Advancing the Service Sector with Evolving Technologies:
Techniques and Principles

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Chapter 1
Predicting Ambulance Diversion

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The high utilization level of emergency departments in hospitals across the United States has resulted in the serious and persistent problem of ambulance diversion. This problem is magnified by the cascading effect it has on neighboring hospitals, delays in emergency care, and the potential for patients' clinical deterioration. We provide a predictive tool that would give advance warning to hospitals of the impending likelihood of diversion. We hope that with a predictive instrument, such as the one described in this paper, hospitals can take preventive or mitigating actions. The proposed model, which uses logistic and multinomial regression, is evaluated using real data from the Emergency Management System (EM Systems) and 911 call data from Firstwatch® for the Metropolitan Ambulance Services Trust (MAST) of Kansas City, Missouri. The information in these systems that was significant in predicting diversion includes recent 911 calls, season, day of the week, and time of day. The model illustrates the feasibility of predicting the probability of impending diversion using available information. We strongly recommend that other locations, nationwide and abroad, develop and use similar models for predicting diversion.

Chapter 2
Hybrid Value Creation in the Sports Industry: The Case of a Mobile Sports Companion as IT-Supported Product-Service-Bundle

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Integrated product-service packages (hybrid products) can open new markets and target groups to companies. However, existing approaches to service or product development do not sufficiently address simultaneous development and domain-specific issues. A very promising new field for such bundles is the health and fitness industry. In this research, we designed and built an IT-supported training system for running, the Mobile Sports Companion (MSC), which closely interlocks a product and corresponding services using an iterative development process. We tested the pilot system with 14 recreational athletes. The results of the field test show that the MSC proved to be a promising tool to offer athletes an effective
individual, flexible, and mobile training. However, the system, as it is, did not sufficiently represent the human trainer behind it, thus lowering its acceptance and the credibility of its recommendations. Our next step is to integrate features that could strengthen the athlete-trainer relationship. The MSC could turn out to be a promising field for future e-business applications in the sports service industry.

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Managing customer service is critical for both nonprofit and for-profit dial-up modem Internet service providers. When system operators face excess demand, they can either add capacity or adapt their management techniques to deal with their limited resources—this article considers the latter. We examine system configuration options and the resultant effects on customer service levels in a simulated dial-up modem pool operation. Specifically, we look at a single pool operation and examine the effects of imposing time limits in a seriously overloaded system. We analyze the results on several key customer service measures. The results show that imposing these limits will have a distinct, nonlinear impact on these measures. Customer productivity and actual system load are shown to have major impacts on the performance measures. Interactions between several system and environmental parameters are also discussed.

Chapter 4
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This study investigates Greek accounting offices use of Information and Communication Technologies (ICT). Initially, a comprehensive questionnaire was developed. It contains 35 questions with multiple answers and 2 open questions tailored to the accountants. One hundred accountants' offices in a Greek county answered the questionnaire. The findings present their current ICT infrastructure and their use of ICT and accounting e-services. Greek accounting offices have made improvements in adopting new technology in their everyday work. All use email, antivirus software, and the Web. Most submit VAT (Value Aided Tax), Taxation Statements, and APS (Analytical Periodic Statement) via Internet. However, most are not cautious about backing up their data daily; they do not create electronic files for all their documents; they do not update their software via Internet; and they do not use advanced software applications. Finally, they expect the government and the Accountants' Chamber to finance their ICT infrastructure.

Chapter 5
Exploring the Adoption of Technology Driven Services in the Healthcare Industry ...................... 66
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Recent developments in information and communication technologies have helped to accelerate the diffusion of electronic services in the medical industry. Health information services house, retrieve, and make use of medical information to improve service quality and reduce cost. Users—including medical staff, administrative staff, and patients—of these systems cannot fully benefit from them unless they can use them comfortably. User behavior is affected by various factors relating to technology characteristics, user characteristics, social environment, and organizational environment. Our research evaluated the determinants of health information service adoption and analyzed the relationship between these determinants and the behavior of the user. Health information service adoption was found to be influenced by service characteristics, user characteristics, intermediary variables, facilitating conditions, and social factors.

Chapter 6
Temporal Aspects of Information Technology Use: Increasing Shift Work Effectiveness

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The dynamic nature of organizations and technologies require a comprehensive understanding of how organizational forms and information technology interact. While previous research and theories of information technology have investigated aspects such as organizational structure, individual and group behavior, and inter-organizational relationships, shift work, an important temporal aspect often found in service organizations, is surprisingly absent in the literature. The purpose of this paper is to examine the effect that shift work has on employee use and satisfaction with information technology. The results of a field study of a police organization indicate that information technology systems are valued differently by workers on different shifts. The authors discuss how this research helps advance theories of technology use and effectiveness (such as task-technology fit and technology acceptance model) and present important practical implications of this study for strategic alignment of technology in the areas of systems design, implementation, addressing the needs of peripheral workers, and resource management.

Chapter 7
Implementation Success Model in Government Agencies: A Case of a Centralized Identification System at NASA

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A recent presidential directive mandated that all U.S. government agencies establish a centralized identification system. This study investigated the impact of users’ involvement, resistance, and computer self-efficacy on the implementation success of a centralized identification system. Information System (IS) usage was the construct employed to measure IS implementation success. A survey instrument was developed based on existing measures from key IS literature. The results of this study indicated a strong reliability for the measures of all constructs (user involvement, computer self-efficacy, user’s resistance, and IS usage). Factor analysis was conducted using Principal Component Analysis (PCA) with Varimax rotation. Results of the PCA indicate that items of the constructs measured had high validity, while Cronbach’s Alpha for each factor demonstrates high reliability for all constructs measured. Ad-
Additionally, results of a structural equations modeling analysis using Partial Least Square (PLS) indicate that computer self-efficacy and user involvement had positive significant impact on the implementation success. However, the results also demonstrated that user’s resistance had no significant impact on IS usage, while end user involvement had a strong negative impact on user’s resistance.

Chapter 8
SERREA: A Semantic Management System for Retail Real Estate Agencies
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In the scenario of market competition in the Retail Real Estate Agencies (RREA) business, having exact information regarding properties in supply and their associated demand is a differentiating factor for organizations. The Semantic Web represents an opportunity to create extensible services that hold precise information concerning these types of markets. The objective of the current initiative is to use this market data as a competitive advantage for organizations. In this article, the authors propose SERREA, a management system for RREA based on semantics and constructed using Web Services, which has been implemented successfully in one of the leading agencies in Spain. The goal of this paper is to show how RREA benefits from using Semantic Technologies in the context of their business operations.

Chapter 9
Mass Customisation Models for Travel and Tourism Information e-Services: Interrelationships Between Systems Design and Customer Value
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Online travel firms exploit current ICT advances for developing mass customization (MC) capabilities and addressing the needs of the sophisticated travellers. However, studies investigating MC in services and specifically in tourism are limited. By adopting a customer-focused approach, this paper addresses this gap by analysing the following issues: a) the ICT and product dimensions that online firms can customise for developing and implementing different MC models; and b) the customer value and benefits provided by the different MC models. After reviewing and illustrating the interrelationships of studies coming from the fields of customer value, MC and IS design, the author proposes a customer value based framework for developing MC models. The applicability and practical implications of this framework are demonstrated by analysing the MC practices of three online travel cyberintermediaries. Finally, the paper summarises the formulation of research propositions investigating the influence of users’ characteristics on the customer value and benefits sought by MC practices and on the design of the IS platforms supporting MC services.

Chapter 10
Technology Fears: A Study of e-Commerce Loyalty Perception by Jordanian Customers
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The Internet and all other types of networks have changed life in general and doing business in particular, and as a result, many companies are now conducting and transferring their businesses online. In this paper, the authors evaluate whether loyalty issues are the major obstacles to the growth of e-commerce in Jordan. A survey conducted for the study reveals that technology fears are major barriers to loyalty in Internet banking and e-commerce activities among consumers. The results suggest that unless the technology fears of adopters are acknowledged, some of them are not successful.

Chapter 11
Predictive Models in Cybercrime Investigation: An Application of Data Mining Techniques
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With increased access to computers across the world, cybercrime is becoming a major challenge to law enforcement agencies. Cybercrime investigation in India is in its infancy and there has been limited success in prosecuting the offenders; therefore, a need to understand and strengthen the existing investigation methods and systems for controlling cybercrimes is greatly needed. This study identifies important factors that will enable law enforcement agencies to reach the first step in effective prosecution, namely charge-sheeting of the cybercrime cases. Data on 300 cybercrime cases covering a number of demographic, technical and other variables related to cybercrime was analyzed using data mining techniques to identify and prioritize various factors leading to filing of the charge-sheet. These factors and the respective priority rankings are used to suggest various policy measures for improving the success rate of prosecution of cybercrimes.

Chapter 12
Deploying New Perspectives of Network Organizations for Chronic Diseases’ Integrated Management
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The social frame of healthcare organizations in Europe (and in particular in the Italian Public Sector), as a combination of relational, formal and informal aspects, is one of their most relevant sources of complexity, which leads to different approaches about decisional, clinical and organizational processes (Cicchetti, 2004). These issues have been enlightened as well by the increasing social incidence of chronic-degenerative pathologies, such as Diabetes Mellitus type 2. In this regard, the Italian national e-government strategy has first pointed out the need for paths of integration and interoperability among information systems to ensure a safe exchange of information (CNIPA, 2008). The activity of “integrated design” of information flows between doctors and patients allows the creation and development of reticular organizational forms in which many non contiguous actors work at the same time on the diagnosis and care process. This paper shows how the adoption of the Social Network Analysis (SNA), as theoretical and methodological perspective that emphasizes the social reality as reticular framework (Moreno, 1987), can provide an innovative approach for the study of the “pathology networks” and the “integrated management” of Diabetes Mellitus type 2, where ICT solutions are (or are about to be) currently involved.
Chapter 13
Marketing and Reputation in the Services Sector: Higher Education in South Africa and Singapore

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Over the past few decades the tertiary sector has developed from a predominantly inward focussed industry serving public interest to an internationalised and commercially competitive industry. Resulting from this fundamental change is a drive to better understand the most prominent dimensions that impact on internationalisation, more particularly, the expectations and experiences of students. Although some of these can be argued to be country specific, and thus differentiate between markets, others are universal and impact on the overall industry. One of the latter is a pressure to consider and treat students as clients introducing all the dynamics of service delivery and management. The primary objective of this paper is to identify the most important variables related to marketing and reputation issues when selecting a university in South-Africa and compare the same for Singapore students. This study revealed that the most important consideration for the South African sample, regarding marketing and reputation related variables when choosing an institution of higher education, is the academic reputation of the institution, while the marketing activities were regarded as priority by the Singaporean sample.

Chapter 14
Data Mining in Nonprofit Organizations, Government Agencies, and Other Institutions

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Data mining involves searching through databases for potentially useful information, such as knowledge rules, patterns, regularities, and other trends hidden in the data. Today, data mining is more widely used than ever before, not only by businesses who seek profits but also by nonprofit organizations, government agencies, private groups and other institutions in the public sector. In this paper, the authors summarize and classify the applications of data mining in the public sector into the following possible categories: improving service or performance; helping customer relations management; analyzing scientific and research information; managing human resources; improving emergency management; detecting fraud, waste, and abuse; detecting criminal activities; and detecting terrorist activities.

Chapter 15
Understanding Expectations, Perceptions and Satisfaction Levels of Customers of Military Engineer Services in India

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Customer satisfaction and client orientation concepts are needed in all service providing organisations, including those engaged in construction and infrastructure provision within the public sector where the public perception about their services is at its lowest. This study measures the expectations and percep-
tions of various service elements among clients of Military Engineer Services (MES) in India. Customers' survey mode was used to measure the expectations, perception, importance and satisfaction. The perceived quality of services provided by this department was measured with SERVQUAL instrument on selected attributes using the Gap approach for identifying priorities. Additionally, this study also examines the influence of demographic characteristics of clients on expectations and perceptions of the clients. The results can be used by similar organisations for cultural and structural change to increase accountability and performance, in which the results indicate that the three most important dimensions in the order of importance among the clients of MES are tangibles, responsiveness and reliability.

Chapter 16
Service Registry Design: An Information Service Approach ............................................................. 239

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A service registry is a Service-Oriented Architecture (SOA) component that keeps a 'catalogue' of available services. It stores service specifications so that these specifications can be found by potential users. Discussions on the design of service registries currently focus on technical issues, while service registries should take into consideration information needs of business domain users. In this regard, the authors consider service registries as information services and develop a comprehensive framework for designing service registries. This framework introduces aspects that determine a design space for service registries. In this design space, the authors identify views, requirements, processes, and means in the design of a service registry that supports the lifecycle information of a service. A vital part of these requirements is further implemented and demonstrated in a prototype built as a 'proof-of-concept' for the framework. This paper also discusses a case study used to evaluate the prototype. In this case study, a registry prototype has been populated with realistic services of a large insurance company, and 21 experienced IT and business professionals from a consultancy organization evaluated the prototype for its user satisfaction.

Chapter 17
Operational Performance Analysis of a Public Hospital Laboratory ..................................................... 260

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Efficient utilization of scarce resources is an issue for any healthcare system. In developing countries, proper tools, techniques, and resources must be widely used in healthcare operational planning. Considering the necessity of effective resource planning, this study focuses on the rural healthcare system of Bangladesh and concentrates on the sub-district government hospital laboratory. The authors' determine possible ways to improve operations of laboratory facilities. To analyze existing system efficiency, sample laboratory data is fed into a simulation model. This paper identifies several possible ways for future expansion and suggests using simulation for better planning and analysis.
Chapter 18
A Mashup Application to Support Complex Decision Making for Retail Consumers .......................... 277
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Purchase processes often require complex decision making and consumers frequently use Web information sources to support these decisions. However, increasing amounts of information can make finding appropriate information problematic. This information overload, coupled with decision complexity, can increase time required to make a decision and reduce decision quality. This creates a need for tools that support these decision-making processes. Online tools that bring together data and partial solutions are one option to improve decision making in complex, multi-criteria environments. An experiment using a prototype mashup application indicates that these types of applications may significantly decrease time spent and improve overall quality of complex retail decisions.

Chapter 19
Using the Critical Incident Technique to Identify Factors of Service Quality in Online Higher Education .............................................................................................................................. 295
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Information technologies are changing the way in which higher education is delivered. In this regard, there is a necessity for developing information systems that help university managers measure the quality of online services offered to their students. This paper discusses the importance of considering students' perception of service quality. The authors then identify key factors of service quality, as perceived by students, in online higher education. To this end, the Critical Incident Technique (CIT) is proposed as an effective qualitative methodology. Some benefits of this methodology are highlighted and an exploratory research is carried out in a real environment to illustrate this approach. Results from this research explain which quality dimensions are considered the most valuable to online students. Information provided by this methodology can significantly improve strategic decision-making processes in online universities worldwide.

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