

Data Analytics, Control Systems, Business Risks Mini-track

Jee-Hae Lim
University of Hawaii, Manoa
jeehae@hawaii.edu

Tu Xu
University of Hawaii, Manoa
tx@hawaii.edu

1. Introduction

Over the last three decades, information technology (IT) has emerged as a critical component in sustaining and transforming business processes, which enhances agility and control environment. Data analytics often refer to IT and processes that support reporting, statistical analyses, and data mining. The use of data analytics applications can help firms to sense changes in the market, to improve their response speed and efficacy, to reduce business risks, and to increase competitive advantages. Given the growth in the use of data analytics, it has become imperative in many organizations for helping firms make better, more informed and often faster decisions. However, not all firms investing in data analytics improve their control systems because of significant risks and uncertainties in governance, economy, and environment.

In this mini-track, we seek research papers and experience reports that explore the role that data analytics play in identifying and analyzing a firm's risks and establishing effective control environments. Analyzing data in a timely manner enables firms to gain insights from their internal and external environments and to better sense changes in their markets; indeed, it serves as a basis for determining how risks, control effectiveness, and policy compliance should be managed. With data surrounding us, how businesses can take advantage of the insights generated by data analytics to better understand risks and uncertainties that they are facing and more importantly, to improve their risk management and control systems are important questions.

Further, we seek to focus on some key concepts of data analytics and control systems, including the metrics for data analytic technique selection and success, how the use of data analytics in start-ups can be leveraged in other contexts, and in general, expanding the use of data analytics beyond organizational systems.

2. Sessions

We thank the authors who have submitted papers to this new mini-track. This year's mini-track includes the following two research papers. Both papers discuss the opportunities of exploiting analytics to mitigate business and control risks. One paper focuses on exploiting unstructured data to improve internal controls, while the other focuses on exploiting structured data to improve external controls. Combined, they demonstrate multiple benefits of sophisticated data analytics on risk mitigation, which have not been shown before.

The first paper, titled, "Unstructured Data for Cybersecurity and Internal Control" by Jesús Canelón, Esperanza Huerta, Norma Leal, and Terry Ryan, proposes a research framework for studying the connections—realized and potential—among unstructured data (UD), cybersecurity, and internal controls. The paper discusses current and potential applications of UD to cybersecurity and internal controls. The paper's implications further support auditors, regulators, and technology vendors, giving guidance on incorporating the analysis of UD into business and audit procedures. In addition, the authors discuss the challenges accountants face to adopt and exploit UD, providing them with guidance for its analysis.

The second paper, titled, "Autoencoder Neural Networks versus External Auditors: Detecting Unusual Journal Entries in Financial Statement Audits" by Martin Schultz, and Marina Tropmann-Frick, proposes a design science research for applying a deep learning technique—namely autoencoder neural networks—to the detection of unusual journal entries for audit purposes in order to extract nonlinear features and more complex patterns from a dataset. In addition, the authors incorporate domain knowledge into the preparation of the used real-world cases by adding several computed attributes that emulate audit relevant aspects of journal entries. Their findings highlight the

designed artifact for detecting unusual journal entries with autoencoder neuronal networks.

We strongly believe that this mini-track has great potential to stimulate the creation of a robust, interdisciplinary analytics research community within HICSS.