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Five Seemingly Insurmountable Challenges Related to Attaining Long-Term Value from Theorizing about Information Systems

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Abstract

Recent articles such as Avison and Malaurent (2014) and Grover and Lyytinen (2015) question taken-for-granted assumptions about the centrality of theory in research published in leading journals and the near necessity of following repetitive scripts that sometimes are an obstacle to creativity. This paper goes a step further by providing examples and observations that illustrate five seemingly insurmountable challenges related to attaining long-term value from theorizing about information systems.

1) Divergent definitions of basic terms makes it extremely difficult to accumulate IS knowledge.
2) The IS discipline seems to take for granted that knowledge must take the form of theory.
3) Many beliefs and practices related to IT will not hold still for long due to the rapid pace of technological change
4) Most concepts and phenomena that are relevant to IS are not uniquely about IS.
5) Institutional practices at multiple levels encourage use of scripts that are obstacles to creativity and knowledge development.

The conclusion identifies directions for initial progress related to each challenge.

Keywords: theory, theorizing, conceptual artifact, script for doing IS research

Scripts and Academic Scorekeeping are only Part of the Problem.

A recent twist in ongoing discussions theory and theorizing in IS and other fields (e.g., Keen, 1980; Sutton and Staw, 1995; Weick, 1995; Schatzki, 2001; Gregor, 2006; Weber, 2012; Lee, 2014) questions whether theory development is the ultimate goal of IS research and whether widely accepted scripts for performing and publishing IS research are an effective path toward genuinely valuable results. Avison and Malaurent (2014) uses the example of Schultze (2000) to question the possibly excessive primacy of theory in IS field. Grover and Lyytinen (2015) questions the use of taken-for-granted research scripts that encourage the development of uninteresting mid-range theories. It suggests encouraging more research that focuses in new directions on either side of the currently predominant mid-range theorizing.

Goal and organization. This paper contributes to the discussion about theory and theorizing in IS by identifying and discussing five challenges to attaining long-term value from theorizing about IS. It argues that overemphasis on theory and overuse of safe but uninteresting research scripts are valid issues, but can be viewed as parts of five challenges that in combination limit the long-term value of theorizing in the IS discipline. This paper looks at each challenge in turn. As a preview of the ideas, Table 1 lists each challenge along with major examples and observations that will be covered. The conclusion suggests paths for addressing each challenge. Some of this paper's ideas are controversial, such as the assertion (related

to the fifth challenge) that institutional practices in the IS discipline seem like a design theory for minimizing both practical impact and Blue Ocean theorizing.

This paper's title speaks of seemingly insurmountable challenges because a high probability path for overcoming these challenges is not at all obvious given current beliefs and practices in IS research and in surrounding institutions. On the other hand, the story of the black swans (that were assumed impossible until they were observed in Australia) illustrates why most claims related to insurmountability cannot be proved convincingly, especially at a time of rapid change. The point is not insurmountability but rather the need for the IS discipline to respond to the challenges if is to increase its contributions to the world.

Note: This paper builds on Grover and Lyytinen (2015) in various ways and refers to it many times. Accordingly, many citations to that paper will be abbreviated as G&L. The references also contain a substantial number of self citations because Appendices 1 and 2 illustrate major points about theorizing related to the author's long-term research.

Challenge to attaining long-term value from theorizing about IS	**Related examples or observations**
1) Significant disagreement about definitions of basic terms makes it extremely difficult to accumulate IS knowledge.	The IS literature reveals significant disagreements about the definition of many *basic terms*, such as theory, system, information system, IT artifact, and service.
2) The IS discipline seems to take for granted that knowledge must take the form of theory.	Knowledge related to IS involves a variety of conceptual artifacts, not just theory. Theorizing creates or improves a range of conceptual artifacts, not just theory. There is no reason to believe that theory is better than other types of conceptual artifacts. Most knowledge about IS comes from practice, not academic theorizing.
3) Many beliefs and practices related to IT will not hold still for long due to the rapid pace of technological change.	IT has changed rapidly for decades and continues to do so. Current beliefs and practices related specifically to IS and IT usage (not to psychological variables such as intention to use something) are related to current and recent technologies in use. The long-term value of studying current beliefs and practices is questionable if exponential improvement trends in IT capabilities will continue.
4) Most concepts and phenomena that are relevant to IS are not uniquely about IS.	Information systems are a special case of work systems. Most of the basic knowledge (e.g., the conceptual artifacts) related to information systems in general are equally relevant to work systems, i.e., are really about work systems, not just IS.
5) Institutional practices at multiple levels encourage use of scripts that are obstacles to creativity and knowledge development.	Frequently counterproductive institutional scripts include scripts for performing research, scripts for writing articles, and scripts for evaluating research.

Table 1. Five challenges and related examples or observations

1) Significant Disagreement about Definitions of Basic Terms Makes It Extremely Difficult to Accumulate IS Knowledge.

G&L bemoans that way that theories and variables from reference disciplines often are imported into IS/IT research without some of the original nuance. In my opinion a potentially more important problem is that many basic terms that appear frequently often take on inconsistent or even contradictory meanings despite the IS discipline's espoused concerns about rigor.

Even a cursory look at some of the most basic concepts shows that the discipline's record on rigor is disappointing. The problem is not so much with individual pieces of research, but with the discipline's inability to accumulate research findings on the way to a body of knowledge for IS. It is difficult or impossible to accumulate knowledge related to concept X when researchers define X in fundamentally

different ways. The following examples illustrate that disagreement about definitions of basic terms is commonplace in the IS literature.

Theory. Perhaps surprisingly, the discussion of theory and theorizing in the IS discipline still includes significant disagreement about the definition of theory. Weick (1995, p. 386) notes that "theory belongs to the family of words that includes guess, speculation, supposition, conjecture, proposition, hypothesis, conception, explanation, [and] model," … "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."

Gregor (2006) identifies five different types of theory, theories for analysis, for explanation, for prediction, for explanation and prediction, and for design and action. Schatzki's (2001) view of theory encompasses all of Gregor's types: "Theory means, simply, general and abstract account. A theory of X is a general and abstract account of X."... [Theories include] "typologies of social phenomena; models of social affairs; accounts of what social things (e.g., practices, institutions) are; conceptual frameworks developed expressly for depicting sociality; and descriptions of social life—so long as they are couched in general, abstract terms." Expressing a very different perspective, Weber (2012), Straub (2012), Niederman and March (2014), and others restrict the notion of theory primarily to Gregor type IV theories (for explanation and prediction). Generally consistent with those views G&L (p. 272) says that "most published IS theory falls into [the] Gregor Type IV category and constitutes the main theoretical body of the field's knowledge."

In contrast, as noted in Alter (2015c), "the list of IS theories in the "Theories Used in IS Research Wiki" (Larsen et al., 2014), which is available in the Research section of the website of the Association for Information Systems, includes many sets of concepts that are called theories in the IS discipline even though they would not qualify under Weber's (2012) criteria. Examples include actor-network theory, behavioral decision theory, contingency theory, critical realism theory, evolutionary theory, feminism theory, game theory, general systems theory, institutional theory, sociotechnical theory, soft systems theory, and structuration theory. Other widely cited IS-related theories that do not appear in the Wiki and that would not qualify include activity theory, coordination theory, and practice theory. Many sets of ideas that are called theories in other fields also would not qualify. Examples from mathematics include group theory, number theory, perturbation theory, and set theory.With this divergence of views about the definition and nature of theory, it is unclear what is meant by the Call for Papers for the ICIS 2015 track on IS Theory Development and Use when it starts with Lewin's (1952, p. 169) taken-for-granted aphorism that "there is nothing more practical than a good theory." To what extent does that refer to theories mentioned above that many IS researchers do not see as theories?

System and information system. "It is no exaggeration to describe most IS researchers as having used the term 'system' or 'systems' to refer to just about anything that involves electronic information processing." (Lee, 2010, p. 339) … "The conflict between the information system discipline's espoused theory of itself as a systems discipline and its theory-in-use of itself as a non-systems discipline has the obvious detrimental consequence in which much information systems research does not qualify as truly information *systems* research." (p. 341).

An obvious confusion related to the term *system* involves whether *system* is a general-purpose synonym of *software*. For example, many systems analysis and design textbooks implicitly assume that system means software and that system development is software development. Another prominent area of confusion related to the term *system* involves the nature of information systems. A list of 20 definitions of information system in Alter (2008a) that were arranged more or less in order from primarily social to sociotechnical to entirely technical includes the four in Table 2.

Confusions about the meaning of system and information system make it unclear what is meant by the widely cited DeLone-McLean IS success model, which Straub (2012) includes as a type IV theory and notes is "the most highly cited article in the IS literature since 1990":

> "SYSTEM QUALITY and INFORMATION QUALITY singularly and jointly affect both USE and USER SATISFACTION. Additionally, the amount of USE can affect the degree of USER SATISFACTION - positively or negatively - as well as the reverse being true. USE and USER SATISFACTION are direct antecedents of INDIVIDUAL IMPACT; and lastly, this IMPACT on

individual performance should eventually have some ORGANIZATIONAL IMPACT." (DeLone & McLean, 1992).

By Table 2's first definition, which is often repeated in one form or another, an information system is a social system or sociotechnical system. Since people are integral components of sociotechnical systems, the quality of such systems is partially about the quality of the people who are participants. But if people are participants in the system, then the meanings of use and user satisfaction become questionable because people would be using something they are a part of, and because many of the individual impacts primarily would be impacts of the conditions of their participation rather than impacts of the information produced. And if people are part of the system, then their job roles probably determine their (typically mandatory) use of the software more than their user satisfaction.

"An information system is a social system, which has embedded in it information technology. The extent to which information technology plays a part is increasing rapidly. But this does not prevent the overall system from being a social system, and it is not possible to design a robust, effective information system, incorporating significant amounts of the technology without treating it as a social system." (Land (1985, p. 215), cited by Magalhães (1999, p. 6))
"A simple definition might be that an information system is a system in the organization that delivers information and communication services needed by the organization." (Davis, 2000, p. 67)
"Assumed to mean computer-based systems, which are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful information." (Jessup & Valacich, 2008, p. 567)
"An information system is a data table, whose columns are labeled by attributes, rows are labeled by objects of interest and entries of the table are attribute values." (Pawlak, 2002)
Table 2. Examples from a list of 20 definitions of information system in Alter (2008a)

IT artifact. "Vastly inconsistent definitions of "the IT artifact" in leading journals and conferences demonstrate why it no longer means anything in particular and should be retired from the active IS lexicon." Alter (2015b, p. 47). Table 3 lists representative examples to support that suggestion.

"Given an artifact whose performance has been evaluated, it is important to determine why and how the artifact worked or did not work within its environment …. Theorizing in IT research must explicate those characteristics of the **IT artifact** operating in its environment that make it unique to IT and require unique explanations. (March & Smith, 1995, p. 259)
"By and large, **IT artifacts** (bundles of material and cultural properties packaged in some socially recognizable form such as hardware and/or software.) continue to be under theorized."(Orlikowski & Iacono, 2001, p. 121)
"We conceptualize **the IT artifact** … as the application of IT within a context to enable or support some task(s) embedded within a structure(s) that itself is embedded within a context(s)." (Benbasat & Zmud, 2003, p. 186). That paper went on to say, "the four elements of an **IT artifact** include information technology, task, task structure, and task context (p. 188).
"**IT artifacts** are broadly defined as *constructs* (vocabulary and symbols), *models* (abstractions and representations), *methods* (algorithms and practices), and *instantiations* (implemented and prototype systems). (Hevner et al., 2004, p. 77).
"We argue toward a more expansive view of **the IT artifact** to include any designed solution that solves a problem in context" (Gregor & Hevner, 2011, p. 4)
"This track calls for papers concerning the "IT artifact", where **the IT artifact** is understood as information technology (IT) (software, hardware, infrastructure, data communications), IT-enabled systems (information systems) and processes and methods associated with IT and IT-enabled systems development." (Track Description, IT Artifact track, ICIS 2013)
Table 3. Vastly inconsistent definitions of the concept of "IT artifact"

The definitions of IT artifact in Table 3 say that it could be any of the following:

- information technology, a configuration of hardware and software
- bundles of material and cultural properties packaged in a recognizable form
- something that includes information technology, task, task structure and task context

- constructs, models, methods, and instantiations
- any designed solution that solves a problem
- IT-enabled system
- methods associated with IT
- IT-enabled system development.

Those vastly different interpretations of IT artifact have very few properties in common, making it almost impossible to theorize about IT artifacts in general, except as "any topic that involves IT in any way."

Service. Many characteristics of service as generally perceived in the business and social world are almost completely contrary to characteristics of service that are required in the computing world. The business and social world tends to view services as sociotechnical activities involving people who may or may not use technologies as they try to facilitate beneficial outcomes for others. Related views and theories of service include concepts such as coproduction and value co-creation based on collaborative activities that typically involve mutual visibility, adaptation, and mutual empathy between provider and customer.

The world of service computing (e.g., Oberle et al., 2011) requires contradictory assumptions by treating services as encapsulated functionalities that purposefully separate client entities from server entities. Those functionalities are launched by messages in a predefined format, produce responses in a predefined format, and are governed by explicit rules of engagement that determine which client entities have the right to request service from which server entities. Mutual visibility of the client and server is minimized. Server entities have no empathy for clients and no awareness of the status, needs, likes, and desires of the client entity beyond the specific information in a preformatted message that launches a service. Thus, the service computing world expects and requires exactly the opposite of the mutual empathy that is viewed as commonplace and often expected as inherent in high-quality service.

Implementation. Organization scientists and business practitioners think of implementation as moving to a new way of doing work in an orgranization. Computer scientists view implementation as getting an algorithm running on a computer. Needless to say, organizational change differs greatly from getting algorithms running correctly on computers. It is not clear how and IS researcher should interpret the statement such as "implementation success increases when agile approaches are used."

The minimal agreement about definitions of theory, system, information system, IT artifact, service, and implementation does not bode well for compiling a body of knowledge for IS. Based on the above examples, it would be difficult to interpret the meaning of many generalizations or conclusions that use basic terms such as system, information system, IT artifact, service, and implementation. If the only way to understand a principle, hypothesis, or theory that uses those terms is to study the original research, what are the IS concepts (i.e., not just psychological or economic concepts from reference disciplines) that researchers can understand without guessing?

2) The IS Discipline Seems to Take for Granted that Knowledge Must Take the Form of Theory.

The representation of knowledge in Figure 1 and the related explanation clarify why perpetuation of the IS discipline's currently dominant view of theory and knowledge unnecessarily limits the discipline's contribution to the world. This section's discussion of IS knowledge, theories, and theorizing calls for moving away from the view expressed in three statements from G&L:

> "*The dominant way of producing knowledge in information systems (IS) seeks to domesticate high-level reference theory in the form of mid-level abstractions involving generic and atheoretical information technology (IT) components." (p. 271)*
>
> "Most *published IS theory falls into this Gregor Type IV category [theory for prediction and explanation] and constitutes the main theoretical body of the field's knowledge." (p. 272)*.

> *"Currently, our top level journals and their gatekeepers often view theory as a goal in itself. It is the basic construct of knowledge in the field, and it defines the identity of the field (Weber, 2006)."* (p. 289)

Figure 1 diverges from dominant views of theory and knowledge by including data, information, examples, and stories as part of IS knowledge, thereby asserting that IS knowledge is not limited to theories, and isn't even limited to abstractions. Figure 1 separates abstractions into non-rigorous conceptual artifacts and rigorous conceptual artifacts. It assumes that theories are rigorous conceptual artifacts, and that theories can be divided into categories based on the whether and how they are testable.

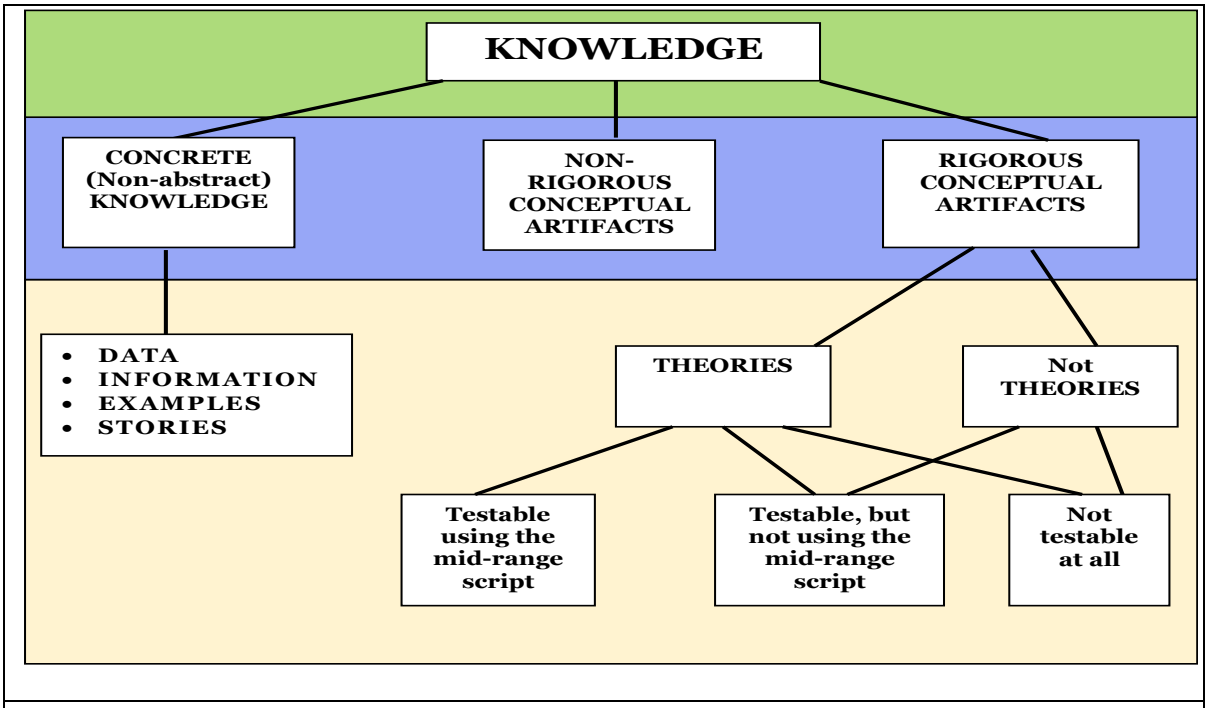

Figure 1. Broad Categories of Knowledge Related to Information Systems

Data, Information, Examples, and Stories as Knowledge

G&L (p. 271) calls for expanding the breadth of IS research by including "*on the one hand, inductive, rich inquiries using innovative and extensive data sets and, on the other hand, novel, genuine, high-level theorizing around germane conceptual relationships between IT, information and its (semiotic) representations, and social behaviors.*"

G&L's point about "innovative and extensive" data sets seems unnecessarily limited if a legitimate goal of IS research is to capture, articulate, and disseminate valuable knowledge. Consider the following example from the *Journal of the American Medical Informatics Association* concerning barcode medical administration (BCMA) systems, which enhance patient safety by making sure that the right drug is administered in the right dose to the right patient at the right time.

> "The authors studied BCMA use at five hospitals … [They] identified 15 types of workarounds, including, for example, affixing patient identification barcodes to computer carts, scanners, doorjambs, or nurses' belt rings; carrying several patients' prescanned medications on carts. The authors identified 31 types of causes of workarounds, such as unreadable medication barcodes (crinkled, smudged, torn, missing, covered by another label); malfunctioning scanners; unreadable or missing patient identification wristbands (chewed, soaked, missing); nonbarcoded medications; failing batteries; uncertain wireless connectivity; emergencies. The authors found nurses overrode BCMA alerts for 4.2% of patients charted and for 10.3% of medications charted." (Koppel et al., 2008, p. 408)

The "script" (G&L) for publishing in leading IS journals would surely reject this paper as atheoretical, especially since the term theory appeared only once, in a reference to using grounded theory. On the other hand, many respected journals in medicine probably would view this article as a contribution to knowledge due to its evident value for medical practitioners. It also is unquestionably a contribution to knowledge for researchers interested in workarounds, an important phenomenon in the operation and use of information systems. Personally, I found the range of workarounds mentioned in this article both useful and inspirational when I was trying to develop a "theory of workarounds" (Alter, 2014).

It is widely recognized that examples and stories are an important type of knowledge even if that thought might seem taboo in IS journals and in courses on research philosophy. For example, an article about the "untold story" in IS research (Ramiller and Pentland, 2009, p. 474) explains an important limitation of what it calls the "variables-centered" research paradigm.

> [That paradigm] "focuses its attention on covariance among independent and dependent variables. As the predominant research tradition in the [IS] field, the variables-centered paradigm ought to constitute a major platform from which our community can speak to issues of managerial interest. Unfortunately, the variables-centered paradigm appears to distance researchers from the organizational actors, such as managers, to whom they would give advice and counsel. Particularly disturbing is the systematic erasure of those very actors from the domain of inquiry. Erased, too, are their actions and means of acting. Thus, when it comes time to offer useful prescriptions for action, our community attempts to do so on the basis of research in which, ironically, neither actors nor action directly appear."

It would be possible to find many examples in which valuable knowledge appears in the form of relatively straightforward information, examples, and stories, i.e., not just in sophisticated quantitative analysis of large data sets. An example is the Bay of Pigs invasion in 1961 and the way it illustrates the dangers of groupthink. Someone should collect, compare, and contrast 100 such examples to develop a set of general criteria (but hopefully not a G&L script) for explaining the value, legitimacy, and publishability of research focusing on examples and stories.

Conceptual Artifacts

Figure 1 uses "conceptual artifact" as a blanket term for knowledge that is abstract, and therefore something other than data, information, examples, or stories. In Bereiter's (2005, pp. 64-65) use of that term, *conceptual* refers to "discussable ideas, ranging from theories, designs, and plans down to concepts, like unemployment and gravity. *Artifact* conveys that these are human creations and that they are created for some purpose. However, being conceptual, they are not concrete artifacts either, as are books, statues, and fire hydrants." Conceptual artifacts have origins and histories; can be described; can be compared with other artifacts; have varied uses; can be valued or judged worthless; may be modified or improved upon; may have unforeseen attributes, uses, or defects that may be discovered; and may be understood and used differently by people with different levels of skill.

One of the central purposes of most research disciplines is to create, improve, and disseminate conceptual artifacts that encapsulate knowledge related to the questions that the discipline addresses..The various types of conceptual artifacts include not only theories but also research questions, paradigms, analogies, myths, concepts, variables, propositions, hypotheses, frameworks, models, metamodels, and methods. Many of these appeared in Hassan's (2014) discussion of products of theorizing. The range of different types of conceptual artifacts that are often important leads to wondering why theory per se has taken on so much importance in the IS discipline as to generate an article (Avison and Malaurent, 2014) proposing that theory has become a fetish. The earlier quotations from G&L imply that current institutional practices in the IS discipline underemphasize the importance of other types of conceptual artifacts.

To illustrate the significance of different types of conceptual artifacts without disrupting this paper's narrative flow, Appendix 1 shows how different types of conceptual artifacts proved useful in theorizing related to work system theory (Alter, 2013b). Similarly, Appendix 2 discusses the evaluation of different types of conceptual artifacts.

Rigorous and Non-Rigorous Conceptual Artifacts

The portrayal of conceptual artifacts in Figure 1 emphasizes distinctions that are important for understanding theories and theorizing and for expanding G&L's proposal to "*push IS inquiry to the "edges" and emphasize, on the one hand, inductive, rich inquiries using innovative and extensive data sets and, on the other hand, novel, genuine, high-level theorizing around germane conceptual relationships between IT, information and its (semiotic) representations, and social behaviors.*" (p. 271) Figure 1 is not concerned with differences between types of conceptual artifacts mentioned above, such as research questions, concepts, frameworks, models, metamodels, and methods. Those differences are covered in Appendix 1 and Appendix 2 and could be the topic of an entire paper on their own right.

Figure 1 separates non-rigorous versus rigorous conceptual artifacts. It does that because a number of non-rigorous conceptual artifacts have attracted a great deal of attention. Three examples are business process reengineering, agile software development, and Six Sigma (as a mélange of tools and methods). All three of these can be viewed as highly influential but non-rigorous conceptual artifacts because different proponents of each idea (e.g., Hammer and Champy (1993) for BPR, Beck et al. (2001) for agile development, and many authors for Six Sigma) describe them in ways that are inconsistent with other descriptions of the same ideas and often do not describe real world attempts to use those ideas exactly as defined.

The visibility and influence of non-rigorous conceptual artifacts is a significant issue for an IS discipline that hopes to have visibility and influence in the world. It seems that dramatic claims wrapped around frequently vague and unproven ideas have more real world traction than empirical findings from most of the research pursued using the G&L mid-range script. On the other hand, G&L's relatively sparse description of Blue Ocean theorizing seems not to imply that the three examples would qualify for that category.

Nature of Theorizing

Figure 2 is an influence diagram that summarizes this paper's view of theorizing and theory. It says that existing knowledge, paradigms, and a researcher's personal knowledge and motives influence research questions. Research questions influence theorizing, which often occurs within a paradigm and which uses and produces conceptual artifacts such as metaphors, analogies, concepts, constructs/variables, theories, and frameworks. Thus, generally consistent with the spirit of Weick (1995), theorizing may produce and test theories, but often produces other types of conceptual artifacts.

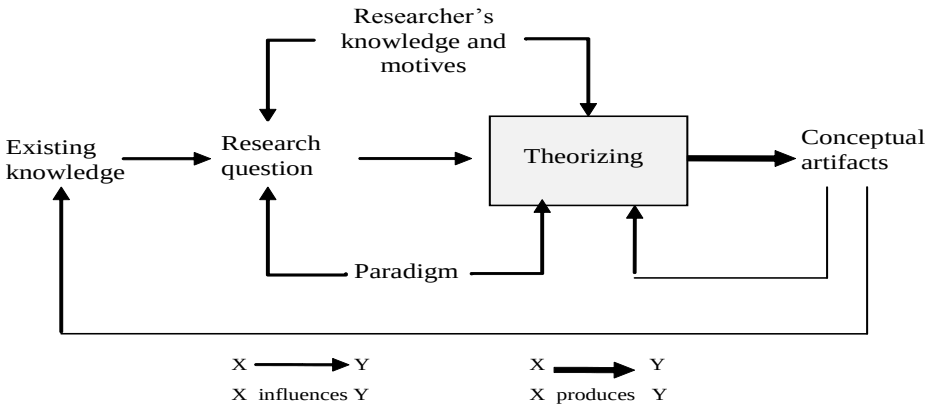

Figure 2. Theorizing produces conceptual artifacts that may or may not be theories

The main point of Figure 2 is that theorizing produces conceptual artifacts that may or may not be theories, as was described in a different way in Weick (1995). As an example, Appendix 1 explains how the theorizing that led to the articulation of work system theory (WST) developed and evaluated many types of conceptual artifacts. One result was WST, a theory by some definitions (e.g., citations to Schatzki

(2001) and Gregor (2006) in Alter (2013b, 2015c)) but not by other definitions (e.g., the evaluation of WST in Niederman and March (2014)). Other valuable results included various versions of a systems analysis method, a set of work system principles, design spaces, various versions of a metamodel, a theory of workarounds, applications to service systems, and so on. Each conceptual artifact that was used or developed during the process of creating WST and its extensions to date can be evaluated using criteria discussed in Appendix 2.

Categorizing Rigorous Conceptual Artifacts by Whether and How They Can Be Tested

Instead of categorizing theories using a scheme such as Gregor's (2006) five categories, Figure 1 describes rigorous conceptual objects as either theories or not theories, and then subdivides theories into three categories: 1) testable using a mid-range script (as described in G&L), 2) testable but not using a mid-range script, and 3) not testable at all.

As noted earlier, the list of IS theories in the "Theories Used in IS Research Wiki" (Larsen et al., 2014), from the website of the Association for Information Systems, includes many sets of associated concepts that are called theories in the IS discipline even though they would not qualify as Type IV theories and therefore would not be testable by G&L's mid-range script. Previously mentioned examples include actor-network theory, behavioral decision theory, contingency theory, general systems theory, institutional theory, sociotechnical theory, and so on.

Notice that testable does not mean falsifiable. Type IV theories can be tested using the mid-range script, stated briefly as identify variables, identify relationships between variables, obtain enough data to test the significance of relationships between the variables, analyze the data, and conclude whether relationships between the variables are statistically significant. That approach cannot be used to test general systems theory or sociotechnical theory in general even with a clear and agreed-upon statement of what those theories say. On the other hand, the value of those theories could be tested by deriving methods and tools from at least some versions of those theories and then testing whether the methods and tools produce equivalent results or better results than other methods and tools based on other theories or viewpoints.

The separation in Figure 1 between conceptual artifacts that are or are not theory also says that theories, especially Type IV theories, are not the only conceptual artifacts that are testable. Other conceptual artifacts are testable in a variety of ways. The starting point for testing any conceptual artifact, theory or not, is to decide which criteria apply to the particular kind of conceptual artifact that is being evaluated. Appendix 2 proposes that the following criteria are relevant for many conceptual artifacts: value, rigor, testability, parsimony, breadth of use, robustness, durability, generativity, and source. While all of those criteria are significant for many conceptual artifacts, some are much more important for particular types of conceptual artifacts. For instance, parsimony is quite important for a type IV theory, whereas it is less important for many models and metamodels.

In many cases, several conceptual artifacts that serve a similar purpose might be compared in order to decide which conceptual artifact is more effective in a particular type of situation. An example mentioned in Appendix 1 is how the work system framework from WST initially contained the concept *business process*, which was later changed to *work practices*, and subsequently changed again to *processes and activities*. The reasons for the changes were related to issues observed in using the ideas for their intended purpose within WST and its applications. Each change might have been viewed as incorrect or misguided by observers particularly concerned with other topics, such as BPM or practice theory.

The categorization of conceptual artifacts based on whether and how they can be tested is quite different from simply insisting on the falsifiability of theories. If the goal is knowledge creation, then articulating and testing a broad range of conceptual artifacts makes more sense than assuming that knowledge is totally captured in Type IV theories (an assumption that is incorrect if one accepts the discussion thus far).

Exaggerated Significance of Theory

Avison and Malaurent (2014) asks whether theory has become a fetish in the IS discipline. This question can be stated more directly by asking whether there is any reason to believe that theories are better than

other types of conceptual artifacts. Thus far this paper has noted 1) there is significant disagreement about what theory means, 2) many conceptual artifacts that are called theories in the academic IS discipline are not theories by widely accepted definitions of theory, 3) if the goal is knowledge creation then many other types of conceptual artifacts are important. Regardless of how many times researchers cite Lewin's (1952) frequently repeated aphorism "there is nothing more practical than a good theory," without looking up the original source it is not obvious whether Lewin was talking about type IV theories, about the full range of theories in Gregor (2006), or about something even more general. The following generalization seems just as plausible as the Lewin aphorism: "Nothing Is More Practical than a Good Theory … except possibly a Good Paradigm or Framework or Model or Metaphor." (Alter, 2015a)

One way to test whether theories actually are better than other conceptual artifacts is to collect a substantial number of examples and anecdotes illustrating that theories are more important than other types of conceptual artifacts. Initial examples of the opposite proposition are shown in Table 4. While those examples might seem cherry-picked, the existence of the examples represents a direct challenge to the possibly excessive primacy of theory in the IS discipline. The challenge is to find a set of convincing examples that illustrate how theories are more important than other types of conceptual artifacts in IS (and definitely not using theories from physics such as the theory of planetary motion, relativity, Maxwell's equations, or quantum mechanics to demonstrate the centrality of theory in the quite different field of IS).

- **Concepts without formal theory**. Many of the most important developments related to creating and implementing systems in organizations were based on concepts but not on theories. Examples include most software development techniques (e.g. entity relationship models) and methods (e.g., agile development).
- **Theories, frameworks, models**. The 2009 Nobel Prize speech by the economist Eleanor Ostrom specifically mentioned relationships between frameworks, theories, and models in her research and contained no implication that theories are more important than frameworks or models. (Ostrom, 2009)
- **Theories vs. methods.** Greenwald (2012, p. 102) found that 82% of Nobel Prizes in physics, chemistry, and medicine in the period 1991 to 2011 cited contributions to methods and only 18% cited contributions to theory.
- **Theory vs. concepts**. The winner of the 2013 Turing Award, the most distinguished award in computer science, noted that he received the award because of concepts related to distributed systems that he helped develop, and specifically not because of theoretical contributions. (McGoneal, 2014)
- **A "world view," not a theory**. As demonstrated by over 6600 citations since it was first published, Vargo and Lusch's (2004) first article on service dominant logic has been discussed and cited extensively by scholars in marketing and related fields. The article presents eight "foundational premises" of a "worldview," not a theory.

Table 4. Examples illustrating that theories are not more important than other types of conceptual artifacts

3) Many Beliefs and Practices Related to IT Will not Hold Still for Long due to the Rapid Pace of Technological Change

G&L's analysis of articles published in in *MIS Quarterly* and *Information System Research* between 1998 and 2012 demonstrates that a safe, mid-range theory script treated IT as largely external to IS theorizing. For example, "*the majority of TAM research reiterates and corroborates the predictions of imported psychological theories about the effects of cognitive states (e.g., attitudes) on the likelihood of an individual's action (e.g., adopting a tool). ….The main challenge here is that the resulting theory does not truly integrate novel features of IT and its properties in explaining the adoption phenomenon. … TAM studies tell us very little about how and why specific classes of IT tools and technologies are adopted and used, or how an IT tool being adopted might reflect back on the individual's intentions*." (p. 276)

What if we grant G&L's wish? It is reasonable to ask what would happen if new institutional practices granted G&L's wish for greater attention to IT and related phenomena in IS theorizing. IT has changed rapidly for decades and continues to do so. The basic trends in the underlying technical capabilities are

exponential (e.g., Moore's Law for semiconductors and its impact on technologies that use semiconductors). As noted by Kurzweil (1999), IT's exponential rate of change has lasted for over 100 years and has extended through five generations of technology (electromechanical, relay, vacuum tube, transistor, and integrated circuit). As that journey continues unabated, current beliefs and practices related specifically to IS and IT usage (not to psychological variables such as intention to use) will be related to whatever are current and recent technologies in use at a particular time.

Imagine that past research had theorized about fundamentally IT-limited phenomena related to management use of computers, software development, cybercrime, personal use of computers, mobile computing, ubiquitous computing, integration of machine learning with business processes, use of virtual reality, access to information, the digital divide, and so on. In all of those areas, it is possible that the value of carefully researched studies of current beliefs and practices grounded in any current version of IT capabilities often would have very short shelf life because the technology itself and possibly the related phenomena might change within five years, perhaps before the research could be published. For example, consider the phenomenon of cell phone use in the less developed world. It would be interesting to look back and ask what might have been the theories about information access and information system access in less developed countries in 1985, 1995, or 2005. Stories such as the use of mobile banking in Kenya, the use of social media in the Arab Spring, and the use of cell phones by migrants during the 2015 migration crisis in Europe easily could have led to more practical understandings and usable insights than theorizing about related IS/IT phenomena five years earlier.

G&L seems to recognize the importance of technological change and examples such as the above, but does so rather indirectly. The closest it comes to mentioning technological change seems to be the following "*As a field in which the dynamics of IT innovation and use catalysts constantly change in human enterprise, we should be keen and acute observers of practice independent of prior theoretical baggage. Pure observation, description, and identification of patterns are valid modes of research and initial steps for rich and robust theorizing (Weick 1995).*" (p. 287)

As noted earlier, there is no way to demonstrate that a difficult challenge is insurmountable. It is certainly possible that researchers will find many fascinating and important ways to integrate IT capabilities and IT phenomena into IS theorizing. The main point here is that even successful efforts in that direction may lead to concepts and theories of only transient interest. In extreme cases, the time required for performing careful research plus the time required to move through rounds of revisions in leading journals could result in publications whose theoretical contributions seem obvious by the time they are published.

4) Most Concepts and Phenomena that are Relevant to IS Are not Uniquely about IS.

The IS discipline has a strongly avowed ambition to produce theories that are uniquely about IS. That ambition motivates discussions of "native theories" (Straub, 2012) versus reference theories. Generally ignored in those discussions is the possibility that most of the relevant conceptual artifacts, including theories, actually are about work systems in general, and therefore in essence are not unique to IS.

Information systems can be defined as special case of work systems. According to WST, "a work system is a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products/services for specific internal and/or external customers." (Alter, 2013b) By this definition, work systems may be sociotechnical systems in which people perform processes and activities. They also may be totally automated systems, including those revealed through decomposition of sociotechnical work systems during analysis and design processes. In other words, this definition overcomes the confusion about whether information systems are sociotechnical systems or hardware/software configurations.

Information systems are work systems whose processes and activities are totally devoted to processing information through activities including capturing, transmitting, storing, retrieving, deleting,

manipulating, and displaying information. (Alter, 2008a, 2013b). Since information systems are work systems, they should inherit most of the conceptual artifacts that apply to work systems in general.

Concepts. Table 5 identifies representative examples of concepts that apply to work systems in general and also apply to sociotechnical information systems in general. Many other concepts could be added. If is important to produce native theories, Table 5 calls for two types of responses:

- Use concepts related to work systems in general to produce theories that apply only to information systems in particular.
- Identify concepts that apply only to information systems and not to work systems in general, and use those concepts to express theories that apply only to information systems.

Element of the work system framework (or system in general)	Concepts related to work systems in general and also to information systems in general
System in general	centralization/decentralization, capacity, flexibility, leanness, scalability, resilience, agility, transparency, variability in demand and workload, predictability of demand and workload, frequency of damaging incidents or failures, frequency of significant errors and exceptions, risk of major failure, workarounds, adaptations
Customers	Satisfaction with product/services produced by system, customer segmentation, customer priority, customer experience, interaction with customer, extent of co-production
Product/services	Total cost to customer, quality perceived by customer, reliability perceived by customer, customizability, configurability by customers, conformance to product/service regulations or standards
Processes and activities	Degree of scriptedness, range of involvement, level of integration, complexity, variety of work, degree of automation, rhythm, time pressure, amount of interruption, form of feedback and control, error-proneness, formality of exception handling
Participants	Knowledge, skills, personal autonomy, personal challenge, personal incentives, personal motives, education
Information	Quality assurance, quality awareness, ease-of-use, security, accuracy, precision, coding, format, source, timeliness
Technologies	Range of functionality, ease-of-use, ease of technical support, ease of maintenance, interoperability with complementary technologies in other work systems
Environment	Alignment with culture, alignment with organizational policies and procedure, conformance with laws and regulations, alignment with external technological trends
Infrastructure	Reliance on shared human infrastructure, reliance on shared information infrastructure, reliance on shared technical infrastructure
Strategies	Fit with the organization strategy, fit with the strategy of related work systems

Table 5. Concepts that are related to work systems in general and also to information systems in general

Principles and theories. A discussion of theories and theorizing should go beyond identifying concepts that are equally relevant to work systems in general and sociotechnical information systems in general. It should ask whether theories related to work systems in general are equally relevant to sociotechnical

information systems in general. That would likely be true of most theories related to work systems because sociotechnical information systems are a special case that should inherit many of the properties of the more general case. And if that is usually true, then concerns about native theories would become a bit more awkward because many native theories could turn out to be theories about work systems in general rather than theories about information systems in general.

To pursue this idea with an example, consider a set of principles that were designed to cover work systems in general and to be used when analyzing and designing IT enabled work systems. Table 6 presents a set of 24 such principles that were validated informally through opinions of six small cohorts of Executive MBA students concerning whether each principle seemed to make sense for most work systems and whether each principle seemed to describe most operational work systems in their own organizations (Alter and Wright, 2010). The list of principles built upon an initial list consisting of one principle per work system element combined with modified versions of sociotechnical principles of Cherns (1976).

Each of the 24 principles could be restated as a Type IV theory in the general form "if X occurs, then Y will be more likely." In addition, each of the 24 principles seems equally applicable to work systems in general as to information systems in general. One implication is that the search for native theories in IS may bump into the fundamental issue that most of the concepts and knowledge that apply to information systems in general are actually concepts and knowledge about work systems in general. A bit of evidence in that direction is that over half of the IS-related risk factors found in a study of the IS risk literature (Sherer & Alter, 2004) were actually risk factors for work systems in general, such as management support, staff competence, and appropriate incentives.

<table>
<tr><td colspan="2">Customers</td><td colspan="2">Product/Services</td></tr>
<tr><td colspan="4">• #1: Please the customers.
• #2: Balance priorities of different customers.</td></tr>
<tr><td colspan="4">Processes and Activities</td></tr>
<tr><td colspan="4">• #3: Match process flexibility with product variability
• #4: Perform the work efficiently.
• #5: Encourage appropriate use of judgment.
• #6: Control problems at their source.
• #7: Monitor the quality and timing of both inputs and outputs.
• #8: Boundaries between steps should facilitate control.
• #9: Match the work practices with the participants.</td></tr>
<tr><td colspan="2">Participants</td><td>Information</td><td>Technologies</td></tr>
<tr><td colspan="2">• #10: Serve the participants.
• #11: Align participant incentives with system goals.
• #12: Operate with clear roles and responsibilities.</td><td>• #13: Provide information where it will affect action.
• #14: Protect information from inappropriate use.</td><td>• #15. Use cost/effective technology.
• #16: Minimize effort consumed by technology.</td></tr>
<tr><td>Infrastructure</td><td colspan="3">• #17: Take full advantage of infrastructure.</td></tr>
<tr><td>Environment</td><td colspan="3">• #18: Minimize unnecessary conflict with the external environment</td></tr>
<tr><td>Strategies</td><td colspan="3">• #19: Support the firm's strategy</td></tr>
<tr><td>Work System as a Whole</td><td colspan="3">• #20: Maintain compatibility and coordination with other work systems.
• #21: Incorporate goals, measurement, evaluation, and feedback.
• #22: Minimize unnecessary risks.
• #23: Maintain balance between work system elements.
• #24: Maintain the ability to adapt, change, and grow.</td></tr>
</table>

Table 6. 24 work system principles (Alter and Wright, 2010)

The challenge. Are there any concepts, principles, and theories that are relevant to sociotechnical information systems in general but not to work systems in general? An initial look at that question led to a proposal to try to organize a body of knowledge for the IS discipline based on a body of knowledge for

work systems in general. (Alter, 2012b) That body of knowledge would start by identifying and organizing a large number of concepts related to work systems in general, and then exploring whether those concepts were equally relevant to sociotechnical information systems in general and other special cases of work systems, such as projects in general or supply chains in general.

5) Institutional Practices at Multiple Levels Encourage Use of Scripts that are Obstacles to Creativity and Knowledge Development.

G&L provides a carefully justified explanation of the mid-range theory script. In my opinion, the academic IS discipline encourages a number of other scripts as well. Such scripts are useful in some cases, but in others are more like obstacles to knowledge development. This section stretches G&L's idea of "the mid-range theory script" to discuss other types of scripts beyond the mid-range script. After observing that G&L seems to follow one established script, and to some extent may seem to reflect another, this section identifies a number of scripts that range from sometimes useful to rarely useful. The underlying challenge is whether and how academic IS discipline should maintain, update, or eliminate those scripts.

G&L's use of one script and possibly another. G&L identifies the use of the mid-range theory script as an obstacle to creative IS research. Ironically, it actually uses another script that occurs repeatedly in IS journal articles and conference papers. That script involves trying to describe or evaluate the current understanding of a phenomenon or topic by looking backward at past publications in *MISQ*, or *MISQ* and *ISR*, or the "basket of eight" top IS journals identified years ago for the purpose of influencing promotion and tenure decisions, rather than for the purpose of providing guidance for research. That might be called the called **script of the narrowly focused rear view mirror.** While G&L's use of that script genuinely supports its purpose and main conclusions, there many cases where that script would overlook important ideas that simply hadn't been published in one or two or eight highly respectable journals that each tend to cover some topics and research approaches, but not others. Consider topics such IT-enabled innovation, open source, value co-creation, secondary design, workarounds, process mining, and encapsulation of functionality. Those few journals may have mentioned those ideas in the past, but it is quite likely that other sources would provide additional insights and examples.

G&L's balance between justification and conclusions seems to follow another script, the **script of justification over value**, in which the completeness and rigor of the justification is viewed as much more important than the value and possible implications of the conclusions. While G&L presents genuinely important conclusions, in my (obviously subjective) opinion it follows the script of justification over value by deferring for many pages the clearest statement of the "take-aways" that would appear in a one or two page summary focusing on value for readers. In my opinion, those take-aways are not crystallized fully until Figure 1 on the 11th page (" the vicious cycle of the mid-range script") and Figure 2 on the 15th page ("the satisficing nature of mid-range theory scripts"). In particular, that figure says that the mid-range script leads to mid-range theories that are simultaneously low in practical value and low in theoretical interest. Therefore the goal of practical value might be served better by research that is more highly data-driven, just as theory development might be served better by "Blue Ocean" theories that are more speculative and possibly less supported by rigorous analysis of data. In relation to serving its readers more effectively, G&L might have put more effort into overcoming the script of justification over value by giving more priority to the well-justified conclusions and their implications, rather than the justifications per se.

A Design Theory for Minimizing both Practical Impact and Blue Ocean Theorizing in the IS Discipline

In my surely controversial opinion, many practices in IS academia are driven by a series of scripts that are far more directed at academic scorekeeping than at knowledge creation and dissemination, which is supposed to be the purpose of the exercise. I think that some of those practices can be viewed as a design theory for minimizing the long-term health and value of the IS discipline. Aspects of that design theory might be described a set of guidelines with accompanying scripts, some of which are named and summarized next. The focus here is on issues related to knowledge creation and dissemination. Important issues related to academic scorekeeping, career development, and institutional reputations are beyond the

current scope. Table 7 summarizes lists the guidelines in the hypothetical design theory along with the name of a script for each statement. The subsequent text discusses each guideline in turn.

Guidelines included in the design theory	Related script
Discourage developing long-term research streams.	script of author anonymity
Maintain the charade of double blind reviewing.	script of double blind reviewing
Discourage self plagiarism.	script of self-plagiarism
Hide research in progress.	script of hiding progress
Make publications difficult to access.	script of publication ownership
Insist that new ideas must be based on previous publications.	script of the narrowly focused rear view mirror script of the literature gap
Promote scripts that encourage formulaic research.	script of formulaic research
Focus on justification more than on value.	script of justification over value
Assume that practicality and lack of rigor go together	script of dismissing practical contributions

Table 7. A design theory for minimizing the long-term health and value of the academic IS discipline

Discourage developing long-term research streams. Instructions for submissions to leading journals and conferences often say clearly that the author's name should not appear in the article. That is okay for previously unknown topics, one-of-a-kind papers (like G&L), authors who are new PhDs, and authors embarking on new research topics, but it is totally counterproductive when attempting to build on one's previous research. For example, this script would prohibit me from including Appendices 1 and 2, which use aspects of my research as an example to illustrate important points about conceptual artifacts and their evaluation. From the opposite direction, in a recent instance, I tried to honor the instruction for author anonymity with just one or two totally necessary exceptions. One of the reviews of my own paper criticized its authors for being unaware of some of my own previous publications.

This type of discouragement might be called the **script of author anonymity**. It presents a "damned if you do, damned if you don't" proposition for authors who legitimately want to build on past research, which is a common path toward impact and value in most areas of science. If the primary goal is knowledge creation and dissemination, then authors should be encouraged, not discouraged, to identify, summarize, and build upon their most relevant research. The effect of author anonymity is basically to discourage developing long-term research streams that bring a much higher probability of impact and value (Exceptions are excellent review articles and a few breakthrough articles that are cited widely).

Maintain the charade of double blind reviewing. Double blind reviewing assumes that reviewers do not know the author and that the author does not know the reviewers. The anonymous author part of the **script of double blind reviewing** is increasingly a charade in the time of Google Scholar and future reasoning capabilities that will be available through tools more like IBM's Watson. The Merriam Webster online dictionary defines a charade as "something that is done in order to pretend something is true when it is not really true."

Ask yourself whether a serious reviewer who has access to Google Scholar cannot make a good guess about the author or at least some of the associates of authors of a majority of research articles. Assume, for example that a submission explains the hypothetical concept of sociomateriality of double blind

reviewing. If I were to review such a paper, I might look up some of the unfamiliar references, or might look up sociomateriality plus several of the concepts in the paper. In many cases I would quickly develop a good hypothesis about who the authors were (if that actually mattered to me at all).

Discourage self-plagiarism. The obvious inappropriateness of publishing essentially the same research multiple times has morphed into a bizarre **script of self-plagiarism** that is designed to prevent an author from repeating previous best explanations of the main ideas related to their past research. Requiring researchers to disguise reuse of key sentences or explanations in their own past publications is totally unrelated to knowledge creation and dissemination. It simply wastes author time and sometimes reader time. It is also demeaning, because it encourages authors to disguise their own work so that their supposed self-plagiarism won't be treated like plagiarism by high school students and college freshmen writing papers about the life of Charles Dickens or the cause of World War I. Based on publisher's copyright contracts that I have seen recently, most journal publishers recognize that authors need to reuse some of their own explanations and provide appropriate permissions in their contracts. The IS discipline should catch up with the journals if it has not done so already.

Hide research in progress. The **script of hiding progress** encourages authors to hide working papers and other indications of research progress so that preliminary findings are not treated as publications whose existence would block the final publication, either by piercing the shroud of author anonymity or by being counted as a publication in academic scorekeeping. The script of hiding progress may actually discourage participation in small workshops and other events that help in developing research ideas and methods. It may lead to counterproductive practices such as suppressing workshop papers that otherwise might receive useful feedback. I can't wait to see a workshop on open source or open innovation in which all of the papers are kept secret for fear that an academic scorekeeper somewhere will learn about them and then prevent broader access to minimize academic double dipping.

Make publications difficult to access. The **script of publication ownership** says that journals own copyright to journal articles and that access to those articles will be limited based on commercial interests. While those interests are obviously important, and while authors usually are allowed to post an earlier version of a published article on their own personal websites, making publications unnecessarily difficult to access clearly does not contribute to knowledge creation or knowledge dissemination.

Insist that new ideas must be based on previous publications. Literature reviews are obviously useful for demonstrating that authors are aware of other research and for positioning research in relation to other research. Standard literature reviews work especially well for research that fits into a widely recognized research stream. Standard literature reviews are less effective as a preface to new ideas or new ways to make sense of new situations. A complete literature review for a discussion of a broad or widely inclusive topic (e.g., a Blue Ocean theory) would tend to be quite long. In effect, the expectation of a complete literature review at the beginning of a paper interacts with publication page limits by tending to crowd out whatever ideas are new and interesting.

As mentioned previously, the **script of the narrowly focused rear view mirror** involves trying to describe or evaluate the current understanding of a phenomenon or topic by looking backward at past publications in *MISQ*, or *MISQ* and *ISR*, or the "basket of eight" top IS journals identified years ago. This script is easy to follow, formulaic, and relatively efficient in the expected number of conference papers or journal publications produced per unit of research or effort. Unfortunately, by design it misses research in journals other than the few that were selected based on reputation rather relevance to the question at hand and often misses the most recent research. Except in cases like G&L whose argument hinged on the frequency of the mid-range theories script in leading journals, the script of the narrowly focused rear view mirror treats the appearance of using an established method as more important than the likelihood of producing better results. The script provides a straightforward answer to typical reviewer concerns about exactly how results were produced, but it is highly likely to miss relevant publications and/or research that would have been found by inspecting broad ranging search results.

Also related to the notion that new ideas must be based on previous publications, the **script of the literature gap** tends to undermine genuine Blue Ocean theorizing. Consider an admission noted in *American Management Review*:

> "Ronald Coase (1937) formalized his influential ideas on the nature of the firm when, at the age of twenty-one, he had to teach a course on the organization of the business unit—a topic about which he knew very little. He later reported, "I made it all up myself" (Coase, 1993: 35), on the basis of his eclectic training, visits to industrial plants, and his curiosity concerning business firm organization. Only after he had formulated his basic ideas did he examine the prevailing literature on the topic."(Kilduff, 2006, p. 252)

In my personal experience, reviews tend to be more positive when a paper pretends that its main ideas were based on the gap in the literature, regardless of whether that was actually true.

Promote scripts that encourage formulaic research. G&L (p. 279) explains strong individual incentives to mid-range theory script, which might be viewed as a special case of a more general **script of formulaic research**. The benefits of formulaic, cookie-cutter approaches are relatively obvious: they are easy to understand, comparatively easy to use, and relatively easy to defend against challenges to whether conclusions are justified.

G&L cites an *Academy of Management Learning & Education* article whose title uses that term, "Beyond Formulaic Research: In Praise of Greater Diversity in Organizational Research and Publications" (Alvesson and Gabriel, 2013). Earlier, editorial comments in *American Management Review* on "Publishing Theory" (Kilduff, 2006) gave a reason why theorizing should not try to use a formulaic script: "One of the important criteria for evaluating theory is the extent to which it runs ahead of existing empirical research in terms of alerting us to research opportunities hitherto unanticipated." Those comments go on to say "good theory leads not through gaps in the literature but through an engagement with problems in the world." One of "five cautions" in the same set of comments is "Don't Follow a Recipe."

Issues about the benefits of formulaic research are quite relevant in design science research (DSR), a topic that G&L chooses to ignore (p. 272) in order to focus on the mid-range theory script that applies mostly to Gregor Type IV theories. Many DSR researchers and apparently reviewers treat a series of steps mentioned in Hevner et al. (2004) as a mandatory checkoff list around which papers need to be organized in order to be received favorably by reviewers. Short of that, researchers focusing on developing new ideas or artifacts sometimes believe it necessary to justify their research as DSR research even if the ideas in the DSR literature actually had no bearing whatsoever on how they pursued their research. Imagine, for instance that Ronald Coase (mentioned above) would have had to justify his theorizing as an instance of DSR, or worse yet, that he would have to present it in a way that was consistent with what some other researcher said was an appropriate DSR process even if that approach was highly formulaic and had nothing to do with his process of creating new ideas. It is essential to have clearly specified guidelines and practices for doing clinical trials. Telling people how to do inherently creative work is not in that category.

Focus on justification more than on value. The **script of justification over value** was mentioned earlier. It emphasizes packaging and positioning and tends to underemphasize content, implications, and potential real world value. Imagine, for example that the reviews of G&L had concluded that its argumentation and overall justification of its conclusions were excellent, but that the authors should add five more pages explaining the implications of their findings in more depth, perhaps covering topics such as numerous examples of specific data-driven research topics that deserve attention or interesting starting points for Blue Ocean theorizing that might prove extremely valuable. Overcoming the script of justification over value in that way would give G&L's highly distinguished authors permission to say things that were more speculative and that might do more to engage the imagination of more readers.

Assume that practicality and lack of rigor go together. The never-ending rigor vs. relevance discussion in IS often conflates rigorous with theoretical and practical with non-rigorous. Rigor is fundamentally not about arcane statistics or about certain forms of theory. It is about defining terms and using basic critical thinking, such as identifying the issues, providing relevant arguments, justifying conclusions, and explaining the range of relevance of the entire discussion. Some research with a practical orientation is just as rigorous as research with a theoretical orientation.

The **script of dismissing practical contributions** assumes that there is a distinction between intellectual contributions and practical contributions, and that claims of practicality undermine claims of intellectual value or rigor. One review that I remember stated that a paper was "merely practitioner material" rather than "research material," and that certain management-related ideas would be of interest to IS practitioners but not of interest to IS researchers. It is unclear why researchers in a practice-oriented field would have little of interest in topics that might be interesting to practitioners in the same field. As an applied discipline, the IS discipline would be healthier and less schizophrenic if it found a way to treat material with practical value as seriously as material that follows a G&L mid-range script.

Conclusion: A Path toward Addressing the Five Challenges

This paper identified five seemingly insurmountable challenges related to attaining long-term value from theorizing about information systems. The challenges were described as seemingly insurmountable because established practices and institutional pressures at many levels make it difficult to move forward in significant ways. Instead of summarizing everything stated thus far, this concluding section simply lists the fives challenges and identifies possible directions for moving forward.

The proposed directions for moving forward generally follow G&L's suggestion about pushing IS inquiry to the data rich and theory rich "edges" of G&L's Figure 2 (p. 285). None of the proposals are about following the mid-range script. Some are about collecting and organizing conceptual artifacts and examples, in essence focusing on conceptually rich data sets instead of theories. Other proposals have a more speculative nature that is more in the spirit of Blue Ocean theorizing even if they do not attempt to produce Blue Ocean theories.

1) Significant disagreement about definitions of basic terms makes it extremely difficult to accumulate IS knowledge. A starting point for moving forward in this area is to identify at least one set of definitions that provide an internally consistent treatment of most of the concepts and phenomena in the IS discipline as was proposed in Alter (2012b). If there is little interest in that topic, or if it seems like too much trouble, then there is little possibility of producing an organized body of IS knowledge.

2) The IS discipline seems to take for granted that knowledge must take the form of theory. This can be addressed through widespread recognition of a series of ideas that were presented and supported to some extent in this paper:

- Recognize that knowledge related to IS encompasses not just theory, but also non-conceptual information and conceptual artifacts of various types. Theorizing creates or improves a range of conceptual artifacts, not just theory. Appendices 1 and 2 illustrate these points. It is possible to go much further by collecting and comparing similar examples, thereby generating a better understanding of identification and evaluation of types of conceptual artifacts that are used and created by IS theorizing.
- Recognize that there is no reason to believe that theory is better than other types of conceptual artifacts, especially since many theories used and cited in the IS literature would not qualify as theories based on frequently accepted definitions of theory. Pursue this further by collecting more examples and anecdotes along the general lines of those in Table 4, thereby extending the inquiry about whether or not theories in general or Type IV theories in particular are more important than other types of conceptual artifacts.
- Replace Lewin's (1952) frequently repeated aphorism about the practicality of theory with a different statement saying that nothing is so practical as a good theory or a good paradigm or framework or model or metaphor, etc. Use that assumption to deepen the IS discipline's discussion of theory-related topics such as the definition of theory, the existence and importance of native theories, the appropriation of reference theories, and possible ways to maximize the benefit for mid-range theories
- Recognize that valuable knowledge related to IS also may be atheoretical and data-centric. Research about workarounds related to barcode medical administration systems was presented as an example. Collecting, comparing, and contrasting a large number of such examples could lead to a set of general criteria (but hopefully not a G&L script) for explaining the value, legitimacy, and publishability of research of this type.

- Compile significant examples of Blue Ocean theorizing, including examples within IS and from other disciplines. Compare and analyze the examples to identify any shared characteristics. Identify characteristics of specific articles that made it possible to publish such theorizing. Relevant sources from the management discipline that are cited elsewhere in this paper include include Weick (1995), Kilduff (2006), and Alvesson and Gabriel (2013).
- Recognize that most knowledge about IS comes from practice, not academic theorizing. Since most knowledge about IS does not appear in academic theories or IS journals, IS academia should approach the issue of knowledge creation with humility. Consider for example the source of knowledge about smart phones, search methods, and infrastructural software. The primary knowledge creators are in industry, not in academia even though some academics have contributed in some ways, often outside of their academic research roles. Research questioning the foregoing assertion about the source of most IS knowledge would start by compiling whatever its authors consider to be IS knowledge that is distinct from knowledge produced in industry.

3) Many beliefs and practices related to IT will not hold still for long due to the rapid pace of technological change. It is possible to explore the impact of this assertion by looking backward or forward.

- Looking backward, identify a series of research conclusions from the last 30 years that no longer seem relevant. Among those, identify research conclusions that specifically were or were not related to IT features, affordances, or capabilities. Characterize the findings in each category to try to understand what differentiates the conclusions that were or were not related to IT features, performances, or capabilities. That type of research diverges far from the G&L mid-range script because it is highly interpretive and accepts the risk of trying to develop claims that some recent or ongoing research is actually about an outdated topic.
- Looking forward instead of backward, identify a series of IT-infused topics that deserve research currently. For each topic, imagine several possible conclusions and estimate how long any of the alternative conclusions might remain relevant as the exponential rate of IT progress continues unabated.

4) Most concepts and phenomena that are relevant to IS are not uniquely about IS. Challenge this assertion by identifying a series of concepts, generalizations, and theories that apply to information systems in general but do not apply to work systems in general. If only a small number of concepts, generalizations, and theories qualify, then it will probably prove difficult to develop a body of knowledge that is uniquely about IS and not about work systems in general.

5) Institutional practices at multiple levels encourage use of scripts that are obstacles to creativity and knowledge development. Identify ways to negate or overcome each of the imagined guidelines in the previously discussed design theory for minimizing the long-term health and value of the academic IS discipline. Here are suggestions for each of the related scripts in Table 7:

- **Script of author anonymity**. Eliminate this obsolete script because it is an obstacle to knowledge creation and dissemination.
- **Script of double blind reviewing**. Recognize that good reviewers will often be able to identify the authors or their associates. Ending the charade of double blind reviewing would make it easier to eliminate the counterproductive practice of requiring that authors anonymize their manuscripts.
- **Script of self-plagiarism**. Eliminate this script because asks authors to waste time by trying to make it seem as though they are not repeating their previous best efforts to explain central ideas or examples that are relevant to the new research.
- **Script of hiding progress**. Encourage authors to obtain as much feedback as possible about their ideas and research. Eliminate the practice (or at least the threat) of disqualifying journal submissions that previously were presented in workshops and were distributed to other researchers for feedback.

- **Script of publication ownership**. Popularize alternative forms of access to research that appears in journals. For example, authors might post draft manuscripts on their personal web sites and organizations such as AIS could index those personal websites on an opt-in basis to make research findings more readily available to researchers who do not care so much about seeing archival copies that appear in journals.
- **Script of the narrowly focused rear view mirror**. Continue looking backward at what appeared only in certain leading journals if the question at hand is about what appeared in those journals. If the question is about something more general, then use Google Scholar or whatever other search engines might be helpful.
- **Script of the literature gap**. Recognize that the script of the literature gap is helpful mostly when there are significant possibilities for incremental improvements in the literature related to a frequently studied subject. Do not insist on pretending that gaps in the literature motivated research when in fact that is not true.
- **Script of formulaic research**. Follow G&L's suggestion to accept and honor meaningful research that falls outside of the mid-range theory script.
- **Script of justification over value**. Change the organization of conference and journal papers. Require that they start with at least several pages of explanation about the reason for the research and the value of the findings. Move primarily statistical justifications to an Appendix.
- **Script of dismissing practical contributions**. Recognize that practical contributions can be just as rigorous as supposedly intellectual (but not necessarily practical) contributions. Look for the possibility of practical value in most research. Publication of research with no foreseeable practical value should be less common than it is now.

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Appendix 1: Conceptual Artifacts in Theorizing Related to Work System Theory

This section explores the applicability of this paper's view of theorizing (Figure 2) and of conceptual artifacts. It looks at the theorizing that occurred in the body of research involving work system theory (WST) and its applications and extensions to date (Alter, 2013b). WST consists of three things, 1) the definition of work system (p. 75); 2) the work system framework (p. 78), summarizing a relatively static view of a work system as it operates during a particular time; 3) the work system life cycle model (p. 78), summarizing how work systems change over time through a combination of planned and unplanned change. The various versions of the work system method (WSM) are applications of WST, not a part of WST. Extensions of WST that are mentioned later in this paper include work system principles, a set of work system design spaces, a work system metamodel, and a theory of workarounds.

This section explains how every type of conceptual artifact mentioned earlier played a role, either in theorizing or as a product of theorizing for WST and directly related topics. This Appendix was inspired partly by the way Avison and Malaurent (2014) discussed Schulze (2000) as an example in its analysis of issues related to the exaggerated emphasis on theory in the IS discipline. Consistent with Weick (1995) and Hassan (2014), this section illustrates why seeing (Type IV) theory as the main result of theorizing is a myopic view of what theorizing is about and what it accomplishes. It also contributes to doubting whether theory (especially Type IV theory) is either better or more practical than other types of conceptual artifacts.

Research question. Alter (2013b, p. 113) describes how the original research question that eventually led to WST was to develop systems analysis ideas that could be used by typical business professionals. Over time, additional research questions arose, such as how to combine simple models for business professionals with more rigorous models for IT professionals. That new research question led to the creation of the first version of a work system metamodel (Alter, 2010a), which has been revised and is now in its fifth version. Another new research question about how emergent change occurred as part of the work system lifecycle model led to a theory of workarounds (Alter, 2014).

Paradigm. The central ideas in WSM did not come from formal IS research, but rather from 1992, 1996, 1999, 2002 editions of an IS textbook. (Alter, 2013b, p. 113) The idea of developing a systems analysis method for business professionals did not fit well into the typical paradigms in the IS discipline, such as performing IT-centric systems analysis, studying determinants of whether IT will be used effectively, and or assessing the economic impact of IT. The issue of how to understand systems in organizations from a business viewpoint seemed to be in an amorphous area somewhere between the disciplines of IS, operations management, and general management. A perceived disconnect from established paradigms led to papers entitled "18 Reasons why IT-Reliant Work Systems Should Replace the IT Artifact as the Core Subject Matter of the IS Field" (Alter, 2003a) and "Sidestepping the IT Artifact, Scrapping the IS Silo, and Laying Claim to 'Systems in Organizations'" (Alter, 2003b). The articulation of work system theory in Alter (2013b) and the subsequent claim that WST is becoming a platform (Alter, 2015c) supports the notion that WST is the core of a paradigm that might be called work system thinking.

Analogy. The idea of developing WSM was based on a direct analogy between IT professionals and business professionals. If IT professionals needed systems analysis methods that would help them, surely business professionals could use an organized systems analysis method that would suit their needs. That thought was expressed in the title of the paper published more than a decade later, "Systems Analysis for Everyone Else: Empowering Business Professionals through a Systems Analysis Method that Fits Their Needs." (Truex et al., 2010).

Myth. The development of WSM was based on what might be viewed as a motivating myth, the unproven belief that business professionals need an organized systems analysis method. On the other hand, part of the rationale for explaining the potential value of WST is that common acronyms such as CRM, ERP, and BPM seem almost mythological. For example, contrary to their names, CRM software does not manage customer relationships; ERP is not fundamentally about resource planning for an entire enterprise; and BPM software does not actually manage business processes. It would be interesting to pursue that line of thinking through empirical research that explores and contrasts the motivational value and misleading nature of myths, hype, and positioning in the IS discipline, both in academia and in practice.

Metaphor. Alter (2013a, p. 1) reports "building on past research highlighting metaphors related to organizations, IS, and projects."... "It is shows how considering common, broadly applicable types of subsystems (not standard IS categories such as MIS and DSS) might provide direction, insight, and useful methods for analysis and design practitioners and researchers." It "identifies relevant metaphors, concepts, theories, methodologies, success criteria, design tradeoffs, and open-ended questions that could augment current analysis and design practice" for eight types of subsystems [e.g., communication, decision making, control] that are relevant to most systems in organizations.

Concept. WST is based on a series of concepts starting with the definition of work system and the definitions of the terms in its two central frameworks. Extensions of WST such as a set of work system design spaces (Alter, 2010b) identify many concepts for analyzing and designing systems. For example, concepts related to *work system as a whole* include capacity, scalability, resilience, and transparency, whereas concepts related to a work system's human participants include age, skills, and interests.

Theorizing related to the work system framework struggled with several basic concepts. Initially, the activity performed by a work system was called its *business process*. Later that was changed to *work practices* to minimize confusion between the process as documented versus the process as performed, and also to avoid assuming that all work systems had well defined processes. That term was replaced by *processes and activities* because some MBA students had difficulty using the term *work practices* meaningfully. Another concept that changed was *output*, which sounded computer-oriented, and therefore was changed to *products and services*. Research related to service science led to changing that term to *product/service* to avoid focusing attention on yes/no distinctions between products versus

services. Alter (2012a, pp. 27-29) explains why those distinctions are of little use in understanding or improving work systems whose product/services combine some characteristics often associated with products (e.g. tangibility and separation between providers and consumers), and some characteristics that are often associated with services (e.g., customizability and customer experience).

Variable. Some, but not all of the concepts in WST and its extensions can be viewed as variables. For example, information, technology, and process steps used in a particular work system are treated as components of a work system rather than as variables that take on multiple values. On the other hand, when designing a system it is possible to think of many attributes as variables that need to be calibrated. A set of design spaces for sociotechnical systems (Alter, 2010b) identifies relevant variables including how structured processes and activities should be, how complex, how automated, how many people should be involved, and so on.

Proposition. The first extension of WST was a set of 24 proposition-like work system principles that extended the sociotechnical principles of Cherns (1976). Alter and Wright (2010) used opinions of six small cohorts of Executive MBA students to evaluate the principles. The criteria were the extent to which they believed that each principle should apply to most work systems in their organizations and the extent to which they believed the operation of work systems in their organizations seemed to conform.

Hypothesis. WST and most of its extensions are not stated in terms of explicit hypotheses, although many of them are based on implicit hypotheses of the form "results of an analysis or design effort would be better if topics X or Y were considered." For example, a discussion of different versions of WSM expresses the implicit hypothesis that CRM-related design and implementation projects would avoid many pitfalls if they viewed the situation as a customer-facing work system rather than as an implementation of commercial software with certain features (Alter, 2013b, p. 115).

Framework. Two of WST's basic components are frameworks: the work system framework and work system life cycle model (Alter, 2013b, p. 78). The latter was given the designation *model* over a decade ago but is more like a framework. An effort to augment the work system framework with more of the spirit of service led to a new framework called the service value chain framework (Alter, 2008b). That framework separates customer and provider responsibilities across generic steps in service instances and incorporates ideas such as service interactions, onstage and back stage from service blueprinting (Bitner et al., 2008), and value capture by both customer and provider across an entire service instance.

Theory. Whether or not WST is a proper theory is controversial. Niederman and March (2014, p. 350) treats Gregor Type IV theories as proper theories and argues that WST is more like an atheoretical model. Alter (2013b, p. 75) calls WST a theory based on a previously mentioned definition of theory as an abstract account (Schatzki, 2001, pp. 12-13). One of the extensions of WST, a theory of workarounds (Alter, 2014) is a process theory augmented by a set of factors that interact to influence each step.

Model. A basic tool in WSM is a work system snapshot, a formatted one-page summary of a work system identifying customers, product/services, processes and activities, participants, information, and technologies (Alter, 2013b, p. 86). A work system snapshot of a particular work system is a model of that work system that is useful in preliminary discussions of what the work system is and what work system-related problems or opportunities are being addressed. Many other models using techniques such as flow charts, swimlane diagrams, and fishbone diagrams can be used as the analysis unfolds.

Metamodel. Different versions of a work system metamodel (e.g., Alter, 2010a, 2012a, 2015c) are extensions of WST that provide a more detailed representation of components of a work system. Analogous to an online map with zooming capabilities, the less detailed work system framework and the more detailed metamodel are related to each other and can be used for some of the same purposes, but are designed to be especially useful for their own particular purposes. (Note: The work system framework can also be viewed as a metamodel because it identifies components that should be included in a work system model of a specific situation. The designation "work system metamodel" was initially used to differentiate between the work system framework and a more elaborated version that was similar in form to metamodels produced over many years by many researchers in the German-speaking IS community.)

Method. WSM is a method for describing and analyzing a system by seeing it as the smallest work system that has a problem or opportunity. The various versions of WSM share the distinguishing features of treating a work system as the unit of analysis, describing the "as is" work system, analyzing it, and

proposing an improved, "to be" work system along with reasons why the changes would be beneficial. As explained in Alter (2013b, 2015c), the development of WSM starting in the 1990s preceded the published articulation of WST as a theory in 2013. Alter (2015c) goes further by explaining how "the beneficial effort of clarifying WST's scope and details started as an attempt to legitimize work system ideas and WSM by the fact that they were based on a theory." The ideas had existed for over a decade, but it seemed that they had to be packaged as a theory in order to seem legitimate.

Appendix 2: Evaluation Criteria for Conceptual Artifacts

Many criteria can be used in evaluating conceptual artifacts. Rigor, falsifiability, and parsimony are key criteria for theories stated as propositions, but other criteria may be more important for other types of conceptual artifacts. Table 8 presents the author's personal view regarding the typical importance of each of nine criteria for different types of conceptual artifacts. Table 8 uses an intentionally imprecise 1-2-3 scale because the main point is not the numbers, but rather the observation that criteria such as rigor or parsimony that are very important for evaluating concepts and theories may be less important for other types of conceptual artifacts such as metaphors, models, or methods that may provide imprecise but useful guidance in many situations. Each criterion in Table 8 will be discussed briefly, with special emphasis on how that criterion is relevant to the discussion of theory and theorizing.

Table 1. Applicability of criteria to different types of conceptual artifacts.

	value	rigor	testability	parsimony	breadth of use	robustness	durability	generativity	source
research question	1	1	2	1	2	2	2	2	?
paradigm	1	1	1	2	2	2	2	1	?
analogy	1	2	2	1	2	3	3	2	?
myth	1	2	2	2	2	3	3	2	?
metaphor	1	2	2	1	2	3	3	2	?
concept	1	1	1	1	2	2	2	2	?
variable	1	1	1	1	2	1	2	2	?
proposition	1	1	1	1	2	1	2	2	?
framework	1	1	2	1	2	1	2	2	?
(type IV) theory	1	1	1	1	2	1	2	2	?
model	1	2	1	2	2	1	2	2	?
metamodel	1	1	1	2	2	1	2	2	?
method	1	2	2	2	2	1	2	2	?

Scale: 1 = almost always important; 2 = sometimes important; 3 = rarely important

Value. The value of conceptual artifacts is related to whether their use leads to non-obvious understandings, insights, explanations, or predictions. The importance of value does not imply that theorizing produces only valuable conceptual artifacts, however. In fact, initial phases of theorizing often create conceptual artifacts of little value other than as stepping stones toward more useful concepts.

Rigor. As is discussed repeatedly, the IS discipline often has difficulty achieving the right balance between rigor and broad applicability. While rigor is often important, greater rigor may not help in many situations, and may only make ideas more complicated and less understandable or less useful. For example, consider how conceptual artifacts such as UML or BPMN models that can be used for software development often are far too rigorous to be used directly by business professionals.

Testability. The idea of testability is quite different from falsifiability, a criterion often associated with Gregory Type IV theories but not with Gregor Type I theories for analysis including "classification schema, frameworks, or taxonomies." For example, testing the usefulness or completeness of models,

methods, or theories that are basically abstract accounts (Schatzki, 2001) is not fundamentally about whether those conceptual artifacts are true or false in their application to specific situations. In particular, "all models are wrong; some are useful" (attributed to the statistician George Box) because they are models rather than reality itself. Along those lines, Star (2010, p. 608) notes that a particular map of a primate's brain "did not need to be accurate to be useful. It could serve as the basis for conversation, for sharing data, for pointing to things—without actually demarcating any real territory. It was a good communicative device across … worlds of clinical and of basic research." Similarly, a heuristic that is not an algorithm may be quite useful even if it does not provide a prescription for every possible situation.

Parsimony. Conceptual artifacts should be as terse and straightforward as possible, consistent with a comment often attributed to Einstein: "Everything should be made as simple as possible, but no simpler." A key trade-off is between omitting important aspects or nuances of an idea by being too simple versus being unnecessarily complex, and therefore unnecessarily difficult to use. The criterion of parsimony is especially important for theories stated as relationships between variables (e.g., Gregor Type IV theories). Parsimony is less important for conceptual artifacts such as many models, metamodels, or methods where more complete coverage of multifaceted situations and special cases may be far more important than parsimony. For example, a metamodel mentioned later identifies many different types of information. An earlier, more parsimonious version treated information only as a general category. The less parsimonious version is more valuable because it reduces the likelihood of ignoring types of information that might be overlooked.

Breadth of use. The boundaries of applicability of conceptual artifacts should be defined starting with areas of most direct applicability, including areas of less useful applicability, and possibly identifying areas where application might be misleading. For example, the widely mentioned technology acceptance model (Davis 1989) says that perceived usefulness and perceived ease-of-use determine an individual's intention to use an artifact, which in turn affects actual usage. That statement makes sense for voluntary usage, but is less applicable when usage is mandatory.

Robustness. For conceptual artifacts this is a tendency to be appropriate across a specific range of relevant situations and to become less appropriate in more distant situations without generating seriously erroneous results. This is consistent with Star (2010, p. 612) noting that "all concepts are most useful at certain levels of scale. [For example] the concept of boundary objects is most useful at the organizational level." The robustness of conceptual artifacts that purposefully or accidentally ignore relevant factors is often problematic. For example, the widely cited IS success model (DeLone and McLean, 1992) was mentioned previously. Imagine applying it to corporate information systems that suffered security breaches involving millions of user accounts. Those breaches challenge any view that those systems are successful, even though use and user satisfaction may have led to beneficial individual and organizational impacts at some point.

Durability. Ideally, conceptual artifacts should have a long shelf life. Inexorable advances in IT make durability a significant challenge for conceptual artifacts specifically related to IT or its use. For example, an interesting theory about e-commerce, e-government, or the creation or use of websites in general could be meaningful only for a few years before becoming obsolete when underlying technologies, expectations, and practices morph into something that is quite different.

Generativity. Part of the value of many conceptual artifacts is in providing a basis for developing other conceptual artifacts and applications of conceptual artifacts. For example agency theory and institutional theory have had a broad range of applications. Similarly for many individual concepts such as agility, control, "anywhere, anytime", service, and value. It is difficult to evaluate the potential generativity of a conceptual artifact in advance, just as it is difficult to anticipate how users may use or adapt products in ways that were never imagined by product designers.

Source. The source of conceptual artifacts matters in the IS discipline in several ways. The refereeing of research papers often pays great attention to where conceptual artifacts came from, and sometimes rejects ideas that are not related clearly to previously published theories. Also, the IS discipline often is concerned with whether theories are "native theories" (Straub 2012) or whether they are imported from elsewhere. The question marks in the column for *source* in Table 2 reflect the author's view that excessive concern about the source of ideas is often substantively counterproductive even if it may be expedient in academic politics.