Big Data Awareness among Final Year Accounting Students

Jainurin Justine

Accounting Centre, Faculty of Business, Economics and Accountancy,
Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

jainurin@ums.edu.my

Abstract

Data play an important role in working environment for current and future accounting professional. In its 5-year digital blueprint, the Malaysian Institute of Accountants identified big data as one of the core areas for accounting professionals. Awareness of big data terms and tools can be beneficial as it encourages students to learn more about the area. An online action research was conducted to examines the awareness of big data terms and tools among final year accounting students in a public university in Malaysia. For this research, 65 final year students were surveyed. The respondents indicated high awareness of common terms and tools related to big data but showed low awareness of more specific terms and tools related to big data. The research findings can be used by academia to improve contents in courses and programs related to accounting in the future. The paper ends with suggestions for future research.

Key Terms: Big data, Accounting students

Introduction

Data play an important role in work environment for current and future accounting professional. Accounting professionals can deal with a huge amount of data in their daily work. Analysing these data in a meaningful and prompt manner can be useful for the organisation as a whole.

There are many definitions of big data. According to Vasarhelyi, Kogan, and Tuttle (2015), data sets can be considered big if the information system is either at its maximum capacity or cannot accomplish the task. TechAmerica (2012, p.10), "Big data is a term that describes large volumes of high velocity, complex and variable data that require advanced techniques and technologies to enable the capture, storage, distribution, management, and analysis of the information." Meanwhile, IBM data scientists break Big Data down into four dimensions as follows: (Zhang, Yang and Deniz, 2015; IBM, n.d., a):

- Volume (Quantity of data)
- Variety (Different sources of data)
- Velocity (Speed of data) and
- Veracity (Uncertainty of data)

In addition to the dimensions known 4 V's, IBM also identified a fifth V, which is "Value", referring to "the ability to achieve greater Value through insights from superior analytics" (IBM, n.d, b)

Global professional accountancy bodies have also emphasised the importance of big data in the profession. For example, the Chartered Institute of Management Accountants (CIMA) (2014) listed the following benefits for businesses:

- Driver-based forecasting and performance management
- Customer segmentation to improve focus and increase revenues
- Improved process efficiency and product quality
- Tracking shipments, improving routes and supply chain management (logistics)
- Understanding customers' needs and identifying opportunities to innovate
- Improving messages and channel effectiveness (advertising and promotional)
- Improved website design based on visitor behaviours
- More effective employee recruitment and retention
- Selling data or analysis services
- New business models

Meanwhile, the Institute of Chartered Accountants in England and Wales (ICAEW) (2019) identified the following uses of big data for businesses:

- Using new sources of data to gain new or enhanced information
- Exploiting the real-time nature of big data to improve services and operations, for example through personalising responses and offers.
- Applying analytics to gain new insights and interrogate entire data sets

CIMA (2014) recommended the following steps in the pathway for management accountants to acquiring competencies in big data:

- Learn something new
- Get familiar with the jargon
- Understand the context
- Be curious
- Build internal links
- Visualise the future
- Become a big data champion
- Network
- Do what you do best

ICAEW (2019) identified the following areas for accountants to exploit big data:

- statistical skills to build the algorithms and understand the robustness of models
- data and technology skills to extract and manipulate the data
- domain knowledge to ask the right questions and gain insight from the analysis

In 2018, Malaysian Institute of Accountants (MIA) launched the MIA Digital Technology Blueprint 2018-2023 as part of its efforts to meet the challenges arising from the digital economy and Industrial Revolution 4.0 (IR4.0). The blueprint identified emerging core areas in digital economy and IR4.0 which include such as big data analytics, cloud computing, automation and artificial intelligence. The MIA Digital Technology Blueprint 2018-2023 sets out five principles in developing digital strategy in the profession and the roles of accountants and MIA as presented in Table 1 below:

Table 1: MIA Principles in Developing Digital Strategy

Principle	Accountants Role	MIA's Role
Principle 1 - Assess digital technology trends	Be aware of digital technology trends and assess how they affect their role.	Provide awareness of digital technology trends and assessment on how they affect members.
Principle 2 - Identify capabilities	Identify capabilities, build differentiated skills and innovate in responding to the change.	Provide training and relevant certification for members to enhance capabilities.
Principle 3 - Harness digital technology	Capitalise on the use of appropriate digital technology.	Promote digital technology adoption and explore collaboration with relevant stakeholders.
Principle 4 - Funding	Determine funding needs and identify financing options.	Engage with policymakers on incentives and grants.
Principle 5 - Governance	Adhere to good governance practices through adoption of industry and regulatory requirements.	Develop and advocate good governance in digital technology usage and adoption.

Based on the existing situation where the existing exposure and knowledge of big data among accounting students may be unknown, the researcher embarked on a quantitative action research with the following objectives:

1. To assess the level of awareness in big data among final year accounting students.
2. To investigate the attitude of final year accounting students towards changes in accounting curriculum related to big data.

The study is expected to several contributions. First, the data collected may provide some descriptive analysis on the big data awareness of final year accounting students. Second, the data collected may be used may be used by the relevant stakeholders such as MIA, institutions of higher learning, lecturers, etc. to introduce changes related to big data in the accounting curriculum.

The design of this quantitative action research is based on the research objectives adapting a questionnaire from a past research on awareness of big data among statistics academics and professionals (Habibullah, 2018). Respondents were final year accounting students of the researcher's institution of higher learning, a Malaysia public university. Seventy students were invited to fill the questionnaire and 65 completed usable questionnaires. To minimise costs and increase accessibility, the questionnaire was placed on-line using Google forms. The results from the data collection were analysed using simple statistics.

Findings and Discussion

Based on the data from the questionnaire filled by the 65 respondents, the findings are discussed in the following section.

In terms of demographic findings, the ages of the respondents ranged from 22 to 26 with an average of 22.6 years old; a majority (80%) of the respondents are female; except for one international student, all students are Malaysians. In terms of pre-degree qualification, a majority of completed Accounting Matriculation program (69.2%) while others completed Diploma (20.0%), STPM (9.2%) and Other (1.0%). Students who completed Diploma as their pre-degree qualification may have additional exposure to information technology in accounting and business as courses in these areas are usually included in their curriculum structure. For the degree curriculum structure, the final year students would have completed information technology courses such as Business Information Systems, Accounting Information Systems I and Accounting Information Systems II.

Based on the data collected, the following can be concluded:

- Most students have high level of awareness of general big data terms and tools
- Most students have low level of awareness of specific big data terms and tools
- Most students think that changes should be made in the accounting curriculum structure to include big data topics.

Table 1 below shows the students awareness level of big data terms and tools. Students indicate that they are aware of terms such as "Big Data", "Data Mining", "Business Analytics", "Cloud Computing", "Data Analytics", "Data Analysis", "Data-warehousing" and "Distributed Processing" which may have been learned from the courses related to information technology that they have taken.

On the other hand, the students indicate that they are not aware of terms such as "Data Science", "Machine Learning", "Bayesian Analysis", "Data Engineering", "Exabyte", "Petabyte", "Brontobyte", "Python", "Java", "R", "Hadoop" and "Grid Computing". The latter terms are related to more specific terms used in big data and also software used in big data. As an example more that 70% of students the students indicated that they have never heard of the terms "Bayesian Analysis", "Petabyte", "Brontobyte", "Python", "Java", "R" and "Hadoop". These terms could be covered as topics within big data courses.

The students also indicated that they are receptive to the idea of including big data courses in the accounting degree structure. This could be considered for future revisions of the degree structure so that future students are equipped with the knowledge and software used in big data.

Table 1: Summary of Students Responses on Awareness of Big Data Terms

Terms	Percentage			
	I am very well aware of this concept	I am aware of this concept but only to some extent	I have heard this term but I am not aware of its meaning	Never heard this term
Big Data	27.7%	58.5%	13.8%	0.0%
Data Science	1.5%	23.1%	44.6%	30.8%
Machine Learning	9.2%	27.7%	35.4%	27.7%
Data Mining	18.5%	61.5%	16.9%	3.1%
The Internet of Things	26.2%	36.9%	21.5%	15.4%
Business Analytics	21.5%	64.6%	12.3%	1.5%
Artificial Intelligence	38.5%	29.2%	16.9%	15.4%
Cloud Computing	60.0%	40.0%	0.0%	0.0%
Data Analytics	29.2%	58.5%	9.2%	3.1%
Data Analysis	41.5%	56.9%	1.5%	0.0%
Bayesian Analysis	0.0%	3.1%	21.5%	75.4%
Data Engineering	6.2%	24.6%	50.8%	18.5%
Algorithm	18.5%	49.2%	24.6%	7.7%
Exabyte	1.5%	4.6%	33.8%	60.0%
Petabyte	1.5%	4.6%	21.5%	72.3%
Brontobyte	1.5%	4.6%	15.4%	78.5%
Python	4.6%	13.8%	30.8%	50.8%
Java	9.2%	38.5%	41.5%	10.8%
R	0.0%	3.1%	23.1%	73.8%
Hadoop	1.5%	4.6%	18.5%	75.4%
Data-warehousing	47.7%	49.2%	3.1%	0.0%
Distributed Processing	44.6%	36.9%	10.8%	7.7%
Grid Computing	9.2%	32.3%	32.3%	26.2%
Crowdsourcing	15.4%	40.0%	24.6%	20.0%

Conclusion

Recommendations

Based on the preliminary findings, the researcher would like to propose the following.

Firstly, more academic research in the field of big data and accounting be carried out to create more awareness and interest among academic and students.

Secondly, training of accounting academic in the field of big data particularly those related to accounting courses. Institutions of Higher Learning and other stakeholders such as the Ministry of Higher Education, the Malaysian Institute of Accountants and professional accountancy bodies can support and contribute towards this effort.

Thirdly, inclusion of topics and examples relating to big data in relevant courses in the university. For example, Gamage (2016) suggested the following topics to be included in the courses in the main accounting fields:

- Management Accounting: Application of Big Data to competitor analysis, Big Data as a strategic resource
- Accounting Information Systems: Business intelligence, Enterprise analytics Information search and retrieval, Data mining, familiarity with languages such as XBRL, specialized software/reporting systems with decision support, ERP systems, Cybercrime, Data management issues
- Auditing and Assurance: Data Analytics in auditing , Mine new sources of data, Data integrity , Privacy, Safeguards, Cybersecurity, Design and evaluate IS controls, Manage IS risks and compliance, Overseeing fraud risk assessment
- Taxation: Indirect tax and Big Data, tax value and non- tax value form data that is collected in the tax function, Visualize accounting data

Research Limitations

The research conducted is limited due to the number of respondents and also the limited group of respondents. A further research should be carried out to obtain findings among more respondents and on wider scale, i.e. more coverage in terms of other institution of higher learning and also to obtain in-depth understanding of the students' awareness and knowledge of big data. This could be done by expanding the questionnaire to include specific questions to test students' understanding of the key terms used in big data. An improved research would provide better insights to stakeholders and better data analysis resulting in more sound and clear recommendation.

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