Preface

All of us are aware of the technology that surrounds us today, no matter where we go. We may not understand how all this works, but we do know that all this provides us a level of comfort and ease that we could not think of going back just 50 to 100 years from now. Technology advancement has changed the face of the world. There are various components we can discuss regarding technology, but we restrict our presentation to the ones that justify the topic and scope of this book. There are three major components of this book, and these are:

1. **Technology**: The driving force behind all the big and small enterprises.
2. **Innovation**: The driving force behind all the new ways to deal with new problems and needs arising in industries and research.
3. **Enterprise Transformation**: How enterprises have been impacted and transformed with the acceptance and active growth of technology.

We begin our discussion with a very general question, Why do we need technology in today’s world? The answer is not straightforward because we are still trying to answer this question. Can we do without technology? The answer is, Yes! Is it important to use technology to progress? The answer is, Probably Yes! If we need to keep up with the needs of today’s society, technology provides a way to fulfill those needs more efficiently and quickly. Technology, in general, as any other tool we have invented, can be a boon or a bane for the society. We can discuss how technology can be disruptive in our lives and what is the need and requirement of today, and what can and must be changed, but from this point onwards, we will spend a significant amount of time on how technology has changed the face of enterprises. This book can assist academics, practitioners, doctoral students, as well as undergraduate students desiring to further understand the impacts of technology and innovation on enterprise transformation.

The book is organized as follows.

**ORGANIZATION OF THE BOOK**

The “Introduction” introduces the main concepts of the book, that is, technology, innovation, and enterprise transformation. All the three components are explained and described in detail. This introduction is written with the idea that the book is based on the foundation of the interconnection of technology, technological and business innovations, and how they transform various enterprises.
Chapter 1, “Technology Integration in Work Settings,” presents how technology integration is gaining pre-eminence in the workplace. While plentiful definitions exist, researchers have attempted to answer many questions related to technology. Most of the issues dealing with technology in the workplace, but are not limited to, technological entry, technological adoption, technological adaptation, technological appropriation, and technological invention. This chapter delves into the concept of technology integration in work settings. Starting with definitions, the chapter examines the nature of technology, its interrelationship with knowledge and the learning organization, its importance in the workplace, and its association with innovation.

Chapter 2, “Emerging Technologies and Organizational Transformation,” discusses how various recent technologies, such as, Internet of Things (IoT), Augmented Reality (AR), additive manufacturing (3D-printing), and smart technologies and robots (smart driver-less cars, nurses, and home robots) are changing and challenging the way various tasks are accomplished. It discusses in detail the resources used to accomplish these tasks. Technology is making the world smaller and highly interconnected. On the other hand, these technologies, like robots, are replacing not only blue-collar workers but also highly skilled surgeons.

Chapter 3, titled “New Technologies and the Impact on the Business Environment,” presents an approach to the strategic role of new technologies, like tablets and cloud computing, and the impact on the business environment. It discusses the importance of companies to understand and use these new technologies in their various organizational processes, always looking for the strategic alignment of information technology with organizational strategy. The chapter also discusses the contribution of information technology to the information systems of companies, through the resources and solutions available today, such as tablets and cloud computing. The research method is the survey conducted in firms located in an industrial Brazilian shoe industry.

Chapter 4, “Structural Services: A New Approach to Enterprise Integration,” indicates that at present, enterprise integration is based on the Service-Oriented Architecture (SOA) and Representational State Transfer (REST) architectural styles and contends that both have advantages and limitations for enterprise integration. SOA, based on behavior, has a lower modeling semantic gap for complex applications but lacks support for structured resources common in lower-grained applications. REST is based on structure and hypermedia but has a higher semantic gap in complex applications and, as this chapter contends, does not entail a lower resource coupling than SOA. A new architectural style, Structural Services, is proposed to get the best of both worlds, while reducing coupling with structural interoperability based on the concepts of compliance and conformance. Unlike REST, resources are able to offer a variable set of operations, and unlike SOA, services are allowed to have structure and use hypermedia. A distributed service programming language is briefly described to illustrate how this architectural style can be instantiated.

Chapter 5 provides a view of “The Impact of Knowledge Management Information System on Businesses.” Organizations put their focus on organizational knowledge rather than on material resources. They increase their efforts to maximize knowledge utilization in order to cope with global trends, improve their business processes, make effective decisions, improve the quality of their products/services, and increase their effectiveness. The successful management of organizational knowledge leads organizations one step further in their work, and it is an important factor in gaining and maintaining a competitive
advantage. The knowledge management processes can be facilitated and supported by various information technologies and techniques. Some of the information techniques and technologies give better effects in knowledge management processes than others. This chapter proposes a model of a knowledge management information system as a result of extensive research and analysis.

Chapter 6, “Securing Enterprises from Malicious Attacks on their Networks,” presents an innovative model to safeguard the networks of various enterprises. In this information age, enterprises can survive only by implementing ways to deliver their services at a fast pace. With this comes the need for establishing communication networks that can transfer information quickly. One key player in these networks is a Router. Routers interconnect networks of various enterprises, and the more secure the entry or exit points are made, the more robust the security of these enterprises is. These routers become the first direct targets and are vulnerable to security attacks. If these routers are not tightly protected, the attackers get an edge to intrude the system. In order to ensure the security of these routers, Secure Access Control Lists (ACLs) Filtering-Based Enterprise Networks (SAFE-Nets) are proposed in this chapter. In this scheme, routers are configured with Access Control Lists (ACL) that are used to filter in the intended packets and filter out the dangerous malicious packets from network traffic. This consolidates security deployment over the entire network on top of anti-virus software, weak passwords, latent software vulnerabilities, and other related secure measures. This can help network technicians working for various enterprises manage security at low costs.

Chapter 7, “Innovation Styles, Processes, and their Drivers: An Organizational Perspective,” presents that technology innovation is not just a result of funds invested in research and development of a firm; it is a culmination of long-standing investments in well-thought-out processes, plans, and strategies. The chapter aims to address these aspects of technological innovations. The innovation process is a unique one, and each firm has a different style of bringing in innovation as per their requirements. These diverse innovation requirements are a direct consequence of the organizational structure and the innovation philosophies that those structures have embedded in them. Based on academic research done over the past decades on topics of organizational impact of innovation, the authors analyze the different innovation philosophies that organizations have, the processes that organizations use to promote innovation, as well as the drivers that impact these philosophies and processes.

Chapter 8, “Are Universities Unsocial with Social Media?” is an interesting take on academia and its resistance to accept change, and if it does, it does it slowly. Many of today’s business organizations have replaced or augmented traditional marketing with social media in order to promote their products or services and take advantage of blogs, social networks, audio, video, email marketing, and collaborative environments to reach their customer base. The benefits include cost savings, stronger customer loyalty, increased sales, heightened product/service awareness, the ability to mine data, and reaching customers quickly. Universities, while focusing on the primary responsibility of teaching, are also employing social media to promote their business to their customers, the students. While university programs are sometimes criticized for focusing on theory instead of specific skills and relevance to the workplace, could this same criticism also be applicable to how universities use social media and how this burgeoning business tool is perhaps not being taught? In this chapter, various uses of social media in the university setting are uncovered and recommendations are made for improvement of social media initiatives.
Chapter 9, “A Past to Present Journey: A Critical Analysis of the Chief Information Officer Role,” explores the role of the Chief Information Officer (CIO). A detailed review of existing literature traces the evolution of this role and highlights its characteristics and configurations. CIO role effectiveness can be described in terms of three demand-side roles: strategist, relationship architect, integrator, and three supply-side roles: educator, information steward, and utility provider. To explore the configuration of roles of CIOs in Australia, a large-scale survey of CIOs was conducted. The Australian results, based on 174 responses, are compared with those from similar studies in USA. The top priority for the Australian CIO was information steward, ensuring the organizational data quality and security and recruiting and retaining IT skilled staff. In comparison, the first priority for the USA CIOs was utility provider - building and sustaining solid, dependable, and responsive IT infrastructure services. This study’s findings have implications on CIO career development and recruitment.

Chapter 10, “The Evolving Role of the Chief Information Officer (CIO),” argues the role of the CIO has emerged to become the highest-ranking IS executive in many organizations today. The new role of CIO was created in the early 1980s, a time when organizations had just begun to recognize the strategic importance of IS. Prior to that, the most senior role in IS had been that of the IS Manager, a functional or line manager role with only limited involvement with top management. This new role was expected to work within the top management team to “bridge the gap” between the IS department and top management, to ensure the ongoing successful exploitation of IS across the organization. Today, it has been suggested that the role of CIO has now evolved to cover the need to also “bridge the gap” between the organization itself and its external IS technological environment. The purpose of this chapter is to review the IS management literature relating to the CIO in order to gain a greater understanding of the evolution of this role.

Chapter 11, “Aligning Strategy and Information Technology,” provides the reader with high-level insights into the complexities of aligning strategy and Information Technology (IT) by reviewing core areas of the extant strategic alignment literature. Strategic alignment has proven to be a perennial issue for organizations and management teams alike for more than three decades now. In some quarters, the actual meaning of the concept is ambiguous, and the chapter aims to provide a clear understanding of what strategic alignment fully means and involves. The chapter addresses the origins of the construct and elicits many of the known reasons that describe the inherent challenges from a practical management point-of-view. Insights into various perspectives are shared based on past empirical studies. Given that strategic alignment is embedded with the very essence of strategy, insights into context, content, and process as they relate to this important IT management domain are presented.

Chapter 12, “The Role of Information Systems within Enterprise Architecture and their Impact on Business Performance,” introduces the role of Information Systems (IS) within enterprise architecture and their impact on business performance, thus explaining the theoretical and practical concepts of Information Technology (IT), technical alignment, IS capabilities, IS effectiveness, enterprise architecture, and business performance; the implementation of IT strategy; and the importance of IS within enterprise architecture and their impact on business performance; and the application of IS within enterprise architecture and their impact on business performance. The focus on the role of IS within enterprise architectures and their impact on business performance by utilizing IT based on the practical application of IT, technical alignment, IS capabilities, and IS effectiveness is to connect people, processes, and technology for the purpose of maximizing corporate IT, technical alignment, IS capabilities, and IS effectiveness. Applying IS within enterprise architecture will greatly enhance business performance and reach business goals in digital age.
Chapter 13, “Effects of Information Technology on Business Performance and the Use of Accounting Measures,” argues that the understanding of the link between Information Technology (IT) investments and firm performance is still not completely understood in spite of numerous studies. However, these studies are not united in how they examine the effects of IT on business performance. They differ in their criteria, methodologies, and samples. Therefore, while there are positive effects associated with IT on firm performance, it is still difficult to reach overarching conclusions and highlight that there is still a need for further research. Specifically, this chapter contributes to this area of study by discussing the different types of benefits that firms can get from IT investments, examining the use of accounting variables to quantify the effect of IT, and providing future research directions.

Chapter 14, “Logistics and Supply Chain Management and the Impact of Information Systems and Information Technology,” indicates supply chain management is the backbone of the movement of goods and services. Supply chain management is a term that has evolved from logistics. Traditional supply chain management involved a salesperson, who was the focal point in the supply or logistical chain. In a traditional supply chain model, a business would contact a salesperson to inquire about a product or a salesperson would pitch a product to a business; then the ordering process or supply chain management of movement of goods would funnel through the salesperson as the initial interface. Today, the supply chain has evolved; IT has changed the landscape of the supply chain with applications, such as RFID (Radio Frequency Identification), CRM (Customer Relationship Management systems), and ERP (Enterprise Resource Programs). The result is major changes in competitiveness, efficiency, costs, and strategy. This chapter examines the evolution of supply chain management and the impact of IT.

Chapter 15, “Business Competence and Acumen of Information Technology Professionals,” discusses the literature on the importance of information technology professionals acquiring business competence skills. Conventional wisdom suggests IT professionals should first and foremost be proficient in all technical aspects and abilities with managerial, strategic, and soft skills as secondary. The business competence of information technology professionals may not seem to be a new technical or strategic development; however, the landscape of business has changed significantly. The information technology infrastructure is embedded throughout most organizations. Information technology and those responsible for IT can no longer afford to operate in a silo as they have in the past. Today’s businesses rely more than ever on the technical infrastructure to provide scalability, functionality, and adaptability. The technical infrastructure is relied upon to help meet and assist with business operational, managerial, strategic, and competitive needs. This chapter examines the business competency of information technology professionals as a new development within IT.

Chapter 16, “Advances in Technology Project Management: Review of Open Source Software Integration,” argues since that organizations must continually drive the down costs of software driven projects, there is a need to evaluate the Systems Development Life Cycle (SDLC), and other software-based design methodologies. These methodologies include looking at software-based alternatives that could save a significant amount of money by reducing the amount of proprietary software. This submission explores the use and integration of Open Source Software (OSS) in software driven projects to include in enterprise organizations. Additionally, the legalities of the GNU General Public License (GPL), Lesser General Public License (LGPL), Berkeley Software Distribution (BSD), and Creative Commons are explored with the integration of these OSS solutions into organizations. Lastly, covered are the software
assurance and cyber security controls to associate with OSS to deploy a hardened product that meets the needs of today’s dynamically evolving global business enterprise. The authors review multiple Linux distributions and their uses. Reviewed in depth are the copyrights and open sourcing legal implications. As indicated through legal case reviews, there are some very valuable benefits to open source software, in that it allows for collaboration in the development of new software and technology that can undoubtedly spur innovation and improve many processes and functions that individuals and businesses in our society rely on every day. Consequently, one purpose of the GNU GPL is to protect and preserve individual rights and the creativity of others, while at the same time providing a benefit and contributing to society at large. OSS must be considered in the development process, as it is essential in overall license cost reduction with the ability to reuse already-constructed software.

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