Journal of the Association for Information Systems

Research Commentary

Reach and Grasp in the Debate over the IS Core: An Empty Hand? [1]

Ron Weber
Faculty of Information Technology
Monash University
Ron.Weber@infotech.monash.edu.au

Abstract

Papers published about the need for a theoretical core in the information systems (IS) discipline can be characterized as either nature-of-the-discipline commentaries or logic-of-the-core commentaries. The former articulate the authors' views on those phenomena that research in the IS discipline ought to investigate. The latter scrutinize some of the logic that underlies arguments made by those who either support or reject the need for a theoretical core. Unfortunately, nature-of-the-discipline commentaries are unlikely to help clarify or resolve fundamental issues that underpin the debate. Too often they are based on idiosyncratic views that are difficult to either justify or refute. Logic-of-the-core commentaries, however, lay bare the arguments made by the protagonists so they can be evaluated. In this paper, I examine the logic-of-the-core arguments made by Lyytinen and King (2004) and evaluate their validity.

Keywords: Information Systems, disciplinary identity, disciplinary legitimacy, theoretical core, syllogism, necessary condition, sufficient condition

Introduction

Many papers have now been published relating to the debate about whether the Information Systems (IS) discipline needs a theoretical core[2]. Elsewhere I have characterized these papers as either *nature-of-the-discipline* commentaries or *logic-of-the-core* commentaries (Weber, 2006, pp. 294-296). The former present the authors' views on the nature and scope of the IS discipline and the important questions that the

---

[1] I am indebted to my colleague John Crossley, Professor of Logic at Monash University, for comments on earlier versions of this paper. All errors that exist in the paper, however, are my responsibility alone. I am also indebted to Kalle Lyytinen and John King for the intellectual stimulus and their goodwill in an exchange that has now extended over many years.

[2] See, e.g., King and Lyytinen (2006) for a selection of published papers and commentaries on these papers.

authors believe research within the discipline ought to address. The latter present the authors' analyses of some of the logic underlying the arguments made about whether having a theoretical core will clarify the IS discipline's identity and/or enhance its academic legitimacy.

The vast majority of papers published on the debate are nature-of-the-discipline commentaries; few provide logic-of-the-core analyses. Nonetheless, elsewhere I have argued that nature-of-the-discipline commentaries have limited usefulness as a means of resolving the debate about whether the IS discipline needs a theoretical core (Weber, 2006, p. 295). Such papers also provide interesting insights into the authors' views about those phenomena that ought to be the focus of research within the IS discipline. Aside from the quality of the rhetoric they manifest (and perhaps the extent to which the authors' views are congruent with one's own views), however, few bases exist for choosing one view over another. In sharp contrast, logic-of-the-core commentaries bring the protagonists in the debate face to face. Each such commentary has the rationale underpinning its arguments surfaced and scrutinized.

In this paper, I focus on one of the few papers that addresses logic-of-the-core arguments–namely, Lyytinen and King (2004). Their paper, which was published in this journal, also provides a nature-of-the-discipline commentary. Nonetheless, in some parts of their paper they commit to a logic-of-the-core argument, for which as a scholar (and a long-time participant in the debate about the need for a theoretical core in the IS discipline) I am grateful. Their argument allows us to engage directly in determining where we agree and where we disagree. In this regard, the quality of our rhetoric provides us with poor shelter in our affrays.

One more time! Theoretical cores and academic legitimacy

Lyytinen and King (2004, p. 225) use the following syllogism[3] to address the matter of theoretical cores and academic legitimacy in a discipline:

1. All disciplines that have a theoretical core have legitimacy as an academic discipline.
2. The discipline of physics has a theoretical core.
3. Therefore the discipline of physics has legitimacy as an academic discipline.

Given the major premise that all disciplines that have a theoretical core have legitimacy as an academic discipline and the minor premise that physics has a theoretical core, the conclusion that physics has legitimacy as an academic discipline is valid in logic. Of course, whether the major premise and minor premise are true is another matter. Assuming they are, however, the conclusion is true.

As an aside (but a point of precision), Lyytinen and King (2004, p. 225) claim in relation to the above syllogism: "The argument thus far follows a valid form (*modus ponens*)." They are correct in saying that the argument follows a valid form. They are incorrect, however, in saying that the argument uses *modus ponens*. Because they have used a

---

[3] Note, in an attempt to make my arguments clearer, I have stated Lyytinen and King's formalizations of their "syllogisms" as English text.

quantifier in their major premise ("all disciplines"), *modus ponens* does not apply. Instead, the argument is valid because it is based upon a *categorical* syllogism.[4]

Lyytinen and King (2004, p. 225) then use the following syllogism, which they call a "complementary syllogism" in relation to their first syllogism:

> 1b. All disciplines that do not have a theoretical core do not have legitimacy as an academic discipline.
> 2b. The discipline of information systems does not have a theoretical core.
> 3b. Therefore the discipline of information systems does not have legitimacy as an academic discipline.

Again, the conclusion that the IS discipline does not have legitimacy as an academic discipline is true, *if* the major premise and minor premise are also true. Nonetheless, Lyytinen and King (2004, p. 225) comment: "The problem, however, comes with syllogisms [*sic*] (1b), (2b), and (3b), which the core theory assumes–called the logical fallacy of denying the consequent. This suggests that a *lack* of legitimacy results from the *lack* of a strong theoretical core, and thus from the denial of the antecedent (theoretical core, *modus ponens*)[5] the denial of the consequence (legitimacy) can be inferred. The chain (1b), (2b), and (3b) cannot be entailed from (1), (2), and (3), and is a logical fallacy. From the absence of something one can derive everything, which is tantamount to nothing."

I have four concerns about Lyytinen and King's arguments. The following subsections address each of them.

Confusion about Necessary versus Sufficient Condition

To evaluate the validity of Lyytinen and King's syllogisms, it is important to understand the concepts of "necessary condition" and "sufficient condition" in logic.

In logic, the expression:

$$p \Rightarrow q$$

is read, "**p** only if **q**," or "if **p** then **q**," or "**p** implies **q**." In this expression, **q** is a *necessary* condition for **p**. In other words, condition **q** must always hold whenever **p** holds. Other conditions might also have to hold before **p** holds. Whatever these conditions, however, if **p** holds, the condition **q** must always hold. For instance, the condition "person is a female" is a necessary condition for the condition "person is a mother." Whenever a person is a mother, it is necessary that the person be a female. On the other hand, being a mother is not a necessary condition for a person to be a female. Some females do not have children, and thus they are not mothers.

In logic, the expression:

---

[4] *Modus ponens* is also known as a *hypothetical* syllogism, and hypothetical syllogisms do not use quantifiers (like "all *x*" or "for every *x*") in their major premise. See the entry "syllogism" in *The Columbia Encyclopedia*, Sixth Edition, 2001, at http://www.bartleby.com/65/sy/syllogis.html.
[5] As per footnote 4, Lyytinen and King are again incorrect in saying they have used *modus ponens*.

$$\mathbf{p} \Leftarrow \mathbf{q}$$

is read, "**p** if **q**," or "if **q** then **p**," or "**q** implies **p**." In this expression, **q** is a *sufficient* condition for **p**. In other words, if **q** holds, then **p** will hold, but it is important to note that **p** might still hold even when **q** does not hold. For instance, the condition "person has been beheaded" is a *sufficient* condition for the condition "person is dead." Nonetheless, a person might be dead for reasons other than being beheaded. In this regard, being beheaded is not a *necessary* condition for a person to be dead.

Finally, in logic, the expression:

$$\mathbf{p} \Leftrightarrow \mathbf{q}$$

is read, "**p** if and only if **q**." In other words, **p** implies **q** and **q** implies **p**. For instance, assume **p** is the condition "month with less than 30 days" and **q** is the condition "month is February." If condition "month with less than 30 days holds," it is necessary that the condition "month is February" hold. Similarly, if the condition "month is February" holds, it is sufficient for the condition "month with less than 30 days" to hold.

Using these notions, Lyytinen and King's major premise (1) is that having legitimacy as an academic discipline is a *necessary* condition for the academic discipline to have a theoretical core. Alternatively, it is that having a theoretical core is a *sufficient* condition for the academic discipline to have legitimacy. It is important to understand that this premise, taken on its own, entails:

- Whenever a discipline has a theoretical core, it will also have academic legitimacy.
- A discipline might have academic legitimacy even though it does not have a theoretical core.
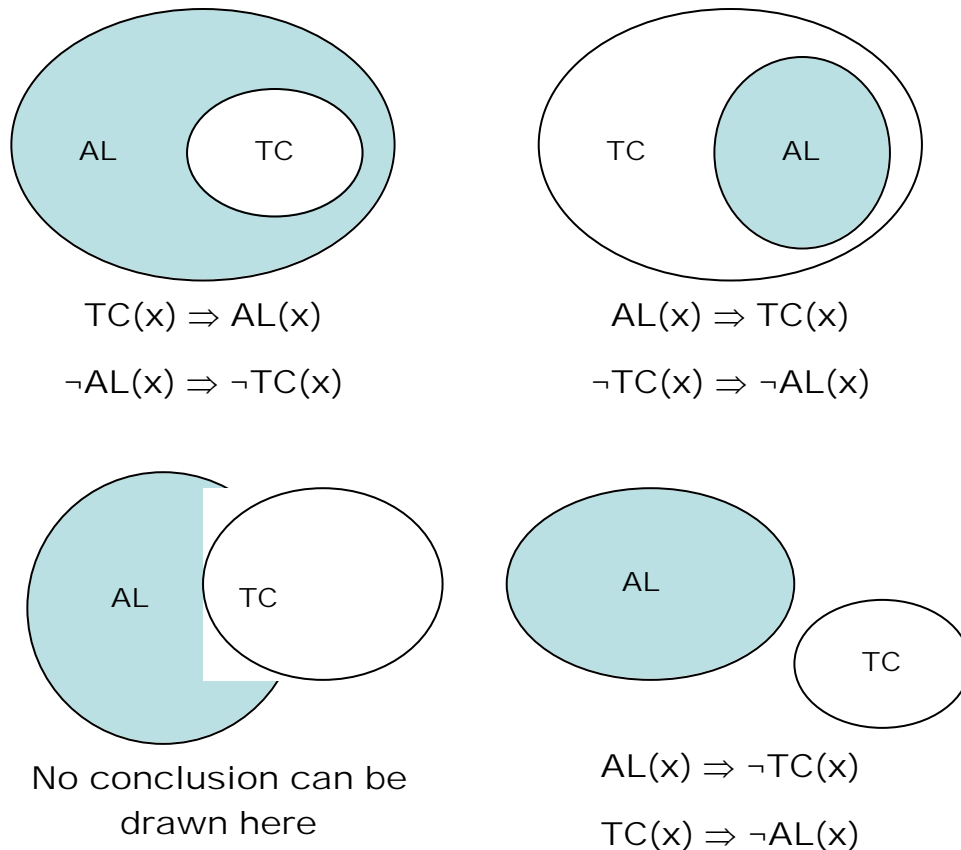
I will leave it to other scholars who argue for the importance of having a theoretical core in the IS discipline to evaluate whether Lyytinen and King's major premise is a true statement of their own position. From my perspective, however, Lyytinen and King's major premise is a *false* statement of the position of at least some scholars who argue for the importance of having a theoretical core in the IS discipline. In this regard, I see three premises underlying the arguments made by these scholars.

First, I believe that some who argue for the importance of a theoretical core contend that having a theoretical core is a *necessary* condition for academic legitimacy. In other words, their major premise is the *converse* of Lyytinen and King's major premise. Note that this converse premise, taken on its own, entails:

- Whenever a discipline has academic legitimacy, it will also have a theoretical core (see also Figure 1, upper right-hand quadrant).
- A discipline can have a theoretical core, but it might not have academic legitimacy.[6]

---

[6] Following this line of reasoning, it might be helpful to think of attaining academic legitimacy as a two-step process. First, a core for a discipline must be determined, but the discovery of a core does not mean that academic legitimacy will be attained immediately. Moreover, the existence of

$$TC(x) \Rightarrow AL(x)$$
$$\neg AL(x) \Rightarrow \neg TC(x)$$

$$AL(x) \Rightarrow TC(x)$$
$$\neg TC(x) \Rightarrow \neg AL(x)$$

No conclusion can be drawn here

$$AL(x) \Rightarrow \neg TC(x)$$
$$TC(x) \Rightarrow \neg AL(x)$$

Figure 1: Possible Relations between Having Academic Legitimacy (AL) and Having a Theoretical Core (TC).

Second, I believe some who argue for the need for a theoretical core in the IS discipline would make a stronger-form argument. Specifically, I believe they would contend that having a theoretical core is both a *necessary* and a *sufficient* condition for a discipline to have academic legitimacy. In other words, if an academic discipline has legitimacy, it must have a theoretical core. Moreover, the existence of a theoretical core is sufficient for an academic discipline to have legitimacy. In short, academic legitimacy cannot exist without a theoretical core and *vice versa*.

Third, I believe some proponents of the need for a theoretical core in the IS discipline, myself included, would contend that having a theoretical core is neither a necessary nor a sufficient condition for academic legitimacy. Instead, they would argue that having a theoretical core is a necessary condition for having a *clear disciplinary identity*, not academic legitimacy. Whether having a clear disciplinary identity is a necessary or a sufficient condition for academic legitimacy is itself an important issue for debate.

---

a core does not guarantee that academic legitimacy will emerge eventually (other conditions must also be satisfied). Second, the process would then continue by arguing that some disciplines (but not all disciplines) that have a core then go on to attain academic legitimacy. If a discipline does not have a core in the first place, however, it will never go on to attain academic legitimacy.

Inconsistencies Between Statements and Premises

Lyytinen and King make conflicting statements about the arguments advanced by scholars who support the need for a theoretical core in the IS discipline. For instance, at one point in their paper, they state (p. 223): "The central question is whether the IS field's legitimacy rests on the presence of a theoretical core. In order to be convincing, the argument that legitimacy can be gained *only through* the possession of a theoretical core must be both valid and sound" (my emphasis). In logic, their use of the phrase "only through" means that they are stating that "the possession of a theoretical core" is a *necessary* condition for "legitimacy to be gained." Their syllogism, (1), (2), and (3) above, however, is *not* a correct statement of this argument (instead, they are arguing in this syllogism that the possession of a theoretical core is a *sufficient* condition for legitimacy).

Subsequently, they state (p. 225) in relation to their first syllogism: "Premise (1) implies an inductive generalization: all academic fields with a strong theoretic core are found to be legitimate, *and* that no legitimate field can be found that lacks a theoretic core." Such an inductive generalization would require empirical data on which to base it. Moreover, this is a new interpretation of their premise, and they are now making a *different* argument from the one they made earlier in their paper (p. 223). Moreover, it is inconsistent with the statement they make in the previous paragraph (p. 225): "However, under these circumstances, the argument that a theoretical core is *necessary* for legitimacy cannot be established deductively, and can be made only by empirical induction" (my emphasis). This statement is true, but it does not follow from their first syllogism. Again, according to their first syllogism, legitimacy is necessary for a theoretical core and not *vice versa*. To turn the arrow of implication around requires an inductive argument.

In relation to premise (1), Lyytinen and King state (p. 225), "…it is much easier to test the premise by finding an example of a field that is legitimate, but that has no theoretic core." This statement again reflects their confusion over the difference between a necessary condition and a sufficient condition. According to premise (1), academic legitimacy is a *necessary* condition (not a sufficient condition) for possession of a theoretical core. In other words, having academic legitimacy does *not* guarantee the existence of a theoretical core (other conditions might also have to be satisfied before a theoretical core exists). Contrary to Lyytinen and King's claim, therefore, "finding an example of a field that is legitimate, but that has no theoretic core" does *not* "test the premise." Instead, to test it would require finding a field that has a theoretical core but does not have academic legitimacy as an academic discipline.

Elsewhere in their paper, Lyytinen and King argue (p. 226): "There are many legitimate academic fields…that have no theoretic core." Again, their line of argument is contrary to premise (1), because it makes sense only in the context of a theoretical core being a *sufficient* condition for academic legitimacy (the converse of premise (1)). Subsequently, Lyytinen and King also argue (p. 226): "The presence of a theoretic core can sometimes be *useful* in establishing or sustaining legitimacy, but it is unsound to argue that having a theoretical core is *necessary* (my emphasis) for this purpose." Lyytinen and King's premise (1) does *not* state that having a theoretical core is a *necessary* condition for academic legitimacy. Rather, it states that having a theoretical core is a *sufficient* condition for academic legitimacy (Figure 1, upper left-hand quadrant).

In short, Lyytinen and King give inconsistent representations of the premises and arguments supposedly made by scholars who contend that the IS discipline needs a theoretical core. As a result, their first syllogism is not a valid formulation of one of these representations.

Confusion About the Notion of a Complementary Syllogism

Lyytinen and King (2004, p. 225) claim that their syllogisms (1), (2), and (3), and (1b), (2b), and (3b) are "complementary." I am unclear about the meaning they ascribe to a complementary syllogism. The formula $\neg TC(x) \Rightarrow \neg AL(x)$, where $\neg TC(x)$ means a discipline does not have a theoretical core and $\neg AL(x)$ means a discipline does not have academic legitimacy, is normally called the *contrapositive* of $AL(x) \Rightarrow TC(x)$, and the first formula is logically equivalent to the second (Figure 1, upper right-hand quadrant). On the other hand, in general $\neg TC(x) \Rightarrow \neg AL(x)$ and $TC(x) \Rightarrow AL(x)$ have no obvious connection (see upper diagrams of Figure 1).

Recall that Lyytinen and King's major premise (1) entails that:

- Whenever a discipline has a theoretical core, it will also have academic legitimacy.
- A discipline might have academic legitimacy even though it does not have a theoretical core.

Note, however, that their major premise (1b) entails that:

- Whenever a discipline does not have a theoretical core, it will also not have academic legitimacy.
- A discipline might not have academic legitimacy even though it has a theoretical core.

These two major premises provide the foundation for two quite distinct arguments. The first supports Lyytinen and King's argument that academic disciplines can have legitimacy without a theoretical core. Ironically, the second supports the arguments made by some scholars who contend that the IS discipline needs a theoretical core– specifically, having a theoretical core is a *necessary* condition for a discipline to have legitimacy. Note the contrary implications of the two premises. The first says that academic legitimacy *will always be present* whenever a discipline has a theoretical core. The second allows that academic legitimacy *may not be present* whenever a discipline has a theoretical core.

Confusion about the Logical Fallacy of Denying the Consequent

Recall that Lyytinen and King (2004, p. 225) state: "The problem, however, comes with syllogisms [*sic*] (1b), (2b), and (3b), which the core theory assumes–called the logical fallacy of denying the consequent." Unfortunately, the nature of the "problem" they perceive is unclear.

From one perspective, it is unclear whether Lyytinen and King are referring to the first or the second (or both) of their "complementary syllogisms" when they claim that the logical fallacy of denying the consequent has been committed. If it applies to their *first*

syllogism, it entails the following argument (which is fallacious): If a discipline does not have legitimacy (denial of the consequent), then it does not have a theoretical core. Given they have stated in major premise (1) that legitimacy is a *necessary* condition for having a theoretical core, of course the possibility exists, therefore, that a discipline does not have legitimacy but may still have a theoretical core–hence the fallacious argument.

From another perspective, if the fallacy applies to the second syllogism, it entails the following argument: If a discipline has academic legitimacy, it has a theoretical core. As I have argued above, some proponents of the need for a theoretical core would indeed reach this conclusion, but it *would not* be on the basis of committing the fallacy of denying the consequent in relation to Lyytinen and King's second syllogism. Rather, it would be on the basis of their affirming the antecedent in Lyytinen and King's second syllogism (a valid form of argument).

Curiously, in their subsequent sentence (p. 225), Lyytinen and King then state (presumably in relation to their first syllogism): "This suggests that a *lack* of legitimacy results from a *lack* of a strong theoretical core, and thus from the denial of the antecedent (theoretical core, *modus ponens*) the denial of the consequence (legitimacy) can be inferred." Of course, this is the fallacy of denying the antecedent. It seems they are making this argument as a basis for refuting major premise (1b), because they then state (p. 225): "The chain (1b), (2b), and (3b) cannot be entailed from (1), (2), and (3), and is a logical fallacy. … Accusation (1b),'The lack of intellectual core implies lack of legitimacy,' cannot be logically derived from accusation (1) 'A strong theoretic core confers legitimacy,' rendering (2b) and (2c) inconsistent." They are correct in saying that accusation (1b) cannot be derived from accusation (1) (see the upper diagrams in Figure 1). Indeed, as I have pointed out above, their two syllogisms present *different* arguments. More to the point, however, their second syllogism is not a correct representation of the arguments made by at least some of those who support the need for a core in the IS discipline.

Lyytinen and King also comment somewhat dismissively (p. 225): "The claim that the lack of a theoretical core deprives IS of legitimacy is invalid, and not worth further consideration." Even if we accept their claims about false premises and false arguments, the conclusion that "lack of a theoretical core deprives IS of legitimacy" could still be true! In logic, a conclusion can be true even if the premises are false and the argument is invalid[7]. For instance, consider the following: If the moon is made of marshmallow, the sun shone somewhere on the earth today. Here the conclusion is true, even if the major premise is false.

Lyytinen and King's confusion about the validity of premises and arguments also leads them to wrong conclusions. For instance, they state (p. 241): "In its strongest form, the theoretical core argument draws on fallacious reasoning." Nowhere have they shown that the reasoning is fallacious. Rather, they have questioned the validity of the premises and not the reasoning. Their inconsistent and sometimes incorrect representation of the premises, however, undermines the merits of their arguments.

---

[7]   More precisely, the argument is a *fallacy*.

Still one more time! The criticality of definitions and premises

I have argued elsewhere (Weber, 2006, pp. 296-297) that evaluating the validity[8] of arguments about the need for a theoretical core in the IS discipline depends on the following matters:

- Providing precise definitions of constructs such as "discipline," "identity," "academic legitimacy," and "theoretical core."
- Evaluating the validity of premises.
- Evaluating the validity of arguments.

In relation to the first matter, surprisingly, Lyytinen and King (2004, p. 223) claim: "… none of the commentaries about the IS discipline's need for a theoretical core have articulated exactly what is meant by the term 'theoretical core,' a point acknowledged by Weber (2003)." I have re-read my editorial several times, and nowhere can I see that I "acknowledge" this point. On the contrary, in Weber (2006, pp. 296-297), I refer to several places where I have tried to define the notion of "core" precisely.

In relation to the validity of premises, Lyytinen and King (2004, p. 226) claim: "There are many legitimate academic disciplines that can be characterized by their focus of study, by the methods their members use, by the tendencies in their opinions or findings, and by their impact on the thinking of those outside their discipline, but they have no theoretical core: classics, German literature, accounting, and history, to name a few." In short, they are disputing the validity of major premise (1b) by finding a counter-example (disciplines that are legitimate but do not have a core). Indeed, they are arguing for the validity of major premise (1) above that they articulated, which allows for the possibility of a discipline having academic legitimacy even though it does not have a theoretical core.

I applaud this turn in their arguments, because it allows us to sharpen the focus of our debate. My response is that some proponents of the need for a theoretical core would disagree that classics, German literature, accounting, and history are "legitimate" academic disciplines. In this regard, I know one of these disciplines reasonably well– namely, the accounting discipline. Other proponents of the need for a theoretical core would argue that Lyytinen and King's counter-example misses the point of their arguments because their focus is the clarity of disciplinary identity and not academic legitimacy.

In any event, the debate needs to focus now on what the protagonists mean by "discipline" and "legitimacy" and, for my part, the nature of disciplinary identity and the nature of some particular disciplines that are usually found within humanities and arts faculties in tertiary institutions. In addition, the protagonists need to debate the validity of

---

[8] I point out in Weber (2006, p. 299) that Lyytinen and King (2004, p. 223) distinguish between the *validity* and *soundness* of an argument. Validity refers to the correctness of the logic. Soundness refers to the truth of the premises. Using their terminology, a valid argument may have untrue premises. In this paper (as in Weber 2006), I use the term "validity" to apply to both the correctness of the logic and the truth of the premises. More precisely, the term "fallacy" applies only to the question of whether the logic is correct. See the entry "fallacy" in *The Columbia Encyclopedia*, Sixth Edition, 2001, at http://www.bartleby.com/65/fa/fallacy.html.

premises and arguments. For the moment, however, this debate must await another forum.

In relation to the validity of arguments, the test to be undertaken is whether the consequent follows from the premises and the rules of logic. Nonetheless, I have pointed out earlier that Lyytinen and King reach an erroneous conclusion because in logic a conclusion can be true even if the premises are false and the argument is a fallacy. Thus, protagonists in the debate about the need for a theoretical core in the IS discipline need to take care when evaluating the validity of arguments. Untrue premises and fallacious arguments do not always mean that conclusions are untrue.

Summary and Conclusions

In my rebuttal of some of Lyytinen and King's (2004) claims in this paper, I have sought to show how logic-of-the-core contributions to the debate about the need for a theoretical core in the IS discipline force protagonists to confront areas of agreement and disagreement directly. In a logic-of-the-core exchange, protagonists have little alternative but to define key terms and state critical premises and arguments more precisely. As the exchange unfolds, therefore, they should be able to pinpoint where they agree or differ. In some cases, they may also find good reasons to change their minds (which should be a welcome outcome in scholarly discourse!).

It is also important that protagonists in the debate strive to state premises and arguments correctly and consistently. In this regard, I have shown that some of Lyytinen and King's (2004) formalizations of the premises underlying the arguments made by other protagonists in the debate are incorrect. I have also shown that Lyytinen and King are making different arguments at different places in their paper. An unfortunate outcome is obfuscation rather than clarity in the debate.

In a sequel to their paper, King and Lyytinen (2004, p. 539) argue that "greatness comes not from holding tight to what we can grasp, but rather from our willingness to reach beyond what we can grasp."[9] Their view is that those who continue to "grasp" for a theoretical core in the IS discipline will undermine the possibility of "greatness" in the discipline. I hold a different view. "What we can grasp" with relative ease are reference-discipline theories, phenomena associated with the latest information technologies, consolation for our "anxiety discourse" in rhetoric about the youthfulness of our field, appeals for the legitimacy of methodological pluralism, and so on. What is difficult to grasp–that which extends our reach–is the *core* of the IS discipline. Therein lies the possibility of "greatness." We must take care that the things we can now grasp with relative ease ultimately do not leave us with an empty hand.

References

King, J., and K. Lyytinen, eds. (2006), *Information Systems: The State of the Field*, Chichester: John Wiley & Sons.

King, J., and K. Lyytinen (2004), "Reach and Grasp," *MIS Quarterly*, 28, 4, December, pp. 539-551.

---

[9] Their inspiration is Robert Browning's poem, "The Faultless Painter."

Lyytinen, K., and J. King (2004), "Nothing at the Center?: Academic Legitimacy in the Information Systems Field," *Journal of the Association for Information Systems*, 5, 6, June, pp. 220-246.

Weber, R. (2003), "Still Desperately Seeking the IT Artifact," *MIS Quarterly*, 27, 2, June, pp. iii-xi.

Weber, R. (2006), "Like Ships Passing in the Night: The Debate on the Core of the Information Systems Discipline," in King, J., and Lyytinen, K., eds. *Information Systems: The State of the Field*, Chichester: John Wiley & Sons, pp. 292-299.