Research Methods in the Information Systems Discipline: A Literature Analysis of Conference Papers

Completed Research

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Abstract

I examine the employed research methods of 1,023 article from Information Systems (IS) conferences in order to assess the status quo of the usage of research methods in the IS discipline. Thus, I follow a long tradition of IS researchers who study literature in order to investigate and discuss topics such as diversity, innovativeness, boundaries, and maturity in relation to the discipline's evolution. To that end, in alignment with previous scholars, I identify a categorization framework and classify all articles manually. My results provide information about the absolute and relative number of employed research methods in three selected years show a clear change of used research methods. I discuss the results in the light of new challenges for the discipline (e.g. BigData, Design Science, private IS usage).

Keywords

Research method, research designs, research strategies, research approaches, meta-research.

Introduction

The Information Systems (IS) discipline has undergone a constant evolution since its beginnings in the 1970s. While innovations, societal evolutions, and smaller fashion waves impact IS research (Baskerville and Myers 2009) in general, the changes have recently been accelerated by the enormous influence the Internet has developed on the way of doing business (e.g. Cloud Computing, E-Commerce, E-Business) and the way individuals interact also outside of firms (e.g. social networks, blogs, user generated content). Further drivers include the miniaturization of IT that now makes the adoption of information systems feasible in many areas of life (e.g. self-tracking, eHealth) and the falling cost of hardware that contributed to the emergence of the ubiquitous computing paradigm (Yoo 2010). This evolution of the IS discipline is in fact closely linked to the adoption of computers in evermore use cases outside the boundaries of companies, now spanning many applications in public institutions and private households (Ferstl and Sinz 2013; Lee 2016). The broader spectrum of applications and consequently the increasing body of relevant theories is nicely reflected by the discipline's name being altered from Management Information Systems to Information Systems, which highlights the importance ascribed to the transition.

The relevance of such developments for IS research also becomes evident along the multitude of newly emerging tracks on major IS conferences (International/European/Americas Conference on Information Systems I/E/AMCIS) in comparison to the number of traditional tracks (see Ayanso et al. (2007)). For example, the main topic of ICIS 2018 “Bridging the Internet of People, Data, and Things” lays focus on the digitization of our everyday life and routines and the increase in data generation. Furthermore, ECIS2018 promotes tracks such as “Big Data Analytics and Business Transformation”. Moreover, also AMCIS2018 includes discussions on new trends and developments with the following tracks: “ICTs in Global Development” or “Data Science and Analytics for Decision Support”. The seize of the trends by the discipline’s scholars also becomes apparent in Journals. Examinations of the evolution of journals (Gable 2010) indicate a careful but recent shift from an almost exclusive focus on business-related topics to a wider perspective that also includes contributions covering topics outside the operational business.
context. These new topics and trends induce changes in the employment of research methods (Riedl and Rueckel 2011) in the way that data analytics are needed in order to analyze the large amounts of user-generated and secondary data due to private IS usage (twitter, Facebook etc.) or more field work is done to understand how individuals interact with technology in the new non-organizational environment.

Since the beginning of the era of IS, scholars have started to examine the literature of the discipline in order to capture its identity. Literature analysis serve to discuss topics like diversity, agility, legitimacy, boundaries, and maturity of the discipline. They investigated various variables concerning IS literature: core topics (Sidorova et al. 2008), co-citations (Culnan 1987), research methods (Chen and Hirschheim 2004), nationalities of authors (Gallivan and Ahuja 2015), underlying epistemology (Orlikowski and Baroudi 1991). Results from such bibliometric or scientometric analysis lead to vivid discussions that help to form an identity of IS research and question the focus of the discipline. Especially, research methods are often investigated for such discussions. In general, research methods reveal a “philosophical assumption” or “world view [...] of the researcher” (Orlikowski and Baroudi 1991, p. 2) and they may also account for new types of information such as Big Data (Chen et al. 2012) or new IS approaches (e.g. Design Science). Pluralistic research methods may help to avoid “misunderstandings or incorrect conclusions” (Ayanso et al. 2007, p. 674), supports “greater confidence in findings” (Palvia et al. 2004, p. 290), and offer “rich insights into various phenomena of interest that cannot be fully understood” (Venkatesh et al. 2013, p. 21).

However, in the light of the new trends of the past years, existing studies of IS literature show various shortcomings. First, studying the meta-analysis from Riedl and Rueckel (2011) and engaging in some explorative literature research, it becomes apparent that most of such work is already outdated. The detection of any of the above named trends is rather limited to the years of 2006 and 2007 (Ayanso et al. 2007; Venkatesh et al. 2013). Yet, IS trends such as BigData or the relevance of Design Science and NeuroIS just arose since then (Iivari 2007; Riedl and Rueckel 2011), so, they cannot be reflected in the results of previous studies. Second, due to the increased number of articles, studies focus solely on a small number of outlets (Ayanso et al. 2007) and are thus prone to biases such as regional ones (Chen and Hirschheim 2004; Riedl and Rueckel 2011). Additionally, more recent studies mainly investigate only one aspect at a time and do not take a holistic view on the disciplines development (Venkatesh et al. 2013). In order to overcome these shortcomings, I aim to answer the following research question:

What are currently employed research methods and does the composition of research methods reflect new trends and phenomena of the past years in IS literature?

To that end, I undertake a bibliometric analysis of ECIS and ICIS articles in order to quantify the usage of a set of research methods in various IS outlets and over a selected but broad period of time (full years of 1995, 2005, 2015). The results will help to obtain an updated view on the use of research methods. Furthermore, in order to ensure that my data is representative and meaningful, I compare my results on a historical basis and with some previous work.

Theoretical Background

Beyond various IT (Information Technology) and management related questions, the IS disciplines shows a broad spectrum of self-reflection since its beginning. This self-reflection mainly encompasses examining the intellectual structure of the discipline. Such an intellectual structure conceptualizes scholarly work in the form of thematic analysis (Hirschheim et al. 1996) or approaches (Vessey et al. 2002). With the help of such (often) critical self-reflections, IS scholars discuss for example issues such as diversity (Alavi et al. 1989; Cocosila et al. 2009; Culnan 1986), identity (Agarwal and Lucas 2005; Benbasat and Zmud 2003), boundaries and methodological rigor (Chen and Hirschheim 2004; Grover et al. 1993), publication biases (Gallivan and Ahuja 2015), cumulative research tradition (Farhoomand and Drury 1999; Hamilton and Ives 1982a), and legitimacy (Lyytinen and King 2004). In particular, a large stream of research is engaged into studying the employed research methods to debate on the identity of the discipline, to influence identity formation (Riedl and Rueckel 2011), or to ensure diversity (French and Shim 2011). In this sense, various discussion over the previous decades concerned positivist vs. interpretivist paradigms, rigor vs. relevance, the core of IS, and very recently behavior vs. Design Science (French and Shim 2011). Riedl and Rueckel (2011) analyzed twenty different studies that investigated the employed research methods from 1968 until 2006 and give a comprehensive overview on the most prominent evolutions of the last decades.
First of all, it is vital to discern the role of the research method within the research process (Jenkins 1985): A research method helps the researcher to gather data. After the data collection itself, data analysis starts. The results of data analysis answer to a specific research question. For that reason, the research method represents the first part of a methodology chosen by a researcher to engage into scientific work.

The article alone from Riedl and Rueckel (2011) reveals 50 different research methods that have been applied in IS research. Additionally, when studying various frequently cited and discussed articles in IS research a broad collection of (meta) categories of research methods, research methods, and data collection methods can be collected. However, each author uses another framework and or adapts existing ones. So, it exists unanimity about the exact range of IS research methods and it remains difficult to find simple definitions and differentiations for research methods, approaches, strategies and paradigms. In the following, I try to summarize the utmost number of perspectives of IS scholars. Especially Orlikowski and Baroudi (1991), Chen and Hirschheim (2004), and Galliers and Land (1987) focus on the underlying epistemological aspects of the employed research methods to show that the positivist paradigm (i.e. testing of hypothesis and drawing conclusions from a selected sample) clearly dominates during the period of interest. Furthermore, Vessey et al. (2002) differentiate another level they refer to as the research approach. They distinguish evaluative (e.g. evaluating an Enterprise Resource System), descriptive, and formulative (e.g. formulate an algorithm) research approaches. Their study revealed that evaluative approaches dominate in IS research. Moreover, most authors (Alavi et al. 1989; Chen and Hirschheim 2004; Farhoomand and Drury 1999; Harrison and Wells 2001; Holz et al. 2006; Venkatesh et al. 2013) classify the employed research method in empirical (based on observations, describing an object) vs. non-empirical (based on ideas, frameworks) and qualitative (narrative data collection) vs. quantitative research (numerical/statistical data collection). Yet, other mix these levels and combine research methods with meta-designations or data collection (Backlund 2005).

In fact, Riedl and Rueckel (2011) analyze twenty research methods studies and identify four research methods that are used the most in IS research: surveys, case studies, laboratory experiments, and field experiments.. Yet, the remaining 45 research methods identified by Riedl and Rueckel (2011) are less often or even rarely used (e.g. protocol analysis, game playing, hermeneutics, secondary data usage). In addition, differently named research methods often describe very similar ways of data collection. For example, this encompasses methods including data analytics or secondary data usage which all use already “existing” (Chen and Hirschheim 2004, p. 206) “large, diverse, and dynamic data sets of user-generated content” (Müller et al. 2016, p. 289). This represents a challenge for detecting essential changes within the usage of research methods and the discussion of challenges and trends. The unanimity and plethora of named research methods by scholars might hinder my goal of recognizing any reflection of “new IS topics” (such as data analytics, design science. Neuro IS) and changes on the employment of IS research methods. First of all, the data is not easily comparable (as each author has a different framework with only small overlaps). Second, the existing names of research methods may not necessarily reflect a change in the IS discipline (e.g. almost no framework contains design science as a research method). For that reason, I chose to not only rely on one framework but to combine multiples to take differentiations into account and ensure easy comparisons with other studies.

Furthermore, even though scholars studied the use of research methods since 1968 in order to answer various questions on behalf of the status quo of the discipline, the most current data set only includes data from 2007 (Venkatesh et al. 2013). Yet, in the last years, the discipline acknowledges more and more “new questions and opportunities created by the availability of Big Data” (Agarwal and Dhar 2015, p. 444) and other research methods such as design science (Hevner et al. 2004; Ivani 2007) or NeuroIS find their way into IS research. Thus, in order to quantify the influence of such evolutions on the discipline, I aim to gather data from immediate and distant past.

Methodology

I conduct a bibliometric analysis to quantify the use of research methods in IS literature by categorizing and counting the employed research methods (Chen et al. 2012; Sørensen and Landau 2015). For the categorization I undertake a content analysis (Weber 1990) of IS articles in order to measure science-specific “publication patterns” (Arnott and Pervan 2012, p. 926).

For the categorization I developed a framework for classifying research methods, strategies, and approaches. The frame work was developed based on literature. A first (explorative) round of
categorization considered the Chen and Hirschheim (2004). Through this rather inductive approach, I realized that the employed categories do not properly represent the categories needed for a more thorough analysis that can be compared to other studies or interpreted in regard to my research questions. For that reason, I reworked the categorization framework by taking into consideration the categorization from Alavi et al. (1989), Hamilton and Ives (1982b), Harrison and Wells (2001), and Venkatesh et al. (2013). All four articles were used because they either are quite similar or cover a broad spectrum of research methods. Additionally, they are from different time periods which should cover a broad variety of research methods. I essentially differentiate empirical and non-empirical research designs (see Table 1, definitions can be found section “theoretical background”). Non-empirical research mainly consists of a qualitative approach containing research methods such as conceptual, opinion, other, or literature analysis (with an only quantitative analysis goal). Empirical research designs (field study, literature review, action research, etc.) follow a quantitative and/or qualitative approach. Finally, my framework also accounts for mixed strategies and approaches (both) and combinations of different multiple research methods. The research methods are explicitly defined in the articles named above.

<table>
<thead>
<tr>
<th>Research design (1 or both of the following)</th>
<th>Empirical</th>
<th>Non-empirical</th>
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<tr>
<td>Research approach (1 or both of the following)</td>
<td>Quantitative</td>
<td>Qualitative</td>
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<tr>
<td>Research method (1-n of the following)</td>
<td>Action Research</td>
<td>Simulation</td>
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<td></td>
<td>Ethnography</td>
<td>Prototype</td>
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<td>Case Study</td>
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<td>Survey</td>
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<td>Field &amp; Lab Experiment</td>
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**Table 1 Overview the Combined Categorization Framework**

In the first exploratory categorization round there was significant increase in articles using a design science methodologies as well as data analytics studies. Rather than inventing a new category myself, I chose to reuse existing categories in use a combination of the non-empirical research method prototype (as used by Alavi et al. (1989), Van Horn (1973), and Jenkins (Jenkins 1985) in the case of an application or software development) combined with field study or action research, for example. This decision originates from the discussions within the community about similarities between design science and other research methods or epistemologies (Burstein and Gregor 1999; Iivari and Venable 2009; Järvinen 2007).

Additionally, concerning the research methods including data analytics/secondary data/grounded theory/big data/archival data (Alavi et al. 1989; Hamilton and Ives 1982b; Holz et al. 2006; Jenkins 1985; Müller et al. 2016; Vessey et al. 2002), I tried to bring together these categories that are basically quite similar but have a different notation in various studies. Following Riedl and Rueckel (2011) and my experiences, I approach the issue by reconsidering a traditional and established research method before inventing a new artificial one. Considering the definitions of these similar categories, they all describe the (re)gathering of already (often automatically) collected data from a real world setting (blog, twitter, stock prices, consumption readings). As the data has been gathered in an explorative way without a primary experimental design, I recognize several aspects that describe a field study (Alavi et al. 1989; Cheon et al. 1993). In order to more precise on the non-empirical research methods, I used a variety of categories. Notable, the category conceptual was enlarged. According to Alavi et al. (1989) and Chen and Hirschheim (2004) this category contains articles that develop frameworks, models, and work with theories. From my insights from coding of ECIS and ICIS articles in the first round, the category should also encompass conceptual work in the context of algorithm development or mathematical modeling.

In order to gather a representative and reasonably sized sample, I chose to include all publications that appear in the conference proceedings of ICIS and ECIS for the years 1995, 2005, 2015 (see Table 2). As I started my analysis mid 2016, I wanted to include the full number of publications of a whole year and the previous year (2015) offered a complete year of publications. Having already over 600 articles at hand, I chose to select two further years to cover a broad period and to ensure historically comparisons as well as previous studies. I selected two top IS conferences because (1) the data base is large, (2) the data is more recent (due to the missing delay for the review process that exists for journal articles, see Sørensen and Landau (2015)), (3) in many cases the articles represent a first version of highly qualitative journal articles anyway, and (4) most previous studies rely on journal publications only such that I can contribute by enlarging the perspective.
In an Excel file various data was stored an analyzed descriptively. For each article the following information is available: the year of publication, the publication outlet (ECIS or ICIS), the authors, the title, the abstract, the research design, the research approach, one until five possible employed research methods, additional information (such as if an article named another research method which did not fit to my categorization or further precisions such as lab or field for experimental research methods). In 674 articles the explicitly named research methods were extracted and correspond to my categories named above. 145 articles did not mention a precise research method, for that reason, the coder categorized the articles according to my framework. For 71 articles at least one research method had to be renamed (because the named research method did not fit in my categorization scheme). Finally, 133 articles employed several research methods either explicitly named and according to my categories or no explicit research method and had to be categorized according to my framework. The categorization process encompasses analyzing the full text of an article, as abstract and title (both collected in a data base) do not often contain the focal information. So, the coder scans the methodology section and the general structure of a paper.

<table>
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<tr>
<th>Proceedings / Journals</th>
<th>Number of all Publications in</th>
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<tr>
<td></td>
<td>1995</td>
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<tr>
<td>ECIS</td>
<td>104</td>
</tr>
<tr>
<td>ICIS</td>
<td>44</td>
</tr>
<tr>
<td>Total for all:</td>
<td>148</td>
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Table 2 Overview on the Number of Articles Analyzed

All in all, in order to ensure validity and reliability of the classification, I developed a detailed guideline for coders and used a training sample of over 40 articles.

Results

In order to answer research question one about the current employment of research methods, I counted the articles and the employed research methods per article for 2015. Then, I summarized the frequencies in bar charts (Figure 1 and 2). As the bar chart 2.1 and 2.2 of Figure 1 show, the majority of the articles of my sample (both outlets together) are still of an empirical (44%) as well as qualitative (45%) nature. The predominantly used research methods (chart 2.3 of Figure 2) in both outlets together are: conceptual, case study, field study, survey, and literature review. They account together for over 90% of all employed research methods. The remaining research methods (experiment, prototype, ethnography, simulation, literature analysis, other, action research, and opinion) are far less often employed. Please consider that due to the fact that an article may use up to five research methods, the number of employed research methods (n=996) exceeds the number of articles of 2015 (n=630) in my data set. When comparing the compositions of 2015 for the different outlets (ECIS and ICIS), the results show (2.1 and 2.2 in Figure 2), that in the ICIS proceedings of 2015 the employed research methods are dominated by conceptual research methods (70%) whereas ECIS articles preferable employ conceptual as well as case study and field study methods. Moreover, ECIS shows to have accepted a greater part of articles that use empirical as well as non-empirical research designs (21 and 5 percentage points difference). ICIS publishes relatively more empirical and mixed (both empirical and non-empirical) designs. Considering the research approaches, articles of both conferences employ the same relative part (21%) of quantitative approaches. Yet, ECIS is dominated by qualitative approaches (53%), while ICIS articles almost equally use qualitative as well as mixed approaches.

Relating to research question two, I also analyzed the frequencies for the three main variables (research design, approach and methods) for all three selected years (1995, 2005, 2015) to get an impression on trends and variations. Considering the overall frequencies for all outlets and years, empirical designs (over 40% articles), qualitative approaches (over 50% articles), and conceptual research methods (over 85% employed research methods) dominate the sample. The bar charts 2.4 and 2.5 of Figure 1 show the different shares of employed research designs and approaches in each year (1995, 2005, 2015) as well as for each conference separately and consolidated. The charts show that mixed research designs increased from 1995 to 2015. The non-empirical research designs decreased during this period (from 66% in 1995 to 36% in 2015) and empirical ones slightly increased. The shares are different for the research approaches: mixed and pure quantitative approaches slightly increase and qualitative approaches rather decrease.
In a next step, I zoom into more details and analyze to what extent the research methods are being used in the conferences for all three years (see Figure 2). To that end, I show the relative part of employed research methods for the complete sample which contains 1,023 articles with 1,531 identified research methods. I report the shares of frequencies for both conferences/outlets together as well as individually. First, I can observe that during all years conceptual research methods dominate. Yet, there is a small increase from 1995 to 2015 (10 percentage points). The effect seems to be mainly induced by the ICIS research methods as the share has been almost doubled. However for ECIS there is rather a downward trend – a small one of 10 percentage points. Then, the share for the second most often used research method, case study, is relatively stable over the years for both conferences together (1995: 15%, 2005: 16%, 2015: 12%). The small decrease is mainly due to the ICIS articles, where the share of case studies was more than cut in half (from 16% to 6%). For ECIS, there is rather an upward trend. The third most often used research method is survey (questionnaires and interviews). The share of this research method decreases mainly for ICIS (from 20% in 1995 to 5% in 2015) and stays stable for ECIS articles. All in all, the trend for both conferences is rather decreasing.

Further, field studies are the fourth most often used methods. I observe that there has been a really small share in 2005 - especially induced by ICIS research methods: In 1995, 12% of all research methods constitute field studies, in 2005 there is only 1%, and in 2015 the share rises again up to 10%. For ECIS, the share of research methods clearly increases (doubled from 1995: 5% to 2015: 10%). These four research methods already cover 80-90% of all employed research methods in my sample. The remaining 10-20% constitute: literature review, opinion, experiment, action research, literature analysis, tutorial, others, simulation, ethnography, and prototype. For both conferences together only the share of the literature review increases (from 1% to 5%), but all other research methods show rather a decrease (simulation, action research, experiment, opinion, and tutorial is even nonexistent in 2005 and 2015) or stability (ethnography and prototype). Comparing the individual compositions of both conferences, I observe that for ECIS there even is no tutorial method at all and for ICIS tutorials were only employed in 1995. Literature analysis (only quantitative data collection methods) only appear in 2015 for both conferences. In the ICIS sample the research methods others, simulation, literature review, and ethnography only appear (but with a really small share) in 2015. The same almost applies for action

Figure 1 Results Showing the Relative Part of Employed Research Designs, Approaches as well as Methods for the Conferences for 2015 and of the Employed Research Designs and Approaches for all three Years
research which only appears in 2005 and 2015 in ICIS conferences. Moreover, prototypes and experiments were only employed in 1995 and 2015 in ICIS. Interestingly, opinion methods have a rather large share only in 2005 (9% in comparison to 2% in 1995 and 1% in 2015) in all ICIS articles. For ECIS simulation and ethnography methods do not appear in 2005 (yet decreased in comparison to the share in 1995), and the remaining research methods (others, action research, and opinion) show a downward trend. Only literature analysis, experiments, and prototypes show a slight increase of a hand of percentage points.

![Figure 2 The Relative Part of Research Methods Employed (n=1,531) in Articles (n=1,023) for 1995, 2005, 2015 and all Outlets (Separate and Together)](image)

**Discussion and Conclusion**

In order to investigate the current composition of research methods employed in IS conferences as well as demonstrating if there are any changes within time that may reflect trends and changes in IS research, I undertook a bibliometric analysis of 1,023 articles from ECIS and ICIS. I derived a categorization scheme from literature that covers a broad variety of research methods as well as vital meta-categories (research designs and approaches). Concerning the current composition (for 2015) empirical designs, qualitative approaches, and the following research methods dominate: conceptual (58%), case study (12%), field study (10%), survey (8%), and literature review (5%). There are clear differences between ECIS and ICIS conferences in the use of research methods, designs and approaches. ICIS is much more dominated by conceptual methods (which have almost doubled since 1995). Whereas ECIS articles employ – to the same extent - conceptual methods as well as case and field studies. In 292 articles of 2015, a conceptual method is used as the first research method and in 85% this first research method is combined with at least one additional research method. This is not surprising, as many articles build upon a self-developed (research) framework or development in order to validate it empirically (which is mostly described in the methodology section). On the one hand, this explains the rather high share of conceptual papers as well as the high share of mixed research designs (83%). All together, these results show that in 2015 authors lay attention to both theorizing as well as empirical validation. This shows that some calls of scholars (Venkatesh et al. 2013) have been answered to obtain rich insights of various phenomena. Yet, concerning the approaches, mixed as well as purely qualitative ones dominate. This shows a contradicting trend to the findings from Backlund (2005) for ECIS. He finds that qualitative research methods are increasing between 2002 and 2004 as well as that quantitative methods are relatively stable during this time.

Overall, for all three years, the data show that conceptual methods have increased (especially for ICIS). Another upward tendency can be seen for field studies and literature reviews. Yet, methods such as case study, survey, experiment, and opinion have decreased. It becomes apparent that the tendencies between ECIS and ICIS are often contradictory. This can be explained there are regional differences (different preferences for research methods or topics) or differing conference or reviewer strategies and preferences. Then, in almost 50% of the articles of all three years, the conceptual method is used as first method – 70% of these articles use at least another research methods in combination. Again, this explains the rather high share of conceptual papers as well as the mixed research designs. Interestingly, when zooming into
additional information of the research methods, I observe that only in 2015 the methods design science appeared. As the method does not represent a specific category in the categorization scheme, I renamed the employed research method and checked if only a framework or a prototype was developed and by what kind of research method it was validated (e.g. action research). Almost 45% of all renamed research methods are design science studies. The surge of design science papers may explain why prototype methods experience a sudden (re)-appearance in 2015 in ICIS papers. Furthermore, I can see that there is a significant increase in the availability of automatically observed data (also often called secondary data) that is analyzed in the form of field studies. I assume that this new kind of data is more often automatically analyzed with data analytic methods which decreases the risk of subjectivity when interpreting collected qualitative data. This data encompasses secondary (such as electricity consumption or geographical tracking) and user-generated data (such as from Twitter, Facebook, Blogs). Additionally, the share of field studies slightly increased from 1995 to 2015, especially for ECIS. Moreover, in accordance with Backlund (2005), I also observe an increase of interviews (as I differentiate interview surveys and questionnaire surveys with the additional information). Finally, considering the research designs, I can see that especially for ECIS the share of non-empirical research decreases and empirical designs increase. On the contrary, for ICIS mixed designs significantly increase at the expense of pure empirical and non-empirical designs. The reported results show that there has been an evolution of the usage of research methods in the light of new trends (Open Data, Big Data (Laine and Lee 2015)) and “research orientations” (Tivari and Venable 2009). This is translated by the newly analyzed data, for example. Yet, the tendency is positive and it will be interesting to re-examine the situation in a couple of years, as the comparison with selective years of the previous 20 years already showed an interesting evolution of different research methods.

The results contribute in various ways to literature. First, I provide an update on employed research methods in IS of previous but outdated studies (Backlund 2005; Chen and Hirschheim 2004; Ebeling et al. 2012; Farhoomand and Drury 1999; Glass et al. 2004; Palvia et al. 2004). Second, the data set is only based on conference proceedings which are often ignored in larger journal publications (see theoretical background). This enlarges the perspective and adds interesting insights on research methods employed in journal articles. Third, as most studies use a large variety of categorization schemes, I attempt to have developed a more unified framework that takes into consideration various distinctions (research designs, approaches, methods) that are often used in a very heterogenous way by other scholars. This should help to compare my results easily to other study results and ensures a wide spectrum of employed research methods. Methodologically, in comparison to Backlund (2015) and Ebeling et al. (2012) my others category is really small (about 1% in comparison to 10-41%). This shows that the framework takes into consideration a large number of employed research methods. In comparison to Chen and Hirschheim (2004), surveys are less widely used and the IS research is still dominated by empirical research. So, the interpretivist domain is still rather sparse. Fourth, the insights on the composition of employed research methods may guide researchers to employ more heterogenous research methods, designs, and approaches in order to preserve or increase diversity. They may even get encouraged to revive older research methods from 1995 and 2005 in order to acquire interesting and rich results than traditional research methods (field and case studies as well as surveys). Finally, the results obtained by my study contribute to the general discussions on the IS discipline. As such, the employment of research methods, as part of the intellectual structure of the IS discipline, reveals increasing diversity, openness, maturity, and innovativeness. In alignment with previous researchers, I want to “motivate a more reasoned, reflective adoption of approaches from the diverse perspectives available” (Orlikowski and Baroudi 1991, p. 1). These insights should not only direct authors but also reviewers or track chairs who can manage the plurality and heterogeneity of conferences at the first place. With the appearance of new methods and data, scholars can revisit the discussion of Benbasat and Zmud (2003), Iytyinen and King (2004) or Argawal and Lucas (2005) about the relevance of the IT artefact in IS research.

To begin with the limitations, the implications of the research at hand rely mostly on the subjectivity of only one round of classification by a coder. For that reason, the coder carefully read the papers and reused (if possible) the research method as indicated by the authors. Another limitation relies on the selected focus of the conferences – I cannot rule out that the results in other IS outlets are different. Additionally, concerning the representativeness for the years in between, the three years selected for the analysis (1995, 2005, and 2015) is questionable - special issues or specific conference themes may affect the analysis. Future work will enlarge and refine as well as strengthen my results First of all, I will
integrate 737 journal articles from the Senior Scholar’s Basket of Eight to the data sample. Second, I will draw up a detailed comparison of my research results to previous articles. Third, I will consider additional data such as the keywords of each article in order to allocate an IS topic to each article and compare the evolution of IS topics and research methods over time.

REFERENCES


