

Chapter 2

The Structure of IS Research and IS Discipline Development

Following the results of the bibliometric study presented in the Appendix, we define the structure of IS research in terms of five research areas and 51 research topics. The identified research areas closely mirror those in the Sidorova et al. (2008) study.¹ The research areas include *IT artifact and IS development*, *IT and organizations*, *IT and individuals*, *IT and markets*, and *IT for teamwork and collaboration*. Our ability to replicate the results of the earlier study with an expanded basket of journals and an updated time frame suggests that these areas represent a robust intellectual core of the IS discipline.

At a more detailed level, IS research can be described through a number of research topics (51 topics for the purpose of this study). For the complete list of the 51 topics, see Table A2 in the Appendix. The topics are related to one or more research areas. Examples of research topics that lie almost exclusively within one research area (IT artifact and IS development) include *business intelligence and data mining* and *rule based systems*. Similarly, such topics as *IT investments and firm value* and *supply chain management* are primarily organizational in focus, whereas research on *individual IS acceptance and use* almost entirely falls within the *IT and individuals* research area.

The exclusive fit of the research topics with only one research area is an exception, rather than a rule. The majority of the identified topics have a primary and a secondary research area. For example, such topics as *electronic data interchange* and *supply chain management* lie at the intersection of *IT and organizations* (primary area), and *IT and markets* (secondary area). Similarly, such topics as *software development* and *IS security* are primarily organizational in focus; yet both topics also cover *IT artifact and IS development* issues.

Several research topics are almost equally split between two or more research areas. For example, *cultural issues in IS* are addressed almost in equal parts at organizational and individual levels. *On-line consumer behavior* is an almost equal split between *IT and individuals* and *IT and markets*, and knowledge management

¹ This is not surprising as we intentionally sought to methodologically replicate the results of the study by Sidorova et al. (2008), albeit with expanded journal basket and different timeframe.

deals in almost equal manner with issues of *IT artifact and IS development*, *IT and organizations* and *IT for collaboration and teamwork*.

In spite of the loose correspondence between research areas and topics, the five research areas are useful for organizing the review of the literature within individual research topics. Thus, chapters three through seven are devoted to the review of topics that are most closely associated with the corresponding research areas. Reviews of topics that lie at the intersection of two or more research areas are inclusive, and are not limited to the part of the topic associated with the dominant research area. For example, the review of on-line consumer behavior research includes research related to the IT and markets, as well as individual use of IT, even though the review is presented as a part of [Chap. 6](#), IT and Markets.

Three research topics deserve treatment outside of the individual research areas as they pertain to the IS discipline as a whole. These topics include: F31—IS discipline. F1—IS theories, frameworks, and methods; and F13—instrument development and validation. These are reviewed next.

2.1 IS Discipline Development

As discussed in [Chap. 1](#), the development of the IS discipline has been characterized by a plethora of existential debates over such issues as the identity of the IS discipline and the importance of focus versus diversity in IS research. Other discourses focused on the current role and the future of IS as a reference discipline, as well as the importance of rigor versus relevance in IS scholarship. In addition, a number of relatively pragmatic discussions of issues facing IS academics, from journal rankings to tenure and promotion criteria, took place. All related publications are combined under the IS Discipline topic.

The diversity in research topics and identity debates are primarily concerned with defining the boundaries of IS research. The key aspects of these debates are examined in [Chap. 1](#). Yet a discipline is not defined simply by the topics that are researched. It is also defined by the basic assumptions regarding the role of theory and empirical evidence, methodological approaches, key stakeholders, as well as by the institutional structures such as research journals and assessment standards.

Several empirical studies have examined methodological diversity in IS (Orlikowski and Baroudi 1991; Vessey et al. 2002). In contrast with considerable diversity in research topics and reference disciplines, lower level of diversity was identified in relation to research approaches (Orlikowski and Baroudi 1991; Vessey et al. 2002). As a result, calls were made for the IS discipline to move from a predominantly positivist perspective to embrace more interpretive studies (Alavi and Carlson 1992; Chen and Hirschheim 2004). The relationship of the IS discipline with reference disciplines has received significant attention (Wade et al. 2006; Grover et al. 2006), which is not surprising given the high reliance of IS research on reference disciplines, and the high level of diversity in the reference disciplines used in IS research. Results of studies suggest that, while the IS

discipline has made a modest impact on other disciplines it has not yet reached the status of a reference discipline (Wade et al. 2006).

The relationship between IS research and practice represents another issue critical to the development of the IS discipline. Established to address an immediate business need to understand and predict the consequences of computerization of the workplace, the IS discipline is by its nature an applied discipline. Yet, in its quest to gain legitimacy and position itself among the more established academic disciplines, IS academics placed significant emphasis on academic rigor, often at the expense of producing research relevant to IS practitioners.

Calls for increasing the relevance of IS research were made from late 1990s to early 2010s (Benbasat and Zmud 1999; Lytinen 1999, Straub and Ang 2008), but the IS academics continue to disagree on the means of achieving an acceptable balance between rigor and relevance. Several approaches to increasing the relevance of IS research have been proposed, ranging from the radical approaches of emulating medical and legal professions (Davenport and Markus 1999), to the more moderate approaches of institutionalizing applicability checks (Roseman and Vessey 2008), marshaling the practical experience of the doctoral students (Klein and Rowe 2008), adjusting the writing style of research publications, and utilizing a variety of ways to disseminate IS research (Straub and Ang 2008). Unfortunately, the rigor-relevance balance remains an elusive goal for IS academics (Gill and Bhattacharjee 2009); therefore, the rigor versus relevance debate is likely to continue into the future.

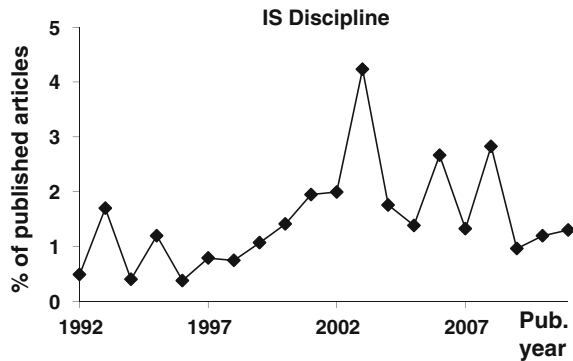
In addition to the recurring discourses outlined above, a significant share of IS-discipline-related publications is focused on issues related to the everyday operation of the discipline. A number of studies are concerned with ranking and characterizing IS journals. Examples include studies of publications and citations data in order to rank journals (Gallivan and Benbunan-Fich 2007), assessments of journal quality and suitability for IS research (Chua et al. 2003; Lewis et al. 2007), and examinations of relative journal influence using social network analysis (Polites and Watson 2009). A number of publications focus on research productivity of individual researchers and their institutions, as well as tenure and promotion standards (Dean et al. 2011; Dennis et al. 2006; Gallivan and Benbunan-Fich 2007).

A peak in research in the IS discipline occurred in the mid-2000s (corresponding to the renewed identity debate). However, in 2009–2011 publications levels returned to the levels common in 1999–2001 period. As many of the debates concern the perennial issues of the IS discipline development, they are likely to continue attracting attention as the discipline moves forward (Fig. 2.1).

2.2 IS Theory and Methods

IS Theories, Frameworks and Methods: The diverse and multidisciplinary nature of the IS discipline is evident from the variety of theoretical perspectives and methodological approaches that co-exist in IS research. Bridging the technical

Fig. 2.1 Trends for articles on the IS discipline



and social domains, the IS discipline draws on the social science as well as engineering research traditions. The social science tradition is represented by the economics-based and behavioral research, whereas the engineering tradition is epitomized by the design science approach in IS research.

The behavioral research tradition is represented by theories that can be broadly characterized along the following dimensions: causal agency, logical structure and level of analysis (Markus and Robey 1989). Causal agency refers to the assumption espoused by the theory regarding the causal agent, which is used to categorize theories into technological imperative, organizational imperative and emergent perspectives. The technological imperative perspective assumes the deterministic role of IT. The IS success model (DeLone and McLean 1992), as well as much of DSS, GSS and website design research is characterized by the technological imperative. The organizational imperative suggests that organizational change occurs as a result of the efforts of IS designers and developers, as well as free-will actions of IT users. The perspective is evident in the individual and organizational IT adoption and use research (Lamb and King 2003), as well as IS management literature. The emergent perspective suggests that technology and human actors interact, and such interaction results in the often un-intended use and consequences of IT. The structuration theory (Orlikowski 1992; Orlikowski and Robey 1991), and the adaptive structuration theory are among the better known examples of the emergent perspective in IS research.

The logical structure of theory refers to the relationship between dependent and independent variables (Markus and Robey 1989). Theories can be classified into variance and process theories. In variance theories, a change in the independent variable is assumed to be a necessary and sufficient condition for the change in the dependent variable. Technology acceptance theories (Davis et al. 1989, etc.), the IS success model (DeLone and McLean 1992), as well as much of the IS research conducted using positivist research methods is variance-theory based. In process theories, changes in independent variables are assumed to be a necessary, but not sufficient condition for the change in the dependent variable. IS theories are formulated at different levels on analysis, including system, individual, group, and organizational levels, with some theories seeking to explain how changes at one

level of analysis (e.g. individual IS use) influence changes at another level of analysis (e.g. organizational IS use).

IS behavioral research has also been characterized by different sets of ontological and epistemological assumptions (Orlikowski and Baroudi 1991), as well as assumptions regarding the goal of theory (Gregor 2006). Positivist IS research assumes that objective reality exists, and that knowledge of such objective reality can be obtained by applying scientific methods. Therefore, positivist researchers seek to uncover such objective reality in the form of underlying social and technical laws or regularities that can help predict future events. Consequently, positivist research studies are usually evaluated in terms of their ability to make conclusions about the underlying objective reality using such criteria as construct, statistical, internal and external validity. In contrast, interpretive researchers assume the existence of multiple socially constructed, subjective realities that can only be understood from the perspectives of individual actors. The goal of interpretive research is to gain understanding of events from the perspective of different parties involved. The evaluation of interpretive research is based on such principles as hermeneutic circle, contextualization, interaction between the researchers and subjects, abstraction and generalization, dialogical reasoning, multiple interpretations and suspicion (Klein and Myers 1999).

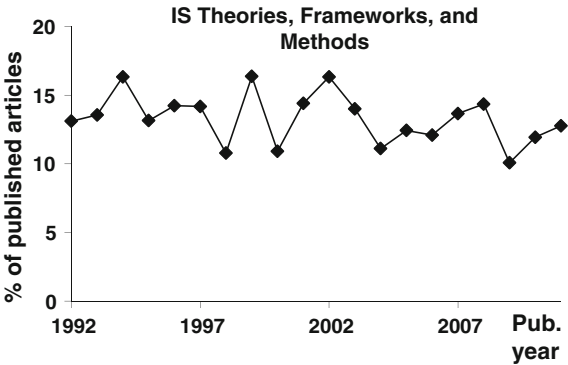
The goal of critical research is to reveal contradiction and conflict in the existing social order (Orlikowski and Baroudi 1991); hence, critical research studies need to be evaluated based on their ability to critique the existing status quo by drawing on core concepts from critical social theories, taking a value position and challenging the existing social practices, and transform the social order through individual emancipation, improvements in societies and improvements in social theories (Myers and Klein 2011). Whereas the positivist research has traditionally dominated the IS discipline (Orlikowski and Baroudi 1991), the interpretive and critical approaches received considerable attention in the 2000s.

The design science paradigm is rooted in engineering, and is usually concerned with the design, development and evaluation of new artifacts and approaches (Hevner et al. 2004; Gregor and Jones 2007). The goal of design science is to create innovations. Design science is not a substitute for behavioral research. Instead, behavioral and design research can co-exist and supplement each other (Hevner et al. 2004). Design research typically seeks to address some of the issues identified in behavioral research by proposing new technological or methodological solutions (Markus et al. 2002). In the recent years design science approach has received renewed attention in the IS academic community.

IS theories, frameworks and methods continues to be an important research theme, accounting for 10–15 percent of publications. As new theories and frameworks are introduced and evaluated, this theme is likely to retain a strong presence in IS research (Fig. 2.2).

Instrument Development and Validation: The idea of construct operationalization and measurement is deeply rooted in the positivist research tradition. With the goal of scientific research seen as uncovering universal laws governing the domain of study (Kerlinger and Lee 2000), researchers seek to create abstractions of

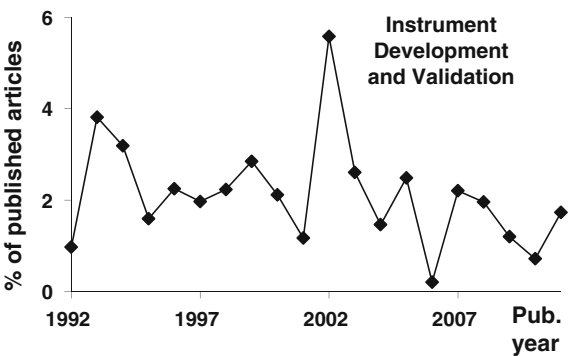
Fig. 2.2 Trends for IS theories, frameworks, and methods



reality using theoretical constructs, and then evaluate such systems of abstractions through theory testing. The pinnacle of theory testing is the ability of researchers to relate theoretical constructs to observable variables, and to measure such variables using measurement instruments. Consequently, an empirical test of a theory is only as good as the operationalizations of the theoretical constructs used in the study. This makes the issue of instrumentation validation and development inseparable from that of methodological rigor. Hence, the quest for rigor in the IS discipline was associated with an increased emphasis on instrument development and validation. Instrument validation typically precedes (conceptually and temporally) the assessment of internal and statistical conclusion validity (Straub 1989). Measurement instruments are typically evaluated in terms of reliability and construct validity, including face, content, discriminant, convergent, and criterion related validity (Kerlinger and Lee 2000; Boudreau et al. 2001).

Research streams in instrument development include construct development methodology (Straub 1989; Lewis et al. 2005), comparison studies between instruments, evaluations of existing instruments, suggested instrument extensions, enhancements, and development of scales for key constructs. Examples of instrument development and validation research include studies conducted to validate scales related to commonly used constructs such as user information

Fig. 2.3 Trends for instrument development and validation



satisfaction (Doll et al. 1995), information resource management (Lewis et al. 1995), information privacy (Smith et al. 1996) and individual trust in online firms (Bhattacharjee 2002). Measuring service quality received particular attention in IS research. Following the original introduction of the SERVQUAL instrument in 1990s (Pitt et al. 1995; van Dyke et al. 1997), its applicability has been explored in the many diverse areas of IT management (Jiang et al. 2002; Yang et al. 2005).

Research in instrument development and validation saw an increase in activity post-1992 as focus on methodological rigor increased. Since then, activity has remained relatively flat (Fig. [2.3](#)).

A Survey of Core Research in Information Systems

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