

What Every Information Systems (IS) Researcher Should Know About IS History (ISH) Research

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Abstract

Growing attention has recently been devoted to studying information systems by utilizing research approaches from History. IS history has come to stay in the arsenal of IS research methodologies. Our team of academics from both history and information systems recognize and discuss what is good historical research and contribute into this very scientific discourse. The underlying methodological issues raised in this article must be understood by all IS historians. The major contribution is a set of practical recommendations for effectively conducting Information Systems History (ISH) research following the methodology of General History. This endeavor helps IS researchers present their scientific works in such a manner that also historians working outside of the IS field would accept those studies as scientifically acceptable, relevant, and in this manner the IS field would become more visible also outside of the field itself.

Keywords: IS history, IS research methodologies, historical methods, historiography

Introduction

Growing attention has recently been devoted to studying information systems (IS) by utilizing research approaches from the field of history. IS researchers have adopted historical research methods for studying specific research themes, such as the early adoption of the Web in Australia during 1992–1995 (Clarke 2013) or the business and IS engineering community in the German-speaking areas in Europe (Buhl et al. 2012). Some have even carried out full-fledged historical research (e.g., Campbell-Kelly and Garcia-Swartz 2013; Pozzebon and van Heck 2006) or immersed themselves in the historiography and philosophy of history (see, e.g., Bryant et al. 2013; Mitev and de Vaujany 2012; Land 2010).¹ These and other similar works provide valuable contributions for the advancement of the IS field.

The origins of IS history (ISH) research can be traced back to the 1980s. Attention to this research track was directed in 1983–1984 on the 75th anniversary of the Harvard University Graduate School of Business Administration, which highlighted that there was an opportunity to strengthen management information systems (MIS) research through an historical tradition. As a result of this, the first large ISH research project was initiated. Following the anniversary, the Harvard MIS History Project was conducted between 1988 and 1995. The project was coordinated by James L. McKenney, Harvard Business School's Professor of Business Administration, and conducted in conjunction with some very influential

¹ Historiography refers to the study of how historical studies are carried out and how the associated findings are presented.

participants, namely Professor of Management Information Sciences, Richard O. Mason, and President of Copeland & Company, Dr. Duncan G. Copeland (Mason et al. 1992; Toland and Yoong 2011). A significant outgrowth of this project were three articles, “Developing an Historical Tradition in MIS Research” (Mason et al. 1997b), “Bank of America: The Crest and Trough of Technological Leadership” (McKenney et al. 1997), and “An Historical Method for MIS Research: Steps and Assumptions” (Mason et al. 1997a), which were published in the September 1997 issue of *MIS Quarterly* (*MISQ*). This established an outline for ISH research (*MIS Quarterly*, 1997). Following this initiative elaborated by Mason, McKenney, and Copeland, researchers of ISH — *IS historians* — seem to have had a more or less shared view about how to apply historical methods (Hirscheim et al. 2003; Porra et al. 2006; Pozzebon and van Heck 2006; Toland and Yoong 2013).

More generally, strengthening a collective IS identity has received significant attention in IS research (see, e.g., Benbasat and Zmud 2003; Galliers 2003; Agarwal and Lucas 2005; King and Lyytinen 2006; Gill and Bhattacharjee 2009; Taylor et al. 2010; Lee 2010; Sawyer and Winter 2011). In line with this, Mason, McKenney, and Copeland had previously stated in their 1997 *MISQ* article that “if MIS is to continue to evolve into a mature discipline, and if MIS is to enjoy the theoretical and professional recognition that academic maturity bestows on a discipline, MIS professionals must begin also to record and examine its history” (Mason et al. 1997b). However, more than only recording and examining one’s own past is involved in ISH research. Indeed, IS as a field not only needs to memorize and treasure its own heritage, but the plurality of IS research methods can, and should, be expanded by applying historical research methods. Mason et al. (1997b) argued that IS was methodologically incomplete until it embraced historiography as a method, declaring that the process of methodical completion had begun. In the same *MISQ* issue, they further suggested steps toward the development of a more robust MIS historiography (Mason et al. 1997a). In our view, the Harvard anniversary initiative and the *MISQ* special issue can be referred to as the beginnings of the first generation of ISH research.

Challenges with IS History Research Methods

In spite of these noteworthy early ISH efforts, it was only recently when any wider interest into ISH research started to emerge within IS community. Most ISH research during the early period consisted of isolated projects scattered around a variety of publishing outlets. However, some five years after the *MISQ* special issue, Frank Bannister (2002) analyzed the Mason et al. (1997b) procedure to make historical research, and based on its application by McKenney et al. (1997), in particular, he suggested that a major limitation of the methodology is its assumption of a crisis; this should be regarded as a limitation because all organizations do not undergo such crises as, for instance, the Bank of America has done. Bannister (2002) made significant further suggestions, paving the way for the second generation of ISH research. He also stated, “Historical research is not radically different from other types of research which are widely used in IS”; however, it had not yet become a familiar research technique due to a lack of methodological guidance. Research results through historical methods, as with other IS research methods, may differ depending on the approach utilized. Thus, in order to interpret previous research, it is essential to have an understanding of historical methods and techniques (Bryant et al. 2013) and the differences between potential methods. Moreover, an understanding of these methods may be a valuable asset for any IS researcher rather than only for those who focus on ISH research.

In terms of research methodology, Nathalie Mitev and François-Xavier de Vaujany (2012) have criticized earlier ISH research: “We found that most IS History papers are supplementarist descriptive case studies with limited uses of History”. The need for more methodological rigor with ISH research also becomes evident by studying the articles in the Basket of Eight IS journals² published since the 1997 special issue in the *MISQ*. IS researchers have mainly sought to study organizational implementation or to test different theories (e.g., social theories) in specific historical contexts or from within boundaries of some subfields of history, such as business history or organizational history. However, leaving history to play the role of

² The Senior Scholar Basket of Eight includes the following IS journals: *European Journal of Information Systems* (*EJIS*), *Information Systems Journal* (*ISJ*), *Information Systems Research* (*ISR*), *Journal of Information Technology* (*JIT*), *Journal of Management Information Systems* (*JMIS*), *Journal of Strategic Information Systems* (*JSIS*), *Journal of the Association for Information Systems* (*JAIS*), and *MIS Quarterly* (*MISQ*). For further information, see: www.aisnet.org.

only a test laboratory for theory development leads to losing the full potential of ISH to advance IS research.

Since the first decade of the twenty-first century, the second generation of ISH researchers did not just follow the outline elaborated by Mason, McKenney, and Copeland. The second generation of ISH overcomes some of the methodological limitations of the first generation procedures; it is more profound and it follows more closely the methodology of professional historians. On a par with higher expectations, also requirements for research contributions have increased. In their excellent editorial flavored with a philosophy of history, Antony Bryant, Alistair Black, Frank Land, and Jaana Porra (2013) suggest that “there is no general agreement among historians of what it is that constitutes ‘good historical research’.” However, we wish to partly challenge this statement, which we believe provides a too easy way out of a fundamental question that needs to be raised and which has tremendous capacity to advance the IS field. Admittedly, there are historians who may represent different subfields of historical research, schools of thought, theories, and worldviews, but there still are general principles widely considered by historians as signs of ‘good historical research’. There are standards, which are expected to be met (see e.g. Myrdal 2012; Howell and Prevenier 2001). If accounts clearly fail to meet them, they are uniformly discarded as historical research.

Focus of this Article

In this article, we seek to recognize and discuss *what constitutes good historical research*, and we believe that the team of authors, including seasoned academics from both history and IS, has the capacity to contribute to this very scientific discourse. We believe that the underlying methodological issues raised in this article must be understood by all IS historians. Moreover, at least ideally, any knowledgeable IS researcher should have a basic level of understanding of these methodological principles to be able to map their own research with the flow of time and fast-evolving societal, business, and technological environments.

We define ISH as a subfield of history of its own. The historical approach suggested in this article does not regard ISH as a part of one of its subfields, such as business history (e.g. Lucas et al. 2009) or organizational history (e.g., Currie and Guah 2007; Igira 2008), or, for that matter, as a paradigm of some school of thought, theory, or particular worldview. Undoubtedly, representatives of specific subfields of history can later present further points and add valuable details to the framework presented here, all of which may help promote ISH research. Indeed, our approach originates from what some would extrapolate as history “proper,” traditional history, or standard history, or, to be politically correct, what is known as *general history*. In the globalized world connected through modern information systems and communication technology, many people envision humanity as one entity and human history as one shared continuum in which they can map themselves. Historian, David Christian, who promoted the so-called “universal history,” stated in 2010 that “in recent years there has been a resurgence of large scale narratives in world history, global history, trans-national history, macrohistory, or whatever we choose to call it” (Christian 2010). For these reasons, we use the more traditional term of “general history” and build upon this research tradition. It is descended from the late-nineteenth century when national histories were distinguished from general history. Yet, it still concentrates on world history, or human history in general, and it includes the main research methods shared by most historians as well as a sense of wholeness, where the complete whole is not forgotten even when the particular is investigated. This encourages multidisciplinary collaboration among those who suppose that solid empirical research correlates to the large and the general.

In this article, we wish to step back from any fine-tuned philosophical, theoretical, or scholarly schisms. Rather, we aim to help the average IS researcher avoid falling into any such pitfalls and to introduce a basic set of methods and techniques, which are used systematically by historians, as a part of the IS researchers’ methodological toolbox. The historians’ set of methods is to be utilized especially when IS researchers mine the complexities of past events and situations, or when they ponder over Information Technology (IT) mediated change for better or for worse (i.e., progress or decline). Even more so this is required when such procedures are fully anew, perhaps for a junior researcher, to whom even a ‘humanistic character’ may sound amorphous and the actual methodology of history remains an unfamiliar area, even when ISH is, in fact, a fundamental part of IS. In general, we aim at answering the question: *What should every IS researcher know about ISH research?* Thus, the major contribution of

this article is a set of practical recommendations for effectively conducting ISH research following the methodology of general history. We hope that this endeavor helps IS researchers present their scientific works in such a manner that historians working outside of the IS field will also find these studies scientifically acceptable and relevant, thus contributing to the visibility of the IS field outside of the field itself.

Four Key Principles of the Methodological Framework for ISH Research

A process model for ISH research, the seven step sketch, was originally introduced by Mason, McKenney, and Copeland (1997a). In their view, research begins with focusing questions, then specifying the domain, gathering evidence, critiquing the evidence, determining patterns, telling the story, and writing the transcript. These are good practices but much easier said than done. This process model—or ‘sketch’ as the authors themselves called it—has been followed by many researchers, but so has the model’s shortcoming, the assumption of a crisis, been copied. Many important issues are still typically lacking even in the second generation of ISH, leaving gaps with the ideals of historians, for instance, when one’s own memories or experiences might not be challenged enough by using other evidence or burdensome methodological rigor could be too easily passed by. By getting familiarized with some 150 IS studies (published since 1992) that have either made history or are referred to as having links to historical approaches or even research, these have become imminent.

Based on this literature analysis of ISH articles, we have noticed four important methodological lessons that should be better understood by IS historians. Of course, in most cases, these issues have not been totally neglected, but all too often seem to be out of balance, when comparing ISH contributions with other fields of general history. The four key principles of ISH research from Table 1 are discussed below.

This presentation is not a full account of IS historiography. We have sought to adopt a positively constructive approach by highlighting exemplary previous works that can be used as role models for ISH research rather than pinpointing to flaws in previous works. A research work referred to in Table 1 highlights a particular aspect, but is not necessarily representative in other aspects. Of course, in some of aspects there are many good examples, and other works could have been highlighted also. In these cases, the selection is purely by the authors.

Principle #1: Focus on Objectivity

The bull’s eye for an IS historian is objectivity. The IS profession is all about systematism. In a similar manner, historians are humans researching human-related issues, but they do it systematically using specific methods on specific sources (see e.g. McDowell 2002). Objectivity is their aim much like the bull’s eye to the archer who, at the same time, realizes the danger of a miss instead of a hit. Of course, 100 percent objectivity with any inquiry remains an ideal for everyone, but at least the aim is objectivity for any professional historian. Understandably, historians do not seek objectivity in a blinkered epistemological sense; thus, they do not make claims of absolute truth either (Howell and Prevenier 2001; Gaddis 2002; Trachtenberg 2006; cf. Toland and Yoong 2013). As in every science, in history the choice of the study topic is a subjective choice made by the researcher, who also chooses the methods to be used and the sources to base the work on and publishes results through a selected outlet to a selected audience. Similarly, the IS historian must be in control of the research process (cf. Bygstad and Munkvold 2011; Lee and Dennis 2012). Objectivity could be defined and described as impartiality, adhering to critical standards and research methods, or with a single word, such as responsibility.

<i>Key principle</i>	<i>Application</i>	<i>Seven step sketch</i>	<i>Other methodological drafts</i>
<i>Focus on objectivity</i>	Positioning of the researcher	McKenney et al. 1997	Walsham 2006; Currie and Guah 2007; Grover 2012; Epstein 2013; Heinrich and Riedl 2013
	Not a “victor’s history”		Bryant et al. 2013; Jakobs 2013
	Contextualization	McKenney et al. 1997; Klein and Myers 1999	de Vaujany et. al. 2011; Campbell-Kelly and Garcia-Swartz 2013; Jakobs 2013
	Avoidance of determinism	Mason et al. 1997a; Toland and Young 2013	Mitev and de Vaujany 2012
<i>Use of primary sources</i>	Formulation of research question	Mason et al. 1997a; Porra et al. 2006; Toland and Yoong 2013	Hepsø et al. 2009; Bryant et al. 2013
	Use of historical records	Mason et al. 1997a; Porra et al. 2006; Pozzebon and van Heck 2006; Toland and Young 2013	Mitev and de Vaujany 2012; Bonner 2013; Campbell-Kelly and Garcia-Swartz 2013; Selander et al. 2013
	Source criticism	Mason et al. 1997a; Toland and Young 2013	Campbell-Kelly and Garcia-Swartz 2013
<i>Sense-making</i>	Continuity and change	Mason et al. 1997a; McKenney et al. 1997; Pozzebon and van Heck 2006	Currie and Guah 2007; Buhl et al. 2012; Davern et. al. 2012; Hirschheim and Klein 2012; Gannon 2013
	Periodization	McKenney et al. 1997; Pozzebon and van Heck 2006	Currie and Guah 2007; Buhl et al. 2012; Petter et al. 2012; Gannon 2013
	Avoidance of anachronism		Mitev and de Vaujany 2012; Bonner 2013; Heinrich and Riedl 2013
	Multiplicity of causalities	Mason et al. 1997a	Davern et. al. 2012; Jakobs 2013; Campbell-Kelly and Garcia-Swartz 2013
	Motive explanations	McKenney et al. 1997	McBride 2005; Jakobs 2013
<i>Readiness for discourse</i>	Detailed documentation	Mason et al. 1997b; McKenney et al. 1997	Bannister 2002; Land 2010; Mitev and de Vaujany 2012; Bonner 2013; Bryant et al. 2013
	”Language” of a historian	Mason et al. 1997a; Toland and Young 2013	Bannister 2002; Bryant et al. 2013
	Searchability	Mason et al. 1997a; Mason et al. 1997b; Toland and Young 2013	Bannister 2002; Land 2010; Hirschheim and Klein 2012; Mitev and de Vaujany 2012; Bonner 2013

Table 1. Exemplary Works in Information Systems History Research 1997-2013

Geoff Walsham (2006) crystallized this by stating that “we are all biased by our own background, knowledge and prejudices to see things in certain ways and not others.” Yet, in their IS research principles Heinz Klein and Michael Myers (1999) argued that participants of interpretive field studies can be interpreters and analysts even as much as the actual interpretive researcher (see also Hepsø et al. 2009). However, historians consider this a compromising approach. A solution for IS historians is to carefully *position oneself in relation to the research topic*. Varun Grover (2012) clearly positioned himself and his analyses, which anchored on his four previous studies of development in the IS field and complemented his personal observations. The positioning is necessary, as he also stated among other things that “we should be proud of what we have accomplished” and “Overall, I am bullish about the field. I think that great strides have been made over the last few decades in building a field that deals with a critically important resource of our time and correspondingly important issues. I have witnessed and partaken in a large part of this evolution” (Grover 2012).

Bryant, Black, Land, and Porra (2013) have reported that there has been a trend in ISH for “*glorious histories*” or “*glorious stories*.” To provide a small relief for IS historians, it should be mentioned that this is not uncommon at all in world history. In a wider historiographical context, this brings to mind the saying: “History is written by the victors”. Historian Gary Baines states: “The derivation of the adage that history is written by the victors is uncertain. The underlying assumption seems to be that victors (re)construct the past from the vantage point of being vindicated by history.” Baines states that in this way the winners secure the rights to the (hi)story, but he also defines multiple points to show that the issue of who gets to (re)write history is rather more complicated than the adage would suggest. One of his points is that history as a record of the past is not an impartial arbiter of human conduct (Baines 2014). Nevertheless, when reading any “glorious history,” such as a success story of an IT company or a biography of an influential inventor, it should be remembered that there are many stories related to the occurrences that have remained untold and may remain so forever. To avoid subjectivity and maintain balance, as far as possible, historians often choose topics without close personal bondage (cf. Epstein 2013; Currie and Guah 2007; McKenney et al. 1997). If there is a personal connection, historians try to analyze their own subjectivity as much as they can and inform in detail about it. This is an important aspect to be noticed, especially when an IS researcher has been an actor linked with the subject (as is often the case).³ One possible way is to provide a career autobiography documented with one’s perceptions and observations that can be utilized by others. A collaboration with a professional historian is an excellent way for IS researchers to operate (cf. Heinrich and Riedl 2013), and to learn how to apply ISH methods.

In most cases, historical events are complex to analyze. They can be approached in multiple different ways and they may include a wide variety of different types of information. Ann Langley (1999) has emphasized the importance of temporal precision also in management research: information behind events can be gathered from historical documents as well as from retrospective interviews with current data collected in real time. This can make the conceptualization of historical events more complex. As historical events should not be misplaced in time, they should neither be misplaced in other ways, but be correctly determined by space. Acontextuality is another major pitfall for ISH, according to Mitev and de Vaujany (2012). Historical events need *contextualization*, that is, to be set in the correct context – a framework (see, e.g. Alapuro 2012; de Vaujany et al. 2011; McKenney et al. 1997). What is important for IS researchers to notice is that contextualization is not the same as actual historical research, but rather a major tool for a historian to comprehend and make visible various relationships and links with matters relevant for understanding the actual subject matter under investigation. Contextualization is a type of mapping and, ideally, serves the research.

This goes hand-in-hand with *determinism*, including the idea that people of today embody a positive result of some type of evolution that was to be reached. However, this type of logic is very far from historical reasoning. It easily leads to a distorted understanding of the subject matter and, perhaps, to a subjective attitude of superiority. Some believe this could be balanced with ‘empathy’ which would aid in imagining how events were experienced, and would also color history more appealing and interesting to others (cf. Toland and Yoong 2013; Lévesque 2008, Mason et al. 1997a). Historical empathy was argued

³ We would argue that personal bondages should be better addressed and reported also in the IS action research tradition.

by historians in the mid-nineteenth century: however, answers/facts/evidence are not sought from empathy but from historical sources. Admittedly, we do also need to understand predecessors who may have had different frameworks in mind (Trachtenberg 2006). However, this would lead us to a philosophical debate on whether people change in history. We need to be able to distinguish between perspectives, but historical empathy should neither be based on imagination nor aim at coloring the story. It certainly cannot be sympathy, which does not aid in aiming at objectivity, either, not even at the relative level, which should be a goal for a subjective and goal-oriented effort.

In sum of Principle #1, it is important for an IS historian to aim at impartiality and contextualize the research well not to stray to propagandize glorious stories of victors or ending up coloring research results. Achieving this is easier if one is familiar with literature concerning the methodology of history.

Principle #2: Use of Primary Sources

An IS historian should aim at heavy interpretive but transparent use of primary sources. For the most part, IS historians have thus far regarded history as a kind of platform for testing social science and other theories (see, e.g., Myers and Klein 2011; Klein and Myers 1999; Lyytinen and Newman 2008; Igira 2008), whereas theorization *per se* has not been strongly linked to history (Mitev and de Vaujany 2012). IS historians have well understood that this is not a definitive answer to IS' call for history, but rather a discussion opener (Bonner 2013). Bryant, Black, Land and Porra provoked: "Perhaps, it is time to pay less attention to creating IS theories, and more to creating IS histories" (Bryant et al. 2013). It should be noted – and this may be somewhat of a surprise for IS researchers – history as a source-based and evidence-based discipline in general is not as theory-oriented as IS (see more in Oinas-Kukkonen et al. 2008). Of course, this does not mean that historical research would not have any links to theory or that historians would not utilize any theories in their research. Theory-based histories exist, but the role of theories varies between the subfields of history. In black-and-white terms, historians consider theory as a group of ideas that is meant to explain a certain topic, and it is always included in research from its very beginning; there has to be an idea to begin with. The choice of theory is essentially subjective (Walsham 2006). However, in history, the core component is history *per se*, not some theory tested by history. History may be tested by theory, and a history produced is a type of theory. Theory, or perhaps a bit simplistically, an idea, is a base for a specific research question, which is the motor of historical research. Janet Toland and Pak Young, authors of a major contribution on the usage of historical method within IS, state that history, in contrast to IS, has a tendency to lack focus and it does "not always offer immediate answers to specific research questions" (Toland and Yoong 2013).⁴ This may help avoid subjectivity, but without focus, historical research is also regarded as a failure by historians. Apparently, much of ISH research has thus far suffered at least from the following flaws: unsuccessfully posed research questions, failure in the proper use of research methods, or weak use of sources and especially primary sources. However, some good examples are discussed below.

The most common way to begin with ISH is to formulate open-ended questions, which have numerous possible answers. Typical open-ended historical questions are *When*, *What* and *How* (Mason et al. 1997a; Porra et al. 2006; Clarke 2013). An example of this type of focusing question can be found in Jaana Porra, Rudy Hirschheim and Michael S. Parks (2006): "What significant changes did the Texaco IT function face over its existence?" However, these types of open-ended questions often provide descriptions only and, ultimately, do not satisfy the historian, whose main task is to explain past events and development and whose main focus is the question of *Why* (see also Hepsø et al. 2009; Toland and Yoong 2013; Bryant et al. 2013). The historian looks after the causes of events, the change that occurred, and the many consequences, both intended and unintended. Answering the key questions is much more important to historians than being able to tell an invigorated better or compelling "story," or to re-enact (cf. Hepsø et al. 2009). Historians do not imagine that they could reconstruct an absolute and all-out storyline. After answers have been obtained for open-ended questions, the next step can be closed questions with a

⁴ Interestingly, this claim was not in their original PACIS conference paper (Toland and Yoong 2011), but was later added to their *AJIS* journal article published c. two years later (Toland and Yoong 2013). It begs the question whether the claim is an extraneous concept from their original paper, derived from an aspiration to directly address an issue in historical research without cultivating some specific IS problem.

limited number of possible answers, such as asking whether Vannevar Bush's 1945 articles in *Life* and *The Atlantic Monthly* directly gave Douglas Engelbart his initial concept for developing the Augment System (which influenced the birth of hypertext, windowing system, and mouse) (Oinas-Kukkonen 2007), or testing some specific hypothesis or even a theory (cf. van der Blonk 2003).

After phrasing the research question, one needs to choose *relevant sources* that provide valid and credible answers to the question at hand (see e.g. Rahikainen and Fellman 2012; Lévesque 2008; Howell and Prevenier 2001). However, approaches that may be available for IS research may be unavailable for ISH research. The historian can only use the available evidence: *If there are no sources, ISH research cannot be carried out*. Ideally, anything can be a source for a historian, who ranks sources according to the value of information provided for answering the particular research question at hand. In any case, this means a heavy use of primary sources providing as much as possible relevant unprocessed and first-hand information originating directly from the researched subject matter. In practice, this means diligent use of historical records and perhaps archival research⁵ (Oinas-Kukkonen et al. 2011; Mason et al. 1997a). Toland and Yoong (2013) comment that an important technique of historical research is to “listen for silences,” but, as a matter of fact, an argument from silence—*argumentum ex silentio*—is generally regarded as unreliable by historians. IS historians need to be aware of the questionable credibility of some sources (Toland and Yoong 2013). The credibility of a source depends on which questions are about to be addressed. As an extreme example, a counterfeit may be the best source for studying research forgeries. Instead of silencing sources, the historian usually amasses an abundance of crude facts; thus, collecting sources should go on until the researcher believes all relevant information is on the table.

IS historians have predominantly relied on second-hand data in their historical research (Mitev and de Vaujany 2012; cf. Selander et al. 2013). Information received indirectly from second-hand sources or even from further off is taken into account by historians, if deemed necessary, but basically it is considered to have less surface contact with the subject matter and, therefore, less reliability (and, instead, have a greater tendency toward biases). Information evaluation, or more precisely *source criticism*, in detail is always present in all types of communication.⁶ Although as a “standard” method of history, it has a more specific meaning. Source criticism focuses on the origins of a source, its description, questions of source originality, and the authority of its author/s, and competence and credibility of the observer. A major phase is the interpretation of the source, which is dealt with in direct relation to the research question at hand. Some source credibility principles seem to be universal, whereas other principles are specific depending on the sources chosen, and they are actively carried out when deemed necessary for testing or promoting authority, validity, or credibility. As a general rule, the credibility of a message is remarkably higher, if a number of independent sources contain the same message. Therefore, historians usually prefer “cross-examining” and researching multiple sources (Myrdal 2012), including also other primary sources, for seeking evidence. The combination of different sources, such as oral history and archival or written texts, render more credibility (Oinas-Kukkonen et al. 2011; Pozzebbon and van Heck 2006; Selander et al. 2013; Bonner 2013) For example, in the monograph, *Humanizing the Web: Change and Social Innovation*, the sources consist of: 1) primary sources, including governmental, research, and international organizations' documents; press releases; news items; interviews; material from non-scholarly journals and magazines; blogs, tweets, emails and videoclips; academic and research websites; commercial and other websites, and 2) secondary sources, for example, references, including research literature that contains indirect information of the subject matter created and interpreted by various researchers (Oinas-Kukkonen and Oinas-Kukkonen 2013). The use of various types of sources challenges the historian to make sense of the past actions and events and pursue a coherent interpretation.

As suggested in Principle #2, it is time to pursue the creation of more IS histories on the basis of posing relevant and clearly articulated questions with sufficient and complementary, valid and credible sources and sound criticism on them. At the same time it must be admitted that there is no clear cut universal

⁵ Sometimes it is possible also to utilize electronic records archives online. For instance, see: <http://www.archives.gov/research/start/online-tools.html>.

⁶ The inquiry known as source criticism can be compartmentalized into internal criticism, which refers to the determination of the reliability or accuracy of the information contained in the source, and external criticism, which refers to determining the authenticity, validity, or trustworthiness of the source.

answers to how many sources is enough in each case (yet, Principle #4 discussed later in this article may help to figure out when to stop collecting new data).

Principle #3: Sense-making

An IS historian should aim at sense-making with periodization and multiple causality. An ideal historical article is one with a clearly defined chronological scope, because time is a basic dimension for historical events (Oinas-Kukkonen et al. 2011), yet this does not mean narrating events in strictly chronological order only, thereby losing thematic discussion (Rahikainen and Fellman 2012); a good example of this is given by Porra, Hirschheim and Parks (2006), who analyzed the history of Texaco's corporate IT function from its inception until Chevron acquired Texaco in 2001.

At the same time when avoiding determinism, historians admit patterns of *continuity and change* in history because this is needed to explain the consistency of past historical events and create a coherent historical narrative and epoch. There are also myth-breaking discontinuities to be observed. For instance, in the article, "From Bush to Engelbart: 'Slowly, Some Little Bells Were Ringing'," this kind of a discontinuity is shown: Douglas Engelbart was intrigued by Vannevar Bush's article, which he read in 1945, but only made a connection back to Bush about 15 years later after having obtained a PhD from UC Berkeley and started to work on his augmentation of human intellect project at the Stanford Research Institute (Oinas-Kukkonen 2007). The historian can successfully make both continuity and discontinuity visible, and with the pursuit of this, it is important to avoid the tendency to create artificial connections between phenomena (see Oinas-Kukkonen et al. 2008). This could even challenge traditional longitudinal studies, correlational research studies, which involve repeated observations of the same variable over long periods of time; longitudinal IS research rarely seems to follow "standard" historical research methods (see, e.g., Bygstad and Munkvold 2011; McLeod et al. 2012; Currie and Guah 2007; Bannister 2002).⁷

IS historians have not usually included long-term analyses in their research (Mitev and de Vaujany 2012), with a few notable exceptions, such as Porra et al. (2006), who in their history of Texaco's corporate IT function addressed four decades. Long-term analysis is important, otherwise continuity cannot be observed and periods of time would not be noticed. However, relatively stable characteristics, which aid in identifying coherent periods of history, can be recognized. Then, an abstraction or generalization is made when time is categorized, divided into blocks. This *periodization* is based on recognizing important turning points in the series of events, and it often follows a genealogical sequence or lifespan. Periods, eras, or epochs are context-specific and they often overlap with each other in a similar manner as there is no one single moment in which a young person becomes an adult. Periods can be categorized in several ways (cf. Buhl et al. 2012; McLeod et al. 2012; Petter et al. 2012; Pozzebon and van Heck 2006; Jordanova 2006; McKenney et al. 1997). For instance, Rudy Hirschheim and Heinz K. Klein (2012) divided the history of IS into four eras. Their article describes the chronology, main events, and issues of each era well; however, they decided not to name the eras, but to number them from one to four (see Davern et al. 2012). When naming the eras/epochs/periods, the names should crystallize the research results reached, and it should also be simple for a reader to grasp and remember. For example, in the monograph, *Humanizing the Web: Change and Social Innovation*, the authors divide IS into the pre-web era, the original web, and the social web (Oinas-Kukkonen and Oinas-Kukkonen 2013). In their article about the United Kingdom National Health Service and the introduction of a national program for information technology, Wendy L Currie and Matthew W Guah (2007) name three distinctive eras that were imbued with distinctive institutional logic in healthcare governance systems: the era of professional dominance and social inclusion (1948–1971), the era of managerialism (1972–1997), and the era of market mechanisms (1998–present).

It has been claimed that since IT-related research is trendy, scholars have lately jumped onto different industry bandwagons (Ramiller et al. 2008). Whether this has happened with loose grounds or not, understanding the influence of these industrial opportunities and limitations is important. The interpretation of research results may be very different when taking into account technological, social, societal, and other considerations related to the different bandwagons. ISH is a tool for making things

⁷ Comp. to Simon Schama's longitudinal and wide-ranging story in *Citizens: A Chronicle of the French Revolution* (Schama 1989).

more tangible and providing deeper insight when self-analysis is carried out within the community, if it is not snared as a handmaiden for various interest groups. The danger in ISH is that one can easily slide from using the past to understand and reveal current assumptions and biases to seek justification and validation of generally accepted contemporary beliefs, or inserting modern beliefs onto the past. That kind of *anachronistic* writing, chronologically inconsistent writing, trivializes history (Bonner 2013), and the unique circumstances may become lost. Mitev and de Vaujany (2012) consider anachronism as a major pitfall for ISH carried out thus far.

All historical events are unique and particularistic (Ramiller and Pentland 2009; cf. Klein and Myers 1999), when estimated at a detailed level. When present-day ideas and perspectives are anachronistically introduced, the result is presentism: the tendency to interpret the past in presentist terms and shift the general historical interest toward the contemporary period and away from the more distant past (Hunt 2002). It can even lead researchers to outline insights into possible future developments and envision the future (Heinrich and Riedl 2013), which, despite being very interesting, is not the IS historian's task.⁸ The fact is, of course, that we can find historians making value judgments and taking part. A researcher might succumb to defining a direction of a change as a pure progression or decline without having evidence researched through critical standards and research methods. However, any abuse of history will quickly erode the reputation of a researcher.

Like periodization, narrative is not only a chronology of events but a medium for sense-making (Webb and Mallon 2007; Bygstad and Munkvold 2011). It is the historian who aims at making sense out of a series of events in a similar manner as in qualitative studies, which aim at explaining a phenomenon via semi-structured interviews, or in quantitative research, which aims at revealing relationships and causalities between constructs through building structural models. Because, epistemologically, the researcher is not fully objective, it is important to aim at objectivity with responsibility (see Principle #1) also when creating the narrative. Entertainment may be important in historical novels and being able to keep the audience is desirable for ISH research, but explaining the change and relationships is still the key in historical research. Narrative must not overlook causation. A causality, as such, one cause to one result, is rarely enough to explain the actions of human beings (cf. Mason et al. 1997a; Howell and Prevenier 2001; Gaddis 2002; Jordanova 2006; Campbell-Kelly and Garcia-Swartz 2013). There may be many causes for events—*multiplicity of causality*—and the importance of these causes may vary. A condition can be both necessary and sufficient.

The historian makes the difference between the data—the source material—and its interpretations (cf. Porra et al. 2005; Bygstad and Munkvold 2011). Several steps need to be taken to make sense of the teased out information and its interpretations. As people have goals, historians place primary emphasis on *motive explanations*. Also, in the case of IS, events occur and choices are made in such a way as to influence their role in the organization (Jakobs 2013; McBride 2005). In their study of the history of cognitive research in IS, Michael Davern, Teresa Shaft and Dov Te'eni (2012) explored multiple causality and motive explanations, but stated that they “did not attempt to examine the motivations, practices, or social contexts of the researchers,” but rather they left this for future research. In addition to multiple causalities and motive explanations, historians admit that there also appear to be coincidences, which may affect historical events and change (Mason et al. 1997a). If the historian is not confident about the reached explanation, the explanation's likelihood and conditions are to be described to the readers. Also, one of the major ways to clarify the interpretations is to try to generalize the explanation, which scientific research is supposed to be able to do.⁹

Thus, Principle #3 suggests that an IS historian should seek to produce thematic discussions with grasp of chronology and periodization and avoid the pitfall of trivializing the complexity of history with multiple causes and explanations into a simplistic narration.

⁸ We could call these IS futurists, who apply the methods of future(s) research into the field of IS.

⁹ The role of generalization in science has been and still is much debated. Without going into an in-depth study of the philosophy of science here, it should be mentioned that no such generalizations should be made in which readers are not told about the existence and logic of a generalized explanations. However, to take a pragmatic stand, generalizations in ISH are “lessons learned” for IS.

Principle #4: Readiness for Discourse

An IS historian should seek discourse with detailed documentation. Historians, by definition, create new knowledge, new interpretations – something that could be called a new theory – on the subject matter. This presumes that the IS historian must be able to situate his or her research within the field and, similarly, he or she must know relevant previous research.

A historian's *detailed documentation* of historical inquiries also produce clarifying generalizations, which are submitted for open criticism and debate. With his or her claims, the IS historian invites and also challenges others to a discussion, such as in the case of Mitev and de Vaujany (2012) when they declare that they “found that most IS History papers are supplementarist descriptive case studies with limited uses of History”. Thus, a historian writes a narrative for others to read and annotate. There are technical solutions to ensure that others are able to follow the narrative or, in other words, the historical research, and can test the new interpretations and even try to (re)research the subject matter, and thus challenge the presented interpretation. Therefore, both sources and methods must be explicitly presented and characterized in the introduction of the text (Oinas-Kukkonen et al. 2011; Howell and Prevenier 2001); yet, most ISH research thus far has had at least some flaws in this sense.¹⁰ Marlei Pozzebon and Eric van Heck (2006) introduce their approach in an exemplary manner, and it is easy to notice that they have used an unusual amount of primary sources for an ISH article of the time. Their description of the source material flows like this: “The main sources of data are archival research and interviews. From 2003 to 2005, we had access to a huge number of archival documents from which we learned about the past history and current context of Holambra. In addition to archival research, three types of interview were applied: face-to-face, phone, and e-mail. Interviews by phone and by e-mail were carried out periodically from April 2003 to December 2004 with Holambra managers and one regional consultant in the flower market. Face-to-face interviews were conducted in January and September 2005. In January 2005, a first visit and set of face-to-face interviews with Holambra managers lasted a total of 6 h. However, these discussions were not tape-recorded, as the organization had forbidden it. The interviewer wrote a summary from notes taken during the interview, including quotes or near-quotes. The second face-to-face interview with one Holambra manager occurred in September 2005, lasted 2 h, and was tape-recorded.” The problem, however, is that they neither identify the sources nor let the readers know where the sources are accessible. Their promise that the interview protocols are available upon request is not enough. In history, there is a very detailed reference system, as “weak documentation is always a bad sign” when one is presenting evidence (Trachtenberg 2006). On the contrary, exact documentation makes all conclusions and their makers transparent. Mason, McKenney, and Copeland (1997b) did identify original documents in their study of the Bank of America, but their endnotes did not explain clearly enough how other IS historians could check them.

As a rare exemplary ISH publication in this sense, William “Bill” Bonner (2013) made clear reference to governmental and international organizations' documents. He identified sources in an exact way, which can be noticed from these two examples: 1) “Clerk of the Legislature of the Province of Alberta (1970). Third Session of the 16th Legislative Assembly of the Province of Alberta, Mr. Hyndman's motion in the Legislature, 25 February. Provincial Archives of Alberta audio tape reference, P.A.A. DUPE 70.397/44, from 3:30 p.m. to 5:30 p.m., Edmonton, Alberta.” and 2) “Copithorne, C. (1973). Letter from the Minister of Highways (Clarence Copithorne) to Mr. Heil (V.P. Polk Canada), voicing surprise and strong objection to Heil's suggestion that MVR data be used for a marketing survey for Ford Canada Limited. Provincial Archives of Alberta, Accession number: 76.346, File/item number: 50100, Box 32.” Also, information about the interviews conducted is to be documented. Bendik Bygstad and Bjørn Erik Munkvold (2011) note that very few empirical IS studies have documented in-depth the interaction between informants and researchers. Yet, an exemplary work in this sense is Brian Gannon (2013) who prepared detailed appendices introducing the interviewed respondents and the context and questions of the interviews.¹¹

¹⁰ Even though we provide some examples of flaws in certain aspects of previous research in this chapter, these referenced works may be exemplary in other aspects.

¹¹ In more general, Gannon (2013) can be used as a model for qualitative research.

An important lesson regarding detailed documentation is that historians keep diligent notes about their references throughout the writing process, which includes multiple iterations over the overlapping phases of the research process (see e.g. McDowell 2002). Perhaps somewhat differently to conventions in other IS research, the researcher should expect to be writing continuously from the very beginning of the research. If researchers are not diligent in documenting their references, it would not be possible to include those footnotes and endnotes, which are needed by others to test and reconstruct the interpretations. Explicit, systematic, and exact references make it possible to test these interpretations based on sources time and time again – indeed, assuming that the data/sources are available, anyone must be able to check and redo the whole study. If there have been multiple informants or even participants involved in the subject matter, there should not be disagreement over the actual facts of the case, even though they may still disagree with an investigator's conclusions and interpretations (Bygstad and Munkvold 2011).

Even when the “*language*” of the historian exists, including traditions, ways of expression, and professional terminology, historians try to write factual prose, which is easy for a reader to follow. Most historical narratives are written for the general audience, and not often only for other historians. Narrative history is mainly popular. Sometimes colloquial language can challenge accuracy, because so much effort is needed for correct writing and achieving clarity and consistency in concepts and terminology. In historical research, terms, concepts, metaphors, and models that are used must be explained without jargon (see McBride 2005; Oinas-Kukkonen et al. 2008). This has been a challenge to IS historians who have, for instance, developed concepts, which actually could have been developed on the basis of non-historical data (Mitev and de Vaujany 2012), such as by adopting conceptual analysis or design science approaches.

A discourse over research results presumes that other people will be able to easily find and read them. Thus, *searchability* is critically important. One important factor is to start using terms and keywords in the publications that can be found more easily than what is currently the case. Rudy Hirschheim and Heinz K. Klein published a major article presenting a reflective history explaining the fragmentation of the IS field (Hirschheim and Klein 2003). However, even this milestone publication does not use “history,” “historical research,” or any similar term in the paper title, abstract, or keywords (cf. Toland and Young 2013; Land 2010; Mason et al. 1997b). However, in a later publication, the same authors define keywords in an exemplary manner from the ISH research point of view (Hirschheim and Klein, 2012). Another fine example of keywords is the article “Seizing the opportunity: towards a historiography of information systems” by Mitev and de Vaujany (2012). The keywords in this article, “IS history,” “historiography,” “historical methods,” and “historical organisation theory” clearly reflect the title of the study and, above all, its content. A lesson for the whole IS community to learn is to start using specific words that point to ISH or historical research, record them, and highlight these as keywords in order to aid others with finding the research and the new contribution produced.

In sum of Principle #4, an IS historian should document research activities and in a diligent and detailed manner and keep writing continuously during the whole research process. The tone of writing should be understandable factual prose flavored with clear concepts and highlighted with incisive keywords. After publishing it is time for discussions and debate; this will demonstrate the strengths and weaknesses of so that both contribution and possible weak spots in the use of source material(s) or other aspects of research can be recognized, the work elaborated, and new research may, perhaps, commence.

Discussion

In this article, we noticed that most of ISH research thus far has been methodologically incomplete. However, as has been previously pointed out by Mason et al. (1997c), the process of methodical completion is under way. Therefore, we suggested a framework that emphasizes four important methodological principles for ISH research: focus on objectivity, heavy interpretive but transparent use of primary sources, periodization and sense-making addressing multiple causality, and readiness for discourse with detailed documentation.

History and IS as scientific disciplines both depend on human beings, and their ‘humanistic character’ is always greater than zero percent. In a similar manner, history and IS, or any idea of them, always has

links to the past. Our own reflections on the state-of-the-art of ISH research and the framework proposed will conclude with a few provocative claims:

1. Any IS research has a share of humanistic character.
2. Any IS research is always linked with history.
3. ISH is a subfield of history of its own.
4. In carrying out ISH research, great attention must be directed to methodological rigor.

The first and second generations of ISH research aim at the same objective: making history. So does the next step, the third generation, but it will pay attention to mostly neglected parts of historical research methods. It can be a route back to the basics, which most historians expect from history. In spite of the improvements that can and should be done to ISH research practices, Bannister's (2002) claim is not far-fetched: "Historical research is not radically different from other types of research which are widely used in IS."

This article has its own limitations. We focused on general history and did not analyze the differences between various subfields of history, an all-out-account historiography, or a philosophy of history. We also stepped back from any fine-tuned philosophical and theoretical debates. Via these, new ideas and details, which help promote ISH research, may be presented.

Indeed, as the citations in this article also indicate, there already exists a significant collection of IS research that at least to some extent uses historical methods. Admittedly, only a relatively small set of articles would satisfy both an IS scholar and a critical historian. In order to foster the growth of these types of works—ISH research, which would satisfy requirements of both sciences—and for the IS discipline to benefit from true insights into ISH, the relevance of history to the study of IS should be part of any IS curriculum and it should be included in the training of future researchers, today's cadre of PhD students (Land 2010).

Conclusion

ISH is where IS meets history. ISH research with its rich and robust approaches and methods seeks to answer specific questions which are directed to sources from the past and it concentrates on subject matters which are considered to be important to the IS community. History not only helps enlighten IS scholars and practitioners, but is a method for IS research. Therefore, IS researchers and historians should read the methodology of history.

Based on the key methodological principles presented in this article, we suggest the following for IS historians and the IS research community:

1. Instead of committing to ISH topics that are personally close or that attempt to glorify one's own field, or a particular company, organization, community, group, or person, do your utmost to aim for objectivity. (Principle 1)
2. Ensure sufficient primary sources and document accurately. (Principle 2; also related to Principle 4)
3. Position your research and results thereof in a larger historical timeframe, timeline, or historical periodization, and avoid acontextuality, anachronism, and determinism. (Principle 3; also related to Principle 1)
4. Familiarize yourself with the historical explanation and discourse. (Principle 4)
5. Collaboration with professional historians is an excellent way to operate and learn. (All principles)
6. Systematically use the term "IS history" and other common terms as keywords in your publications.
7. Methods of ISH research should be an integral part of doctoral education within IS.

There has been a lot of discussion within the IS research community with regard to how the field is likely to move, and to what degree and how IS community members could shape the field's direction. ISH that explains developments of specific research, business streams, or technologies can help when research directions in the IS field are debated, and perhaps even to counteract the simplistic view to relevance, when "relevance is often equated with being 'current'" (Ramiller et al. 2008). The suggestions put forward in this article have the capacity to remarkably advance the IS field. In the future, we hope to see IS histories and reviews of ISH research being produced by using the framework proposed in this article.

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