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Preface

Chapter 1
Case Studies of RFID Practices for Competitive Inventory Management Systems

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The nature of emerging business technologies, such as automatic identification, and data capture innovations, such as smart cards, touch memory, and RFID, proves to be a difficult process to implement and achieve, despite recent efforts, even as implementation continues to lessen. The economy of scales associated with bar codes is a difficult barrier to overcome. Two Pittsburgh-based companies are showcased in this case study, namely Mobile Aspects, Inc., a recognized leader in the integration of RFID-related technologies in inventory management processes of large acute care, and Vocollect, Inc., which is especially noted for its voice-recognition software and small hardware platforms used in warehousing and partially automated inventory systems. The firms' goals for implementing inventory management, specific inventory recommendations and changes, comparison of inventory management processes, selected measures to ensure the quality and security of data transmitted via RFID-based technologies, and lessons learned are discussed.

Chapter 2
An Integer Programming Model to Maximize Battery Manufacturing Productivity

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An Integer Programming (IP) model is formulated and optimally solved for a real-life production planning problem. The model is used to determine the optimum production plan for the formation stage of battery manufacturing in a local battery-producing company. Battery manufacturing is a complicated process that involves several stages and several chemical and physical operations. The formation stage is considered the bottleneck of this process because it has the most critical limitations of time and production resources. In the formation stage, batteries are filled with acid and charged with electricity using different types of circuits. The objective of the model is to maximize the productivity of the critical formation stage by allowing the best utilization of the limited time and equipment resources. The model is able to consider a large number of battery sizes and types and also a large number of charging circuits with different capacities and charging speeds. The model-generated optimum production plans increase daily profits by 12% on average in comparison to manually-generated production plans.
Chapter 3
Improving Security and Efficiency of Multimodal Supply Chains Using Monitoring Technology
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Multimodal supply chains are characterized by multiple changes of transport modes, vehicles, and transport operators, and hence, the risks for theft, untimely delivery, and freight quality deterioration increase. There is a growing need to manage the security and efficiency of consignments. Tracking and tracing services, which are on the market, mainly concentrate on a single mode of transport, such as road vehicles, or transport units, such as containers. This chapter describes a concept for managing the security of multimodal supply chains using monitoring technology. A profound risk analysis was performed to identify threats and vulnerabilities during the different phases of the supply chain and key threat scenarios. A security service concept was developed to cope with the risks using monitoring technology. The technological solution depends on the needs of the supply chain actors and on the supply chain properties. The service concept was tested by monitoring different international shipments leaving from Finland. Intelligent monitoring devices, which were attached to the consignments, collected information on location and environmental parameters and transmitted in real-time to a background system. The chapter gives an overview of the framework, service concept, and the analysed results of multimodal shipments.

Chapter 4
RFID: From Closed Manufacturers’ Systems to Supply Chain-Wide Tracking
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The use of RFID (Radio Frequency Identification) tracking in closed systems is replacing barcode as dominant tracking system in many industrial sectors because RFID enables reading multiple objects simultaneously without visual contact. To enlarge tracking systems to cover global supply chains, all aspects related to RFID, such as radio frequencies, data content, transmission protocols, and message sets, need to be standardised. By collecting, processing, and distributing information efficiently, organisations should be able to improve the efficiency of their transport logistics processes, lower their operational costs, and improve their portfolio of logistics services. This chapter describes the current perspectives, challenges, and benefits of RFID tracking applications in manufacturing industry. The perspectives derived from review of previous research are validated by using case study method.

Chapter 5
Ordering Policy for Imperfect-Quality Deteriorating Items with Initial-Inspection and Allowable Shortage under the Condition of Permissible Delay in Payments
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While developing the inventory model with shortages under permissible delay in payments, it has been observed in the literature that the researchers have not considered the fact that the retailer can earn interest on the revenue generated after fulfilling the outstanding demand as soon as he receives the new consignment at the start of the cycle. Owing to this fact, the present study investigates the impact of interest earned from revenue generated after fulfilling the stock out at the start of the cycle on a single
commodity inventory model with shortages for deteriorating item, in which the whole lot goes through an inspection process on arrival before entering into inventory system, under the conditions of permissible delay in payments. After inspection, the non-defective items are retained to fulfill the demand and the defective items are returned to the supplier. The results have been demonstrated with the help of a numerical example using the tools of Matlab7.0.1.

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Fernando Abreu Gonçalves, CEG-IST, Portugal
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We can address innovation from different perspectives. In engineering practices we can look to changes resulting from attempts to discover ways of overcoming difficulties. How can we manage these innovative practices in engineering design projects? Furthering our perspective we use an actor-network way to look at change processes as chains of translations between heterogeneous actors that are enrolled in changes and where patterns of action are inscribed in durable manners. In an actor-network, the chains of inscriptions are stronger if the number of aligned actors is bigger, and this is the case of engineering projects where the cost of change builds up with time. Through the use of some stylized situations, the authors construct a Perturbation Index to obtain numeric values to assess the dynamics of innovations in engineering practices. The aim is that the application of this index to real situations could lead to meaningful descriptions of such innovation processes. Managing innovation in engineering design projects has to do with the management of project scope. The proposal extends scope management from its definition and planning phases through the control of changes along the execution.

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Hossein Arsham, Johns Hopkins University, USA
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This chapter provides a critical overview of Linear Programming (LP) from a manager’s perspective. The main objective is to provide managers with the essentials of LP as well as cautionary notes and defenses on common modeling issues and software limitations. The authors illustrate the findings by solving a simple LP directly on the original decision variables and constraints space without adding new variables or translating the model to fit a specific solution algorithm. The aims are the unification of diverse set of topics in their natural states in a manner that are easy to understand and providing useful information to the managers. The advances in computing software have brought LP tools to the desktop for a variety of applications to support managerial decision-making. However, it is already recognized that current LP tools, in ample circumstances, do not answer the managerial questions satisfactorily. For instance, there is a costly difference between the mathematical and managerial interpretations of sensitivity analysis. LP software packages provide one-change-at-a-time sensitivity results; the authors develop the largest sensitivity region, which allows for simultaneous dependent and/or independent changes, based on the optimal solution. The procedures are illustrated by numerical examples including LP in standard-form and LP in non standard-form.

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Kenneth Saban, Duquesne University, USA
Governing extended networks is often associated with having the latest collaborative technology and business processes. However, current studies suggest that both are only part of the answer. This chapter argues that a holistic governing strategy needs to be adopted to achieve peak network performance. That strategy requires four conditions: 1) that each organization is ready to work with fellow business partners; 2) that network orchestrators recognize that all business relationships are not created equal and therefore need to be governed differently; 3) that a holistic governing strategy has to be adopted in order to integrate the people, technology, and processes in place; and 4) that people engagement hinges upon six factors (trust, beliefs, communications, culture, reward systems/metrics, and synergy). This chapter is a modification of an earlier work published by IGI Global.

Chapter 9
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Mohamed Gamal Aboelmaged, Al Ghurair University, Dubai, UAE & Ain Shams University, Egypt

Industrialization leaves no doubt that our planet is suffering from global warming, depletion of natural resources, pollution, waste, and other environmental concerns. Consequently, businesses, communities, and governments have been environmentally conscious and shown growing concern for sustainable development, particularly following the establishment of the United Nations Environmental Program (UNEP). This chapter provides further insights into sustainability and supply chain research through adopting a stakeholder perspective to understand drivers and consequences of supply chain sustainability in the United Arab Emirates. The results indicate that pressures enforced by champions and customers are positively related to supply chain sustainability. However, the relationship between government pressures and supply chain sustainability is insignificant. Moreover, the findings provide evidence that the impact of supply chain sustainability on the organizational sustainable performance is significantly positive. Supply managers can learn from these results in developing sustainable initiatives earlier along their supply chain through selecting and evaluating suppliers based on sustainability-related standards. In addition, environmental collaboration with customers and suppliers based on knowledge sharing and application may identify and reduce the total environmental impact.

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Phil Crosby, CSIRO, Australia

Success in project management, and particularly in large, high-technology projects, continues to test the resources of organisations and their sponsors. This chapter revisits the conclusions of an earlier meta-study (Crosby, 2012a) that examined a large number of published case investigations and research efforts relating to the success and failure of projects. In that study, the success factors for general, and high-technology, projects were grouped and ranked as strategic success drivers for use prescriptively by project practitioners and approvers, and the principal drivers were examined closely to reveal any less obvious characteristics influencing project success. This chapter takes the original findings of ranked success drivers and investigates how these align with the experiences of three large contemporary high-technology projects. The conclusions show that, while the original set of drivers remains valid as predictors of project success, the ranking is likely to vary, even between projects that are technically and structurally similar. Two additional success factors are added as a result of the present study.

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Ronald John Lofaro, Embry-Riddle Aeronautical University, USA
It is well over 30 years since the first (then called) Cockpit Resource Management (CRM) training, now called crew resource management was introduced. It is a shibboleth, a sacred cow as it were, despite many issues, concerns, and changes over the years. Some 21 years ago, 1992, an Air Transport Association (ATA)/Federal Aviation Association (FAA)-Sponsored Workshop was convened in an attempt to deal with some specific CRM issues. Yet the issues and needs as articulated in that workshop, and some newer ones, remain. Thus, this chapter is 21 years overdue, leading to the questions: Why now and is it still relevant? As said, some needs, issues, and concerns remain. The relevancy is that both a critique of civil aviation CRM on many levels and a comparison with current USAF, USCG, and USN CRM are presented. The proposed skeletal template for the long-overdue revision of civil aviation CRM, the R-MPM is shown. Next, a new model for an intelligent cockpit automated decision aid/advisory system, Event Response Integrated Decision Advisories (ERICA), is shown. ERICA came about from 2009-2012 work in automated decision-making tools for the cockpit and the realization that the Revised Mission Performance Model (R-MPM) and ERICA were interrelated.

Chapter 12
Beyond the Paradox of Service Industrialization: Approaches to Design Meaningful Services

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Highly industrialized services add value to a company, but at the same time they can destroy it, should an almost identical proposal be made to two different clients who are seeking different experiences. The analysis of human subjectivity shows that the interaction with services goes beyond its mere use, as it is related to human beings’ search for meaning, and it can potentially become a part of its users’ biography and identity. The present chapter compiles some of the models that can contribute to getting over the paradox of service industrialization and which are here divided into two types: those that allow for a deep knowledge of the customer and those that are based upon designing experiences as a value proposition. The present chapter also suggests a research agenda that aims to get over the paradox of service industrialization.

Chapter 13
Adoption and Utilization of ICT in the Chinese Third-Party Logistics Industry

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This paper reports the findings of a questionnaire survey on the adoption and utilization of information and communication technology (ICT) – an important tool to enhance efficiency and responsiveness in modern-day supply chains – in the Chinese third-party logistics (3PL) industry. As a global manufacturing base, China has a burgeoning 3PL industry serving a large number of domestic firms as well as multinational corporations. With more and more organizations outsourcing their logistics function to 3PL firms, the latter have to make use of ICT for efficient communication with clients and coordination of activities in order to work hand-in-hand with customers to meet their day-to-day logistics needs. To investigate the status quo of ICT utilization in China, a questionnaire survey was conducted in 2009 to investigate the level of ICT adoption by the 3PL firms. For comparison, the findings of the Annual Third-Party Logistics Studies from 2007 to 2013 in this regard were also analyzed. The questionnaire survey results reveal that ICT is being widely adopted in the Chinese 3PL industry suggesting a high level of awareness of its significance and benefits to both the service providers and the clients. The ICT used ranges from low-tech telephone, facsimile, Internet access, to more advanced and sophisticated radio frequency identification technology and enterprise resource planning system. While small 3PL companies are using less expensive ICT at a tactical level mainly to cut costs and reduce errors in the day-to-day logistics operations, medium-sized and large firms have evolved to make use of more expensive ICT for planning and strategic purposes, such as business control, customer integration, and service differentiation. Transportation management system is regarded as the most important IT for business
to most 3PL firms surveyed whereas the significance of other systems for warehouse management, order management, and inventory management, etc. varies depending on the services provided and the resources available. A follow-up review of the recent literature suggests that ICT adoption in the 3PL industry of China has not significantly increased since the 2009 survey but the general awareness of the importance of ICT capabilities is growing.

Chapter 14
A Platform for Collaborative Outbound Logistics

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Electronic collaboration in the field of Supply Chain Management notably allows enhanced visibility for each of the involved actors through information sharing and global optimization through coordination. The proper achievement of these advantages is nevertheless not trivial since it implies the development of rather complex IT systems. Each actor is indeed mostly dealing with his own data semantics and custom processes so that data centralization and sharing is seldom achieved. Moreover, even if there would be a willingness to share data, this inherent heterogeneity would constitute a serious burden for software developments. The present chapter presents the results of a research aimed to partially solve these issues. It indeed presents the analysis and design of a platform for e-collaboration among the main Outbound Logistic (OL) actors based on a common conceptualization (including unified data semantics) and a set of services (supporting business processes realization). The chapter briefly presents the generic processes but mostly focuses on the representation of these services at a strategic level through an analysis of their added value and risk for OL actors potentially adopting the software solution.

Chapter 15
Why Information Systems Replication Strategy Fails in Transnational Operation

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In search of cheaper resources and being able to serve nearby market more efficiently in order to maintain and improve their market position in a global economy, companies relocate, extend, or establish new production facilities overseas. Because of this, how to manage the Information Systems (IS) that support transitional activities within companies has become an important agenda not only in the business but also in the academic community. At a glance, replicating information systems and value chain that a company already has in the new facility overseas is seemingly a cheap and easy option. Nevertheless, in practice, it is not a trivial task, and at its worst, the IS can become obsolete. This chapter explains why replication strategy does not always work, and drawing on the practice lens approach, it posits that any changes in technology-in-use are the outcome of an ongoing structuring process where people constitute and reconstitute the structure of an IS in use. The chapter demonstrates that the structure of an IS is not defined a priori but emerges from daily use of the system, along with people’s understandings of the system, and of its role in the context of organisational routines. On this view, any challenges arising from the attempt to replicate the IS can be regarded as largely inevitable, since the structures embedded and enacted in the use of system, along with the practices that in turn recursively structure the use of the system would also have changed.

Chapter 16
Framework Based on Benefits Management and Enterprise Architecture: The Private Cloud in the Business Strategy

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In 2010, a framework aiming to address strategic investment decisions on IT infrastructure was developed. It was based in Benefits Management principles and Enterprise Architecture concepts, being inspired by the emerging public cloud technological trend. Meanwhile, the public cloud concept did not materialise at the expected pace and other alternatives have emerged in the market, in particular the private cloud-based solutions. This fact required the framework to be updated to cope with the business and technological requirements of the private cloud concept. A new version of the framework has been developed and was used to help managers to address IT investment decisions on private cloud in an international bank.

Chapter 17
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With the evolution of information technology, firms offshore outsource services to developing and low service cost countries to have cost as well competitive advantages. This is a growing practice, but there has been limited empirical attention in understanding the outsourcing phenomenon, particularly from the perspective of service provider firms that execute important business processes for their overseas clients. This shows the need to study the factors that play a significant role in the growing trend to outsource and why only a few service provider firms report success. In this chapter, the authors try to find factors that influence performance of service provider firms. Multiple regressions using four indicators of firm performance are carried out to see the influence of certain factors on Information Technology Enabled Service (ITES) firms’ performance.

Chapter 18
Evolution of Supply Chain Collaboration: Implications for the Role of Knowledge............................. 333

Michael J. Gravier, Bryant University, USA
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Increasingly, research across many disciplines has recognized the shortcomings of the traditional “integration prescription” for inter-organizational knowledge management. This research conducts several simulation experiments to study the effects of different rates of product change, different demand environments, and different economies of scale on the level of integration between firms at different levels in the supply chain. The underlying paradigm shifts from a static, steady state view to a dynamic, complex adaptive systems and knowledge-based view of supply chain networks. Several research propositions are presented that use the role of knowledge in the supply chain to provide predictive power for how supply chain collaborations or integration should evolve. Suggestions and implications are suggested for managerial and research purposes.

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