THE WHY, WHAT, AND HOW OF THEORIES IN IS RESEARCH

Completed Research Paper

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Abstract

Theory's pivotal importance has been continuously emphasized in the information systems (IS) discipline ever since its inception. The ability to understand and contribute to theory is an important qualification in the practice of research. Recently we see some of our reference disciplines turn towards reviving their examination of the concept and how it can help producing high quality scholarly contributions. In light of this trend, we suggest that also the IS discipline should intensify its discussion of theory and theorizing. We thus intend to synthesize and reflect upon the debate on theories and theorizing in the IS field. As such, our key contribution is to inform (new) authors about opportunities in theorizing and help them put the concept of theory to work for them. Through this, we hope to advance and support the discipline's current strive towards more theoretical thinking and the increasing demand for theoretical contributions.

Keywords: Theory building, IS theory, information systems research, philosophy

Introduction

Generating knowledge from data can be seen as one of the key contributions of science. Steinfield and Fulk (1990) suggest that accumulated data alone lacks the synthesis and integration needed for knowledge-based claims and compare it to a heap of leaves without a tree. This is further supported by Blalock (1969, p. 2) when he highlights that "any good social scientist knows that the facts do not speak for themselves, [but that] theoretical structures are critical." Examples for the centrality of theory can be found in many disciplines from natural (e.g., physics) to social sciences (e.g., sociology and psychology) (Atmanspacher 2007). Also, such an abstraction of observations into conceptual structures is not just a matter of the ivory tower alone, but carries implications for our ability as researchers to inform practitioners. This is illustrated by Highsmith (1999, p. 14): "Techniques without a theoretical base are reduced to a series of steps executed by rote."

A theoretical base can serve as a crucial basis for the *description*, *explanation*, and *prediction* of the phenomena it relates to – that is, offer an understanding of the what, how, and why behind the scenes (Whetten 1989). Such an understanding will, in turn, help researchers and practitioners alike in their attempt to move beyond rote routines in Highsmith's (1999) sense, but be able to understand the underlying conceptual structures that ultimately enable equally purposeful and meaningful actions. To do so, theories generally are systems of concepts and interrelationships among those that jointly explain the constituent elements of a phenomenon and show how and/or why it occurs (Gioia and Pitre 1990).

Theory's pivotal importance has been continuously emphasized in the information systems (IS) discipline ever since its inception. The legitimacy of the explanations offered by the IS field in comparison to its neighboring disciplines has often been discussed as one of the main motivations for our field's intense discussion about theory and theorizing (Frank 2006; Lyytinen and King 2004). Only through providing credible conceptual accounts will we, as a discipline, be able to compete in what Weber (1997, p. 2) calls the "race for credibility." Nevertheless, IS research seems to continuously struggle with its search for a theoretical core distinct from its reference disciplines in other sciences; let alone the discussion of whether it exists at all or whether we need it (Grover et al. 2006; Lyytinen and King 2004; Olbrich et al. 2011; Straub 2012; Straub 2006; Wade et al. 2006; Weber 2003a). As a possible negative effect, the ongoing search for a consistent domain identity has been described as leading the discipline into an identity crisis (Benbasat 2001; Benbasat and Zmud 2003). As early as during the first International Conference on Information Systems, Keen (1980, p. 9) predicted that "unless we build on each other's work, a field can never emerge, however good individual fragments may be." Moreover, the ability to understand and contribute to theory is an important qualification in the practice of research and, particularly, publishing. For example, the ability to combine empirical observations with theoretical abstractions is one of the key characteristics of publishable research (e.g., Sambamurthy in Lee 2001). Also, theory is consistently named as a top criteria for high quality research (Straub 2009).

Recently we see some of our reference disciplines turn towards reviving their examination of the concept of theory and how it helps producing high quality scholarly contributions (e.g., in management with contributions by Hillman 2011; Shapira 2011; Shepherd and Sutcliffe 2011; Suddaby et al. 2011; Thompson 2011; Tsang and Ellsaesser 2011). In light of this trend, we suggest that also the discipline of IS should intensify its discussion of theory and theorizing based on such landmark papers as Gregor's (2006) influential piece on the role of theory in IS research or Weber's (2012) recent contribution on aspects of quality of theories and theorizing.

On top of this, we suggest that revisiting theory and theorizing is also warranted to hone our discipline's skills in order to conceptually capture new phenomena. An example is the increasing permeation of more and more aspects of our daily lives with ubiquitous ICT; from social media to mobile devices. The related mangling of the technological and the social challenges our theorizing as evidenced, for example, in the difficulties associated with the turn towards Sociomateriality in the IS discipline (Mueller et al. 2012). This manifests in the acknowledgement that artifacts are, to a certain degree, generative in nature which requires us to reconsider how we account for them in our theories (Yoo 2013). To be prepared to theorize how our society is being reshaped in light of the above is one of our key motivations to reconsider theory and theorizing.

In this paper, we thus intend to synthesize and reflect upon the debate on theories and theorizing in the IS field. As such, the key contribution is to inform (new) authors about opportunities in theorizing and help them put the concept of theory to work for them. Through this, we hope to advance and support the discipline's current strive towards more theoretical thinking and the increasing demand for theoretical contributions – both within and outside of our own field. To do so, we start the paper by providing a brief motivation of theoretical work in section 2. In section 3, we continue by presenting the basic conceptual foundations of theory. Then, in section 4 we discuss the process of theorizing including its different modes and strategies. Section 5 then reflects on theory's role for IS research before section 6 provides some concluding thoughts.

WHY – A Motivational Background

Shapira (2011, p. 1320) sees "theory construction as the highest level of scientific inquiry." Above and beyond this, the need for a thorough examination of theory can strongly be rooted in our field's history. While we can only sketch out an overview here (for a more elaborate discussion see, for example, Hirschheim and Klein 2012), the field's evolution can perhaps roughly be described as from topics to methods to theories.[1]

The challenge in the era of topics (roughly from the 1960s to the early 1980s) was to define the essential areas of inquiry IS scholars are dealing with. Motivated by a call for more empirical insights to address "wide-ranging speculations about the effects of new technologies on organizations" (Klemmer 1973, p. 435), many researchers turned towards studying IS in the field. Despite this enthusiasm, though, the times were not without critics. For example, Dearden (1972, p. 90) commented that the "conceptual entity [of MIS] is embedded in a mish-mash of fuzzy thinking and incomprehensible jargon. It is nearly impossible to obtain any agreement on how MIS problems are to be analyzed, what shape their solutions might take, or how these solutions are to be implemented" – a thought that already points towards the increasing importance of theoretical considerations.

Despite advances in identifying the topics and domains of IS research, concerns about the methodological aspects started to be raised by the mid-1980s (Hirschheim and Klein 2012). As summarized by Banville and Landry (1989), some of the critics argued that IS at this stage was characterized by a lack of standardization of research methods (Khazanchi and Munkvold 2000). As a reaction, the methods era (most prominently until the late 1990s / early 2000s and probably even ongoing for some areas of the discipline) brought about an intensified discussion of methods through methods colloquia, edited collections, and influential essays (such as Chin 1998; Lee 1991; or Myers 1997 to name only a few examples).

Beyond better data alone, some of the discipline's key scholars started to express that in order to mature as a discipline, IS would also have to seek for better explanations. While visionaries had addressed this issue for quite a while, more and more of the discipline's leading scholars started to highlight the importance of the field's theoretical development (e.g., Zmud 1998). As, for example, illustrated by Keen's (1980) quote above, a key argument for theory is that it can be a vehicle for informing and guiding the discovery and creation of new knowledge by allowing researchers to build on more basic explanations previously established by their colleagues. Thus, theories facilitate accumulating knowledge in the process of scientific discovery. It is such a cumulative tradition that helps disciplines to advance their understanding of the investigated subjects and to use that knowledge to solve problems in practice (van de Ven 1989). Also, theory makes shared beliefs explicit (Watson in Lee 2001). Since the beginning of the theory era (around the mid-1990s), several scholars have complained about a lack of such an IS-specific cumulative tradition of theory (e.g., Lee 2001; Weber 2003b).

Furthermore, the IS discipline has often been criticized as to merely borrowing theories from other disciplines instead of creating its own (Straub 2012). And in fact, many of the phenomena observed in IS research have rather been explained using theories from neighboring disciplines such as sociology or psychology on the behavioral side and computer science or engineering on the technical side (Baskerville and Myers 2002; Dwivedi et al. 2009; Gregor 2006). As a result, IS is often not fully recognized as a field, seems to have difficulties in publishing its results, and finds itself confronted with a stiff competition for scarce resources in journal space, managerial attention, research funding, and bright young minds (Hirschheim and Klein 2012).

An aspect that has further promoted the theory debate in the IS field is the ongoing and intense discussion in some of our most important reference disciplines. Most prominently, perhaps, the field of management research has seen a number of landmark contributions that seem to periodically provide an opportunity for scholars of this discipline to synthesize and advance their disciplinary understanding of what theory is and means for their research. Perhaps most importantly, the Academy of Management Review delivered impressive collections of detailed reflections on theory and its role for management research in 1989

[1] We acknowledge that this linear model can be seen as a rather crude simplification and want to emphasize that we draw upon it only to illustrate the discipline's increasing attention towards theory. In reality, the three aspects of topics, methods, and theories are likely overlapping and any new aspect of IS research might go through an intense phase of clarification for all three until the respective research community has reached consensus on how to address the phenomenon at hand.

(Bacharach; Chimezie; Eisenhardt; Poole and van de Ven; van de Ven; Weick; Whetten), 1994 (Doty and Glick; Klein et al.), and 1999 (Dansereau et al.; Drazin et al.; Elsbach et al.; Folger and Turilo; Klein et al.; Langley; Lewis and Grimes; McKinley et al.; Morgeson and Hofmann; Pentland; Tsang and Kwan; Weick; Zaheer et al.). Beyond this, also the Administrative Science Quarterly contributed a controversial debate on what theory and theorizing might or might not be in 1995 (DiMaggio; Sutton and Staw; Weick). In the last years, both the Academy of Management Journal and Review have been picking up the debate once more: first in 2007 (Alvesson and Kärreman; Colquitt and Zapata-Phelan; Hambrick; Hitt et al.; van Maanen et al.) and, more recently, in 2011 (Corley and Gioia; Hillman; Oswick et al.; Shepherd and Sutcliffe; Suddaby et al.; Thompson; Tsang and Ellsaesser). And even beyond management, reference disciplines such as, for example, sociology (e.g., Boudon 1991; Freese 1980; Merton 1967; Parsons 1950; Ritzer 1990) show a both long-standing and intense debate on the nature and role of theory and its implications on theorizing in their scholarly work.

Looking at this development, it seems that a discipline profits from reflecting on the advances in theory every five to ten years. This should not only involve the nature of theory alone – that is, for example, its constituents, new conceptualizations, and integration of nomological nets – but also is an opportunity to think about how the way we are working with theory has evolved, which role it plays for our discourse, and what new approaches to theorizing exist. While the IS discipline has seen a few recent contributions in that vein (e.g., Hovorka et al. 2013; Straub 2012; Weber 2012), we extend this discussion by carefully reflecting on what we already know and what we seemingly embodied about theory and theorizing. Building on what can be learned about *what* theory is and *how* we theorize, the following two sections synthesize the state of the discussion on theory across the disciplines and will look for implications that can be applied in our field.

WHAT – Conceptual Foundations of "Theory"

The emergence of the term *theory* can be traced back to some of the perhaps most influential philosophers of science in the late 17th and early 18th century (esp. Hume 1748; Locke 1689) and is probably one of the core concepts that determined the emergence of *science* in contrast to *philosophy* (Bryson 2004; Okasha 2002). Etymologically, the term can be derived from the Greek θεωρία ("*theoria*") which was used to describe a contemplative or speculative interpretation of natural phenomena. As such, theory is an abstraction of the empirical and an important vessel to document our understanding of the world (Mittelstraß 2004). Popper (1980, p. 59) expresses this understanding by referring to theories as "nets cast to catch what we call 'the world' – to rationalize, to explain, and to master it." As for today, Weick (1995, p. 386) proposes that "theory belongs to the family of words that includes guess, speculation, supposition, conjecture, proposition, hypothesis, conception, explanation, [and] model." He continues to observe that "if everything from a 'guess' to a general falsifiable explanation has a tinge of theory to it, then it becomes more difficult to separate what theory is from what isn't." Accordingly, attempts to define what theory is or is not are often difficult and are made even harder by the fact that theory is approximated more often than it is realized, which suggests that theory is a continuum rather than a dichotomy (Runkel and Runkel 1984; Weick 1995). Acknowledging this difficulty, Sutton and Staw (1995) choose a reverse approach in highlighting that references to prior work, mere empirical data, lists of variables and constructs, diagrams, as well as hypotheses (and predictions) by themselves are rarely if at all real theoretical contributions. But while the difficulty to conceptually grasp what theory is can be regarded comforting for all those among us who struggle with it, it also means that limited guidance is provided for current and aspiring researchers that intend to move the IS discipline forward theoretically.

When defining theory, one of the perhaps most influential definitions is proposed by Bacharach (1989). He defines theory as a system of statements targeted at *describing*, *explaining*, and *predicting* real world phenomena. To do so, a scientific theory is a system composed of two core constituents: (1) constructs or concepts and (2) propositions as relationships between those constructs. Collectively, this system presents a logical, systematic, and coherent explanation of a real-world phenomenon within certain boundaries (summary of Bacharach 1989). With respect to the latter, Weber (2012, p. 4) highlights that theories often analytically separate the phenomenon they describe from the context it naturally occurs in in that such a system represents "a particular kind of model that is intended to account for some subset of phenomena in the real world." Thus, the boundaries of a theory are often added as a third constituent.

Constituents of Theory

A closer look at constructs reveals that "such higher order concepts are called constructs because they refer to instances that are constructed from concepts at lower levels of abstraction" (Jaccard and Jacoby 2009, p. 13). As such, they are "approximated units" or a "broad mental configuration of a given phenomenon" (Bacharach 1989, p. 500). They exist only in the world of conception (Ghiselli 1964) and are thus, as hypothetical concepts, not observable directly (MacCorquodale and Meehl 1948). The key purpose of constructs as conceptual abstractions beyond individual empirical observations is to function as heuristic devices for making sense of the empirical beyond the individually observed instances of a phenomenon (Nunnally and Bernstein 1994).

As one of the key constituents of theories, the clarity of constructs is important. There must be a precise understanding of what is being conceptualized. In his seminal editorial on construct clarity, Suddaby (2010) suggests four criteria that help improve the quality of constructs and the theories they belong to. First, empirical phenomena have to be translated into theoretical constructs by means of *definitions*. Thereby, good definitions should be comprehensive, precise, and parsimonious. Second, Suddaby (2010) emphasizes that clearly stating the *scope conditions* of constructs contributes directly to building strong theory. Following the recommendations of Whetten (1989), a theory should provide answers "to what the constructs are, how and why they are related, who the constructs apply to, and when and where they are applicable" (Suddaby 2010, p. 350). Third, Suddaby (2010) emphasizes the importance of *coherence* or *logical consistency*. Thereby, he refers to the ability of a theorist to create logically consistent and theoretically integrated arguments. Finally, fourth, the *relationships between constructs* have to be drawn out in a fashion that the reader can understand. Therefore, Suddaby (2010, p. 350) suggests "to demonstrate the historical lineage of a new construct and position that construct on the horizon of extant related constructs."

Based on the latter, constructs rarely make sense in isolation – or, as Suddaby (2010, p. 350) puts it: "No construct is an island." Quite contrarily, constructs are implicitly defined in terms of a network of associations with observables and other constructs (Cronbach and Meehl 1955). The former refers to associations between a construct and the variables that (reflectively or formatively) specify it; and link it to the empirical. As discussed by Kaplan (1964, p.55), even though constructs are "[…] not observational either directly or indirectly, [they] may be applied or even defined on the basis of the observables." The latter – that is, the relations to other constructs – highlights the need to consider the links among constructs.

Turning back to Bacharach (1989), these links enable researchers to draw conclusions about the mechanisms and dynamics of a phenomenon described by a certain set of constructs and propose explanations and predictions about their empirically observable behavior. These propositions, thus, are conceptual arguments about how and why certain constructs share relationships and the nature of these relationships. Bhattacherjee (2012) highlights that it is the patterns that emerge based on these relations that form the basis for explaining and predicting. He defines propositions as "[…] tentative and conjectural relationships between constructs that are stated in a declarative form[, …] must be empirically testable[, …] and can be judged as true or false" (p. 16). However, with propositions describing the relationship between constructs, they, too, are bound to the conceptual and cannot be tested directly. Bacharach (1989) therefore introduces the distinction between propositions on the conceptual level as well as hypotheses on the empirical. Much like empirically observable variables instantiate constructs, hypotheses are derived from propositions to provide evidence about whether the proposed relationship between two constructs holds in reality – or, in simpler terms, is true or false. The observations and conclusions from empirically testing hypotheses then serve as logical evidence to support or refute the proposition. As such, "propositions are generally derived based on logic or empirical observations" (Bhattacherjee 2012, p. 16).

But such proposed relationships cannot be expected to hold true universally. As indicated by Dubin (1978), all theories are constrained by their specific critical bounding assumptions. Looking, once more, at Bacharach (1989, p. 496), "a theory is a statement of relations among concepts within a set of boundary assumptions and constraints." The assumptions and constraints that limit the theory's applicability generally cover issues such as values (e.g., national or organizational culture the phenomenon is embedded in as well as the researcher's own values), time (e.g., certain historical contexts or statements of duration), and space (e.g., collocated or distributed teams). Gregor (2006) builds upon the boundary notion and shows how it allows us to draw conclusions about the degree of generality (i.e., generalizability) of a theory.

The three constituents introduced above – (1) constructs as the fundamental concepts covered by a theory, (2) propositions as the relationships among these constructs, and (3) boundaries that constrain the context in which the theory is applicable – indicate that a theory is created if all these elements come together. In turn, said theory is then characterized by a unique network of constructs and relations and can be delineated from similar theories based on its boundaries. The resultant system of constructs, propositions, and assumptions is then also referred to as a nomological network. Such nomological networks are among the perhaps most important concepts in regards of the *what* of theory. In essence, the term describes the network that emerges when various constructs are put in relation to one another – also described as a system of signification (de Saussure 2000). It is generally described as serving a dual function (Börner 2007): On one hand, the nomological net helps to implicitly define constructs through understanding to which neighboring constructs any one construct is linked and what the nature of these links is. On the other hand, this leads to an ability to (statistically) assess the validity of a construct – one of the initial purposes for introducing the concept of the nomological net into theorizing (Cronbach and Meehl 1955) – in terms of how well it fits into such a network (Mayer et al. 2008). As such, a nomological network can be understood as "make[ing] clear what [a theory] is" by looking at the "interlocking system of laws which constitute a theory" (Cronbach and Meehl 1955, p. 290). Examples for such nomological networks can be found in the work of Furneaux and Wade (2009, reviewing a set of networks from IS research as well as proposing a nomological network chartering the intellectual core of the IS discipline) or in a recent analysis by Hovorka et al. (2013, integrating separate nomological networks).

Once such a nomological network – constituted by constructs, propositions, and boundaries – is in place, a final step is to think about an appropriate way of representing and communicating it. With theories being conceptual in nature, they naturally rest in the mind of the researcher who initially proposed them or are mental configurations shared among a group of researchers (such as disciplines or schools). In order to inform our understanding of the phenomenon they conceptualize, Gregor (2006) proposes that a "theory must be represented physically in some way" (p. 620) to make it "accessible to more than one person" (p. 621). She identifies words, mathematical terms, symbolic logic, diagrams, tables, or figures as possibilities to physically represent such a conceptual network. However, it is important to note that one theory can have more than one form of representation (e.g., explained in words and depicted in a figure). Nonetheless, "diagrammatic representations are crucial in describing and communicating […] theorizations" (Langley et al. 2013, p. 8).

Forms of Theory

While the above introduces the basic building blocks that constitute a theory, we'd like to remind ourselves that it is not an easy task to tell apart conceptual statements that are theory from those that are not (Sutton and Staw 1995). Acknowledging this challenge, we would now like to extend our treatment of theory by looking at different manifestations or forms such theories can take. In one of the most influential contributions in this vein, Gregor (2006) suggests that some of the constituent properties are contingent on a theory's purpose. She introduces a set of five theory types where each corresponds to a different purpose. The most basic of such purposes is making a phenomenon of interest accessible to scientific investigation. She introduces theories for analysis and description (type 1) as contributions that serve this purpose. They conceptualize a given phenomenon by translating it into an abstract representation that will allow the recognition of patterns between various instances of the respective phenomenon. With those patterns emerging from the empirical observation of the phenomenon, theories gradually grow beyond the mere description of the phenomenon and begin to enable explanations of why certain observations occur. The corresponding type 2 theories (theories for explanation) stress the causal and conceptual links between the various constructs that interact while the phenomenon takes place. Some theories can reliably predict observations without necessarily being able to explain why the predicted outcome occurs (theories for prediction; type 3). As a potential next step, theories integrate explanation and prediction into a comprehensive model (theories for explanation and prediction; type 4). Following the idea of the IS discipline as a science of the artificial (Gregor 2009; Simon 1996), an understanding of phenomena that incorporates some degree of explanation and prediction enables the design of a corresponding information system that acts in a way that constitutes a predictable intervention in the system and produces a desired outcome (theories for design and action; type 5).

A form of theory closely associated with this latter type is the artifact. Often described as constructs, models, methods, or instantiations (Hevner et al. 2004), an artifact can generally be referred to as an artificial, man-made thing that was purposefully created to serve a particular purpose or have a specific meaning in a given context. In general terms, such artifacts are then introduced into said context to change the outcome of a phenomenon. To that end, an artifact will thus entail a certain level of understanding about the phenomenon and becomes a vessel for documenting and testing theoretical knowledge (Carroll and Kellogg 1989). In design research, the artifacts relation to general knowledge is often documented in so called design theories (Gregor and Jones 2007; Piirainen and Briggs 2011). Despite the fact that calls for more clearly defining what the IS artifact actually is are over a decade old (most notably Orlikowski and Iacono 2001), a precise and commonly agreed upon definition is still missing. As a result, the design research community seems to engage heavily in a discourse on how theoretical design is or needs to be and how theory relates to the artifact (e.g., Baskerville et al. 2011; Gregor 2009; Junglas et al. 2011). Nonetheless, the nature of the IS discipline as dealing with artifacts as a science of the artificial in Simon's (1996) sense is often emphasized as a constituent characteristic of our discipline (e.g., Gregor 2009; Holmström et al. 2009).

Besides the nature of theory, Markus and Robey (1988) also draw our attention towards the distinction of different forms of logical structure embedded in a theory.[2] They draw upon Mohr's (1982) classical distinction between process and variance theories to explain different forms a theory can take. While there are a number of important logical differences,[3] variance theories differ from process theories in their assumptions about the relationship between antecedents and outcomes. Mohr (1982, p.36) highlights that "the distinction between process theory and variance theory is best conceptualized in terms of necessary and sufficient conditions as modes of explanation." This means that "in variance theory the precursor is a necessary and sufficient condition for the outcome" (Mohr 1982, p.37). In contrast, process theories generally only posit the precursor as a necessary condition for the outcome, not a sufficient one (Mohr 1982) and are more interested in explaining how outcomes develop over time (Markus and Robey 1988). As such, "process theories assert that the outcome can happen only under [certain] conditions, but that the outcome may also fail to happen [while] variance theories posit an invariant relationship between causes and effects when the contingent conditions obtain" (Markus and Robey 1988, p. 591). While process theories can be criticized as they "allow for the possibility of other, more powerful causal factors influencing the outcome, and evoke the possibility of spurious, epiphenomenal relationships," they generally compensate for this by rich descriptions of "a combination of necessary conditions with probabilistic processes in a specified time sequence" (Soh and Markus 1995, p. 30) – a characteristic which Mohr (1982, p. 37) refers to as a "recipe."

While process and variance are perhaps the two dominant forms of logical structure in IS theories, Burton-Jones at al. (2004) point out that these two need to be complemented with yet a third form of theory: the systems approach. As discussed by Mattessich (1978, p. 277), "the systems approach is based on the insights that the interrelations of certain components result in a [new] system with its very own properties" and emphasizes the components, relationships, as well as the properties and boundaries of that system in contrast to its environment. As such, the systems approach to theoretical thinking is strongly rooted in the ideas of system theory (Bertalanffy 1951; Luhmann 1984) and posits that the world is comprised of wholes and parts that change over time (Boulding 1956). This makes system approaches particularly appealing to multi-level issues, as a consideration of the process through which the whole emerges from the interactions of the parts is uniquely able to capture issues of structure and social shaping. Consequently, Kozlowski and Klein (2000) highlight that a researcher employing system thinking has to pay close attentions to the role of time in her/his theory as the behavior of the parts is generally more dynamic than the behavior of the whole and that the shaping of the whole thus tends to lag behind. Also, all parts of the system (i.e., any individual part, the whole, and all the other individual parts) are linked together by mutual feedback and feedforward mechanisms. This reciprocity, together with the emergence discussed before, are the two perhaps most decisive differences of system theories over process and variance approaches (Burton-Jones et al. 2004).

Range of Theory

Another distinguishing characteristic of theories can be derived from once more looking at IS' reference disciplines. Here, the historical evolution of a theory is often depicted as a process in which it emerges or is built based on a strong basis of descriptive narratives (Holmström et al. 2009; Maanen 1989). While such empirical accounts help theoretical considerations to be based on fit and relevance with their principle problem domain (Glaser and Strauss 1967), this process also highlights that knowledge grows by extension and that providing accounts of small but comprehensible events is a chance to start building cumulative theory (Sutton and Staw 1995; Weick 1989, 1992). While this isn't necessarily a natural starting point of any theory's existence, it provides an opportunity to anchor one end of the range continuum. Here, *substantive theories* are early contributions that are often bound to a specific context or are contingent on a high number of yet unexplored factors possibly impacting the phenomenon (Gregor 2006; Weick 1992). As theoretical statements are observed to be valid across various different instances of the phenomenon, following this process will produce stronger theories of increasing range (Dey 1999; Shapira 2011). This, in turn, should increase our confidence in

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[2] Markus and Robey (1988) also look at "causal agency" and "level of analysis" to look at different explanations of organizational change. While these are important aspects as well, we consider them beyond the scope of this paper.

[3] For an overview of important characteristics please refer to Mohr (1982), Markus and Robey (1988), or Soh and Markus (1995).

these theories (Meehl 1967). For example, Glaser (1978) provides guidelines for developing more advanced theory based on prior substantive theories. Such *mid-range theories* show some degree of generalization either based on the empirical design used to support them or by diligently connecting them to established theoretical explanations of their conceptual statements (Boudon 1991; Merton 1967). *Formal theories* – also referred to as *grand theories* – exhibit an even higher range or degree of generalizability, for example through repeated empirical testing and refinement and/or exhaustive knowledge about a phenomenon's contingencies (Parsons 1950). While there remains some controversy over the *mid-range* and *grand* distinction (most noticeably rooted in the positions developed by Merton (1967) and Parsons (1950)), the general range of the degree of generalizability seems to be a little contested fact among theorists. Closely connected to this is also the long-standing debate on fecundity (also referred to as "richness" or "completeness") versus parsimony in theories (Wacker 1998; Weber 2012; Weick 2007). While the former are generally very rich in detail and offer unique insights into the complexity of the given context they emerge from, the latter are simpler explanations involving fewer propositions and constructs. Based on the fundamental principle of Ockham's Razor, such simpler theories with a higher range are generally preferable, even though a fundamental trade-off between parsimony and fecundity needs to be made (Weber 2012).

For IS, Lee and Hubona (2009) suggest two general forms of validity of theoretical considerations. *Formative* validity of a theory describes a theory's property to adequately capture a phenomenon's concepts and their relations and is achieved through a diligent theory building process over time. *Summative* validity means that it survives repeated empirical testing and that its external validity grows as the theory is able to model, explain, and predict more and more instances of the phenomenon. Hence, substantive, mid-range, and formal/grand theories can (and need to) coexist in order to explain a complex social or socio-technical phenomenon.

An issue that we believe deserves particular attention is the emergent discussion on different levels of abstraction of theories. Looking at the discussion above, theories of all different ranges (from substantive to grand) share the commonality that each of them is a theory about a specific phenomenon that, ultimately, is observable empirically. However, there are theories that are difficult to apply to the empirical directly. These so-called *meta-theories* outline ontological networks of constructs and relationships applicable over several areas of investigation (Milton and Kazmierczak 2006; Straub et al. 1995). As such, they transcend the empirical theories describe above in that they are theories about theories of the empirical world, rather than an abstraction of the empirical (Furfey 2011). Much like meta-models in software engineering, meta-theories can be used to as guidelines for creating context or system-specific theories and thus serve as a sort of gauge. In this, a meta-theory does not aim to specify each instance of any given phenomenon (i.e., empirical observations underlying a given theory) (Milton and Kazmierczak 2006), but it provides an ontological arrangement of constructs and of abstracted assumptions and relations (Ritzer 2001). As such, it offers an overarching perspective, facilitates theory development, and allows for a more profound understanding of theory (Gregor 2006; Ritzer 2001).[4] Examples of such meta-theory are structuration theory (Giddens 1984, 1985), socio-technical systems theory (Bostrom et al. 2009), or Metasociology (Osterberg 1991).

HOW – Terminological Foundations of "Theorizing"

As van Maanen et al. (2007, p. 1148) put it, "good theory is difficult to produce, and unlike pornography, we may not even recognize it when we see it." This suggests that a mere product perspective is not enough, but that a process perspective on theory is needed. In this sense, the term "theorizing" equally refers to evolution of theory over time as well as to the process of theory emergence in the first place. Thereby, product (theory) and process (theorizing) don't have to be competing or contradicting views. Rather they are mutually constituent and complementary. Depending on the researcher's perception of the relationship between process and product, theorizing can be understood as "any process as long as it produces theory" or as "a process that inevitably produces theory." Although literature on this topic seems "sparse and uneven, and tends to focus on outcomes and products rather than processes" (Weick 1989, p. 517), some approaches have been proposed.

In the literature, many different ways of how to actually do theorizing have been proposed and discussed (e.g.,

[4] We acknowledge that "meta-theory" is sometimes used as in meta-analysis or -studies. In this regard, the term refers to a theory that emerges from a synthesis of multiple theories that are grounded in their own respective empirical observations but that have been separate theories so far. This is done through either boundary-spanning constructs – that is, constructs shared by two or more theories (Furneaux and Wade, 2009) – or a careful construction of an overarching meaning (Bostrom et al., 2009; Uto, 2005). Medical research provides many examples of meta-theorizing. We do, however, propose that such theories could also be referred to as higher-order theories as they, too, are describing the empirical. Consequently, we use meta-theory in the sense of theory about theories.

Dubin 1976; Freese 1980; Gioia and Pitre 1990; Jaccard and Jacoby 2009; Weber 2012). Generally, theorizing can be understood as a form of reasoning, that is, an attempt to craft conceptually convincing argument to describe, explain, and predict phenomena observed in the empirical world (Ochara 2013). In this vein, theoretical reasoning can be conceived as "the process of using existing knowledge to draw conclusions, make predictions, or construct explanations" (El Alfi et al. 2009, p. 8). Part of theorizing thus is the usage of general knowledge to explain and predict individual cases. Vice versa, general knowledge is built from an additive understanding of repeated observations of similar phenomena in the past. Theorizing, at its heart, thus seems to be an iterative and never-ending dance: from the specific to the general, and from the general back to the specific. These two parts of the dance are also termed as inductive and deductive reasoning respectively.

Considering both inductive and deductive reasoning, Steinfield and Fulk (1990) present four major approaches to theorizing. The first approach is *inductive theory building* in which researchers formulate theories based upon observed patterns of events or behaviors. Using this approach, observed patterns are explained by referring to the unique attributes of the phenomenon in question. The second approach is to build theories based on a *bottom-up conceptual analysis* of different sets of predictors potentially relevant to the phenomenon under investigation. The resulting framework is then used as a heuristic guide to develop propositions regarding the phenomenon. The third approach is to *extend or modify existing theories* to explain a new context. In this approach, basic theoretical foundations are modified to account for context changes, such as a different organizational setting in which new technologies are employed. Finally, the fourth approach is to *apply existing theories in entirely new contexts*. "By conceptually equating a less-understood with a better-understood phenomenon, scientists mobilize an existing body of knowledge to help deduce expectations for the new situation" (Steinfield and Fulk 1990, p. 18).

While all of these four approaches could be discussed in great detail, we focus the following paragraphs on an introductory overview of induction and deduction as the most dominant modes of theoretical reasoning (Hyde 2000; Kirkeby 1994; Ochara 2013; Spens and Kovács 2006). In doing so, we take a closer look at respective theorizing strategies in IS and its reference disciplines to better understand how they shape and inform our theorizing. Nonetheless, it is important to acknowledge that also other forms of theorizing exist. Most notably, we will briefly discuss retroductive and abductive theorizing. We also take a brief look at what we term pragmatic theorizing, summarizing approaches such as design and action research.

Inductive Theorizing

Inductive reasoning starts with observations that are specific and limited in scope, and results in a generalized conclusion that is likely, but not certain, in light of accumulated evidence (Jamani 2011). Induction involves a process in which general rules evolve from individual cases or observations of phenomena ("data-driven") on the basis of a posteriori explanations (DePoy and Gilson 2007). On one hand, inductive reasoning can provide valuable insights and – due to its *ampliative nature* – actually increase human knowledge, thus make predictions about future events or as-yet unobserved phenomena. On the other hand, it is based on a set of observations which is not complete and, thus, cannot yield certainty (Gauch Jr. 2002). In general terms, "climbing the ladder of abstraction by inferring the general theoretical phenomenon of which the observed particular is a part [...] is perhaps the most critical move in theory building" (Langley et al. 2013, p. 8). In IS and its reference disciplines, many paradigms for inductive theory building exist; common examples are case-based theory building, grounded theory, as well as simulation and experiments.

Case-based theory building is a research strategy that uses one or more cases to create theoretical constructs, propositions, and/or midrange theory from case-based, empirical evidence (Eisenhardt 1989). According to Yin (2003), case studies are rich, empirical descriptions of particular instances of a phenomenon that are typically based on a variety of data sources. Such cases are used as the basis for developing theory inductively. The resulting theory is emergent as it is "situated in and developed by recognizing patterns of relationships among constructs within and across cases and their underlying logical arguments" (Eisenhardt and Graebner 2007, p. 25). Case study research is considered a viable IS research strategy, since (1) researchers can study information systems in a natural setting, learn about the state of the art, and generate theories from practice, (2) it allows the researcher to answer "how" and "why" questions, thus, to understand the nature and complexity of the processes taking place, and (3) it is an appropriate way to research an area in which few previous studies have been carried out (Benbasat et al. 1987). Accordingly, case-based theory building has received considerable attention in the IS field as reflected by several methodological contributions to this approach to theorizing (e.g., Benbasat et al. 1987; Dubé and Paré 2003; Klein and Myers 1999; Lee 1989; Paré 2004).

Another strategy is the *grounded theory method* (Corbin and Strauss 1990; Glaser and Strauss 1967; Mueller and Olbrich 2011b; Suddaby 2006; Urquhart et al. 2010). The basic assumption of grounded theory is that it focuses on the understanding of a phenomenon by looking at its facets in different contexts. It does not primarily take a variance perspective, but aims at understanding the underlying constructs, their relations, and the dynamics of these relationships in a continuous interplay between data collection and analysis (Mueller and Olbrich 2011b). As a result, grounded theory allows for original and rich findings that are closely tied to the underlying data (Orlikowski 1993). In IS research, grounded theory has proved to be useful for the development of context-based, process-oriented descriptions and explanations (Myers 1997). However, grounded theory studies have also been criticized for having a relatively low level of theory development which makes the appropriate use of this approach even more essential (Urquhart et al. 2010).

Furthermore, *simulation and experiments* are increasingly considered important methodological approaches to theory building. *Simulation* is particularly useful when the theoretical focus is longitudinal, nonlinear, or procedural, or when empirical data are challenging to obtain (Davis et al. 2007; Repenning 2002; Zott 2003). Thus, "simulation can be a powerful method for sharply specifying and extending extant theory in useful ways" (Davis et al. 2007, p. 480). To counter critical voices arguing that simulation methods often yield very little in terms of actual theory development, Davis et al. (2007) offer a roadmap for how to use simulations to develop theory and position simulations within the broad context of theoretical development. Very similar to simulation, the use of *experiments* can address problems and limitations encountered in other methodologies, and thus aid theory development (Croson et al. 2007). Although probably being underrepresented in comparison to other approaches, the IS literature has put forth some papers that vividly demonstrate the use of simulation and experiments for theory building (e.g., Abdel-Hamid 1988; Tung and Quaddus 2002).

Dubin (1976) provides some guidelines for the construction of theoretical models that can be applied to and utilized in real-life situations. According to that, the process of building a theory, which "requires hard work and ingenuity" (p. 26), initially comprises three major steps. First, the researcher starts with a selection of things or units ("variables") which s/he is curious about in terms of how they interrelate in the real world. The second step in building a theory is to determine how the selected units are related to each other conceptually, that is, a mode of relationship among the units needs to be specified in detail ("laws of interaction") and the domain of the theory needs to be determined ("boundary specification"). The third and final step is the specification of states in which the model or theoretical system operates ("system states"). After having set forth the components of a theoretical model, the actual use of such a model should be considered. Therefore, as a first step, a logical elucidation of the model itself should be conducted. It consists of making "as many truth statements that derive from the model as suit the tastes or interests of the theorist" (p. 29) which constitute the propositions of the theory. After the propositions have been defined, the researcher becomes concerned with determining whether the model has any connection with the empirical world (i.e., testing of one or more of the propositions). For testing, each proposition has to be converted to a hypothesis by substituting an empirical indicator for each unit in the proposition. In order to contribute to both research and practice, researchers should be aware of the "twin scientific goal of prediction and understanding" (p.30). While from the practitioner's perspective, a theoretical model is best judged by the accuracy of the predictions generated by it, a researcher may appreciate a theory because of the understanding it contributes to her or his knowledge.

As an alternative approach to building new theories, Shepherd and Sutcliffe (2011) present an inductive top-down model of theorizing grounded in a coherence framework and a pragmatism perspective. This model is top-down in that is informed by the literature, but inductive in that it begins with the data from which a theory is built. Inductive top-down theorizing "may enhance the discovery or creation of a paradox (within or across paradigms) and is especially appropriate when the body of previous research is vast, dynamic, complex, and/or from disparate sources" (p. 374). Conversely, this approach may be less appropriate when bodies of literature are narrow, stable, simple, and well integrated.

Deductive Theorizing

Conversely to induction, *deductive reasoning* begins with the assertion of a general principle or belief and proceeds to apply that principle to explain a specific phenomenon (Jamani 2011). Deduction is drawing logical consequences from premises; if the original assertions are true, then the conclusion must also be true. Effectively used in combination with a powerful theory as a priori explanation ("theory-driven"), strict logic of deductive reasoning can result in absolutely certain conclusion (DePoy and Gilson 2007). However, while deductive reasoning can be used to make observations and expand implications, "the conclusion of a deductive argument is already contained – usually implicitly – in its premises" (Gauch Jr. 2002). Thus, it cannot make predictions about non-observed phenomena due to its *non-ampliative* nature (Gauch Jr. 2002).

As pointed out by Dubin (1976, p. 18), "we seem to value deductive theorizing much more than inductive theorizing." In a deductive approach to theorizing, researchers often select explanations from the large range of reference theories. There is a common opinion in our field that only few truly IS-specific theories have emerged in the past years (e.g., Burton-Jones et al. 2004; Weber 2003a); through some controversy has emerged (e.g., Moody et al. 2010; Straub 2012). This is perhaps why many phenomena observed in IS research are explained using theories from neighboring disciplines (Baskerville and Myers 2002; Gregor 2006; Schneberger and Wade 2007). According to Agarwal, "theories and concepts from sociology, economics, and organization theory can assist IS researchers in the formulation of conceptual models that help us gain insights into these questions" (Agarwal in Lee 2001, p. xiv). A popular example in which the theoretical reasoning in a reference theory has been adapted to explain an IS-related phenomenon is the Technology Acceptance Model (Davis 1989) which is based on the Theory of Planned Behavior (Ajzen 1991) which, in turn, was developed from the Theory of Reasoned Action (Fishbein and Ajzen 1975); with the latter two originating from social psychology.

When researchers decide to adopt reference theories to the IS domain, they need to carefully consider the imported theory's basic parts and their fit to the phenomenon, the "dependent variable" and how it matches the phenomenon, the boundary conditions and whether the phenomenon is inside them, as well as the theory's ability to rule out alternative explanations. Further issues are the fit between selected theory and phenomenon of interest, the selected theory's historical context, how the selected theory impacts the choice of research method, as well as the theorizing process' contribution to cumulative theory (Truex et al. 2006).

While borrowing theories from reference disciplines can be interpreted as a sign for the relevance of IS research at the intersection of its adjacent disciplines, many scholars – IS and non-IS – have complained about the lack of an IS-specific cumulative tradition and emphasize the importance of generating IS-specific theories (e.g., Lee 2011; Weber 2003b; Zmud 1998). As a potential remedy, Oswick et al. (2011) see the major constraint of a plain deductive process of theory building in that it focuses attention on issues of refinement, resonance, and extension. This emphasis closes down the space for generating genuinely new and radically homegrown theories. To counterbalance the prevalence of this one-way borrowing, they propose a two-way dialectic process of conceptual blending based on dissonant thinking, disanalogy, and counterfactual reasoning. In doing so, they aim to promote a new way of thinking about theory development and to stimulate the generation of new and more radically home-grown theories.

More hands-on advice for deductive theorizing is given by Sparrowe and Mayer (2011) who make suggestions for grounding hypotheses, which "is one of the most important tasks in crafting effective theory" (p. 1101). According to these recommendations, researchers should (1) position hypotheses in relation to related research, (2) develop a clear, logical argument explaining why the core variables or processes are related in the proposed fashion, and (3) create a sense of coherence in the relationships among the variables and processes in the proposed model – criteria all of which we believe to be in sync with what Suddaby (2010) suggested to improve construct clarity. On the other side, common pitfalls in grounding hypotheses that should be avoided include lack of specificity, fragmented theorizing, and stating the obvious.

Classically, this form of theorizing is found in methodological approaches such as, for example, survey and experimental research. Survey research involves the use of standardized questionnaires to collect data about people and their preferences, thoughts, and behaviors in a systematic manner (Bhattacherjee 2012). Typically, the quantitative-empirical data collected are analyzed by means of inferential statistics to reach conclusions about associations between variables – or, in other words, to test hypotheses (e.g., Straub et al. 2004; Urbach and Ahlemann 2010). An inherent strength of survey research is – among others – its capability to measure a wide variety of unobservable data while – at the same time - being economical in terms of researcher time, effort, and cost. Experimental research, on the other hand, is a research design for analyzing hypotheses in a controlled environment. In it, variables are manipulated by the researcher (as treatments), subjects are randomly assigned to different treatment levels, and the results of the treatments on other variables are observed (Campbell and Stanley 1963). The unique strength of experimental research is its ability to link cause and effect through treatment manipulation while controlling for extraneous variables – thus providing high internal validity (Bhattacherjee 2012).While survey and experimental research are probably the most popular approaches used in deductive theorizing, we acknowledge that other approaches such as positivist case study research (Hyde 2000; Paré 2004; Sarker and Lee 2002; Shanks 2002) might also be applied in a similar sense.

Other Forms of Theorizing

As indicated above, we consider inductive and deductive as the most heavily employed modes of theorizing in IS research. However, it is important to acknowledge that other forms of theoretical reasoning exist and should perhaps extend our arsenal of theorizing processes in IS research. Above and beyond inductive and deductive reasoning alone, two more modes of reasoning are generally acknowledged in the literature: retroductive and abductive (Ochara 2013). The former can be seen as a way to reconcile the deductive-inductive dichotomy in that it tries to overcome the challenges of merely inductive or deductive processes: Induction assumes the existence of data that are not theory laden (Alvesson and Sköldberg 1994) while deduction, on the other hand, implies that theories which are removed from date are possible (Sæther 1998). As a reaction, retroduction much more strongly emphasizes the interplay between the two. As a mode of theoretical reasoning, it uses the concept of analytic frames as a kind of working hypothesis that is constructed from the data and then refined gradually. These analytic frames are "a category of phenomena and provide conceptual tools for differentiating phenomena within the category. Analytic frames articulate ideas, and through this both classify and characterize phenomena" (Sæther 1998, p. 247). To refine these, they are compared against images which are constructed through the process of abstraction from empirical observations (Ragin 1994). Ultimately, this leads to a theory that is equally aligned with the empirical data as well as generalizable analytically. While not in widespread use in IS yet, an approach to retroductive theorizing can be seen in works that embody analytic induction (Gilgun 2001, 2005; Goldenberg 1993; Hammersley 2011; Robinson 1951), more recently know as qualitative deductive analysis (Gilgun 2010).

While all of the above entail some form of interplay between empirical observation and explanation thereof, abductive reasoning more strongly emphasizes a mode of theorizing that relies on a leap of faith in the sense of an inference towards the best explanation (Harman 1984). Thus, abduction (e.g., Dubois and Gadde 2002; Patton 2002) typically begins with an incomplete set of observations and proceeds with the selection of the most feasible explanation for the phenomena. It assumes to have multiple viable explanations for a set of observations or claims. The reasoning process then involves weighting the adequacy of the competing explanations against one another and arriving at the one that most likely leads to a valid and useful explanation ("logic and discovery") (DePoy and Gilson 2007). As more and more observations are added, the seemingly superior explanation will have to defend its selection against the initial or additional rival explanations. While deduction involves reasoning from the general to the specific and induction from the specific to the general, abduction constantly compares between general and specific until the most suitable explanation has been identified (Patton 2010).

A third and final form of theorizing is what we would summarize as pragmatic approaches to theorizing and entails works such as design or action research. Both these approaches are characterized by the fact that they intervene into the "real world" and actually try to influence or change the phenomenon that is being studied and theorized – a real world experiment in a sense. They thus create "possible worlds" (Frank 2009) and allow us to contrast different realities (i.e., instances of the problem) through observing whether a meaningful intervention leads to a desired outcome. As discussed earlier, interventions in this sense need to entail some degree of understanding of the phenomenon the research intervenes in. That intervention will then, in turn, change the values of the variables characterizing the phenomenon empirically or alter its nomological net altogether. If the intervention works (i.e., produces the outcome the researcher has hypothesized), both the intervention as well as the theoretical understanding of the underlying phenomenon seem to be accurate. Thus, the understanding can inform future interventions such as managerial action or the design of a respective information system. This strongly relates back to the prescriptive knowledge embodied in Gregor's (2006) theories for design and action. To this end, action research has a long-standing tradition in the IS discipline (e.g., Baskerville 1999; Checkland and Holwell 2007; DeLuca et al. 2008; Lau 1999) and also resonated into the wider management research community through, for example, the discussion of socio-technical systems (Mumford 2006; Trist 1982). While the move towards a recognition of design work as a form of IS research is much younger, recent contributions highlight the similarity of action and design research (e.g., Cole et al. 2005; Järvinen 2007; Sein et al. 2011). Nonetheless, the relationship between theorizing and designing remains controversial. Increasingly, our community's attention is drawn to reconciling the two (e.g., Fischer and Gregor 2011; Kuechler and Vaishnavi 2012; Lee et al. 2011; Piirainen and Briggs 2011) as compared to contrasting them. Here, we see five distinct forms of pragmatic theorizing: (1) theory as an input to design, (2) theory as a means to evaluate design (i.e., hypothesize about effects), (3) theory as a scaffolding for empirical evaluation (e.g., design experiments), (4) theory as a sense-making device to interpret results of empirical intervention, and (5) theory as an output of evaluation in the sense of a refined or even changed conceptual understanding.

Theory Evaluation

Researchers that attempt to successfully develop theories need generally accepted quality criteria. In his recent article on theorizing in IS research, Weber (2012) presents a framework and criteria for theory evaluation. According to it, a theory should be evaluated from two perspectives, namely the quality of the individual components that make up the theory as well as the theory as a whole. With regard to the parts of a theory, researchers are advised to describe them precisely because they circumscribe the theory's boundary or domain, that is, the phenomena it is intended to cover. A field's understanding of the boundary conditions associated with its theories is perceived as a good proxy for the quality of its theories by many scholars (Gray and Cooper 2010). To assess theory as a whole, Weber (2012) proposes five attributes that "have widespread acceptance among researchers as being significant when assessing the quality of a theory" (p. 13). First, the focal phenomena of a theory should be deemed important from the viewpoint of practice and research ("importance"). Second, a good theory should make novel contributions to a discipline ("novelty"). Third, high-quality theories achieve good levels of predictive and exploratory power in relation to their focal phenomena using a preferably small number of constructs and associations ("parsimony"). Fourth, a well-developed theory demonstrates an adequate balance between being too narrow and too general in their coverage ("level"). Finally, fifth, theories should be articulated clearly to foster tests that can be used to examine conditions researchers believe are most likely to lead to the theory being empirically falsified ("falsifiability").

From our perspective, Weber's framework can be considered a comprehensive set of quality criteria covering most of the common advice given in the pertinent literature. However, to provide a broader picture we synthesized the many suggestions on "good" theorizing from several authors (Bacharach 1989; Bhattacherjee 2012; Corley and Gioia 2011; Glaser and Strauss 1967; Lee and Hubona 2009; Steinfield and Fulk 1990; Suddaby 2010; Wacker 1998; Weber 2012; Weick 1987; Whetten 1989; Witkin and Gottschalk 1988) into a list of exemplary quality criteria which does not claim to be comprehensive or complete (see Table 1).

Table 1. Exemplary Quality Criteria

Quality Criteria	Description
Logical consistency	• Constructs, propositions, scope conditions, and assumptions are coherent • All of the above are internally consistent
Explanatory power	• How much does a given theory explain? • Specify the what, how, and why
Falsifiability	• Theory must be potentially disprovable • Allows for empirical testing
Parsimony	• Examines how much of a phenomenon is explained with how few variables • Only include relevant information
Nomological validity	• Construct makes sense in the context of others relating to it • Construct describes what we are actually interested in
Generalizability	• Conclusions can be drawn with respect to another set of observations • Only conclusions that are logically supported are drawn from the sample
Utility	• Relevant to practitioners • Unique findings

Finally, we agree with Weick's (1989) summary when he argues that "a good theory is a plausible theory, and a theory is judged to be more plausible and of higher quality if it is interesting rather than obvious, irrelevant or absurd, obvious in novel ways, a source of unexpected connections, high in narrative rationality, aesthetically pleasing, or correspondent with presumed realities" (p. 517).

Another perspective to evaluate a theory is propose by Olbrich and Mueller (2013). They propose a framework that can help to describe and analyze a given theory. Based on the range and type dimensions introduced above, they propose that explicitly defined criteria to characterize theories can help both explicit theorizing (i.e., the original contributors identifying their contribution as a theory based on the fact that all constituent characteristics are present) as well as implicit (i.e., through new authors building on the work of others based on a sound understanding of the theoretical core of a given contribution) theorizing. They also suggest that such frameworks – be it theirs or any other commonly agreed upon structure – can help to trace the historical lineage of theories. As an example, they point to the history of the IS success model (DeLone and McLean 1992, 2003; Petter et al. 2008) and how it has grown through cycles of extension and reintegration.

In connection with theory evaluation, we'd like to pick up the product and process dualism briefly discussed at the beginning of this section. In essence, we think that re-entangling product and process in order to form a real duality is warranted. Wacker (2008) develops a set of guidelines to assist empirical researchers to assure that their studies fulfill the requirements of good theory based upon traditional scientific theory building. Beginning with the definition of "good" theory as "a fully explained set of conceptual relationships used for empirical testing" (p. 7), he identifies four properties of theory which are needed for a set of relationships to be a theory (definitions, domain, relationship, and predictions) and additional properties which assure that the theory is a "good" theory. Together, these properties of a theory (as a product) provide the basis for a set of guiding principles for "good" theory building (as a process) for authors to use in their research (see Figure 1).

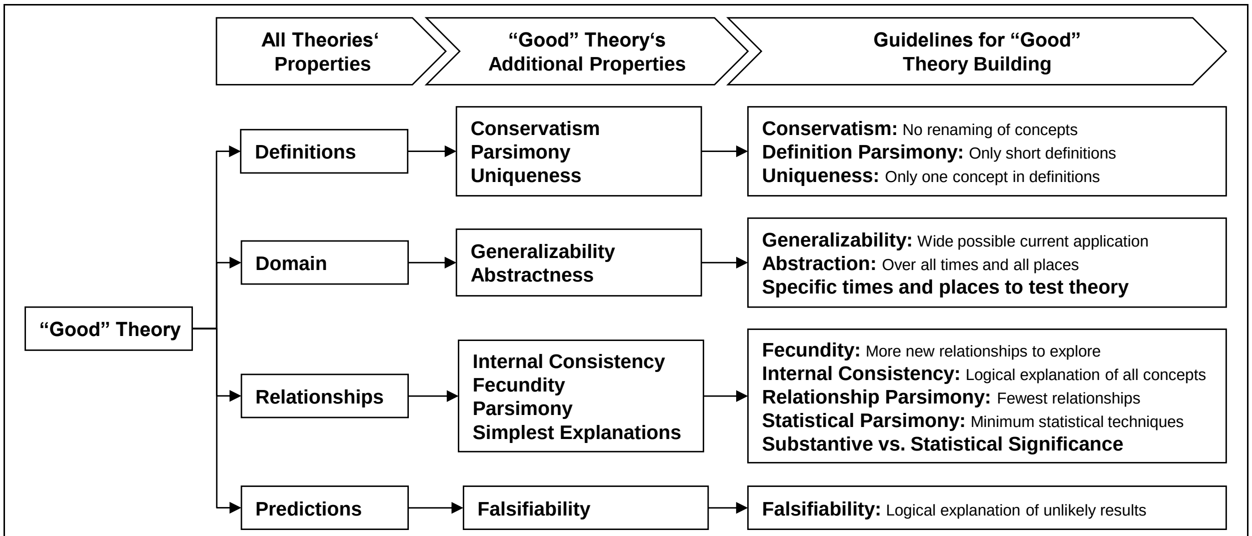

Figure 1. Interdependence of Quality Criteria for Theory and Theorizing (Wacker 2008, p. 13)

According to Weick (1989), the process of theory construction in organizational studies can be portrayed as *disciplined imagination* in a manner analogous to natural selection, where "the discipline in theorizing comes from consistent application of selection criteria to trial-and-error thinking and the imagination, [...] from deliberate diversity introduced into the problem statements, thought trials, and selection criteria that comprise that thinking" (Weick 1989, p. 516). Following this understanding, researchers iteratively design, conduct, and interpret imaginary experiments searching for the most appropriate explanation. Related activities resemble the three processes of evolution: variation, selection, and retention. Variations in the form of conjectures simulate possible scenarios that could explain the phenomenon. Selection includes judgments of whether a conjecture is interesting, plausible, consistent, or appropriate. Finally, the result of the selection process is the retention of a conjecture with the best comparative performance.

NOW WHAT – How to Work with Theory

Now that we have an understanding of the *why*, *what*, and *how* of theory and theorizing, we would like to turn to the question of the *now what* in terms of how this informs our practice of research, how we as scholars can work with theory, and what role it can play for us. As discussed, theory can be seen as an input to and as an output of research. As an input, it enables the researcher to conceptualize any given phenomenon of interest and thus capture it in her/his observations. As an output, it documents what we know about the phenomenon as a synthesis of our work and helps inform others that will do similar studies after us. In any of these two modes, DiMaggio (1995) argues in his comments to Sutton and Staw (1995) that there are at least two important views on the role theory can play for us as researchers.

First, DiMaggio (1995) highlights theory's role as covering laws, that is, "generalizations that, taken together, describe the world as we see (or measure) it" (p. 391). This indicates theory's role as a blueprint from which we draw our theoretical understanding of a phenomenon of interest. Also, relating our findings back to this understanding – developing, refining it – is an imperative for theoretical work. As such, theory serves as the cumulative basis through which we document and advance our understanding of the world; the shoulders of giants we all stand upon. In line with Colquitt and Zapata-Phelan (2007), we propose that scholarly work is stronger if it helps to make these shoulders a little bit higher through its findings. This means that researchers need to strike a delicate balance between building and testing theory in their work in order to make a valid and valuable theoretical contribution. DiMaggio (1995) later extends this point by also pointing towards theory's nature as a (cumulative) narrative which considers theory as an account of a social process through which theory is built as a constructed communal consensus over time. This stresses the empirical tests of the plausibility of the narrative as well as careful attention to the scope conditions of the account.

Second, and closely related, DiMaggio (1995) discusses the role of theory as sudden enlightenment that is often complex, defamiliarizing, and rich in paradox. In this vein, "theorists enlighten not through conceptual clarity, but […] by startling the reader into satori" (DiMaggio 1995, p. 391).

This, we believe, draws our attention to a principal trinity in reflecting on different observations we make and the theoretical contribution we can draw from them. If we have grounded our work well on the shoulders of those that came before us, we are likely to make observations that the theory already predicted or at least indicated before. As discussed above, the resultant observations will likely *confirm* what we already know and can help putting our results in perspective and refining the theory's underlying tenets. In order to be enlightening, however, two more kinds of observations deserve special attention in theorizing: observations that the theory could not explain or predict as is and, even more importantly, observations that challenge a theory's explanations and predictions. The former kind can help to evolve theories and will likely contribute to gradual *extensions* or refinements of what we already know. The latter kind promises more radical or episodic change as these observations are explicitly *contradict* the conventional wisdom of established theories.

This seems to connect well to what Lyytinen and King (2004) refer to as plasticity of the (theoretical) core of a discipline. To be a functioning market for ideas, scholars should employ theory – or multiple competing theories and their explanations for the phenomenon of interest to be exact – in a way that enables "scholars (and practitioners) [to] exchange their views regarding the design and management of information and associated technologies in organized human enterprise" (p. 236). Only if this market (i.e., the theories) is dynamic enough to adapt and evolve will the discipline building around that market be able to produce salient and strong results. Other scholars support this point in talking about "adaptive instability" (Robey 2003, p. 354) or calling for the need for boundary spanning, critical reflection (Galliers 2003).

Turning to Colquitt and Zapata-Phelan (2007) helps us understand the trinity of confirmation, extension, and contradiction in more refined terms. Based on the two principal dimensions of theory building and testing, they introduce five types of theoretical contributions. While two of these bear lesser theoretical contribution (i.e., reporting and qualifying), the three remaining ones (i.e., testing, building, and expanding) all have a high potential of becoming substantial theoretical contributions. In their sense, *testing* refers to a situation in which researchers build a strong foundation for their work in extant literature and then try to verify whether the predictions of the resultant model hold true empirically. While such an approach can help to substantiate a theory and increases its summative validity (Lee and Hubona 2009), we'd suggest that the potential for a theoretical contribution of the testing mode hinges on to what extend its results lead to an adaptation or at least refinement of the underlying theory. *Building*, on the other hand, is by definition a novel contribution as it introduces new or significantly refined conceptualizations with the potential to reshape our understanding of the phenomenon. However, they do not necessarily test the effect of their newly proposed concepts on our understanding. Finally, *expanding* unifies the strengths of testing and building: Testing and building are employed symbiotically in that our theoretical understanding is advanced while simultaneously substantiating this advancement through testing. While the examples used by Colquitt and Zapata-Phelan (2007) predominantly suggest that newly introduced concepts are then tested in extension of existing theory, we suggest that a new or refined conceptualization can also be a result of expanding.

While the above generally consider one theory in isolation, the idea of boundary spanning and integrating multiple nomological nets into higher-order theories (see footnote 4) points towards the opportunity to work with more than one theory. Particularly the extending observations made while building new theory are important here as the theorist might have found the missing link between two hitherto separate nomological nets. In fact, we suggest that multi-paradigmatic work is perhaps amongst the most exiting modes of working with theory. In this regard, Lewis and Grimes (1999) provide a seminal review of multi-paradigmatic research in the broader field of management. They identify a set of six different patterns of interplay between two or more theories. First, *bracketing* is used to contrast two competing theories with special attention dedicated to assumptions and underlying views of the original theorists. This approach employs a kind of "literal replication" of the phenomenon in that two independent explanations are compared. This approach is often used in reviews of – to date – incommensurable, competing theories. Second, *bridging* is also used in reviews frequently. It is more of a unifying approach in the sense of identifying transitioning zones between theories that help bridge two separate paradigms. In its often merely conceptual application, bridging often spurs trans-disciplinary collaboration. Third, when working with multiple paradigms in *parallel*, theorists use multiple paradigms simultaneously to highlight contradictions. This approach can be applied to evaluate two or more rivalry explanations. These approaches often rely on empirical evaluations of the contestants. An IS example for the parallel mode can be seen in Keil et al. (2000) who test four theories on project escalation to determine which theoretical model has the highest explanatory power. Fourth, a *sequential* mode is employed when theories are used consciously to inform one another. Theorists thus use the output of any one theory as the purposeful input for another; or, in Lewis' and Grimes' (1999, p. 675) words, "theorists seek to grasp [...] disparate yet complementary focal points" of the theories used sequentially. Fifth, and closely related to the idea of higher-order theories (compare footnote 4), *metatheorizing* describes "a higher level of abstraction [that] does not imply unification or synthesis but, instead, the ability to comprehend paradigmatic differences, similarities, and interrelationships" (Gioia and Pitre 1990, as cited by Lewis and Grimes, 1999, p. 675). Constructs in such a metatheoretical approach then span different nomological nets. Exemplary work can be found in the recent contribution by Hovorka et al. (2013) who analyze a set of different theories seeking to integrate them. Finally, sixth, Lewis and Grimes (1999) introduce *interplay* as a refinement of the metatheorizing approach. They highlight the importance of using the multiple theories under consideration at the same time in order to leverage their complementarities. This way, we believe, theorists build an extended understanding by looking at a phenomenon through two or more theoretical lenses to get a better understanding of the phenomenon from more than one point of view.[5] Examples are the study by Lapointe and Rivard (2007) who combine three theories of user resistance to explain seemingly contradictory empirical observations while proposing a richer model. Also, we suggest that an integration of theories across multiple levels is an instance of the interplay approach. In this vein, Quigley et al. (2007) use theories on multiple levels of inquiry to build a more comprehensive understanding of knowledge sharing.

While the above certainly cannot be an exhaustive account of the roles theory can and should play for us as scholars, we propose that it is important to reflect upon these while going through the *how* of theorizing. Understanding the role and its implications supposedly helps the theorist to reflect upon how to work with theory at different points in time throughout the process of theorizing, especially in light of the interplay between theory and method we hinted to in the "how" chapter above. Knowing when to draw on theory's conceptual arguments, being able to reflect upon the results and their interpretation constantly throughout the system as our theoretical understanding changes and evolves, and to be able to wrap up the theorizing by synthesizing our key findings enable the generation, documentation, and communication of knowledge which, as discussed initially, is one of the key contributions of science.

Discussion and Conclusion

Looking at the above, our manuscript does not claim to be an all-encompassing almanac of theory let alone an exhaustive prescription to theorizing. We acknowledge that greater minds left their mark in this discussion and that we can only offer a humble synthesis of their thoughts and contributions. Nevertheless, we think that such a synthesis can be an important contribution in itself. Most importantly, and in light of the intensified discussion on theory and theorizing both within and beyond our discipline, we – at most – provide a starting point for this discussion. To do so, we hope that this manuscript lays out a fundamental understanding of *why* theory matters, *what* theory is, and *how* we work with it. Beyond this review of the current state of the discussion on the product and process perspective, we provide a brief reflection on the *now what*; the role of theory in the IS field. We hope that we can offer those that want to join the intensified discussion and reflection on theory with a sound foundation and that we can enable and encourage others scholars, particularly younger ones, to much more explicitly and intensely work conceptually based on their thoughts and results.

Beyond theory as the content of such conceptual work, we'd like to highlight that framing such conceptual contribution is an important part of the art and craft of being a theorist. While we can certainly learn a lot from

[5] We propose that this extension can come in three different forms: Redundant (multiple theoretical lenses result in similar observations thus contributing to summative validity), complementary (different lenses result in observations of different facets of the phenomenon that are mutually exclusive but collectively capture the phenomenon exhaustively), or tangential (different lenses result in observations of different facets of the phenomenon that are mutually exclusive and cannot capture the phenomenon exhaustively).

brilliant writers and theorist such as Allen Lee, Lynne Markus, Wanda Orlikowski, or Karl Weick (to name just a few exemplary ones), publishing conceptual pieces certainly is amongst the most difficult challenges in the publication game. As Zmud (1998, p. xxix) highlights, theory manuscripts "stand solely on their authors' understanding of a phenomenon, [the] relevant theoretical perspectives for embracing this phenomenon, [as well as the authors'] writing abilities." Luckily, one of the side-effects of the current reemergence of the theory discussion is that some of the leading journals also recognize the need to enable future theorists in terms of how to frame and write up their intended contributions. An example is the recent editorial series published by the Academy of Management Journal (Bansal and Corley 2012; Bono and McNamara 2011; Colquitt and George 2011; Geletkanycz and Tepper 2012; Grant and Pollock 2011; Sparrowe and Mayer 2011; Zhang and Shaw 2012). We especially consider the contribution by Sparrowe and Mayer (2011) on grounding hypotheses in deductive theorizing an important piece for all those seeking a stronger command of theoretical writing. Also a general recognition of the multitude of formats and languages that are available in order to present theory is acknowledged increasingly (Shapira 2011). Beyond contributions of writing with and about theory (such as, e.g., Jaccard and Jacoby 2009), Zmud's comment highlighted earlier also draws our attention to the need for the theorist to make very convincing arguments. Thus, also general recommendations on crafting arguments (e.g., Weston 2009) should be taken into account by authors of prospective theory manuscripts.

However, we do not suggest that the above, together with contributions discussed earlier such as Lewis and Grimes (1999) or Colquitt and Zapata-Phelan (2007), should be interpreted as a rigid, prescriptive recipe for theory generation. Quite contrarily, Weick's (1989) emphasis on *imagination* and an increasing recognition of *reasoning* as a key ingredient in theorizing (Fischer and Gregor 2011; Ochara 2013) seem to highlight that theorizing, at its core, is a creative process that challenges the theorist's creativity and cognition. Nonetheless, we propose that the above discussions can provide guidelines for aspiring theorists and help to reflect on the interplay between topic, method, and theory.

As outlined above, a synthesis such as the one we provided will likely never be complete. While we had to focus on the very core of seminal papers on theory and theorizing to maintain a meaningful focus, issues such as the increasing importance of multi-level considerations in theorizing (e.g., Hitt et al. 2007; Klein and Kozlowski 2000; Klein et al. 1999), early trends towards aggregating and consolidating theories used in IS research (e.g., Dwivedi et al. 2012; Hovorka et al. 2013), or the growing interest in the role of theory in design (e.g., Gregor and Jones 2007; Kuechler and Vaishnavi 2008; Lee et al. 2011; Mueller and Olbrich 2011a) are just a few issues we could not cover in the depth they certainly deserve. The same applies to a more refined treatment of the philosophical roots of the theory concept.

In conclusion, one of the main motivations for this paper is to provide a synthesis of what we know about the constituents, the nature, and the role of theory and the implications we can derive from this for our work with it. While a sound command of theory and theorizing seems imperative and self-evident for most researchers, reflecting on our own experiences as well as on the many stories colleagues share on these matters suggests that we need to remind ourselves constantly of what happens in the absence of good theory and theorizing. For example, only if we are aware of the constituents of theory – that is, constructs, propositions, and boundaries – are we able to delineate one theory from another and, thus, able to distinguish one set of explanations and predictions from competing ones. Also, framing our own contributions hinges on knowing what needs to be discussed to make for a solid theoretical contribution. Once we are able to do so, we are likely to find the full potentials of what theory has to offer: It provides us with a framework for synthesis and integration of empirical findings, helps generate a priori hypotheses which adds rigor and falsifiability to research, allows our conclusions to be generalizable across a spectrum of organizations and technologies, provides perspective on the larger issues and directs us toward more broadly-based knowledge claims, directs our attention to central issues of organizational functioning rather than technological imperatives, and provides a mechanism for integrating new and emerging fields with other related fields (Steinfield and Fulk 1990). Moreover, reflecting on Sutton and Staw (1995), theorizing should remind us as scholars to constantly strive for the conceptual how and why in the phenomena we study. Only if we are able to rise above mere descriptions and correlations will we, as a field, be able to claim scientific legitimacy – whether or not we have theories that are native to our field.

Finally, we'd like to conclude with an observation made by some of the perhaps most esteemed theoreticians of our time: "There is nothing so practical as a good theory" (Lewin 1945, p. 129; later reemphasized by van de Ven 1989, p. 488). While they mainly referred to the utility of theory for practitioners, we suggest that the same is true for the practice of (IS) research.

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