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Thirty Years of ACIS Proceedings: An Archival Analysis

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Abstract

This is a research in progress paper seeking to explore trends and characteristics of Australasian information systems (IS) research. We extend a 2008 archival analysis of ACIS proceedings with data collected for conferences held between 2008 and 2019. We also retrieve metadata for proceedings published between 1990 and 2019. Conference statistics, such as submitted/accepted paper counts, acceptance rates and number of delegates are analysed. We also perform quantitative and qualitative analysis on proceeding metadata to explore trends in the size and status of ACIS and the nature of IS research in Australasia. Whilst being a research in progress paper we determine that the acceptance rate of ACIS conferences has decreased substantially over time, particularly after 2007. Further, we identify an increase in the yearly count of distinct countries associated with author institutions and the number of non-Australian/New Zealand publications. The completed research will have important contributions for Australasian IS research.

Keywords ACIS, proceedings, archival analysis, Leximancer, abstract sentence classification

1 Introduction

The 2020 Australasian Conference on Information Systems (ACIS) is a special event as it marks thirty years since the annual conference was first held in 1990 at Monash University in Melbourne, Australia. The conference has evolved over the last three decades, changing names in 1994 from the Australian to the Australasian Conference on Information Systems in an acknowledgement of the increased contribution to the forum by New Zealand researchers. The conference held in 2001 was also significant as it was where the Australasian Association for Information Systems (AAIS) was formed, becoming a chapter of the international body the Association for Information Systems.

Each year information systems academics, researchers and practitioners submit papers to ACIS, papers which are representative of a wide array of original information systems research. There has been a great deal of change in the world of information systems since 1990, so the almost thirty years of ACIS conference proceedings offer a unique perspective into our discipline, particularly in the Australasian region. Accordingly, archival analysis on ACIS proceedings can provide insights into the evolution of Australasian information systems research. Gable et al. (2008) conducted the first archival analysis of ACIS proceedings, uncovering interesting trends and patterns in Australasian information systems research. However, in the 12 years since Gable et al.'s (2008) paper an archival analysis of ACIS proceedings has not been conducted, which is the primary motivation for this study.

2 Research Motivations and Questions

In 2008, Gable et al. noted upon reflection of their archival analysis of ACIS proceedings that “ACIS has a relatively short history” (p. 317), and that as a result “clear trends can be masked by short term variations” (p. 317). They also point out that it was important for future researchers to maintain and expand ACIS proceeding data, particularly in relation to the coverage of the affiliation of authors to varying universities and institutions. Further, Gable et al. (2008) call for various future lines of inquiry on ACIS proceedings, such as the examination of inter university and institution collaboration. They also suggest that having ACIS proceeding metadata available in a digital form can permit a large scope of archival analysis.

This paper outlines research in progress which is motivated to extend the research conducted by Gable et al. (2008) to account for the almost 12 additional years of proceedings and associated metadata now available. We are motivated to act upon their recommendations for future study into this domain, as well as contribute our own archival analytical approaches in the hope to uncover trends and patterns in Australasian information systems research. We also are motivated to apply and observe the utility of two qualitative software tools which we believe can prove beneficial in an archival analysis study – Leximancer (Smith and Humphreys, 2006) and ASCSystem (Stead et al., 2020a and 2020b). In addition, we are motivated to contribute a comprehensive dataset of ACIS proceedings, which can be used by future researchers to conduct further archival analysis or related research.

Ultimately, the purpose of this study is to explore trends and patterns in Australasian information systems research through the qualitative analysis of ACIS proceedings. To achieve this purpose, we posit the following research questions. Many of these have been derived from the archival analysis conducted by Gable et al. (2008), which we seek to extend:

1. What trends are evident in relation to the size and status of ACIS, particularly since 2007?
2. What trends are evident in relation to the acceptance of submitted papers, particularly since 2007?
3. What trends are evident in relation to the university or institutional affiliation and the associated countries of authors accepted in ACIS proceedings?
4. What changes have occurred in the nature of IS research in Australasian information systems research, particularly since 2007?
5. What are the dominant research topics in Australasian information systems research, particularly since 2007?
6. What is the extent and characteristics of inter-university collaboration for research published in ACIS proceedings?
7. What trends are evident in relation to the countries associated with the affiliation of authors of research published in ACIS proceedings?

3 Method

There are four stages in this ongoing research project: 1) proceeding metadata extraction and transformation, 2) conference statistics acquisition, 3) conference and proceeding metadata quantitative analysis, 4) proceeding qualitative analysis. This section will outline each of these stages.

3.1 Proceeding Metadata Extraction and Transformation

The first stage involved extracting proceeding metadata from two sources, the AAIS ACIS proceeding archive¹ and the AIS eLibrary platform². Proceeding metadata refers to the following attributes of each proceeding: title, abstract, publication/conference year, keywords, author name(s), author(s) affiliation and author(s) affiliation country.

When AAIS was formed in 2001 and became an affiliated chapter of AIS it seems that AIS became either responsible for or had the right to include ACIS proceedings and their metadata on their online resources. This is thought to be the case as AIS's online digital content platform, AIS eLibrary, only features ACIS proceedings from the year 2000 onwards. AIS eLibrary permits the export of search query results to .CSV, which made it rather easy to export metadata for ACIS proceedings between 2000 and 2018. As previously mentioned, ACIS was first held in 1990, accordingly AIS eLibrary is missing 10 years of ACIS proceedings, from 1990 to 1999. The AAIS ACIS proceeding archive does however maintain .ZIP files containing PDFs of submitted papers to all ACIS proceedings, including those in the 1990 – 1999 period where metadata is not available on AIS eLibrary. To retrieve proceeding metadata for proceedings published in the period missing from AIS eLibrary, metadata was 'scraped' from the proceeding PDFs. The 'scraping' process was achieved either using PDF to text conversion software or manually re-written into an Excel workbook. There were 695 proceedings extracted from 1990 – 2000 ACIS proceeding PDFs and 1833 proceedings exported from the AIS eLibrary. We were unable to retrieve proceedings for the years 2014 and 2019, as at the time of writing they were not available on AIS eLibrary and we have not been able to retrieve them from other sources.

After extraction of proceeding metadata observations were transformed to resolve data inconsistencies. Examples of these include addressing minor author name variations, such as the occasional use of aliases (for example, Kit in C. N. G. (Kit) Dampney), removal of author middle names and the review of abstracts extracted using PDF to text conversion software to ensure conversion worked as expected. Three other major transformation activities centered around author affiliations. Firstly, for metadata retrieved from AIS eLibrary for proceedings in the period 2001 – 2018 author affiliations had to be retrieved from each proceeding's page on the eLibrary platform as they were not included in the export to .CSV function. This data was easily retrieved using a Python program which automatically retrieved the author affiliations from each proceeding's AIS eLibrary webpage, exporting to .CSV and then joining them with the other proceeding metadata.

Once collated, author affiliations were resolved to the primary institution. For example, the affiliation 'BUSINESS SCHOOL, THE UNIVERSITY OF ADELAIDE' was resolved to 'UNIVERSITY OF ADELAIDE'. In another example, 'DEPARTMENT OF COMPUTER SCIENCE & MATHEMATICS, MUNICH UNIVERSITY OF APPLIED SCIENCES, MUNICH, GERMANY' was resolved to 'MUNICH UNIVERSITY OF APPLIED SCIENCES'. We also transformed other inconsistencies in the affiliations, such as converting 'SAP (SWITZERLAND) INC.', 'SAP AUSTRALIA PTY LTD' and 'SAP RESEARCH 76131 KARLSRUHE, GERMANY' to 'SAP'. Further examples included deciding that UNSW ADFA was to be classified as 'UNIVERSITY OF NEW SOUTH WALES AUSTRALIAN DEFENCE FORCE ACADEMY', separate to 'UNIVERSITY OF NEW SOUTH WALES' given the unique nature of that institution. Business schools were also resolved to their parent institutions, such as 'UQ BUSINESS SCHOOL, THE UNIVERSITY OF QUEENSLAND, ST LUCIA, QUEENSLAND' to 'UNIVERSITY OF QUEENSLAND' and 'BIRMINGHAM BUSINESS SCHOOL, UNIVERSITY OF BIRMINGHAM' to 'UNIVERSITY OF BIRMINGHAM'. The original affiliations as extracted from the proceedings were maintained in the dataset as future research may find them valuable.

Another time exhaustive exercise was identifying each affiliation institution's country. This was done by identifying the distinct resolved institution names then either referring to the source proceeding or searching online to identify the associated country. The dataset is structured so that each author has an affiliation and an affiliation country identified. Therefore, a proceeding can have multiple

¹ <http://acis.aisnet.org/archive.php>

² <https://aisel.aisnet.org/>

affiliations and multiple countries depending on the number of authors. This permits interesting research on not just the cross-collaboration trends between different affiliate institutions but also the countries from which authors of ACIS proceedings belong.

The final dataset for utilisation in the quantitative and qualitative analysis contains the variables and observations as demonstrated in table 1.

Table 1: Example of dataset for quantitative and qualitative analysis

VARIABLE	SAMPLE OBSERVATION
TITLE	A prototypical Skin Cancer Information System
ABSTRACT	Skin cancer is a common problem in Australia and indeed around the world. Within the domain of eHealth, there appears to be no satisfactory clinical software...
YEAR	2013
AIS_ELIBRARY_URL	https://aisel.aisnet.org/acis2013/91
AUTHOR(S)	Alharthi, Ahmed; Busch, Peter; Smith, Stephen
KEYWORDS	ELECTRONIC HEALTH RECORD, ELECTRONIC MEDICAL RECORD, PERSONAL...
AUTHOR_1	Alharthi, Ahmed
AUTHOR_2	Busch, Peter
AUTHOR_3	Smith, Stephen
AFFILIATION_1	MACQUARIE UNIVERSITY
AFFILIATION_1_COUNTRY	AUSTRALIA
AFFILIATION_2	MACQUARIE UNIVERSITY
AFFILIATION_2_COUNTRY	AUSTRALIA
AFFILIATION_3	MACQUARIE UNIVERSITY
AFFILIATION_3_COUNTRY	AUSTRALIA

3.2 Conference Statistics Acquisition

Gable et al. (2008, p. 312) acquire conference statistics to answer research questions centred around the trends in the size and stats of ACIS and the trends in acceptance of papers over time. Statistics used to explore these research questions include: year of conference, city and sponsoring university, conference dates/duration (days), program/conference/organising chair(s), number of submissions, number of accepted papers, paper acceptance rate, number of countries (first author), number of delegates, number of parallel streams/panels/tutorials, keynote and notable speakers, number of doctoral consortium participants and the doctoral consortium chair(s).

Gable et al. (2008) acquired this data for ACIS conferences up to and including the year 2007. As part of this research in progress, we are seeking to extend this data for conferences up to and including 2019. We are using numerous sources to retrieve this data, including each ACIS conference year's website³, the 'index' or welcoming note in each year's proceedings and by directly contacting the respective conference chair(s) via email⁴. For the years 2001 – 2019 (and 2020) we have collected the locations, sponsoring universities and dates/duration. We have acquired most of the other variables desired for the years 2008 – 2013 and 2015. For the years 2017 and prior we used two tables provided in the Gable et al. (2008) paper. One table (p. 314) provided submitted paper and accepted paper counts as well as acceptance rates for conferences in years 1992 – 2007. Another table (p. 318) provided additional data but only for the years 2001 – 2007. These tables combined provided partial data for the years 1992 – 2000 and complete data for the years 2001 – 2007. Gable et al. (2008) also used a similar method of retrieving these statistics (p. 312). Part of the reason this research is still in progress is due to our ongoing efforts to collect the remaining data for the pre 2001, 2014 and 2016-2019 conferences.

³ Each year's website has been provided on the ACIS Wikipedia page including web archive versions: https://en.wikipedia.org/wiki/Australasian_Conference_on_Information_Systems

⁴ We greatly appreciate the help of those who kindly provided statistics, some of which were from backups stored almost a decade ago!

3.3 Conference and Proceeding Metadata Quantitative Analysis

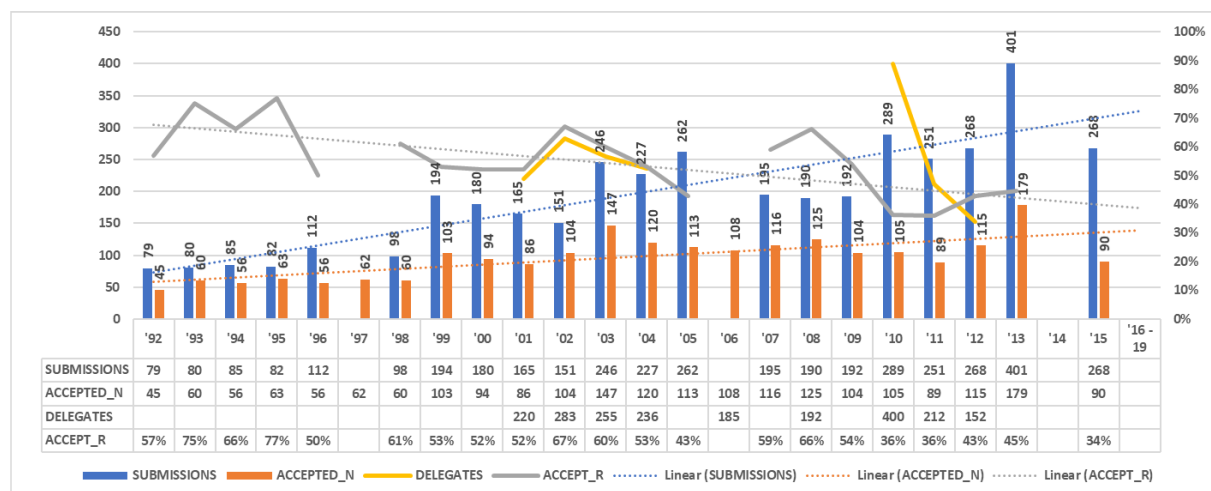
To address the first two research questions identified below, an analysis of the conference statistics outlined in the previous section is required:

1. What trends are evident in relation to the size and status of ACIS, particularly since 2007?
2. What trends are evident in relation to the acceptance of submitted papers, particularly since 2007?

As discussed, we are still in the progress of acquiring conference statistics for the years pre 2001, 2014 and 2016-2019. As a result, we are not in a position to provide a complete analysis and response to these research questions. Regardless, we can provide an outline of the years for which we have collected required data. We collected 2008 – 2013 and 2015 as part of this research and retrieved 1992 – 2007 from Gable et al. (2008, pp. 314, 318). Figure 1 shows the number of submissions, accepted papers, acceptance rate and number of delegates for the years 1992 – 2019, allowing years for which data were not retrieved to appear empty. The black reference line between the years 2007 and 2008 indicate where Gable et al.'s (2008) data ends and ours begins. Gable et al. (2008) noted an apparent decline in attendance numbers for ACIS conferences up to 2007, suggesting that this may have been driven by a decline in IS staff numbers around the world, competition from other international IS conferences and policies reducing the status of conference proceedings compared to journal papers (p. 314). Unfortunately, our collection of delegate numbers for ACIS conferences from 2008 onwards is largely incomplete, but the counts for 2008, 2010 and 2011 seem to suggest increased attendance numbers. The delegate attendance numbers for 2012 indicated a drop compared to 2011, which is why further collection of data is desired before any conclusions with respect to the evolving size and status of ACIS post 2007 is to be considered.

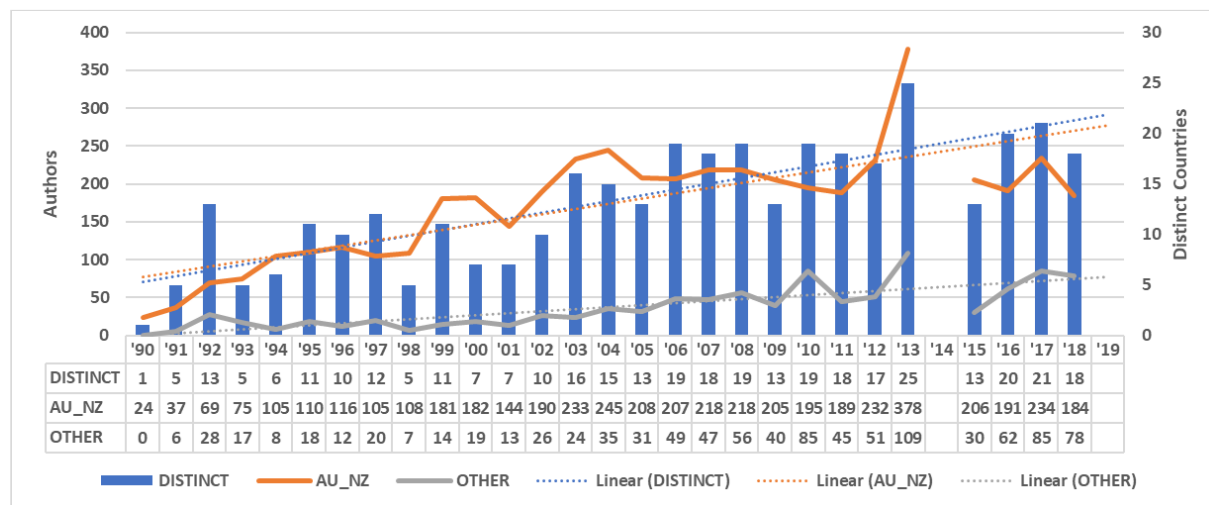
Our collection of submitted and accepted paper counts is reasonably better at this stage than delegate/attendance counts. In their study, Gable et al. (2008) suggest that “one measure of the quality of a research-orientated conference, such as ACIS, is a relatively low percentage of papers accepted for presentation and publication in conference proceedings relative to the number of papers submitted” (p. 314). They note that the acceptance rates for ACIS conferences between 1992 – 2007, where known, are generally below 60%, which tracks well against other IS conferences such as PACIS, AMCIS and ECIS. We have identified the acceptance rates for the years 2008 – 2013 and 2015 (refer to figure 1) which, with the exception of the 2008 conference at 66%, are all below 60% and are generally tracking downwards with the acceptance rate in 2015 being an all-time low of 34%. This is reflective of the increased trend in paper submissions, with a known record of 401 submissions in 2013. The mean submission counts for 1992 – 2007 was 154, compared to the mean of the years 2008 – 2013 and 2015 being 266. Despite our data collection not being complete at this stage, these preliminary numbers are a good reflection of ACIS as they suggest an increase in the popularity of the conference. The decline in acceptance rates is positive, as it aligns ACIS closer with the quality measure of research-orientated detailed by Gable et al. (2008). We look forward to collecting additional data and further analysis using these conference statistics.

Figure 1: Submissions, acceptance rate and delegates for ACIS conferences 1992 – 2020



Further to the analysis on conference statistics, Gable et al. (2008) analysed proceeding metadata to explore trends in relation to institutional affiliation of accepted authors. There have been other studies on ACIS proceeding metadata, such as Cheong and Corbitt (2009) who explored author metadata of ACIS proceedings in their social network analysis. Dang Pham Thien and Kautz (2017) also utilised a social network analysis method to explore co-authorship of PACIS proceedings across institutions. We have collected author affiliations and associated countries for all proceedings 1990 – 2018. This dataset is now to be leveraged in a similar manner to Gable et al. (2008), Cheong and Corbitt (2009) and Dang Pham Thien and Kautz (2017) as we seek to answer our 3rd, 6th and 7th research questions. We are keen to explore these research questions whilst paying particular attention to the associated countries for author affiliations, which we believe is a novel contribution to the body of ACIS archival analysis. We have no complete analysis due to the missing 2014 and 2019 proceedings, but we do wish to point out the increased trend in non-Australian/New Zealand affiliations in recent years as well as an increase in the yearly distinct country count.

Figure 2: Distinct author affiliate countries and Australia/New Zealand or other status



3.4 Proceeding Qualitative Analysis

Gable et al. (2008) conducted qualitative analysis on ACIS proceedings to answer research questions concerned with the nature and characteristics of Australasian information systems research. Our 4th and 5th research questions are based on the ones they posited. To answer these questions Gable et al. (2008) engaged in a qualitative coding process (pp. 311-312), whereby papers were classified into 32 topics derived from Barki et al. (1993) and Palvia et al. (2004). At a broader level, these classes fell into four categories: technical, behavioural/managerial, educations (i.e. IS curriculum related) and other (p. 311). Papers were classified after a review of their keywords, abstract or full paper, in that order of preference (p. 312). In our study we are not classifying each paper into the 32 finer classes, but rather only classifying papers into the Gable et al.’s (2008) four broader categories, however, we are complementing this process with two other approaches.

The first is the use of the Leximancer concept mapping software (Smith and Humphreys, 2006). Leximancer performs a style of automatic content analysis which “goes beyond keyword searching by discovering and extracting thesaurus-based concepts from the text data, with no requirement for a prior dictionary” (p. 262). The software “enables an automated navigation of the complexity of a document or group of documents, identifying ‘concepts’ within the text, not merely keywords” (Hasan and Smith, 2012, p. 4). We are using Leximancer to develop concept maps over the course of ACIS proceedings, attempting to demonstrate the evolution of core concepts over time. In addition, we are using the ASCSystem software (Stead et al., 2020a and 2020b) which enables the automatic classification of abstract sentences into key literature classes, such as a study’s purpose, method, findings and contributions. The use of ASCSystem will allow us to explore ACIS abstracts from novel perspective and dive deeper into the identification of characteristic specific trends over time, such as the evolution of varying motivations, methods and findings of ACIS proceedings.

We will be using Leximancer and ASCSystem in parallel. For example, figure 2 shows the Leximancer concept maps for the purpose and finding sentences extracted from 2000 – 2013 and 2005 – 2018 ACIS proceedings.

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