Preface

Actor-network theory (ANT) plays an important role in modern society, where technology is a natural extension of individuals and businesses. Understanding the interrelated nature of social, technical, professional, and personal networks is crucial to successfully navigating the modern information society landscape. Technological Advancements and the Impact of Actor-Network Theory applies concepts of socio-technical research to examine the implications and effects of human-non-human interactions and relationships. The chapters in this book will provide readers with a more thorough understanding of ANT, including fundamental principles, case studies, and emerging theories in the discipline, contributing fresh ideas to the body of knowledge on socio-technical phenomena and technological innovation.

ORGANIZATION OF THE BOOK

The first chapter, “The Impact of ICT in Educating Students with Learning Disabilities in Australian Schools: An ANT Approach” presents a report on an investigation, framed by the use of actor-network theory, of how the use of Information and Communications Technologies can aid in improving the education of students with Learning Disabilities. The study involved case studies and participant observation of the use of ICT in two outer Melbourne suburban Special Schools and an investigation of the impact of Education Department policies on these school environments.

Chapter 2 covers Australia’s national e-health solution known as the Personally Controlled Electronic Healthcare Record (PCEHR). The authors contend that while implementations and adoptions of e-health solutions are necessary, it is essential that an appropriate lens of analysis should be used in order to maximize and sustain the benefits of Information Systems/Information Technology (IS/IT) in healthcare delivery. As such, the authors of this chapter proffer Actor-Network Theory (ANT) as an appropriate lens to evaluate these various e-health solutions and illustrate, in the context of the Personally Controlled Electronic Health Record (PCEHR), the chosen e-health solution for Australia.

“Climate Information Use: An Actor-Network Theory Perspective” employs an interdisciplinary attempt to investigate agricultural climate information use, linking sociology of translation (actor-network theory) and actor analysis premises in a qualitative research design. The research method uses case study approaches and purposively selected a sample consisting of wheat growers of the Fars province of Iran, who are known as contact farmers. The data is analyzed using a
combination of an Actor-Network Theory (ANT) framework and the Dynamic Actor-Network Analysis (DANA) model. The findings reveal socio political (farmers’ awareness, motivation, and trust) and information processing factors (accuracy of information, access to information, and correspondence of information to farmers’ condition) as the key elements in facilitating climate information use in farming practices.

Chapter 4 extends existing metaphors used to conceptualize the unique features of contemporary IT artifacts. Some of these artifacts are innately complex, and current conceptualizations dominated by a “black box” metaphor seem to be too limited to further advance theory and offer practical design prescriptions. Using empirical material drawn from a longitudinal case study of an Internet-based self-service technology implementation, this chapter analyzes various aspects of an artifact’s fluidity. Post-actor-network theory concepts are used to analyze the artifact’s varying identities, its vague boundaries, its unexpected usage patterns, and its resourceful designers. The successes and failures of the artifact, its complex and elusive relations, and the unintended ways user practices emerged, are also analyzed. This chapter contributes by extending orthodox metaphors that overemphasize a stable and enduring IT artifact—metaphors that conceal the increasingly unpredictable and transitory nature of IT artifacts—with the distinctive characteristics of fluidity. Several prescriptions for the design and management of fluid IT artifacts are offered.

Chapter 5 presents findings from a longitudinal exploratory case study that examined the application of a pervasive technology solution: a mobile phone to provide superior diabetes self-care. Notably, the benefits of a pervasive technology solution for supporting superior self-care in the context of chronic disease are made especially apparent when viewed through the rich lens of Actor-Network Theory (ANT), and thus, the chapter underscores the importance of using ANT in such contexts to facilitate a deeper understanding of all potential advantages.

“Information and Communications Technology Projects and the Associated Risks” explores and examines the risk factors in the deployment of ICT projects in organizations. Using the case study method, the research employs actor-network theory in the analysis of the data to understand the factors that manifest themselves into risks during the deployment of ICT projects in organizations. The study reveals that factors, such as knowledge base, performance contract, and communicative structure, are used to enable and support and at the same time to constrain the deployment of ICT projects in organizations.

Chapter 7 introduces a socio-technical view of public service innovation. The aim of this research is to extend on the notion of bureaucracy, which is traditionally focused on the politics of office environments. This socio-technical view extends the traditional view to include the politics of service networks, particularly within IT-enabled public service innovation. The chapter focuses on how service innovation is exploited to align specific interests through the process of translation and shifts the focus from value co-creation to value co-enactment. In essence, this chapter explains how public service technological innovations act as an agent of bureaucracy that alters the relational dynamics of power, risk, responsibility, and accountability. For demonstrative purposes, this chapter describes a case study that examines IT-enabled service innovation with an academic service environment.
Chapter 8 focuses on two specific e-health solutions: the PCEHR in Australia and the German EHC. National e-health solutions are being developed by most if not all OECD countries, but few studies compare and contrast these solutions to uncover the true benefits and critical success criteria. The chapter provides an assessment of these two solutions, the possibility for any lessons learnt with regard to designing and implementing successful and appropriate e-health solutions, as well as understanding the major barriers and facilitators that must be addressed. Finally, ANT is used to provide a rich lens to investigate the key issues in these respective e-health solutions.

Chapter 9, “Human Interactions in Software Deployment: A Case of a South African Telecommunication” holistically examines the roles of non-technology actors in the deployment of software in organizations. The Actor-Network Theory (ANT) provides a lens in the analysis of the empirical data.

In the next chapter, “School Management Software in Australia and the Issue of Technological Adoption,” the single environment of education management systems in one country (Australia) is used to show how outcomes of similar technologies can be very different. An actor-network approach is used to explain how some technologies succeeded and others failed. Understandings reached in this case illuminate the power of the approach that includes listening to the technological actors in addition to the human. This chapter identifies actors and interactions and shows the connection between those interactions and the final outcomes of the innovations.

Chapter 11 imagines a conversation between the seemingly divergent fields of feminist methodologies and actor-network theory, and considers the theoretical and methodological challenges that ANT and particular branches of feminist thought raise for the other. This chapter examines an empirical project that calls for an engagement with both ANT and feminist methodologies. Through the lens of this empirical project, four methodological questions are considered, which an alliance between ANT and feminist methodologies would raise for any research project: 1) Where do we start our analysis? 2) Which actors should we follow? 3) What can we see when we begin to follow the actors? 4) What about politics? The potential places where ANT and feminist methodologies can meet and mutually shape research on scientific practice and technological innovation are explored. In doing so, this chapter moves towards envisioning new intersections between feminist methodologies and ANT.

Chapter 12 considers the challenges that OECD countries face in the delivery of healthcare. To address these challenges, most are turning their attention to e-health as the panacea. Indeed, it is true that in today’s global and networked world, e-health should be the answer for ensuring pertinent information, relevant data, and germane knowledge anywhere anytime so that clinicians can deliver superior healthcare. This chapter asserts that it is only by embracing a rich theoretical lens of analysis that the full potential of e-health can be harnessed, and thus, it proffers Actor-Network Theory (ANT) as such a lens.

The next chapter, “Evolving Digital Communication: An Actor-Network Analysis of Social Networking Sites,” analyses elements of social networking sites to establish how a combination of heterogeneous elements of technology, media, language, users, data, and information are networked together to provide this new communication media. An analysis of literature on social networking sites is included in this chapter to reflect the new social networking language
and style, the content shared via this media, the mode of use, and the language used for communication, which is a combination of a number of technological and social entities. This chapter examines how the Actor-Network Theory (ANT) can be used to explain social networking and includes some issues for research on this topic.

In Chapter 14, the authors do not address innovation in terms of development of new products; instead, they address them as changes in practices an engineer creatively adopts during engineering design projects. They adopt Actor-Network Theory as a way to understand these change processes (translations). The authors design a perturbation index inspired in Earned Value management to measure translation effort, having in mind the management of scope. Then they assess changes of regime in resource allocation of tasks and conclude with some changes that can lead to innovative results.

Chapter 15 reports on a study of online investing that found that the human actors were translated to more active and involved investors due to the changes, over time, in the online services that are available: the non-human actors. The Internet is a constantly evolving technological actor. New tools have the potential to change interactions with users. In this study, it became evident that new services had a noticeable effect on the behavior of investors. Not only did investors report changes in their behavior when they moved from offline to online investing, but they also reported changes in their investing strategies over time as new services became available. This study showed a new and interesting confirmation of the value of allowing non-human actors to be heard.