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BIBLIOMETRIC ANALYSIS OF PUBLISHED ARTICLES ON ACCOUNTING INFORMATION SYSTEMS (AIS)

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Abstract: *Impact of evolving Information Technology (IT) on accounting function in the organisations is unavoidable. Business transformation resulted from IT directly or indirectly affecting the 'heart' of a business function, namely accounting. Consequently, how evolving IT is shaping today's accounting functions has attracted considerable amount of research over the years. Investigating the impact of IT on accounting demands for a blending of accounting and IT perspectives to better reflect the issues concerned (referred as Accounting Information Systems or AIS). Therefore, this paper examines scholarly works on AIS as published in two prominent AIS journals; International Journal of Accounting Information Systems (IJAIS) and Journal of Information Systems (JIS) based on selected bibliometric characteristics. This article reports analysis of the published works in terms of subject area, authorship, citations and authors' keywords based on 455 articles published from year 2000 to 2018 as obtained from Scopus online database. The analysis reveals that majority of the AIS research have been classified under business, management and accounting and decision science rather than IT domain. While two and three authorships are most commonplace, authors from United States (US) contribute substantially to both journals. This paper also reports citation analysis over the years. Among the most used keywords over the years, among others; continuous auditing, Extended Business Reporting Language (XBRL), Enterprise Resource Planning (ERP) and big data that correspond quite well to the emerging technologies affecting accounting function in the last decade. Keywords analysis using VOSviewer reveals more exciting fact on strength of the connection amongst the keywords and the changing trend of AIS research topics over the years. The outcomes of this paper offer meaningful insight on current trend and potential way forward of AIS-related works, particularly to accounting scholars and graduate students.*

Keywords: *Accounting Information Systems (AIS), Bibliometric Analysis, Keywords Analysis, Scopus Online Database, VOSviewer*

Background and Research Objective

Rapid evolution on information technology (IT) has transformed the way events or transactions data are being captured, processed, stored and communicated. Similarly, drastic changes on digital technology in the mid-20th century followed by the internet revolution in the late 20th and early 21st centuries have empowered even greater capability for business to process and communicate larger amounts of data in the fastest speed (Badua & Watkins, 2011). In more recent years, an enterprise system seamlessly connects all business functions together. These IT evolutions ultimately give widespread impact to business, in general, and to accounting and auditing functions, in particular (Sutton, 2006). Enterprise system, such as Enterprise Resource Planning (ERP) demands for greater roles of accountants to report both financial and non-financial information, revamps approach of auditing computer-based system and managerial control measures, and to some extent creates new forms of consulting services to business organisations (Grabski, Leech & Schmidt, 2011).

The Fourth Industrial Revolution (IR 4.0) that transforms production, business operation, workforce as well as the society (Deloitte, 2017), pushes even greater opportunities and challenges both to business at large and accounting function that support the business operation. IR 4.0 specifically focuses on expanding flexibility of the processes along the supply chain and its supporting business functions (including accounting) by integrating IT in data collection, transmission as well as analysis domains (Dai & Vasarhelyi, 2016).Thus, the IR 4.0 with diverse set of technologies as its pillars; big data and data analytic, robotic, cybersecurity, artificial intelligence, simulation and internet of things, among others, have gradually raised the concerns among researchers on their impacts to accounting function as well as the profession. The big data, for example, promises greater capability for business to process larger amount of data in diverse formats. Thus, accounting could have been possibly the best function to deal with the big data within an organisation (Bhimani & Willcocks, 2014). Big data also enables management accountant to play even greater roles in organisation by conducting more comprehensive data analytic for performance measurement analysis and supporting other managerial decisions (Appelbaum, Kogan, Vasarhelyi & Yan, 2017). Audit function is also expected to embrace the big data an analytic revolution by leveraging the value of real-time data for accurate and effective decision-making support (Dai & Vasarhelyi, 2016). In another respect, automation of accounting and auditing tasks is expected to impose considerable impact on the roles of the accounting workforce in business (Moffit et al., 2016). Meanwhile, increased transformation of business by various IT solutions at the same time increases the threats of cybersecurity. In response to the increasing rate of cybersecurity threats, new approaches of conducting risk assessment audit are expected to change as well (No & Vasarhelyi, 2017).

Consequently, constant evolution of IT and its diffusion into business operation have attracted considerable research to better understand its implementation issues and perceived impacts to accounting function. Considering the fact that both accounting and IT scholars view the issues from different angle, it is therefore reasonable to anticipate the blend between accounting and IT research perspective in investigating those issues (Efendi, Mulig & Smith, 2006). Hence, having clear understanding what does AIS concern about and how does AIS connect accounting and IT domain need to be first established. Accounting broadly concerns on processes of providing information on economic decision making for various stakeholders. Thus, it encompasses external and internal reporting, tax, and assurance services, among the major fields of inquiry within accounting functions (Murthy & Wiggins, 1986). On the other hand, IT by its broad definition focuses on the "design, implementation, use and management of an information systems" (Murthy & Wiggins, 1986). This so called core IT field emphasises

mainly on the issues pertaining to IT as well as how individuals and organisations interact with the IT (Murthy, 2016).

Having considered AIS as an intersection between the domains of accounting and IT, what qualifies a research to be in AIS category has been receiving considerable debate. Despite the fact that specifying the boundary distinguishing AIS with other research domains is one of the greatest challenges (Arnold & Sutton, 2002), how accounting domain overlaps with its parent's domain i.e. management information systems (MIS) domain is clear (Poston et al., 2000). Earliest attempts to define the AIS research suggest that AIS research is closely related to its "parent domains of MIS and accounting," however, the core distinguishing aspect is that AIS focuses dominantly on the issues related to "transaction processing for accountability purposes of an organisation" (McCarthy, 1990, p. vi). Similarly, Hunton (2002) further stresses that while both accounting and IT concern on similar business issues, accounting emphasises more on optimising business value via the IT deployment and ensuring appropriate internal control measures whereas IT core value resides on the technical matters of such deployment. This corresponds to Murthy and Wiggins (1986) argument that while both accounting and IT focuses on information as the core, the former concerns most on the information itself while the latter concentrates on the structure of the system that produces those information.

Murthy and Wiggins (1986) further suggest that research concentrating on any aspects of information-related activities i.e. collection, process and communication of information via computer-based system potentially belongs to the mainstream AIS research. Meanwhile, any research investigating system-related issues and its impact to the system output (information) may also be classified under AIS research domain. As more recent work suggests, AIS research must, "in one part, address some aspects of IT including but not limited to the design, use, control and audit of systems. Meanwhile, the other part of the research should also address the accounting functions, i.e. auditing, managerial accounting, financial accounting, taxation and not-for-profit accounting" (Murthy, 2016, p. 165). In sum, AIS researchers must be aware that research focusing on AIS needs to acknowledge the interwoven of accounting and IT domain as highly crucial to understand the role of AIS in business.

Thus, in such a globally connected economy, it is interesting to examine how accounting function adapts to the changes imposed by IT revolution. Examining literature focusing on the intersection of accounting and IT domains could possibly shed some light on the development of the AIS research domain. Literature review analysis promotes meaningful insights of the AIS research trends over the years apart from making ways for the direction of future research work. Earlier work on literature analysis on AIS research either focuses on AIS in general (Efendi et al., 2006; Ferguson & Seow, 2011; Hutchison, White, & Daigle, 2004; Ismail, 2009a; Murthy, 2016) or on specific application of AIS such as management accounting integrated system (Rom & Rohde, 2007), impact of data visualisation on accounting (Dilla et al., 2010) and ERP and accounting (Grabski et al., 2011). While examining AIS research in general facilitates researchers to establish research trend over time, narrowing the focus on specific AIS domain offers in-depth understanding of the issues concern.

Reviewing prior literature of AIS have been carried out either on multiple related journals or specific journal. Several studies widen the focus by identifying AIS works as published in the top ranked contemporary accounting journals (Efendi et al., 2006; Stone, 2002) or combination of journals of relevant disciplines, i.e. AIS, IT and accounting (Ferguson & Seow, 2011; Poston et al., 2000). Such approach enables comparison on nature and focus of AIS research as published in core accounting journals, AIS focused journals or IT focused journals. For

example, Efendi et al. (2006) whom analysed 482 articles published on seven top ranked accounting journals demonstrated that AIS scholarly works appear more extensively on the top accounting trade journals as compared to the academic journals. Meanwhile, Poston et al. (2000) whom examined 17 top journals of Accounting, AIS, MIS and Computer Science reported domination of computer science theories in most AIS works.

Several other scholars investigated AIS published works on specific journal. The most common references for AIS research analysis were IJAIS (Hutchison et al., 2004; Ismail, 2009b; Poston et al., 2000) or JIS (Badua & Watkins, 2011; Moffitt, Richardson, Snow, Weisner & Wood, 2016; Samuels & Steinbart, 2002; Weber, 2016). To illustrate, Samuels and Steinbart (2002) review of 159 articles published over 15 years in JIS has concluded that all works equally incorporate the element of accounting and MIS while the cited works are also being derived from both knowledge domains. A more recent work (Guffey & Harp, 2014) had conducted more extensive review on works published in JIS for over 25 years. Generally, the results indicate consistent improvement on the journal impact factor. Most recently, Weber (2016) provided a review on 30-year publications of JIS. They specifically focused on analysing the keywords and citation. As for IJAIS, earlier work by Hutchison et al. (2004) had examined 99 articles published in the first ten volumes of the journal. The results demonstrated bright prospect of the journal to shape the AIS body of knowledge with greater diversity of topics and research methods. Ismail (2009b) also reported similar outcomes with commending progress in AIS research, particularly in the aspect of theoretical development. Applying a bibliometrics approach, Muehlmann, Chiu and Liu (2015) had examined 64 articles published in the first decade publications of Journal of Emerging Technologies in Accounting (JETA). Meanwhile, Ardianto and Anridho (2018) conducted bibliometric and content analysis on emerging AIS journal, International Journal of Digital Accounting Research (IJDAR). The 15-year scholar works review reported AIS as the most dominant accounting area with authors from US, Spain and Australia are the main contributors of the scholarly works. Setting wider scope of the review, Chiu, Liu, Muehlmann and Baldwin (2018), reported review on six selected AIS-related journals as published between 2004 and 2016. Review of 677 articles reported that most journals have no specific focus in publishing AIS-related articles. There are also varying percentage of focus on emerging technologies across journals while the most linked accounting research areas to AIS are auditing and financial accounting.

While previous studies cover extensively on content analysis of the AIS scholarly works, thus limiting the time frame, this current paper examines all articles currently available on the Scopus database. Although the analysis is rather surface than in-depth, automation of the data available enables authors to carry out analysis on details of the articles as obtained from Scopus database. In response to the earlier discussion, this paper, therefore aims to conduct a bibliometrics analysis on published AIS scholarly works. However, this study narrows down the scope to the scholar works published in two of the leading AIS journals, namely International Journal of Accounting Information Systems (IJAIS) and Journal of Information Systems (JIS). The aspects of focus for analysis include; subject area classification, authorship and affiliation, citations and keywords.

This study offers insights on the changing trend of AIS-related studies based on the overview of the research published to date. This is particularly essential as technological change in business environment promotes great research opportunities for interdisciplinary research area such as AIS (Wu, Hao, & Yao, 2009). For AIS to quickly adapt to the rapid changes in IT, continuous refinement and evaluation of the IT artefacts affecting accounting roles is highly needed (Geerts, Graham, Mauldin, Mccarthy & Richardson, 2013). The impact of a recent

technology change such as mobile and cloud computing, big data, internet of things and artificial intelligence are expected to be revealed through the analysis. In addition, by examining what previous works have been focusing on would enable authors to offer possible insight and clearer perspective for researchers to project future research directions. AIS topics of interest are likely to prosper over time in line with IT innovations (Sutton, 2010). The research findings should be of interest for prospective postgraduate students to have better perspective on the trends of prior works in AIS.

Authors outline this paper into four major sections. The next section elaborates method being employed while section three reports the findings and discussions of the collected data. The paper ends with conclusion, limitations and future directions.

Research Method

This paper employed a bibliometrics approach in providing analysis of prior studies on AIS. The Bibliometrics approach employs mathematical/statistical tools in evaluating quantity and quality of the published materials in order to observe trends or pattern of a specific research area (Sweileh et al., 2017). In addition, a more extensive bibliometrics analysis facilitates forecast of the research growth rate in a particular research domain (Cherng, Malim & Singh, 2015).

This study, however, limits the scope to two of the leading journals of AIS-related research, namely JIS and IJAIS. Both journals are reported as among the top ranked publication outlets for AIS-related works (Ferguson & Seow, 2011; Guffey & Harp, 2014; Moffit et al., 2016). Having said that, all the research works published in these two journals are directly or indirectly related to AIS. Hence, no further filtration process took place to remove irrelevant articles from the data initially obtained from Scopus database. Table 1 summarises selected profiles of the two leading journals included for this study.

Table 1: Description of Journals

	IJAIS	JIS
Country	United Kingdom	United States
Publisher	Elsevier Ltd	American Accounting Association
First publication	Year 2000 (*initially published as Advances in Accounting Information Systems*)	Year 1986
Available in Scopus since	Year 2000 to present	Year 2009 to present
Scopus Ranking	Ranked 75th for Accounting	Ranked 70th for Accounting
Cite Score*	1.7	1.36

* Based on Scopus database record as of 2017.

Authors extracted details of all articles published (restricted to research articles category) in both journals from Scopus online database as of 28 February 2019 into *'csv'* file. Table 2 shows distribution of final articles included for analysis.

Table 2: Distribution of Articles by Journal

Journal Name	No. of articles	Publication years covered*
IJAIS	302	2000 - 2018
JIS	153	2009 - 2018
Total number of articles	**455**	

*Publications details available in Scopus database

Results, Analysis and Discussion

As Table 3 indicates, despite the blend between accounting and IT, all published AIS research are classified under Business, Management and Accounting as well as Decision Science categories. Meanwhile, only 153 (33.6%) out of 455 published articles in both journals are classified under Computer Science category while 286 articles (62.9%) are also classified under Economic, Econometric and Finance. The data reported suggest that scholar works in both AIS journals mainly emphasising the AIS issues from business and accounting perspective rather than IT perspective.

Table 3: Classification of Articles by Subject Area*

Subject area**	Total	%
Business, Management and Accounting	455	100.0
Decision Sciences	455	100.0
Economics, Econometrics and Finance	286	62.9
Computer Science	153	33.6

*As produced by Scopus

**Each article may be classified into more than one area.

Next review focuses on authorship-related information. Overall, 455 articles examined involved 706 authors (both main author and co-authors). As Table 4 reveals, 62 articles (13.6%) published are single-authored while the other 36.3% and 32.5% are the collaboration of either two or three authors respectively.

Table 4: No. of Authors/Paper

	1		2		3		4		5		Total
IJAIS	49	16.2%	109	36.1%	96	31.8%	45	14.9%	3	0.9%	302
JIS	13	8.5%	56	36.6%	52	33.9%	30	19.6%	2	1.3%	153
Total	**62**	**13.63%**	**165**	**36.26%**	**148**	**32.53%**	**75**	**16.48%**	**5**	**1.10%**	**455**

[1]Coverage: Year 2000 – 2018

[2]Coverage: Year 2009 – 2018

With respect to the country/territory, about 60% of all the contributing authors are from United States (US), followed by Australia (10.1%) and Canada (7.4%) (Table 5). The facts reported in this study is somewhat consistent with Ardianto and Anridho (2018). Similarly, comparison across journals further indicates domination of authors from US are somewhat higher for articles published in JIS (67.7%) as compared to IJAIS (50.9%) based on the given analysis period.

Table 5: Contributing Authors by Country*

	IJAIS[1]		JIS[2]		Overall	
Country	**N**	**%**	**N**	**%**	**N**	**%**
United States	215	56.6	126	67.7	341	60.2
Australia	42	11.1	15	8.1	57	10.1
Canada	24	6.3	18	9.7	42	7.4
United Kingdom	11	2.9	5	2.7	16	2.8
China	6	1.6	4	2.2	10	1.8
Netherlands	9	2.4	1	0.5	10	1.8
Germany	6	1.6	2	1.1	8	1.4
Belgium	3	0.8	4	2.2	7	1.2
Finland	6	1.6	-	-	6	1.1
New Zealand	4	1.1	2	1.1	6	1.1
Spain	4	1.1	2	1.1	6	1.1
Qatar	4	1.1	1	0.5	5	0.9
Malaysia	4	1.1	-	-	4	0.7
Taiwan	3	0.8	1	0.5	4	0.7
United Arab Emirates	4	1.1	-	-	4	0.7
Denmark	3	0.8	-	-	3	0.5
India	1	0.3	2	1.1	3	0.5
Italy	2	0.5	1	0.5	3	0.5
Singapore	3	0.8	-	-	3	0.5
Brazil	1	0.3	1	0.5	2	0.4
Greece	2	0.5	-	-	2	0.4
Iceland	2	0.5	-	-	2	0.4
Iran	2	0.5	-	-	2	0.4
Ireland	2	0.5	-	-	2	0.4
Lebanon	2	0.5	-	-	2	0.4
Mexico	1	0.3	1	0.5	2	0.4
South Korea	2	0.5	-	-	2	0.4
Croatia	1	0.3	-	-	1	0.2
Fiji	1	0.3	-	-	1	0.2
Indonesia	1	0.3	-	-	1	0.2
Liechtenstein	1	0.3	-	-	1	0.2
Portugal	1	0.3	-	-	1	0.2
Romania	1	0.3	-	-	1	0.2
South Africa	1	0.3	-	-	1	0.2
Sweden	1	0.3	-	-	1	0.2
Switzerland	1	0.3	-	-	1	0.2
Thailand	1	0.3	-	-	1	0.2
Undefined	*2*	*0.5*	-	-	*2*	*0.4*
Total	**380**	**100.0**	**186**	**100.0**	**566**	**100.0**

*As reported by Scopus Online database

[1]For publications from year 2000 – 2018

[2]For publications from year 2009 - 2018

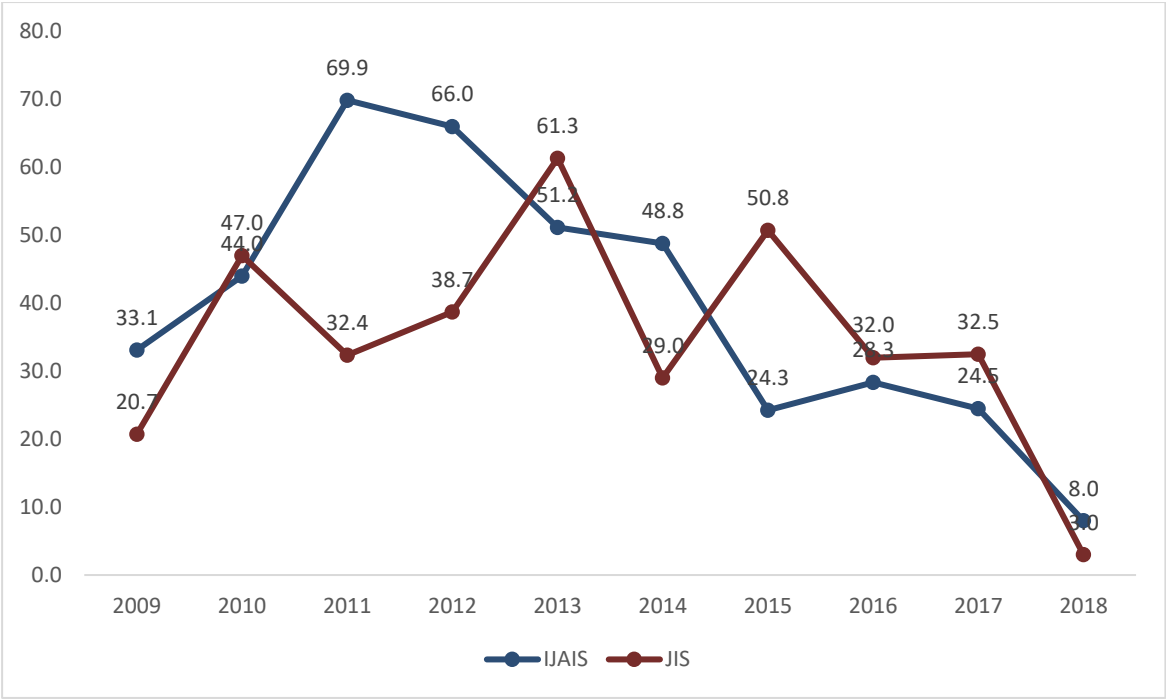
With respect to author's affiliation, the results seem consistent as most of the affiliations of the authors reside in the US except several institutions are based in Australia. Based on Table 6 tabulation, the highest number of authors' affiliations include University of Central Florida (25), University of Queensland (23) and followed by University of Waterloo (19) and Iowa State University (18).

Table 6: Authors Affiliations*

Affiliation	**N**	**%**
University of Central Florida	25	3.5
University of Queensland	23	3.3
University of Waterloo	19	2.7
Iowa State University	18	2.5
Bentley University	15	2.1
University of Melbourne	14	2.0
Rutgers University-Newark Campus	13	1.8
University of Hawaii at Manoa	13	1.8
Florida Atlantic University	13	1.8
Rutgers Business School, New Jersey	12	1.7
Arizona State University	11	1.6
University of South Florida, Tampa	10	1.4
Queensland University of Technology QUT	10	1.4
Bowling Green State University	10	1.4
Michigan State University	10	1.4
Others	*490*	*69.4*
Total	**706**	**100.0**

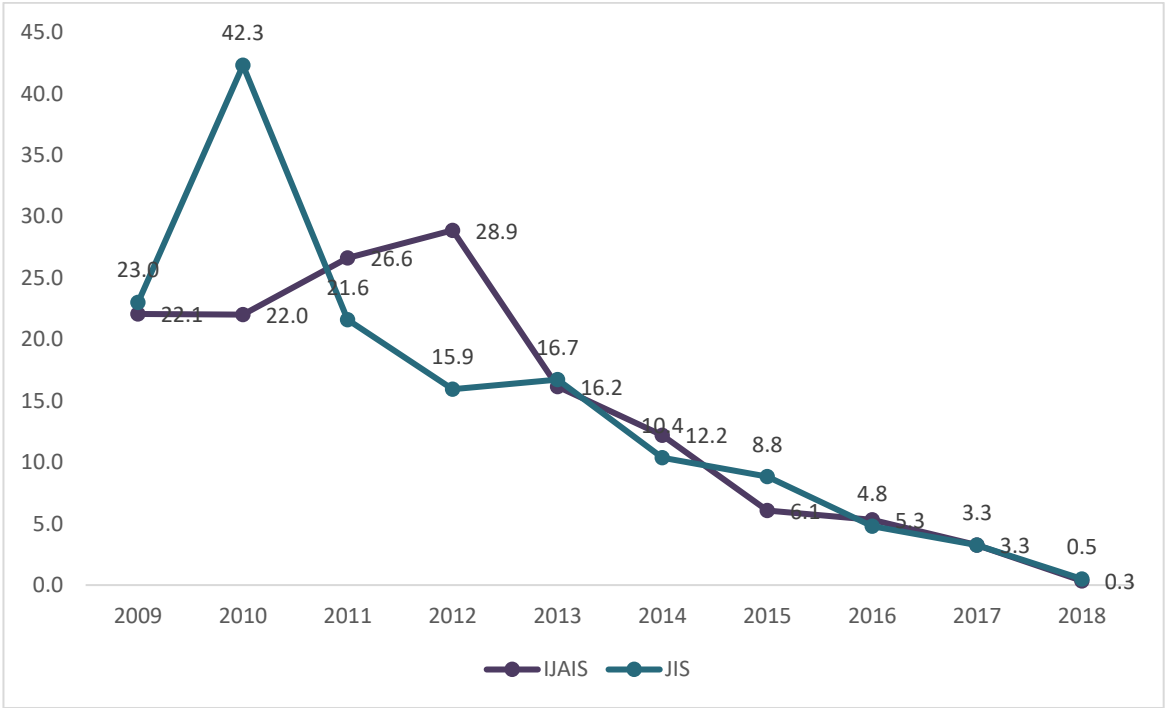
*Based on Scopus online database

Next analysis focuses on frequency of citations and citations/year. Citation analysis helps to assess the degree of impact of the published work on existing research domain (Ardianto & Anridho, 2018). For comparability purpose, Figure 1 and Figure 2 that follow depict number of citations per year and number of citations per paper between both journals for articles published from 2009 to 2018. As both diagrams indicate, there are no obvious domination of citations across the journals over the years. Issues raised by the respective journal during a particular year may be one of the possible factors affecting citations of the articles published of that particular year (s). Nevertheless, having more inclusive sources other than Scopus may provide greater confirmation on the citation analysis as the citations reported varies across different databases (Muehlmann, Chiu & Liu, 2015). This paper, however, is restricted to the Scopus citation data reported for each article.



*Calculated based on total citations of the year/no. of years counted from the publication year to the current year (Ardianto & Anridho, 2018)

Figure 1: Average Citations per Year*



*Computed by dividing no. of citations/year with no. of articles published in a particular year

Figure 2: Average Citation per Article*

To explore authors' influence on AIS-related articles published in these two prominent journals for the covered publication years, Table 7 outlines top five authors with the highest published works into both journals (both as main author or co-author). Overall, there are 160 authors that have contributed to 455 articles being reviewed for this study.

Table 7: Top Contributing Authors (2000 – 2018)

Author	Affiliation	Scopus h-index*	No. of papers
Steve G. Sutton	University of Central Florida, USA	20	23
Vicky Arnold	University of Central Florida, USA	13	14
Vernon J. Richardson	University of Arkansas System, USA	26	12
Miklos A. Vasarhelyi	Rutgers University-Newark Campus, USA	18	11
Glen L. Gray	California State University Northridge, USA	11	10

*Based on Scopus database as of March 2019

We then conducted analysis on the author's keywords of each article. The list of keywords was extracted from the keywords supplied by Scopus database for both journals from year 2000 to 2018. Initial list of the keywords supplied is 722. However, some modifications were made on the keywords being supplied, i.e. to remove common phrases such as accounting, accounting information systems, or information technology and to standardise the keywords used (e.g. full phrase vs. short form, or singular vs. plural form). Table 8 reveals 11 most commonly used keywords in both journals. The highest occurrences refer to the continuous auditing and XBRL as among the common areas of concern on AIS field. Other emerging issues such as big data and data mining have been on the raising trend in line with the emerging of big data era. Further investigation across journals also reveal similar pattern. Thus, authors do not report the findings in the article.

Table 8: Most commonly used keywords (2000 – 2018)

Keyword	No. of occurrences
Continuous Auditing	31
XBRL	29
ERP	23
Internal Control	20
IT Governance	19
Continuous Monitoring	12
Decision Aid	12
Fraud	11
Internal Audit	11
Big Data	10
Data Mining	10

Using Wordle, we further produced a map of top 50 keywords that are most commonly used in all articles examined. Worldle produces cloud word map based on the occurrences of each keyword as reflected on the keyword's font size. Similar to the earlier reported facts, as Figure 3 indicates, among the most frequently used keywords include; XBRL, ERP, continuous audit, internal control and IT governance. Other keywords related to more emerging technologies include business intelligence, enterprise system, big data, social media, data mining and data analytics, among others. This result could be consistent with observation by other studies that AIS research currently giving more focus on emerging technologies surrounding accounting functions (Chiu et al., 2018; Muehlmann et al., 2015).

Figure 3: Most Frequently Used Keywords (Wordle)

Finally, this paper extends the keywords analysis by examining the strength of the relationship between keywords using VOSviewer (Figure 4). The diagram employs colour, circle size, font size, and thickness of the connecting lines to demonstrate the presence and strength of the relationship between one keyword to another. However, to ease the analysis, only keywords with minimum of four (4) occurrences were included for analysis. The keywords were divided into seven clusters based on the strength of their association. As presented, big data, data mining, auditing, and fraud, in many instances, co-occur together. This is particularly true as the emergence of big data in recent years do give certain implications to auditing and fraud detection procedures. Similarly, e-commerce, continuous audit, Internet and XBRL are closely linked together. The introduction of internet, particularly the evolution of XBRL technology has reported considerable effect on corporate reporting practice and has enabled continuous reporting to be highly possible. That is why, these keywords are commonly related to each other. Meanwhile, continuous auditing, internal control, information security, enterprise systems and ERP are in another cluster of related keywords. This is consistent with the fact that ERP or enterprise systems brings considerable transformation of how business operates, which triggers greater security-related risks to an organisation. These, to some extent, influence the roles of accountants in an organisation, particularly in the aspect of controls, risk management and auditing technique. Hence, issues surrounding the impacts of ERP to accounting are currently a growing research area (Sardo & Alves, 2018).

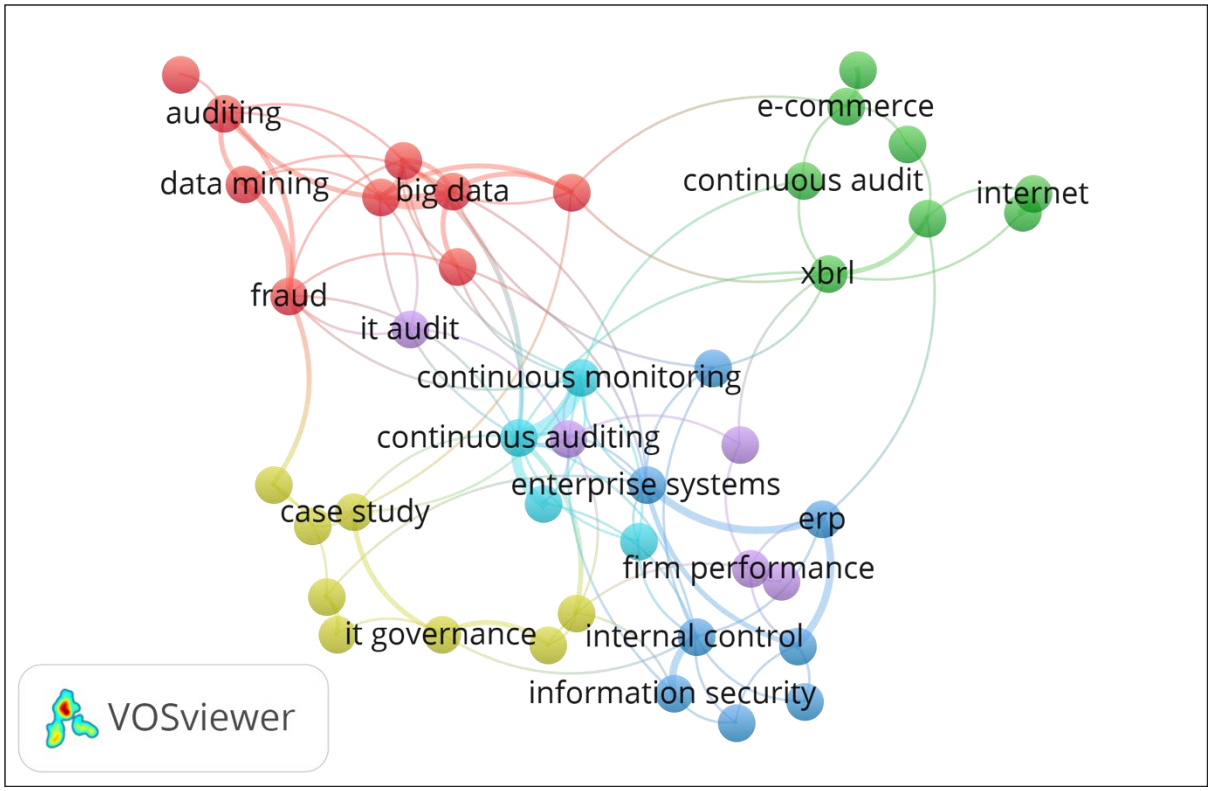


Figure 4: Network Visualization Map

Meanwhile, the overlay visualisation map (Figure 5) indicates development of topics over time. It was found that issues related to big data, business intelligence, IT audit, and social media are among the most recent concerns for articles published in 2015 onwards. In another respect, issues related to XBRL, continuous monitoring, IT governance, and information security are among the topics of concern between 2010 and 2015. On the other hand, issues related to voluntary disclosure, e-commerce, ERP are more common in the last decade.

Conclusion

Greater roles of IT in today's business directly or indirectly affecting accounting, one of the core functions of any business entity. In view of growing research works examining the impacts of IT to accounting, this paper conducts review of selected bibliometric characteristics for 455 scholarly AIS works published in two leading journals from year 2000 to 2018 as obtained from Scopus online database.

Despite a blend of accounting and IS/IT domain, majority of the scholarly works are classified as business, management and accounting as well as decision science than computer science. Analysis by country shows that authors from the US contribute over 50% of the published articles.

Finally, Worlde and Vosviewer outputs reveal that issues involving ERP, big data, data analytic, continuous auditing and digital reporting (XBRL) receive greater attention by many researchers, particularly for a more recent publication. The analysis further shows trend changes on the issues of focus over the years. Despite insightful analysis provided in this paper, going in-depth on the keywords using more sophisticated analyses or tools potentially reveal more exciting fact on possible transformation of the research focus over the years (Muehlmann, Chiu & Liu, 2015).

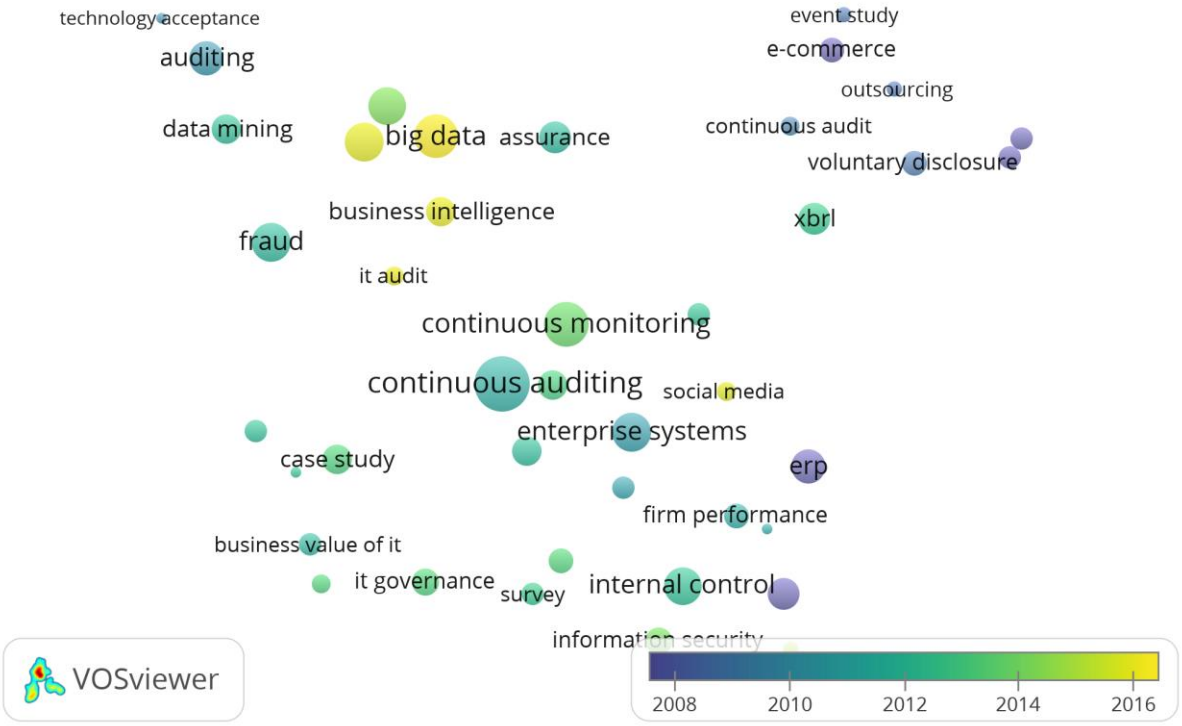


Figure 5: Outlay Visualization Map of The Author Keywords

Several limitations and further extensions of the paper deserve special consideration. Although JIS publication has started since 1991, this paper restricts the review to articles published from 2009 onwards that are available on the Scopus database. Having access to the earlier publication profiles obviously provide more comparable and comprehensive analysis. As for potential extension, more advanced bibliometrics elements may be considered to unleash more meaningful perspective on the patterns of earlier AIS research, particularly on the citation and keywords analysis. More importantly, in-depth analysis or article-level analysis (e.g. Ferguson & Seow, 2011; Poston, 2000) on more recent AIS works published promised even more insightful facts for analysis. To wrap up, in view of the unique aspect of AIS research that blends the two distinct subject areas of accounting and IT, effort to establish AIS to stand as an independent research domain is very much needed. Thus, examining profile of research in this research domain should be very much welcomed as a building block for development on its research framework.

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