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“Big Data”: A new twist to accounting

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ABSTRACT

This commentary introduces the “Big Data” (hereafter, Big Data) Special Issue of the *Journal of Accounting Education*. We argue that while the data sets are now larger than ever before and better data analytic software is available, the primary goal of accounting has always been the same – to create and provide information to internal and external decision makers. In addition, this commentary identifies resources for incorporating Big Data into the classroom. These resources include links to free datasets, software tools, cases, and class slides. Finally, we conclude with a discussion of the articles in this Special Issue and how they fit into the existing Big Data literature.

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1. Introduction

Despite the current focus on “Big Data” (hereafter, Big Data) and its effect on accountants, the goal of accounting has always been to provide information to decision makers (Capriotti, 2014). Even before Pacioli documented the double entry system of debits and credits (Payne, 2013), accountants tried to make sense of large volumes of business data, whether it came from a paper-based system, an early/legacy computer-based system, or a highly technical, all-encompassing enterprise system.¹ Using available analytical tools, accountants recorded, filtered, summarized, and consolidated this data to provide information for internal and external decision makers. Further, internal and external auditors examined the data to make sure it complied with GAAP, applicable laws, and management’s directives—more recently using a variety of automated techniques including generalized audit software and continuous auditing that could scrutinize all transactions of a firm.

In the last few years, the term Big Data has emerged as the new buzz word. While some claim Big Data is, “just turning mess into meaning” (Kho, 2016, 28), Gartner (2016, *emphasis added*) provides a more official definition of Big Data as, “**high-volume, high-velocity** and/or **high-variety** information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation.” Volume, velocity, and variety are known as the three-Vs and imply that vast amounts of transactions are quickly created from a wide variety of sources. Other sources frequently suggest two additional Big Data Vs – veracity and value (Merritt-Holmes, 2016). Veracity refers to the data accuracy and reliability of data while value examines the cost-benefit of collecting data (Zhang, Yang, & Appelbaum, 2015; Merritt-Holmes, 2016).

Accountants tend to focus on the veracity and value/cost-benefit of data collection. Volume and velocity have been around since the 1990s when enterprise systems (and even some legacy systems) were created to handle high volumes

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E-mail addresses: djanvrin@iastate.edu (D.J. Janvrin), mwatso40@unc.edu (M. Weidenmier Watson).¹ “According to Pacioli, accounting is an ad hoc ordering system devised by the merchant. Its regular use provides the merchant with continued information about his business, and allows him to evaluate how things are going and to act accordingly.” (ITICALE, 2016).

of transactions and flow of information between companies (e.g., Rockart, 1988; Grabski, Leech, & Schmidt, 2011). Therefore, some claim that the biggest difference with Big Data is the bigger variety of data (Zicari, 2015), including data generated externally by a variety of sources including websites, texts, Internet of Things (IoTs), RFID, sensors, and other items/sources. However, enterprise systems have been collecting non-financial information for decades in the general ledger and other accounting applications/modules both of which are the traditional domains of accountants. Moreover, accountants have a history of expanding their expertise to new data. For example, in the 1990s accountants expanded traditional auditing services to assurance services. These assurance services examine and assure a wide variety of different types of information such as systems reliability and e-commerce. Webtrust and Systrust (now merged as Trust Services Principles) are programs that include examining the security, availability, processing integrity, online privacy, and confidentiality of information technology (American Institute of Certified Public Accountants (AICPA), 2016). Expanding assurance skills to new sources of (external) Big Data can be seen as the next step in the evolution of accounting.

2. Why is Big Data important in the accounting curriculum today?

Ensuring that students can work with Big Data is important in today's environment. For example, the Pathways Commission, formed by the American Institute of Certified Public Accountants (AICPA) and the American Accounting Association (AAA) to examine the future of higher accounting education, suggests, in Action Item 4.1.6, that educators "transform learning experiences to reflect current and emerging technologies and global trends in business" (Pathways Commission, 2014, 72). The Pathways Commission recognizes that technology is used to "gather, transform, and analyze data into meaningful information for decision making" (2014, 72). Enumerated technologies include "data visualization, enterprise business services, telecommunication, cloud infrastructures, integrated audit modules, database dashboard metrics, web-based collaborations, [and] extensible business reporting protocols" (2014, 72). Given that these technologies are transforming the accounting profession, the Pathways Commission recommends that accounting programs integrate business and accounting information technology throughout the curriculum. This recommendation is supported by a 2015 Pathways' survey of practitioners that rated spreadsheet and business intelligence/analytics as the two most important skills for students.

Accreditors also recognize the need for students to understand Big Data. The AACSB Accounting Standard 7 (AACSB, 2016) specifically states:

Consistent with mission, expected outcomes, and supporting strategies, accounting degree programs include learning experiences that develop skills and knowledge related to the integration of information technology in accounting and business. Included in these learning experiences is the development of skills and knowledge related to data creation, data sharing, data analytics, data mining, data reporting, and storage within and across organizations (p.3).

Essentially, the AACSB wants an interdisciplinary, integrated accounting curriculum that exposes students not only to the concepts of statistics, data management, and analytics, but also to hands-on use of appropriate tools for Big Data (AACSB, 2016, 30). It is interesting to note that while (non-accounting) business classes may be used to fulfill the Standard, this Standard only applies to accounting degree programs. This suggests that the AACSB believes that accounting is where Big Data belongs.

To help instructors prepare students for the ever changing challenges of their future accounting careers, the *Journal of Accounting Education* dedicates a special issue to Big Data. Our hope is that this issue will allow instructors to quickly and easily incorporate Big Data skills into their classrooms. To further this goal, we also provide additional resources available to instructors and discuss how they can be used in conjunction with the resources in this Special Issue.

3. Sources of Big Data materials

The American Accounting Association (AAA) has increased its efforts to support instructors incorporating Big Data into the classroom. In both 2015 and 2016, it hosted Accounting is Big Data (AiBD) conferences with a fast track one-and-a-half day seminar for academics to interact with accounting/industry practitioners and software vendors. In addition, the inaugural AAA AIS Bootcamp included Data Analytics as a topic in 2016. These conferences provide a wealth of resources to help instructors.

AAA's website and Commons provides a forum for AiBD resources.² The AAA resources include 2015/2016 AiBD Conference PowerPoint slides; videos of speakers, panels, and technology demonstrations; and potential discussion questions and cases.

The AAA also hosted one-hour Big Data webinars in 2015–2016 and has archived these education materials on its Commons. The webinars cover Tableau, available datasets, as well as Big Data in auditing and managerial accounting. For example, an April 20, 2016 webinar (Data & Analytics in Auditing and Auditing Education Webinar) discusses how KPMG audits 100 percent of all transactions and provides a sample dashboard used by audit teams. This webinar also includes how to use IDEA to audit the expenditure cycle (by Allan Blay).

² The 2016 AAA AiBD conference materials can currently be found at: <http://aaahq.org/Meetings/2016/Accounting-Is-Big-Data-Conference/Presentation-Materials>. The 2015 AAA AiBD conference materials can currently be found at: <http://commons.aaahq.org/hives/5747a30fd/summary>.

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