Data Analytics, Control Systems, Business Strategies

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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 (DA) could transform the real value that firms generate in the near future because patterns discovered from past archives enable firms to identify opportunities and risks and better plan for the future. In addition to producing more value externally, DA also affects internal process, improving productivity, utilization, and growth. Thus, acknowledged potential benefits of DA technology include reduced risks and costs, improved system quality and transparency, the ability to focus on core competencies, and access to new technologies.

However, firms that invest highly in complex or asset-specific DA are likely to create transaction difficulties and generate agency problems that could lead to cost overruns and, ultimately, project failure. Therefore, not all firms investing in DA improve their businesses because of different strategic choices, 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 DA play in identifying and analyzing a firm's strategic determinants and establishing effective control environments. Analyzing data in a timely manner enables firms to gain insights into 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 DA to better understand risks and uncertainties that they are facing and more importantly, to improve their business strategy and control systems are important questions. Further, we seek to focus on some key determinants of DA and control systems, including the metrics for DA strategic techniques and success, how the use of DA in start-ups can be leveraged in other contexts, and in general, expanding the use of DA beyond organizational systems.

2. Sessions

We thank the authors who have submitted papers to this mini-track. This year's mini-track includes the following three research papers. All accepted papers discuss the opportunities of exploiting DA to detect anomalies and fraudulent activities, and enhance risk management. Combined, they demonstrate multiple new benefits of sophisticated DA on risk mitigation. Their findings have implications for executives and IT practitioners.

The first paper, titled, "High-Performance Fake Voice Detection on Automatic Speaker Verification Systems for the Prevention of Cyber Fraud with Convolutional Neural Networks" by Ricardo Buettner, Jan Gross, Philipp Roessler, Julia Winter, Daniel Sauter, Hermann Baumgartl, and Patrick Ulrich introduces a novel way to automatically detect fake voices using DA. Their technique is based on convolutional neural networks, a machine-learning approach. Data suggests that their technique is highly effective in identifying spoofing attempts. We look forward to applications of their technique in the practice.

The second paper, titled, "Shadow IT Behavior of Financial Executives in Germany and Italy as an Antecedent to Internal Data Security Breaches" by Nicola Castellano, Carsten Felden, and Robert Pinsker employs a randomized experiment to investigate German and Italian financial executives' tendencies to attempt internal data breaches. They develop a behavioral theory and document an interaction effect between country and executive's level of cybersecurity awareness on executive's shadow IT behavior. Their causal evidence has both practical implications and theoretical contributions.

The third paper, titled, "Towards Design Principles for a Real-Time Anomaly Detection Algorithm Benchmark Suited to Industrie 4.0 Streaming Data" by Philip Stahmann and Bodo Rieger reports ten interviews with

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industry experts on how real-time anomaly detection algorithm should be evaluated and selected in the Industrie 4.0 era. The authors offer six design principles for benchmarking real-time anomaly detection algorithms. These design principles help guide future implementation of real-time anomaly detection.

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