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# WHAT ARE YOUR FAVORITE METHODS? - AN EXAMINATION ON THE FREQUENCY OF RESEARCH METHODS FOR IS CONFERENCES FROM 2006 TO 2010

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# WHAT ARE YOUR FAVORITE METHODS? – AN EXAMINATION ON THE FREQUENCY OF RESEARCH METHODS FOR IS CONFERENCES FROM 2006 TO 2010

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## Abstract

*The objective of this study was to analyze, which research methodologies are currently being used in the field of Information Systems (IS). To analyze research activities from different parts of the world, the proceedings of five conferences “on Information Systems” were included over a five year period from 2006 to 2010. In addition to the “International Conference on Information Systems” (ICIS), papers were also taken from the regional Americas (AMCIS), Australasian (ACIS), European (ECIS) and Pacific Asia (PACIS) conferences on information systems. The results of this study indicated that two methods were most popular at conferences by far: “survey” and “concept implementation / proof of concept”. Both at conferences and in journals in the IS field, researchers concentrated on only a few research methods, which meant that many other research methods were rarely used. Across all conferences, a trend towards methods orientation could be observed. Only few conference-specific differences in method usage could be found. Across all conferences, researchers noted a slightly increasing trend towards using combinations of methods. Some differences in preferred method combinations could be identified among regional conferences and ICIS. Compared to recent journal-based studies, the favored research methods were quite similar.*

*Keywords: Research Methods, Method Combination, IS Conferences, Frequency Analysis.*

# 1 Introduction

The objective of this study was to analyze which research methodologies are currently being used in the field of Information Systems (IS). To analyze research activities from different parts of the world, the proceedings of five conferences “on Information Systems” were included over a five year period from 2006 to 2010. This contained not only the “International Conference on Information Systems” (ICIS), but also the regional Americas (AMCIS), Australasian (ACIS), European (ECIS) and Pacific Asia (PACIS) conferences on IS. In the past, the methods used in IS were frequently a subject of studies (e.g., Hamilton and Ives, 1982; Galliers and Land, 1987; Clarke and Turner, 2002; Palvia and Pinjani, 2007). Most of these studies analyzed top IS journals over a period of time and aimed to describe the development or problems within the IS field. However, hardly any of these studies examined papers after 2003 (Avison et al., 2008; Myers and Liu, 2009). There is a need for new studies on IS research methodology to fill this gap. Furthermore, proceedings of conferences have hardly been considered in methodological analysis (Cocosila, Serenko and Turel, 2011). The use of well-established research methods seems to be a success factor for publication. Thus, knowledge about preferred methodologies and combinations in IS research is a benefit for every researcher.

There is no reason why conferences should not be investigated in terms of research method because papers from conferences also contribute to the IS field. For this study, conferences offer some advantages over journals: first, the publication of papers in conferences might reflect a more current state of methodologies used than papers in journals, which might be due to the nature of the review process. The review process for journals might include several rounds; conferences typically include only one round of reviews. Therefore, papers are published much faster in conferences than in journals (Xu and Chau, 2006; Whitley and Galliers, 2007). Second, conferences offer a broader range of topics than journals. While journals are often specialized on core topics, IS conferences also cover topics and methodologies that might not be published in top journals. Furthermore, compared to conferences, only a small group of leading researchers usually publishes in top journals (Vogel and Wetherbe, 1984; Palvia and Pinjani, 2007; Cocosila, Serenko and Turel, 2011). Third, journals in different regions are influenced by local research traditions and their related methodologies (e.g., Chen and Hirschheim, 2004; Myers and Liu, 2009). In well-established journal rankings, the up and coming Asia-Pacific region is underrepresented. Thus the methodologies used in these regions was not considered in former journal-based studies (e.g., Vessey, Ramesh and Glass, 2002; Chen and Hirschheim, 2004; Palvia et al., 2004; Myers and Liu, 2009). The selected conferences on IS in this study provide better regional coverage to analyze the international development of IS research methodologies. When comparing the results of this study with those of journal-based studies, the authors found similarities and differences in research methodologies. The development of research methodology in the IS field could be observed in comparison with previous studies. Although the field of IS has existed for several decades, it is still a young discipline. It includes several aspects of computer science, economy, psychology and many others; therefore it has adopted research methods from all these reference disciplines (Benbasat and Weber, 1996; Vessey, Ramesh and Glass, 2002). In different regions, there was a simultaneous development of IS traditions (e.g., Swatman, 2001). Especially in North America and Europe, two IS traditions have developed, each with its own set of preferred research methodologies. North American research has especially been influenced by the behavioral approach, which looks at why quantitative and empirical methods are preferred. European research has been dominated by computer science with its qualitative and non-empirical methods. This diversity has been analyzed and proven by several studies (e.g., Evaristo and Karahanna, 1997; Chen and Hirschheim, 2004; Myers and Liu, 2009). As a consequence of this increasing internationalization, a greater exchange and cooperation could be observed. A few early studies pointed to the benefits of combining multiple methods, but at first this suggestion was barely accepted by researchers, as described by Landry and Banville (1992) or Mingers (2001). In recent years, leading IS researchers from both North America and Europe have looked to combine rigor and relevance to improve the research quality of both traditions (Lee, 1999; Hevner, March and Park, 2004; Österle et al., 2011).

## 2 Related work and research approach

The characteristics of the IS field were analyzed by examining different aspects, for example reference disciplines, citations, or topics. The research methods used were already studied in the early days of the IS field, mostly through examination of one or more journals over a period of time. For example, Hamilton and Ives (1982) investigated 15 North American MIS Journals over a period of ten years from 1970 to 1979. They aimed to discover trends in research strategies and identify differences between strategies used by practitioners and academic researchers. To this end, they analyzed the research methods used. To their surprise, most researchers used non-empirical methods (70.1%). Further, they identified a stronger tendency toward using empirical research in academics articles as compared to papers by practitioners. Two years later, a study was published by Vogel and Wetherbe (1984) with similar findings. They examined the research methodology profile of 15 leading North American MIS journals and the universities that published in them. With regard to earlier studies, they improved the methodology classification. In their results “survey,” “case study,” and “subjective / argumentative” were the leading research methods. This discrepancy between the results of the two studies could be attributed to differences in the methodology classifications. Vogel and Wetherbe (1984) showed that leading researchers often used the same traditional methodology. Galliers and Land (1987) published a range of other research methodologies that were feasible to the IS field. This list included “descriptive / interpretative” and “action research.” One year later, Barki, Rivard, and Talbot (1988) developed one of the first keyword classification schemes for the IS field. It included a list of 14 research methodologies. When the study was updated in 1993, 19 IS research methods were identified (Barki, Rivard and Talbot, 1993). The focus on IS research methodology analysis changed as a consequence of increasing internationalization. A study from Evaristo and Karahanna (1997) compared North American and European research methods. The analysis of doctoral dissertations from 1985 and 1990 showed significant differences in methods used. While researchers in North America predominantly used empirical research methods such as “field study” and “laboratory study,” European researchers predominantly used non-empirical methods such as “conceptual” and “system development.” They also discovered correlations among the preferred reference disciplines and the various research methods.

Study	Vessey, Ramesh and Glass (2002)	Chen and Hirschheim (2004)	Palvia et al. (2004)	Myers and Liu (2009)
Period	1995-1999	1991-2001	1998-2003	1998-2007
Papers	488	1893	1226	1329
Manual coders	Two coders	Unknown	Three coders	Unknown
Duration	Unknown	1.5 years	0.5 years	Unknown
Single or mixed methods	Single method	Single and mixed methods	Up to two methods	Single and mixed methods
Data base	5 journals (only US)	8 journals (4 US, 4 EU)	7 journals (only US)	6 journals (4 US, 2 EU)
Analyzed journals	DS, ISR, JMIS, MISQ, MS	AMIT, EJIS, ICIS, ISJ, ISR, JIT, JMIS, MISQ	CACM, DS, I&M, ISR, JMIS, MISQ, MS	EJIS, ISJ, ISR, JAIS, JMIS, MISQ
Method categories	19	6	14	5

Table 1. Selected journal-based studies about methodologies used in the IS field.

Over the last 10 years, some larger studies have been published about the international development of the IS field and the methodologies used, as summarized in Table 1. All of the studies are based on the analysis of several journals. Some other studies examined only one journal (e.g., Palvia and Pinjani, 2007; Avison et al., 2008) or the proceedings of one conference (e.g., Backlund, 2005) over a period of time. Recently, some studies were published in which the proceedings of conferences were indeed analyzed, but these studies focused on other aspects of the IS field (e.g., Galliers and Whitley, 2002;

Chan, Kim and Tan, 2006; Xu and Chau, 2006; Cocosila, Serenko and Turel, 2011). No recent study has examined the development of research methodologies for several conferences from different regions over one period of time. This study compares the research methodologies used in the proceedings of international IS conferences in different regions. Journals were not considered. For this purpose, the following questions are answered:

- Question 1: Which research methods are used most often in the IS field?
- Question 2: Are there any conference-specific differences?
- Question 3: Are there preferred combinations of research methods?
- Question 4: Do the results prove the findings of recent studies concerning IS journals?

To identify trends in the development of research methodology, the authors chose a five-year period between 2006 and 2010. This examination was based on the proceedings of five conferences on IS because they had a similar focus and were well established. The authors analyzed the literature using a computer-aided qualitative content analysis as described below. The results of the frequency analysis provided the basis for a qualitative interpretation based on the research questions. The results were tested for similarities and differences over time within the conferences and in a regional comparison. With this approach, a comparison to results of previous studies was possible. The authors were also able to investigate whether the much-discussed differences between European and North American IS research were still valid.

### 3 Categorization of research methods and population of items

This analysis proceeded in five steps: The *first step* involved preparing the database. The proceedings of the conferences being investigated were downloaded as PDF files. The database for the analysis consisted of the proceedings of five well-respected international IS conferences (ACIS, AMCIS, ECIS, ICIS, and PACIS; Table 2). These five conferences were considered representative for an international comparison because of their importance and different regions.

Name	About the conference
ACIS	“The Australasian Conference on Information Systems (ACIS) is the premier conference in Australasia for Information Systems academics and professionals, covering technical, organisational, business and social issues in the application of Information Technology.” ( <a href="http://conferenceit.com.au/acis2010/index.htm">http://conferenceit.com.au/acis2010/index.htm</a> )
AMCIS	“The Americas Conference on Information Systems (AMCIS) is an annual research conference in the information systems discipline held in the region. AMCIS attracts up to a thousand or more attendees principally from North America but increasingly from other regions of the world as well. (...)” ( <a href="http://www.amcis2010.org/home/index.php?option=com_content&amp;task=view&amp;id=12&amp;Itemid=27">http://www.amcis2010.org/home/index.php?option=com_content&amp;task=view&amp;id=12&amp;Itemid=27</a> )
ECIS	“The European Conference on Information Systems (ECIS) is the largest and most prestigious Information Systems (IS) conference in Europe. (...). With the foundation of the Association for Information Systems (AIS) in 1994, ECIS was recognised as a regional AIS conference. Today, ECIS is the leading conference for European IS researchers, (...)” ( <a href="http://www.ecis2008.ie//index.php?option=com_content&amp;task=view&amp;id=5&amp;Itemid=6">http://www.ecis2008.ie//index.php?option=com_content&amp;task=view&amp;id=5&amp;Itemid=6</a> )
ICIS	“The annual International Conference on Information Systems (ICIS) is the most prestigious gathering of I/S academics and research-oriented practitioners in the world. (...) By 1986, (...) ‘International’ was appended to the name creating the International Conference on Information Systems. ICIS became truly international in 1990 when the conference was first held outside North America in Copenhagen, Denmark.” ( <a href="http://home.aisnet.org/displaycommon.cfm?an=1&amp;subarticlenbr=79">http://home.aisnet.org/displaycommon.cfm?an=1&amp;subarticlenbr=79</a> )
PACIS	“The Pacific Asia Conference on Information Systems (PACIS) is the main international Information Systems (IS) conference and the only AIS sponsored conference in the Pacific Asia Region. (...)” ( <a href="http://mlaa.com.au/pacis2011/About%20Pacis.htm">http://mlaa.com.au/pacis2011/About%20Pacis.htm</a> )

Table 2. Examined IS conferences.

For these conferences, the contributions from a range of years (2006 to 2010) were considered to ensure a comparison over time. From the population of downloaded papers, all panels, teaching cases, and senior scholar papers were excluded. Inaccurate or incomplete files were also excluded. These files included those that only consisted of an abstract or were otherwise unable to be evaluated electronically. Table 3 shows how many items from each conference in each year were considered as part of this analysis. The remaining PDF files were converted to text files because the analysis software required plain-text input.

Conference	2006	2007	2008	2009	2010	Total per conference
ACIS	108	116	104	97	105	530
AMCIS	537	501	413	723	517	2,691
ECIS	203	197	215	250	167	1,032
ICIS	115	197	199	192	260	868
PACIS	115	152	133	117	72	589
Total per year	1,078	1,068	1,064	1,379	1,121	5,710

Table 3. Number of examined IS papers per conference and year.

Category	Research method	Keywords
AR	Action research	action research
CA	Conceptual / mathematical analysis	conceptual analysis, concept mathematical, concept study
CI	Concept implementation / proof of concept	implementation, proof of concept, concept proof, conceptual model, reference model
CS	Case study	case study
DA	Data analysis	data analysis
ET	Ethnography	ethnography
ES	Descriptive / exploratory survey	survey, interview
FE	Field experiment	field experiment, experimental study, experiment
FS	Field study	field study
GT	Grounded theory	grounded theory
HE	Hermeneutics	hermeneutic
ID	Instrument development	instrument development, instrument, prototype, artifact
LH	Laboratory experiment	laboratory experiment, experiment
LR	Literature review	literature review, literature analysis
MP	Mathematical proof	mathematical proof
PA	Protocol analysis	protocol analysis
SI	Simulation	simulation
OM	Other methods	n/a

Table 4. Categories of research methods (classification scheme).

In the *second step*, the analysis was prepared. An electronic content analysis was used in combination with a keyword classification scheme. As part of the literature review, several classification schemes for categories of IS research methods were extracted (Barki, Rivard and Talbot, 1988; Palvia et al., 2003; Vessey, Ramesh and Glass, 2005). Depending on the research questions and the text corpus, a classification scheme was chosen that enabled the authors to detect research methods using both keyword frequency analysis and a comparison with previous studies. For the following examination, a classification scheme from Vessey, Ramesh and Glass (2005) that was derived from Barki, Rivard and Talbot (1993) was used. The classification scheme contained 19 different research methods. Not all method categories could be distinguished, because categorization was done using a keyword search. “Conceptual analysis” and “conceptual analysis / mathematical” were combined into one category. This study did not distinguish between “laboratory experiment – human subject” and “laboratory experiment – software.” Papers with non-matching research methods were assigned to category OM (other methods). Keywords were derived from these categories to identify research methods. A keyword catalog was assigned to each research method (Table 4). Based on the keyword catalogs,

batch analysis scripts were created using the data-driven scripting language Gawk. (<http://www.gnu.org/software/gawk>).

For the *third step*, after the preparation phase, a pretest was performed. The previously defined keywords were verified manually in samples to ensure their reliability for an automatic search algorithm. The corresponding text passages of the samples were reconciled to deduce the research methods used. For example, in category CI (concept implementation / proof of concept) different spellings of the keywords “implementation,” “proof of concept,” “concept proof,” and “conceptual model” were applied. In other categories, where appropriate, only one keyword in all possible spellings was used. For example, in category CS (case study), only the keyword “case study” was used. During the pretest, both the analysis scripts and the keywords were adjusted. To reduce false positives, a paper had to contain five keyword hits for a particular category before it counted in that category. The authors are aware of the risk that this threshold might stop a few papers from being counted in the correct category. However, using the threshold meant that only papers that could clearly be assigned to a category were included. The keyword search was also restricted to all pages of a paper except the references section to prevent titles of methodological papers from falsely leading to hits.

In the *fourth step*, during the analysis phase, the batch analysis scripts were executed using the text files as input data. The output was a structured list (CSV file) of keyword and category hits.

In the *fifth step*, the analysis was evaluated. The results of the analysis were processed in a spreadsheet and were analyzed in several ways as described in section four.

## **4 Presentation of results related to the research questions**

### **4.1 Question 1: Which research methods are used most often in the IS field?**

The most frequently mentioned methods throughout all five conferences were “descriptive / exploratory survey” (24.7%) and “concept implementation / proof of concept” (21.8%), as presented in Table 4. They were used in nearly half of all papers and in total about three times more frequently than the next most popular research methods “instrument development” (8.7%) and “case study” (8.3%). In contrast, some methods were used very little or not at all; these included “conceptual / mathematical analysis,” “hermeneutics,” “mathematical proof,” and “protocol analysis”. As a result, most of the methods used in papers in this study relied on only four of the 17 categorized methods (63.5%). Overall 20.82% of the methods used could not be assigned to a method category in the classification scheme and were summarized in “other methods.” The method used in a particular paper could be counted in that category for three reasons. The first reason is that no method was used. Second, there were missing categories or missing words in the search base. And third, the threshold of five hits per paper was not reached in any of the categories. Nevertheless, the underlying classification scheme (Vessey, Ramesh and Glass, 2005) was suitable for this research method categorization. In that study, the authors did not detect all the analyzed research methods (Table 5) nor did they assign a research method to all of the papers (11.6%).

As shown in Figure 6, the assignment of certain research methods in papers improved over the past years, even if there was only a slight trend. This suggests that researchers through all conferences counted on more widely known and accepted methods. This trend was particularly strong for AMCIS and PACIS. While on average, 14.4% of papers from ACIS were assigned to “other methods,” twice as many from AMCIS were in this category (30.7%).

Research methods	ACIS	AMCIS	ECIS	ICIS	PACIS	Conferences total	Glass et al. (2004)
Action research	0.9%	0.6%	1.3%	0.4%	0.6%	0.8%	0.0%
Conceptual / mathematical analysis	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.1%
Concept implementation / proof of concept	27.3%	20.5%	24.1%	16.5%	20.6%	21.8%	1.6%
Case study	10.7%	6.6%	9.8%	5.6%	9.0%	8.3%	12.5%
Data analysis	0.7%	0.4%	0.7%	1.0%	0.8%	0.7%	5.3%
Ethnography	0.8%	0.1%	0.7%	0.3%	0.2%	0.4%	0.2%
Descriptive / exploratory survey	27.9%	21.1%	25.7%	23.9%	24.8%	24.7%	2.7%
Field experiment	2.2%	4.3%	3.2%	9.3%	5.3%	4.9%	1.6%
Field study	0.5%	0.1%	0.9%	0.2%	0.2%	0.4%	24.5%
Grounded theory	0.6%	0.7%	0.5%	0.8%	0.5%	0.6%	0.2%
Hermeneutics	0.0%	0.2%	0.1%	0.3%	0.1%	0.1%	-
Instrument development	8.9%	7.2%	10.2%	11.0%	6.1%	8.7%	3.5%
Laboratory experiment	2.2%	4.3%	3.4%	9.1%	5.4%	4.9%	16.8%
Literature review	1.3%	0.8%	0.9%	0.5%	0.6%	0.8%	0.8%
Mathematical proof	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Protocol analysis	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	1.2%
Simulation	1.5%	2.2%	2.0%	2.6%	1.8%	2.0%	1.4%
Other methods	14.4%	30.7%	16.5%	18.4%	24.1%	20.8%	-

Table 5. Percentage of research method categories assigned to each conference and in total.

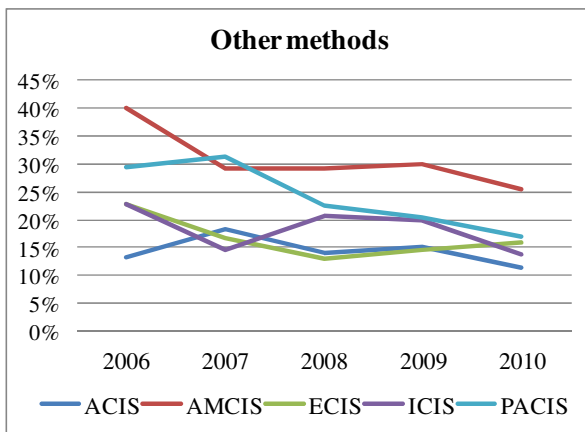


Figure 6. Distribution of method hits assigned to the category "other methods" (by conference and year).

#### 4.2 Question 2: Are there any conference-specific differences?

All conferences shared the same first and second most-favored research methods. They showed a continuous curve in terms of "descriptive / exploratory survey" with a slight deviation from ACIS (Figure 7 (a)). Despite some fluctuations, the method "concept implementation / proof of concept" remained at a similar level for all conferences (Figure 7 (b)). The use of "case studies" increased sharply over time, especially for the ACIS and PACIS. Due to this trend, the term was used more often



at ACIS and PACIS than “instrument development,” in contrast to the other conferences. Only at ECIS was a decreasing trend recognized (Figure 7 (c)). When the method “instrumental development” was applied, ECIS and ICIS were at a higher level (Figure 7 (d)). The ICIS showed a distinct increasing trend, whereas ECIS fell back to the level of the other conferences. Compared to the regional conferences, there was a different distribution of favored research methods at ICIS. While “field experiment” and “laboratory experiment” were used less frequently at regional conferences, they were used much more frequently than “case study” at ICIS. Even though there were some differences in the methodology distribution among regional conferences, these were by far not as severe as in regional journals. There could be different reasons for this: first, conferences are not as influenced by regional research traditions as journals. Since all conferences had a blind review process, the origin of the reviewers could not be analyzed. However, most of the track chairs are from the respective regions. An influence of the regional research tradition can be assumed. Second, as a result of globalization, there is a global trend towards a conjoint research methodology among IS conferences.

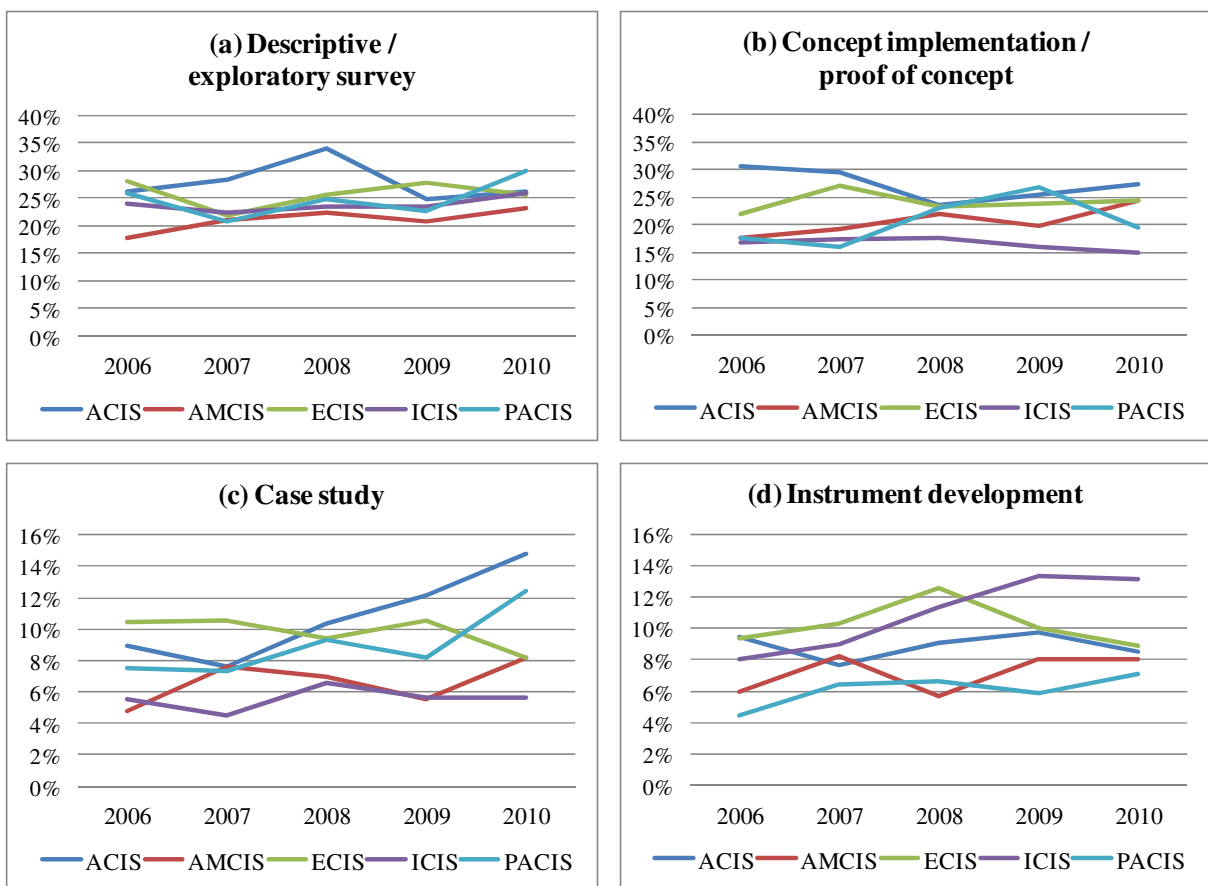


Figure 7. Distribution of method hits assigned to the most commonly used categories of research methods (by conference and year).

#### 4.3 Question 3: Are there preferred combinations of research methods?

The approach to computer-aided qualitative content analysis used in this paper allowed the authors to examine method combinations. Within the 5,710 analyzed conference papers, 8,307 research methods were identified and assigned to a category in the classification scheme. The combinations of the most frequently mentioned research methods were examined. The category “other methods” was not included in this analysis because it could not be combined with other methods. The result is illustrated in Figures 8 (a) and 8 (b), and shows that nearly 50% of the papers used a combination of the most

common methods. The by far favored combination in all conferences was “concept implementation / proof of concept” and “descriptive / exploratory survey” (CI + ES) (17.2%). Figure 8 (a) shows the average spread per conference over time. The conferences showed some specific differences in preferred research methodologies. For a further identification of trends, the average spread per year over the conferences is illustrated in Figure 8 (b). There was a slight trend towards increasing method combination across all conferences.

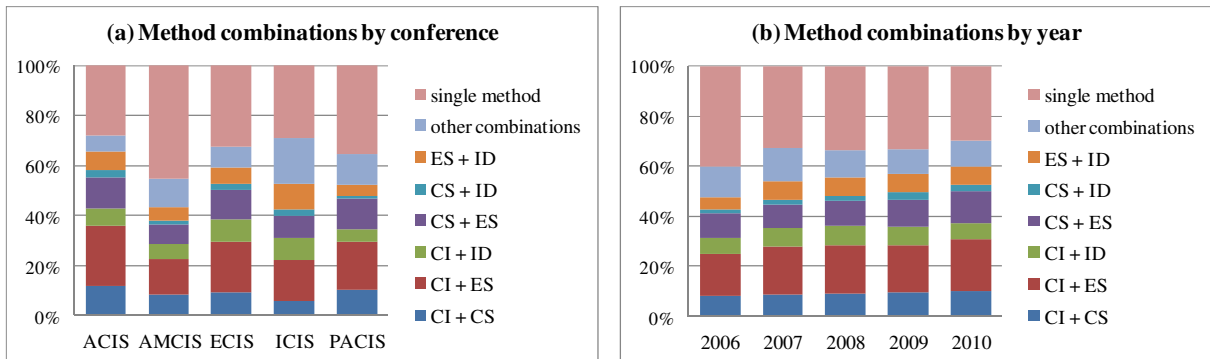


Figure 8. Combinations of research methods by conference (a) and year (b).

While the comparison of the usage of research methods (Question 2) showed some conference-specific characteristics, a consideration of the method combinations verified these results. At AMCIS, on average, over 50% of the methods were used without a combination. The other conferences had an average of 37.8%. The ACIS, ECIS and PACIS had a higher tendency toward “concept implementation / proof of concept” and “descriptive / exploratory survey” (CI + ES), “case study” and “descriptive / exploratory survey” (CS + ES) and “concept implementation / proof of concept” and “case study” (CI + CS). However, ICIS papers tended towards “descriptive / exploratory survey” and “instrument development” (ES + ID) and there was a significantly higher ratio of “other combinations” than the mainstream (Figure 8 (a)).

Following recent recommendations from leading researchers for a systematic combination of research methods to enhance rigor and relevance in the IS field (Lee, 1999; Hevner, March and Park, 2004; Österle et al., 2011), the conferences showed a development in this direction. The ratio of single methods decreased about 10% over the past five years. Furthermore, the results of this study showed a constant use of mainstream method combinations. While the ratio of all mainstream method combination slightly increased, the ratio of “other combinations” remained at the same level (Figure 8 (b)).

#### 4.4 Question 4: Do the results prove the findings of recent studies concerning IS journals?

The results about methodology used in conferences matched the results of previous larger studies about the methodology used in journals, as described in section two. One exception was the study from Vessey, Ramesh and Glass (2002). Although their classification scheme was used in this study, there were some differences in several method categories (Table 5). While “concept implementation / proof of concept” and “descriptive / exploratory survey” were found much more frequently in this paper, Vessey, Ramesh and Glass found other research methods such as “conceptual / mathematical analysis,” “field study” and “laboratory experiment” much more often. Apart from the study by Vessey, Ramesh and Glass (2002), all other studies identified “survey” as the most frequent method used. “Conceptual analysis” and “case study” were also in the comparative studies among the three research methods most frequently used. In contrast to them, in this study “laboratory experiment” and “field experiment” shared 5<sup>th</sup> place with 4.9%. “Action research,” which was found to be in third place in Europe in the study by Myers and Liu (2009) with 12%, was almost never used in conference papers. Also, at ECIS, the ratio was only 1.3%. The results of this study showed that the same research

methods were most favored in both conferences and journals. Compared to other recent journal-based studies, the findings were similar overall (Table 9).

Study	Vessey, Ramesh and Glass (2002)	Chen and Hirschheim (2004)	Palvia et al. (2004)	Myers and Liu (2009)	This study
Period	1995-1999	1991-2001	1998-2003	1998-2007	2006-2010
Papers	488	1893	1226	1329	5710
Coding	Manual	Manual	Manual	Manual	Computer-aided
Method categories	19	6	14	5	17
First	Field study (24.5%)	Survey (41%)	Survey (22%)	US: Survey (52%) EU: Case study (50%)	Descriptive / exploratory survey (24.7%)
Second	Laboratory experiment (16.2%)	Case study (36%)	Frameworks and conceptual models (11.6%)	US: Laboratory experiment (24%) EU: Survey (29%)	Concept implementation / proof of concept (21.8%)
Third	Conceptual analysis (14.7%)	Laboratory experiment (18%)	Laboratory experiment (11.2%)	US: Case study (19%) EU: Action research (12%)	Case study (8.3%)

Table 9. Comparison of similar studies with results of this study.

The percentage differences among the studies could be explained mainly by the different numbers of method categories in the underlying classification schemes. By considering the many research methods available to in IS, the authors were able to identify new trends. Researchers in the IS field tended to use only a few research methods in both journals and conferences. Therefore, a less differentiated classification scheme also adequately identified the most-favored research methods. Another reason for percentage differences were the different methods used in the studies to assign a paper to a method category.

## 5 Conclusion

In recent conferences on IS the by far most favored research methods were “descriptive / exploratory survey” and “concept implementation / proof of concept.” The distribution of the method categories in this study was similar to the results of previous journals-based studies. Although there were many methods available to researchers in the broad IS field, only a few dominating research methods were used. In this study, most of the analyzed methods (63.5%) relied on only four of the 17 categorized methods. The other research methods were little or never used in either conferences or journals (Table 9). Thus it could be shown that the same dominant research methods were established between conferences and journals. These methods could be regarded as typical for the entire IS field. Across all conferences, a trend towards an increasing method orientation could be observed. In the meantime, an international harmonization of methods has taken place. For this reason, conferences shared similar preferred research method categories, with one exception. Unlike the regional conferences, a higher percent of ICIS papers used “field experiment” and “laboratory experiment” and there was a significant trend towards “instrument development.” As a consequence, only a few differences could be detected among the regional conferences in the use of research methods. Especially the significant differences between North America and Europe described in previous journal-based studies (see section two) could not be verified with the included conferences. In fact, a global trend toward a conjoint research methodology could be observed. In the analyzed method combinations, some specific differences and similarities among the conferences could be observed. At AMCIS, over 50%

used single methods. Preferred combinations at the regional conferences were “concept implementation / proof of concept” and “descriptive / exploratory survey” (CI + ES), “case study” and “descriptive / exploratory survey” (CS + ES), and “concept implementation / proof of concept” and “case study” (CI + CS). In contrast, at ICIS, a slight deviation in the distribution of “other combinations” could be observed. They were used significantly more often, together with “descriptive / exploratory survey” and “instrument development” (ES + ID). Over the five-year period, there was a slight trend towards method combination. Considering the enhanced efforts of leading researchers to promote the combination of research methods for increasing rigor and relevance (see section one), this result confirmed its acceptance in the IS field.

The authors of this paper were aware of some limitations to the analysis method used. The classification scheme was one limitation, and it had a significant influence on the results. To ensure the comparability to previous studies, an established classification scheme was chosen. However, in this study, there was no discussion of the research methods. Such a discussion might be done in future work. A second limitation was the assignment of keyword lists to the methods categories. This assignment was essential for the analysis and had a direct impact on the reliability of the results. Due to the limit of five hits per paper for assignment to a method category, papers that included less mentions of their own research method or analysis of the methodology were not identified properly. In consequence, it could be that not all papers included in the “other methods” category actually used other methods, but that these papers could not be clearly identified by the technique used in this analysis. In contrast, the coding was based on computer-aided content analysis and a large sample was employed. This analysis always delivered the same results under the same conditions. Additionally, it offered the possibility to adjust parameters such as keywords.

Studying research methods that are used at conferences is an important addition to the previously performed journal-based studies. It allows for a broader inclusion of the IS field than an exclusive consideration of top journals from North America and Europe. The results are useful for researchers who are planning conference publications. Section four shows which methods are commonly used and often combined in the IS field. Furthermore, the results showed an increasing research method orientation and it could be assumed that this is a success factor.

Finally, a detailed conference-specific analysis is a proper follow-up research of this study due to the convergence of the method usage. Particularly, the barely detectable deviations in the method combinations in the context of the current debate on multi-methods call for further intense analysis in future studies. For example, aspects such as the track topics or the author’s origin offer deeper insight into the research methodology used in the IS field.

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