Methodological Pluralism: An Emerging Paradigmatic Approach to Information Systems Research

Aminah Zawedde1, Jude Lubega2, Saul Kidde1, and Irene Nakayimba1
Faculty of Computing and Information Technology,
Makerere University, P. O. Box 7062 Kampala, Uganda
{sazawedde; jlubega; skidde; inakiyimba}@cit.mak.ac.ug
1: PhD student, Department of Information Systems
2: Senior Lecturer, Department of Information Technology

Abstract
The alienation of information systems (IS) research from practice is blamed on the dominance of the positivist paradigm which may not always produce practically relevant knowledge that is practicably adopted. To date most IS research is hinged on a positivist approach mainly because IS has evolved by adopting concepts from other disciplines that use the same paradigm for research. Research in IS however, is a multi-activity process that may require different research approaches. Use of mono-methods poses potential inadequacies in solving IS problems since strengths and weaknesses of various methods for the different stages of research differ. The purpose of using multi-method research is meant to address these potential drawbacks of the individual methods by exploiting the strengths of each method at the various stages of research. Analysis of the epistemological assumptions for each of the methods is therefore essential not only to establish the appropriateness of use of a method in a phase of research but also the compatibility of methods to be used together. The strength of methodological pluralism therefore depends on how well the epistemological characteristics of the research methods are matched. This paper reviews leading works in IS research paradigms and proposes an approach that uses a matrix to guide methodological pluralism analysis which is the major contribution of the paper to literature. The matrix has a six phase logical flow criteria of analysis that can iteratively guide a user to decide whether or not to use methodological pluralism through sequencing or triangulation that is augmented by a similar logical flow chart.
1. Introduction

Information Systems (IS) research is described as a rich tapestry of diverse research methods, paradigms, and approaches that are multi-disciplinary and multi-national [Becker and Björn 2007]. These two further assert that in the recent past most of the IS research has been carried out using mainly the positivist approach with results that are difficult to apply in industry or generalizable to other disciplines. Becker and Björn [2007] further cite that the research done since the late 1960s was initially based on 100% positivist approach but has gradually reduced to 89% positivist approach in the USA and 66% in European journals by 2004. This status quo is attributed to the IS research community considering qualitative research that is inherent in the interpretivist paradigm as having no place in scientific research [Mingers, 2003].

There is increasing use of interpretivism [Munro and Mingers 2002; Becker and Björn 2007; Hirschheim and Heinz 1989] to enable capturing of social factors that are key in information system development. Triangulating the methodologies based on the interpretivist paradigm with those based on the positivist paradigm can therefore improve social responsiveness of IS research. It has commonly been argued that the use of methodological complemetarism within the information system (IS) discipline and within individual pieces of research will produce richer and more reliable results [Brocklesby 1993]. Multi-method research was advocated on the grounds that both the target of the research and the research process are complex and multidimensional, requiring a range of different approaches [Mingers 2003]. Becker and Björn [2007] whose arguments are in favor of methodological pluralism, assert that all IS research situations should be viewed as intrinsically complex and multidimensional and can therefore be solved by various research methods. Their arguments are based on the fact that different research methods provide a different view on a certain observable fact of interest and research processes take place in different phases, which show substantially distinct characteristics and thus require the application of methodological pluralism. However, for methodological pluralism to be a success there is need for interoperability of the research methods in question to help solve different IS research situations. Currently there is no streamlined procedure for
determining compatibility of the research methods used to address particular IS research situations. This paper reviews leading papers in IS research paradigms and proposes a framework to guide methodological pluralism and suggests ways of overcoming drawbacks in the use of multi-methodologies research.

2. A Philosophical Approach to Methodological pluralism

Information systems are complex systems usually with a number of activities that are intertwined with feedback relationships amongst them but also having some activities having stronger influence on the system as a whole than others. Researchers in IS cite this as the major justification of methodological pluralism [Mingers 2003; Becker and Björn 2007]. Brocklesby [1993] point out that the question which is asked, however, is; “Which Methodology and when should it be used?” The determinants for these is based on: “the number of elements in the system, the nature of their interactions, their attribute and the degree of organization in the system” [Brocklesby 1993]. This author further suggests classification of methodologies before use, using critical thinking. This is in order to reveal the strength and weaknesses of the available system approaches given the assumptions made independent of the problem to be solved but with ability to consider a particular problem situation. He asserts that while this may be easy to do in a particular paradigm, its legitimacy has been questioned in methodological pluralism from different theoretical and philosophical paradigms posing the problem of paradigm incommensurability.

Mingers and Brocklesby [1997] support Brocklesby’s [1993] argument by asserting that methodological pluralism should be taken as a separate pluralist paradigm that accepts a plurality of theories and approaches that should be integrated in the long run. Mingers [2003] also supports Brocklesby’s [1993] need for the comparison of the strengths and weaknesses of the individual methods before combination so as to reflect upon the interests being pursued and proposes a need for alternative theoretical frameworks to guide the logical investigation in combining methods.

Using critical thinking, one can then avoid paradigmatic incommensurability based on analysis of the four paradigm qualities. Brocklesby [1993] in order to support the promotion of pluralism makes use of Habermas’ theory of human interest which provides for “work allowing individuals to accomplish objectives and to enhance material well being through social labour” He argues that Habermas’ theory bridges the different methodologies and makes them compatible by serving the three key social interests of technical, interaction and power.

Concerns about Methodological Pluralism

A number of authors have argued for and against use of methodological pluralism
in information systems research, notable among them being, Gil-Garcia and Pardo [2006] who suggest six (6) advantages for methodological pluralism namely; a more comprehensive approach to a phenomenon, triangulation of results, validation of methods, asking broader sets of questions, integrating of results amongst disciplines and the enabling of discoveries. Those for methodological pluralism argue that it provides a more comprehensive approach to studying a phenomena by giving more comprehensive answers and increasing the understanding of the problem. Mingers [2001] argues that “Different research methods especially from different paradigms focus on different aspects of reality and therefore a richer understanding of a research topic will be gained by combining in a single piece of research.” Mingers and Brocklesby [1997] concentrate on designing a framework to overcome the impact of cognitive biases and social and cultural obstacles to methodological pluralism. They leave out the need for an approach to guide upcoming researchers on the analysis of the epistemological assumptions of the methods to determine compatibility of the methods themselves.

Gil-Garcia et al. [2006] explain that methodological pluralism can triangulate results, which is useful in validating interpretation of results from one method to the other in a particular environment. They further argue that methodological pluralism not only validates results but also methods when weaknesses of one method are overcome by strengths of another method in a single study. This is especially helpful given that research follows a phased approach in which case a method could be stronger for one phase but weaker in another phase when compared to another method [Munro and Mingers 2002] as is the case for all methods.

The analytical power of having both qualitative and quantitative paradigms being used in one study gives researchers a broader exploratory potential and ability to capture both subjective and objective information in a research process [Mingers 2003]. In addition Mingers [2003] argues that there is better contribution of insight from multiple disciplines and potential feedback into the disciplines themselves as well as fostering future research enabling discovery of new outcomes.

However, those against methodological pluralism cite a number of factors as disadvantages to using methodological pluralism including cost of studies, publication pressure, limited research knowledge on methodological pluralism, incompatibility and incommensurability between methods, and too much knowledge being revealed in the research. The increased cost in multi-methodological pluralism arises from increased time required to do the research, human and other resources given the amount of work involved. Researchers are also under pressure to publish yet article reviewers are not very familiar with methodological pluralism literature [Mingers
given the inherently interdisciplinary disciplines involved in methodological pluralism research. Pollack [2005] further argues that a novice researcher may encounter method incompatibility and sometimes incommensurability if they do not critically analyze the epistemological and ontological assumptions underlying the methods to be combined before commencing the research.

The case for methodological pluralism can therefore be successful only if one thoroughly reviews literature in the methods to be analyzed upon which a comprehensive analysis of the epistemological and ontological assumption underlying the methods is done to mitigate the disadvantages as highlighted above and decide whether to continue or not.

3. **Analysis of a method’s epistemological characteristics to enhance methodological pluralism**

A paradigm consists of assumptions about knowledge and how to acquire it. These assumptions are shared by the scientific community that uses a particular paradigm. Burrell and Morgan [1979] give two types of assumptions; epistemological and ontological. Combining the subjective and objective dimensions of these assumptions enables systems to be treated as natural yet one is able to study the social aspects in them. Mapping the subjective and objective dimensions to order and conflict allows the capturing of distinguishing assumptions of alternative information system research approaches [Brocklesby 1993] in a philosophically grounded way. Burrell and Morgan [1979] further assert that for methodologies to be combined, consistency must be achieved by constructing and defining a virtual paradigm with a predefined cognitive purpose. This can easily be achieved by exploring the methodological mission, goals and aims. This is because “the mission, goals and aims of a methodology represent a cognitive projection to the behavior domain that enables the natural congruence of methodologies” [Mason 2006]. Frank [2006] argues that “A method is meant to guide research, emphasize core requirements of scientific work, and support evaluation and comparability of research. However, only if a method is suited to support all intellectually inspiring and promising prospectives on developing knowledge can this serve the purpose.” Frank’s [2006] work goes a long way in ensuring that there is a balanced use of methodologies through methodological conceptualization and analysis which helps avoid either methodological dominance or methodological anarchy when combining methods.

Frank [2006] asserts that there is need “to differentiate between the generic epistemological contribution, abstract and concrete knowledge contribution (i.e. construction and critique), its representation, the criteria used to justify the knowledge contribution as well as the corresponding justification procedure.” Frank [2006]
further attributes critique to represent a generic epistemological contribution that is aimed at challenging or evaluating given knowledge contributions. Frank [2006] puts methodological pluralism to a new dimension by suggesting the configuration of research methods in which case a unification of conceptions into conceptual frameworks of the candidate research methodologies is done and core concepts are chosen for compatibility in methodological pluralism. This notion is what this paper labors to make more explicit such that new knowledge about combining methods is gained by the researcher to make informed decisions. Frank [2006] like Mingers [1997] suggests a conceptual framework idealized design science approach in information systems research and emphasizes the need for a procedure in arriving at the social impact and theoretical underpinning of the methods being combined. However, he only explicitly spells out criteria for the knowledge contribution aspects of; originality, abstraction, justification when compared with requirements, inspiration, aesthetics, dependence from technology, purpose, specification and empirical test for the methods being compared. This paper furthers Frank’s work by developing an epistemologically based criterion for analysis methods to ensure not only compatibility but also the way in which they should be combined.

To operationalize his contribution, Frank [2006] suggests that application through prototypical research that are common in IS research is done in such a manner that concepts that are not required are omitted. This is so, given the fact that the conceptual framework is only an abstraction of the real world situations. Frank [2006] further asserts that to develop an explanation to this conceptual framework, one or more theories are applied to the resulting phenomena to form a set of hypotheses. The hypotheses are tested against reality referring to the corresponding theory of truth performed as a field study. However, in his suggestion for application of this conceptual framework to methodology analysis for use in methodological pluralism, Frank [2006] introduces criteria based only on the knowledge contribution for the different methods and omits criterion of the analysis of their ability to solve problems.

This leaves a gap of a systematic approach for decision making on whether or not to use methodological pluralism, which methodologies should be combined and which type of methodological pluralism should be used. This paper proposes a systematic approach that can be used by researchers who would wish to use methodological pluralism as a research approach.

4. Proposed approach for methodological pluralism approach
The methodological pluralism approach is used basing on the assumption that the strengths of the methods used to solve a particular problem should outweigh the
weaknesses of both methods and therefore are able to address the problem in a more comprehensive manner [Jack and Raturi 2006]. However, this comes with drawbacks in case the methods that are combined are incompatible or do not have a similar theoretical base. This is attributed to the researchers not first establishing the approach that will be used to combine the different methodologies. The different approaches include [Cooper 2003]:

- Paradigm bracketing that first determines the difference between the method assumptions and does not combine approaches that differ.
- Discordant pluralism where there is synergism in conditions which are highly regulated but may fail under relaxed ones.
- Paradigm bridging that combines theoretically and methodologically incommensurate methods with a bridging theory that resolves the difference.
- Complementarism that requires combining methods with the same theoretical base [Yolles 1998].
- Methodological imperialism by subsumption that considers methods from one paradigm and uses them within the theoretical and methodological assumptions of another.

Upon identifying the appropriate approach to be used for methodological pluralism to address the problem at hand, the researcher has to ensure that the triangulated methods have their combined strengths overlapping the weaknesses in order to achieve robustness of the methods. The researcher should also use a variety of validity methods when using methodological pluralism to ascertain that there are no wide variations in the results across the methods used [Jack and Raturi 2006].

When a researcher embarks on using methodological pluralism as a research approach, the matrix below in form of a table and a flow chart can be used to determine whether the underlying theories and philosophical underpinnings will lead to synergism and cost efficiency. The proposed approach is based on concerns raised by various researchers as discussed above. It should be noted that carrying out the activities in the table below may be iterative until the researcher has reached a certain level of understanding of the nature of the problem at hand given the fact that most researchers start with a broad picture of the problem situation [Gil-Garcia et al. 2006]. The process begins and ends with reviewing literature [Richardson and Pugh 1981]; this is because whether the analysis reveals that the researcher should use one or the other type of methodological pluralism or revert to any of the individual methodologies, a review of literature needs to be redone to justify the choice.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Activity</th>
<th>Expected Output</th>
<th>Action</th>
<th>Justification for Action</th>
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<tbody>
<tr>
<td>1.</td>
<td>Thoroughly review literature for the methodologies to be analyzed upon which a comprehensive analysis of the epistemological and ontological assumption underlying each methodology is done to mitigate the disadvantages.</td>
<td>List of epistemological and ontological assumptions underlying each methodology.</td>
<td>If assumptions support pluralism proceed to phase 2 else review literature again to consider other methods</td>
<td>This is done to ascertain the relevance of the assumptions related to each methodology to solve the problem.</td>
</tr>
<tr>
<td>2(a).</td>
<td>Compare the paradigms to which the methodologies you would like to combine belong so as to determine whether they coexist in terms of knowledge generation based on the five (5) approaches listed above [Yolles 1998].</td>
<td>List of similarities and differences of the methods in terms of epistemological assumptions. Methodological compatibility and categorization of congruence of methodologies and paradigm incommensurability.</td>
<td>If Complementarism exists, use triangulation else use sequencing but ensure consistency of shared inputs and outputs [Gil-Garcia et al 2006] and proceed to phase 3 revert to phase 1 and explore other methods.</td>
<td>This is done to ascertain compatibility of grounding theories and to ensure that there is no wide variations in the results across the methods used.</td>
</tr>
<tr>
<td>2(b).</td>
<td>Ascertain whether for a given cognitive purpose, the inputs of one methodology can act as an output of the other with consistency.</td>
<td>List of shared inputs and outputs with consistency.</td>
<td></td>
<td>This is to ensure that resources are not wasted.</td>
</tr>
<tr>
<td>3.</td>
<td>Identify both the strengths and weaknesses of each method.</td>
<td>List of weaknesses and strengths.</td>
<td>If strengths outweigh weaknesses proceed to phase 4 else go back to phase 1.</td>
<td>This is done so that one can ascertain trade off points and to be able to carry out phase 4.</td>
</tr>
<tr>
<td>4.</td>
<td>Ascertain whether the strengths of both methodologies are synergistic and whether the strengths of one method mitigate the weaknesses of the other.</td>
<td>Net effect of methodological pluralism.</td>
<td>If the synergistic effect is beneficial for the problem at hand proceed to 6 else go back to phase 1.</td>
<td>This is an important phase that helps the researcher determine that the use of methodological pluralism will be better than using any of the individual methods alone.</td>
</tr>
<tr>
<td>5.</td>
<td>Carry out an analysis to ascertain the beneficial effect of methodological pluralism when compared to increase in cost and time for the research when using single methodologies.</td>
<td>Cost-benefit analysis</td>
<td>If the benefit outweighs the cost use methodological pluralism else proceed with the methodology that provides most benefit</td>
<td>This phase helps the researcher ascertain whether the use of methodological pluralism does not escalate the costs to an extent far beyond the synergism achieved through the pluralism.</td>
</tr>
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</table>

Table1: Matrix for analyzing candidate methodologies for methodological pluralism.
5. Discussion
Methodological pluralism is the paradigmatic research approach for future IS research given the multi-phased nature of research in the discipline. However, up to now challenges to researchers in choice of the approach has not only been between sequencing and triangulation but also with how to arrive at the appropriate duo or trio to be used together. Methodological compatibility is a must for methodological pluralism to be of value and not to be detrimental to IS research; however, this should go along preferably with symbiotic mutualism or at the least, symbiotic commensalism of the candidate methodologies. An in depth concurrent analysis of
the epistemological assumptions of the candidate methodologies needs to be done to ascertain a number of areas. First and foremost, one has to ascertain that generally the cognitive aspects of each method support pluralism. Secondly, that there is beneficial synergism between methods given the strengths and weaknesses of each method when applied to same phases of the research. Finally but by no means the least, that the most efficient form of pluralism to be used will not lead to costs of the research over perceived benefit that cannot be justified while using methodological individualism. These three cognitive theoretical requirements for methodological pluralism are the key to a researcher’s decision on whether or not to triangulate or sequence two or more methods.

The findings of this paper affirm Frank’s [2006] and Mingers’[1997] assertion where they recommend a conceptual framework idealized design science approach in information systems research which emphasizes the need for a procedure in arriving at the social impact and theoretical underpinning of the methods being combined.

6. Conclusion and Recommendations
Methodological pluralism makes it possible for multi-dimensional research strategies to narrow the qualitative-quantitative divide. It further has the ability to enhance and extend the logic of qualitative explanation [Mason 2006]. However, methodological pluralism poses challenges of exploiting and mitigating epistemological and ontological differences between the methods thus the necessity for an approach to guide researchers in analyzing candidate methodologies for compatibility and cost effectiveness. This paper has proposed a means of achieving this goal. The paper neither looked into the breakdown of activities for analysis of the methods nor the level of effort required for each phase of analysis. Further work can be done in this area.

References


