals and collectives, and also among any stakeholders, frequently happen in the current society which in turn leads collaborative work to be misdirected, and thereby the collaboration becomes difficult and problematic. Organizational performance can be improved by cognitive reliability and validity, and can be developed by the viability of the participants. Timely and appropriate application of knowledge management methodology is essential to change the healthcare fields by sharing and spreading new value of knowledge beyond the barriers among academic disciplines, or beyond a particular interest

limited to a specific field. In the organization embraced by socio-technical methodology, knowledge management plays a crucial role in enhancing organizational resilience/adaptability and in improving organizational performance especially during turbulence in uncertain and complex society. Given the state of healthcare operations globally – contending with exponentially increasing costs, myriads of technology options and in most instances aging population problems – the tools and techniques of KM offer a welcome oasis after an extensive trek through the Sahara desert, indeed, one might be tempted to state that KM might be the panacea for healthcare in this 21 century.

In an attempt to navigate through the relatively uncharted waters of knowledge management for innovative organizations and more especially the role of knowledge management in redesigning innovative organizations, this book presents essential theories, concepts, methodologies and evidence-based applications. In particular, the reader will find the key tools and techniques necessary for the designing of an innovative healthcare operations presented in the following chapters. Knowledge management provides two thinking modes, normal scientific and post normal scientific modes. In normal science, the problems are solved by nomothetic approaches to causality, while in the post normal scientific thinking mode, the problems are appreciated by hermeneutic approaches to an a causal phase of social event service. Knowledge management plays an essential role in continuously transforming the organization into a dynamic and resilient organization by facilitating the interpretation of current issues in the field. Hence, knowledge management provides efficient and effective methodologies for creating a reliable organizational climate/culture which will emerge synergetic power of amplifying together (Haken, 1978, Shimuzu, 1992), not simply fusing and living together, and for creating an innovative work atmosphere where collaboration and alignment among different disciplines can ensue. Given the universal need to embrace the key tools and techniques of knowledge management and yet the challenge to apply these tools and techniques appropriately in the manufacturing and service sectors as well as the community at large, this book focuses on underscoring both the universal need for knowledge management and the importance of contextual applicability and understanding the different nuances on the events, as in management by the participants' value which leads to an innovative operations.

This book is recommended for university students, researchers, practitioners or service-providers primarily in the healthcare field as well as in those who are interested in knowledge management and are eager to develop their current understanding of organizational environments in order to transform them into innovative ones, such as managers and leaders in team work/projects, management staff in industry, professional healthcare workers, nurses, physicians, hospital administration managers.

This book is written with four explicit sections and has two implicit parts. Section I and II combined make up the first implicit part of the book which focuses on the essential concepts and critical aspects of KM. Specifically Section I provides an introduction to the fundamental aspects of knowledge and knowledge management, while Section II provides exposure to important methodologies and emphasizes the importance of socio-technical perspective for effective KM. Thus Section I and II provide the reader with the essential tools and technologies for harnessing good KM practices. Section III and IV make up the second half of the book. In these two sections the attention turns to evidence of examples in various areas of the healthcare sector (Section III) and then to evidence in local communities and family lives in Section IV. Given that healthcare operations have significant impact not only to healthcare-providers and patients but also the community, it is important to illustrate the impact of redesigned healthcare operations and/or the importance of redesigning existing healthcare operations to/for these various stakeholders.

Section 1: Fundamental Aspect of Knowledge and Knowledge Management

This first section consists of four chapters: “Knowledge Economy for the Innovative Organization” by Wickramasinghe, “Managing Knowledge for Enhancing the Participants through Organizational Learning and Leadership” by Saito, “Permitting the True Potential of Knowledge Assets to be Utilized with KMI” by Wickramasinghe, and “Normal Science and Post-Normal Sciences” by Geisler.

Together these four chapters outline fundamental considerations regarding critical aspects of the knowledge construct (i.e., the dualities found within the knowledge construct as discussed in Chapter 1 and the connection between knowledge management, organizational learning, and leadership as discussed in Chapter 2). Chapter 3 discusses the fundamental components necessary to develop an appropriate and robust knowledge management infrastructure (KMI) and finally Chapter 4 presents important implications and considerations for methodologies for knowledge management that can only be fully appreciated through the understanding of significant aspects of normal and post-normal sciences.

Knowledge management is a nascent evolving field. Our goal in this section is to provide readers with the essential core elements of the KM discipline so that they have a solid foundation, exposure, and understanding of the key concepts. Given that the primary focus of this book is the use of KM for redesigning healthcare operations, we naturally focus our attention on those key aspects of KM that we believe are most beneficial when applied to any/all healthcare scenarios. Specifically, it is necessary to understand the roles for people and technology as well as how to develop appropriate and solid KM infrastructures so that the true potential of all

knowledge assets can be maximized. This in turn requires appropriate leadership, good metrics, and a need to break away from rigid and outdated structures and/or archaic approaches to viewing problems and scenarios.

On the completion of this section, the reader should have a solid grounding in the fundamental core principles that are necessary in order to understand the role for knowledge management in redesigning innovative healthcare processes.

Chapter 1 (Wickramasinghe) describes the knowledge economy for innovating organization by providing definitions of basic concepts, knowledge, knowledge economy, knowledge management, and explains the knowledge spiral in information processing in society as well as knowledge creation from two major perspectives, i.e. the people-oriented perspective and technology-oriented perspective.

Chapter 2 (Saito) explains that managing knowledge facilitates the process of organizational learning and enhances organizational climate/culture in which the participants feel confident and are inspired in contributing to the organization in order to harness competitive advantages. Organizational learning capabilities and organizational learning process models are described in relevance of knowledge management to organizational learning and technology

Chapter 3 (Wickramasinghe) discusses the importance of establishing and sustaining an appropriate knowledge management infrastructure (KMI) in order to provide the organization with the best possible foundation from which to leverage its intellectual assets.

Chapter 4 (Geisler) provides the key attributes of normal science and the recently heralded post-normal science and argues the subjugation of post-normal science to social, economic urgencies and exigencies is only a matter of degree. This chapter brings researchers in the area of social sciences an inquiry into theory-in-use as well as espoused and established theories.

Section 2: Approaches to Healthcare Operations Management

This section presents six chapters as follows: Chapter 5, “Whole Systems/Holistic Approaches to the Continuation of Organizational Transformation,” by Saito. Chapter 6, “Knowledge Information Processing Levels and Knowledge Information Interpretation,” by Saito. Chapter 7, “The Intelligence Continuum and Emergency and Disaster Scenarios,” by Wickramasinghe. Chapter 8 “Evaluation of Human Action: Foucault’s Power/Knowledge Corollary,” by Wickramasinghe. Chapter 9, “Key Considerations for the Adoption and Implementation of Knowledge Management in Healthcare Operations,” by Wickramasinghe and Geisler, and finally Chapter 10, “Realizing the Healthcare Value Proposition: The Need for KM and Technology,” by Wickramasinghe.

As already discussed in the preface, integral to the presentation of knowledge management issues in this book is the embracing of the sociotechnical perspective; a perspective that takes into consideration both human and technology issues that must complement and coordinate if superior operations are to be effected. In order to develop a full appreciation of the importance of such a sociotechnical perspective to facilitate ones understanding of the role of knowledge management in redesigning innovative healthcare organizations, it is vital to first investigate key concepts, including whole systems and holistic approaches, as discussed in Chapter 5, the knowledge-information processing dynamic presented in Chapter 6, as well as the dynamics of intelligence both human and machine (or artificial) as presented in Chapter 7, and finally and often one of the most daunting aspects in the application of knowledge management initiatives, namely that of the power dynamic, which is presented in Chapter 8. Chapters 9 and 10 then begin to focus explicitly on healthcare contexts and present key issues concerning the adoption and implementation of KM, as well as the role of KM for realizing the healthcare value proposition. Taken together, Sections 1 and 2 provide the fundamental principles of KM and human action. In Sections 3 and 4, instances of these key aspects are highlighted in various healthcare contexts.

On the completion of this section, the reader should be well equipped to understand most, if not all, the key aspects of sociotechnical dynamics.

Chapter 5 (Saito) describes conceptual framework of whole systems, holistic or integral social systems, and the classification/categorization of human cognition-action at the individual level as well as the organizational culture in the collective level. Typology of methodologies for intervening complex social systems and for changing organizational culture is also explained.

Chapter 6 (Saito) provides knowledge information processing loops and explains the multiplicity of knowledge information processing. The three throughputs of knowledge information and organizational learning, the feed back and feed forward processes of knowledge information, holistic management and knowledge information interpretation are described for the argument of future study in aligning of misfit between operation management and human action

Chapter 7 (Wickramasinghe) presents the model of the intelligence continuum. This model outlines a structured approach that is particularly useful in emergency and disaster scenarios in order to make effective and decisive decisions which draw upon the power of the extant knowledge base.

Chapter 8 (Wickramasinghe) discusses the need to incorporate post modern philosophies such as that the work of Foucault with classical theories such as agency theory, to develop a rich lens for understanding the dynamics of knowledge and its management in innovating organizations.

Chapter 9 (Wickramasinghe) describes key considerations for the adoption and implementation of knowledge management in healthcare operation,

Chapter 10 (Wickramasinghe) describes that it is only possible to realize the healthcare value proposition by embracing the tools, techniques, strategies and protocols of KM.

Section 3: Case Studies Illustrating Key Workplace Issues

This section presents four chapters all by Saito as follows: “Perceived Organizational Environment and Perceived Reliability in the Case of Hospital Nurses,” Chapter 11, “Roles of Interpersonal Relationship in Improving Organizational Performance in the Case of Hospital Nurses,” Chapter 12, “Interference of Mood States at Work with Perceived Performance, Perceived Efficacy, and Perceived Health,” Chapter 13, and finally, “Causal Relationship Among Perceived Organizational Environment, Leadership, and Organizational Learning in Industrial Workers,” Chapter 14.

The chapters in this section focus on critical current workplace issues in hospitals (in Chapter 11 and 12) and also in industry (Chapters 13 and 14). Effective application of knowledge management tools are made when the participants can understand the current situations of their workplace and share the reality. The participants need appreciation process for sharing the reality. Case studies or field studies are very important for the purpose of identifying the reality in workplace. Without the evidence obtained by case studies or investigations, redesigning innovative workplace operations is unlikely to result in successful outcomes.

The relationship between job cognition and incident behaviors of hospital nurses is presented in Chapter 11. In Chapter 12 nurses’ behaviors at a subsystem level without any strategies is described. Significant interference of mood state at work with perceived self-efficacy, perceived performance, and perceived health forms the focus of Chapter 13. Finally, in Chapter 14 crucial roles of organizational learning and leadership as a leverage for the development of organizational performance in industry provides a good example of how to identify the reality and then start appreciative steps by means of knowledge management tools. The results of these four chapters suggests that understanding and sharing the current workplace information is critical in order to make workplace operations superior through the appropriate application of knowledge management methodologies.

On the completion of this section, readers will be equipped to identify key current workplace issues and to adopt appropriate methodologies of knowledge management in order to effect appropriate organizational redesign to enable effective and superior operations whether in the healthcare sector or manufacturing.

Chapter 11 (Saito) presents evidence on the relationship of perceived organizational condition and the performance reliability which are observed in hospitals

in Japan. Occurrence of erroneous actions relates to organizational control and also relates to specific working time during 24 hours. Cognitive reliability on work conditions and work environment played critical roles in improving work performance and reducing human errors during the course of providing high quality of care.

Chapter 12 (Saito) provides evidence on the relationship between interpersonal relationship and organizational performances in the case of hospital nurses. Team reciprocity, communication accuracy and performance reliability representing organizational performance are provided and compared by emotional regulation, communication type and appreciation level of professional nursing work.

Chapter 13 (Saito) presents evidence on the interference of mood states at work with perceived performance, perceived efficacy and perceived health by using industrial workers. Mood states at work are influential moderators in affecting workers' perceptions. The perceptions of performance, self-efficacy, and health status significantly differed among mood states at work, and a vigorous mood at work had positive effects on workers' perceptions which leads to the enhancement of work ability and interpersonal management competency. It is important to note that while this chapter does not discuss healthcare operations, but the lessons from it are most pertinent to the healthcare sector.

Chapter 14 (Saito) provides some evidence on organizational learning observed in industries in Japan, and discusses organizational learning as a leverage in developing organizational performance. Mediating roles of organizational learning and leadership by type are crucial in improving organizational performances and in changing organizational climate coping with complex social environment. As with the previous chapter, we note that while this chapter not specifically discuss healthcare operations, but the lessons from it are most pertinent to the healthcare sector.

Section 4: Case Studies Illustrating Key Issues and Investigations at the Community Level

The final section presents four chapters as follows: Chapter 15, "Eye-Movement and Performance during Reading of Cerebral Palsy Patients," by Karashima, Chapter 16, "Roles of Home Care and Rehabilitation Equipment for the Aged who Need Care in Improving Performance," by Nishiguchi, Chapter 17, "The First Attempt of Intensive Approaches in Cognitive Rehabilitation in Clients with Severe Traumatic Brain Injury (TBI)," by Fujii, Chapter 18, "Further Directions in Cognitive Rehabilitation in Community- and Home-based Daily Trainings in Clients with Severe Traumatic Brain Injury (TBI)," by Fujii.

The objective of these chapters is to provide readers with empirical studies and investigations dealing with the CP patients, the aged, and the TBI clients in com-

munity life, which illustrate current problems in their lives without the benefits of the appropriate adoption of the tools and technologies of knowledge management. The idea of this book is to highlight all areas in innovative healthcare operations where the tools, techniques, and technologies of KM can be utilized. The empirical studies which make up Section 4 emphasizes an area within healthcare; namely, that of home-based and community-based care, one that is less well understood and more often than receives less attention, and shows that the need for KM is just as important and relevant in this context to facilitate the designing of innovative operations.

Supporting tools and technologies for the TBI patients, CP patients, or the aged peoples who have a social handicap have been developed in each disciplinary section. However, a particular disciplinary knowledge is not adequate for active people who want to develop their own future life styles. People require foresight in their future lives in society as well as deep insight into the current circumstances. Knowledge on sociotechnical systems in addition to the specific disciplinary knowledge is needed for the people who search future perspective/scenario of their lives. Redesigning appropriate mechanisms of sociotechnical systems makes socially handicapped people become empowered to see their desired reality. Appropriate application of knowledge management methodologies are hardly expected without the prudent inquiries to future scenario as well as to current problems for the socially handicapped people.

On the completion of this section, the reader will be equipped with some key points to understand how socially handicapped people perform their own cognition-behavioral coupling processes. Their reactions in cognition and behavior levels are so characteristic that you can not understand without adequate analytical data and study results, and also their future perspectives vary depending up their living environments whether or not they have family support and satisfactory living surroundings. Moreover, this section highlights that KM plays as an important role in the community, as well as other contexts of healthcare.

Chapter 15 (Karashima) provides experimental evidence of eye-movement and performance in reading still documents of Japanese characters (Experiment 1) and scrolling documents (Experiment 2) by comparing between cerebral palsy (CP)patients and students. Characteristic eye-movement and performance of CP patients were clarified by comparing reading time, eye fixation duration, frequency of fixation, and the intervals between eye fixation in Experiment 1, and the most comfortable scrolling speed in Experiment 2. Appropriate daily care supported by the tools of knowledge management as well as by specific disciplinary technology is required for redesigning the social lives of the CP patients with characteristic eye-movements.

Chapter 16 (Nishiguchi) presents a barrier-free design for the aged who need home care and rehabilitation equipment. Home care and rehabilitation equipment are described as the method to remove barriers in daily activities, such as transferring the individual from bed or chair, mobility, eating, dressing, taking bath, verbal and auditory communication. The effectiveness of homecare and rehabilitation equipment is also described in emphasizing the importance of environmental adjustment for the aged, and the difference between male and female users in the feelings of satisfaction and well-being.

Chapter 17 (Fujii) describes the roles of home-based daily cognitive rehabilitation in two severe traumatic brain injury (TBI) clients, Client A and Client B. This chapter provides evidence on how the regular practice of work book training is effective and how home-based practice is efficient for the clients. The step-by-step processes in their home and the community where the TBI clients were engaged and the reliable relationship among stakeholders, care-givers, supervisors and the clients, provided the clues and tips for clients to get suitable to their new job and to successful social reentry.

Chapter 18 (Fujii) provides the outcomes of the cognitive rehabilitation tests carried out by using young clients with severe traumatic brain injury (TBI). This Chapter suggests that the cognitive deficits of the TBI clients are improved first in attention, reading abilities, memory and executive function. After long-term training for social re-entry, memory in TBI clients are further improved.

Evidence-based practice leverages in developing knowledge management and in creating new values which change organizational environment. The organizational environment continues to be transformed and enhanced by preparing a set of scenario for the future by means of multi-modal methodological approaches, and juxtaposing hermeneutic approaches as well as nomothetic approaches. The authors, belonging to different disciplines, present some evidence of current circumstances and the need for organizational change in various healthcare scenarios. Viewpoints range from Management Systems Engineering, Human Factors Engineering, Brain Research, Management Sciences, Information Sciences, to Social and Health Sciences, Cognitive Psychology, Industrial Organizational Psychology, and Rehabilitation Psychology. The chapters we have prepared in this book are designed to help all the readers to gain deeper insights and a broader understanding of knowledge management and how it impact a multiplicity of interwoven disciplines, fields and events, and moreover that application of knowledge management to any organizational context will indeed facilitate superior outcomes. The studies and investigations presented in this book are only some examples intended to illustrate key points rather than be representative of all scenarios that require knowledge management. Most of our studies were to determine the reason why these kinds of events happened and to suggest how to take an action in operations, while a few of the studies describe

the application of knowledge management methodology suitable to each event. What we present then in the following pages is a sample of the role of knowledge management in redesigning innovative operations and we underscore the need for on going research in this key area. We hope that all our readers will enjoy this book and find some hints and tips in the chapters introduced in this book as they try to grapple with the role of knowledge management in their own areas of interest and specialization.

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