Analytics for Accounting Information Systems Applications

Panel

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ABSTRACT

Accounting Information Systems occupies a special role in IS education and research. The interests of accountants and information technologists frequently converge, particularly on the notion of the internal audit and the IT audit, which are central to the evaluation of IT governance and IS Security in the firm. Analytics technologies provide a new and powerful means with which to conduct accurate and discerning audits of the corporate IT and Cybersecurity Function and are explored here as a tool for classroom and research use.

Keywords

Accounting Information Systems, IT Audit, Analytics, R

INTRODUCTION: PANEL OVERVIEW AND OBJECTIVE

The development of data analytics skill is very important for accounting information systems experts (Huerta & Jensen, 2017). Data analytics offers tremendous opportunities to generate both value and increasing accuracy in the internal audit process (Schneider, Dai, Janvrin, Ajayi, & Raschke, 2015). Organizations around the globe are embracing data analytics and the research suggests that firms using data analytics outperform their competitors by 5% in productivity and 6% in profitability (Barton & Court, 2012). Accounting information systems researchers imply that these market forces, along with others, might be factors in favor of adopting analytics (Alles, 2015). However, researchers and practitioners alike suggest that the adoption process has been slow in regard to these important new technologies, and for that reason they emphasize changes in accounting information systems curricula, particularly focusing on data science.

Accreditation bodies have encouraged business schools to introduce these emerging technologies, owing to a recent paradigm shift in accounting information systems where researchers now deal extensively with non-structured data and/or non-financial data, and for which technologists and accountants are subsequently not well prepared. Given these circumstances, our panel emphasizes the importance of R programming as a key analytics skills for instructors and researchers; R is widely used in other related disciplines such as economics and finance, and it is a very versatile application as there are many add-on “packages” available for the application that suit emerging needs of data science researchers and educators. Though many R packages are available for financial modeling, many of these existing R packages can also readily be used for accounting analysis and auditing purposes. Therefore, the panel aims to discuss the importance of the R application and different suitable packages that can be used in accounting information system research and learning.

DATA SCIENCE IN ACCOUNTING INFORMATION SYSTEMS RESEARCH AND TEACHING

Recently accounting information systems research has gone through a paradigm shift. Many researchers in this area now focus on non-structured data, particularly textual analysis. Research suggests that analysis of non-conventional data such as text
analysis of 10-K reports, voice analysis of corporate officers, mining of social media, and earnings call reports provide new insights that were not previously available. In these cases, R programming can be very handy, offering numerous packages that are useful for parsing non-structured data. However, many accounting information systems researchers are not well aware of the tremendous potential of R for their research or teaching. In addition, for fraud risk assessment R offers specifically useful analytics packages such as ggplot2 which can be used for data visualization, and which enhance the process of fraud risk assessment and fraud detection in the assessment of the potential for material misstatement in an audit. Aside from research applications in analytics for accounting information systems scholars, the same R packages can be utilized in the classroom for training future accountants in leading edge technology-facilitated auditing processes. This training is important for performing new and emerging roles in accounting and accounting information systems in the modern workforce.

**R Packages that can be used by Accounting Information Systems Scholars and Educators**

There are many R packages that can be utilized for accounting information research and instructional purposes. Some of the packages that can be utilized are as follows:

- dplyr
- ggplot2
- Rvest
- Xbrl
- Edgar
- Finereportr
- edgarwebR
- getFilings
- twitter
- ROAuth
- Wordcloud
- Sentiment

**Popular in Industry and Academics**

R is well suited for IS professionals with accounting skills for many reasons. First, it is very flexible; as a development of the open source community, R offers a diverse and continually expanding range of analytics capabilities linked to add-on “packages” which can be downloaded and added to user installations for expanded functionality. Secondly, as an open source application R does not entail the substantial financial investments that some other analytics packages incur. Lastly, R is quite popular in industry with many Fortune 500 companies having already adopted it for their use in analytics; this provides a useful point of interface for scholars who wish to conduct research with such companies, and a useful job market advantage for students seeking employment.

**PANEL LAYOUT AND DESIGN**

The purpose of this panel is to bring topic area experts on analytics, pedagogy and accounting information systems together for a demonstration of the uses and applications for analytics tools in accounting information systems contexts, particular the internal audit and IT Audit processes. For that reason, each panelist is an expert in analytics tools and techniques, and half of the panelists are also credentialed accountants with Accounting IS duties and interests. The panel will open with a discussion of the value of internal audit and accounting information systems to the technology function of the firm, followed by a full discussion of the uses to which analytics tools can be put to meet the emerging uses of technology in accounting and IT audit processes.

**Panel Participants**

Tom Stafford (moderator)
Louisiana Tech University
Computer Information Systems Department

Tom Stafford leads a group of doctoral students at Louisiana Tech who are CIS students, but come from the internal auditing sector of the accounting industry. As such, the research activity of the Louisiana Tech CIS department tends to focus on technological implementation of accounting practice, including internal audit and IS Security considerations.
Tawei (David) Wang  
Driehaus College of Business  
DePaul University

David Wang is on the Information Systems faculty of DePaul University’s College of Business. As an Internal Auditor and Certified Public Accountant with keen analytics skills, Dr. Wang is uniquely positioned to provide authoritative guidance on the uses of analytics technology for internal audit purposes and can speak to the processes involved in training students in such technology.

Rhonda Syler  
University of Arkansas

Rhonda Syler is on the Information Systems Faculty at University of Arkansas and is a thought leader on innovative problem-solving pedagogy and Analytics Education. The immediate Past President of the Association for Information Systems special interest group for education, SIGEd, Dr. Syler’s work on analytics with AMCIS resulted in a landmark workshop on SAS and Tableau analytics tools in Boston at AMCIS 2017, and she brings expertise related to the intersection of analytics and pedagogy to our panel.

Md. Shariful Islam  
Louisiana Tech University  
Computer Information Systems Department

Sharif Islam is a doctoral student in Computer Information Systems. He is a CPA, a certified internal auditor and a management accountant. His research focuses on the nexus of Information Systems and Internal Audit and his most recent interests involve the increasing utility that analytics implementations have for leading edge technology-facilitated auditing.

CONCLUSION

This panel brings together an optimal mixture of professional experience, academic expertise, research visibility and applied IT Auditing and Analytics skills for purposes of demonstrating the importance of emerging analytics technology in accounting information systems application and education. Among the avenues for obtaining training and enrichment in the uses of information technology in accounting and internal audit, panels such as this provide guidance and inspiration to educators who seek to bring such skills to the classroom and their research. As such, attendees can then provide richer experiences to their students, clients, and research colleagues on the matter. IT Security researchers and Accounting Information Systems scholars and teachers who attend will come away with a new perspective on the role of analytics as a critical aspect of IT Audit as part of that process.

REFERENCES


