80-724-07 - Research Methods in IT

Fall 2009: J01

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Introduction

This seminar, which examines information systems research, has three main objectives. The first is to give students the opportunity to further their knowledge of research methods in the specific context of the study of information systems. Under the second objective, students will develop the skills needed to critically evaluate research quality and understand how various research methods are applied by information systems researchers. The third objective is for the student to attain sufficient mastery of the concepts and methods discussed in class to be able to draft a good research proposal.

We will attain these objectives by analyzing information systems research in terms of the methods currently used in the field and how well IT researchers are applying these methods. In addition, students will apply this new knowledge throughout the seminar through a variety of methodological exercises and by developing a research proposal on a subject of their choice.

We will cover four main themes:
Theme 1: Research in IT: epistemological and methodological issues
Theme 2: Review of the literature
Theme 3: Quantitative methods
Theme 4: Qualitative methods

Teaching Approach

Students will be encouraged to share their interpretations of the assigned readings, analyze them and criticize them. They will write summaries on different subjects, complete methodological exercises and make presentations to their fellow students. Finally, students will draft a research proposal on a subject of their choice.

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Learning Material

Bibliography

- Lecture notes - number 80724C
  ISBN: 0-15--507897-6

Assignments and Examinations

Participation - 25% (％)
Summaries and methodological exercises - 40% (%)
Research proposal - 35% (%)

Plagiarism
Please consult the acts and gestures that are considered plagiarism or another academic violation, along with the applicable procedure and sanctions, which range up to suspension and even expulsion from HEC. Violations are analyzed based on the facts and circumstances, and sanctions are applied accordingly. Learn more about plagiarism

List of themes

**Theme 1 : Research in IT: Ontological, epistemological and methodological issues**

**Description**
Theme 1: Research in IT: Ontological, epistemological and methodological issues
This theme will be covered in the first three meetings. Students will gain an understanding of the main epistemological positions in management sciences in general and, more specifically, in information systems. We will also discuss some of the fundamental issues faced by any researcher, independent of their epistemological position. We will look at the notion of theory and what constitutes a contribution to theory, as well as how research questions are formulated. The issues raised in these seminars will continue to be discussed throughout the term.

Prior to discussing those research issues, however, we will devote some time to techniques that are aimed at facilitating one of the main activities of a researcher, that is, reading.


Session 1 (September 9 2009): Are you positivist, neo-positivist or interpretivist? Please note that the readings marked with an asterisk are mandatory. The other are listed as complements. The assigned reading materials can found in the lecture notes that are available for purchase at COOP HEC - unless otherwise indicated.


*Myers,M., Qualitative Research Methods, http://www.qual.auckland.ac.nz/


Questions:
1. Based on your readings, what are the main epistemological positions in information systems?
2. Provide a definition of each.
3. What epistemological position best corresponds to your own perspective as a researcher?

**Session 2: September 16 2009**

Please make sure that you have read the chapter below and be prepared to present the authors' "model."


*Epistemological perspectives in action*


Questions:

1. Review questions on Class 1 materials: What is pragmatism? What is paradigm incommensurability?

2. You have reviewed five empirical studies. What is the epistemological positions taken in each of these articles and explain the reasoning behind your response.

3. Assume that each of these articles is considered of good quality, each under its own epistemological assumptions. Identify some of the key elements to which that researchers have to be attentive if they have to do high quality research under each epistemology.

**Session 3 (September 23 2009): Theory, theories and models**


Questions:
1. What is a theory? What is it not?
2. Be prepared to present the following terms:
   - taxonomy
   - theory for explanation and theory for prediction
   - process theory and variance theory
   - causality
   - generalizability
3. What do Sutton and Staw mean by "What Theory is not?"
4. What does Weick mean as "Theory Construction as Disciplined Imagination?"

Theme 2 : Analyzing the past to prepare the future: reviewing the literature

Description

A review of the literature can take several forms, and its timing will depend on the research question, the investigator's objective and his or her methodological approach. Exploring this theme will shed light on the various roles played by a review of the literature and allow us to examine various approaches to conducting a review.

Session 4 (September 30 2009):


* Kumar, R., Research Methodology, Chapter 3 Reviewing the literature, distributed in class.


Questions:
1. Webster and Watson's article pertains to how to review the literature when you write a Review paper such as an Academy of management Review or an MISQ Review paper. Please be prepared to explain how you will apply their recommendations in developing your theory?
2. How does Kumar's chapter complement the Webster and Watson paper?
3. The other articles are examples of literature reviews for different purposes: some aim to develop theories, others have other purposes. Please read them with the following questions in mind:
   ○ What is the degree of "exhaustivity" required when doing a literature review?
   ○ What are the main steps in doing a literature review?
   ○ How do the authors analyze the literature they have reviewed?
   ○ What use do they make of the result of their analysis?

Theme 3 : Quantitative Methods

Description

Most positivist or post-positivist researchers prefer using quantitative methods to validate the research models they propose. This course will not consider other applications of quantitative methods, such as more
exploratory investigations.

**Sessions 5 and 6: Developing measures and validating constructs**

Construct validation is a critical part of conducting quantitative research under a positivist perspective. Based on their readings in the literature on methodology, students will be encouraged to analyze and evaluate various attempts to develop measures and validate constructs. The readings listed below were carefully selected and ideally you should have read all of them. Indeed, during the course of your Ph.D. program, make sure that you read all, in preparation for your comprehensive exam, for your thesis, and for your academic career!

Generally speaking, Straub, Gefen and Boudreau's Web site (http://dstraub.cis.gsu.edu:88/quant/) is a good source of references on quantitative research.

**Session 5 (October 7 2009): Methodological considerations - the starred (*) readings are mandatory for this session.**


**Questions**

1. Based on the readings in the section Methodological considerations, derive a clear and precise definition for each of the following terms. Indicate the tools and methods available to researchers for examining data characteristics vis-à-vis each validity dimension.

- Construct
- Conceptual definition
- Operational definition
- Reliability
- Face validity
- Content validity
2. Please prepare and submit your responses to question 2 - electronically before MIDNIGHT October 6.

The theory that you propose contains a certain number of constructs. Please provide a conceptual definition for each of the key constructs. Suggestions: I am sure that some of the constructs were inspired from the literature you read. Survey this literature to find how the construct was conceptually defined by authors (e.g., as Lapointe and Rivard 2005 did for resistance and as Limayem, Hirt and Cheung did with habit). From the various definitions that you find in the literature, propose your definition. You do not have (for this exercise) to do it for each construct of your theory. Do this review for at least one construct. Yet, try to provide a conceptual definition for each.

Select one of the constructs, ideally one that you are proposing and for which there does not already exist an operational definition. Propose items to operationalize this construct.

Present a plan to describe how you would go about validating the construct.

3. Bonus question. This question pertains to reflective and formative constructs. We will spend more time on this later in the course. Yet, it would be interesting, if you have time, that you tried to answer the following question. Read the introduction of Diamantopoulos and Winklhofer as well as the introduction of Petter and Straub. What is a formative construct? What is a reflective construct?

Session 6 (October 14 2009): Applications


Questions

1. The four articles are examples of studies wherein construct validity was central. Read each article and for each be prepared to describe how the authors went about construct validation.

2. On the basis of the discussion that we had during Class 5 and of the readings for today’s class, revise the paper that you submitted for class 5. Please make sure to include "card sorting" in your construct validation design and try to ask a few colleagues to "sort cards" for the construct that you operationalized with items. Include the results of this card sorting exercise in your revised paper. Please submit your paper in electronic form before midnight on Tuesday October 13.

3. During lunch time you will be invited to present your theory to the class. Prepare your presentation - maximum of 5 slides - and email it to everyone before next class. The objective of this presentation is for all of us to comment on your work and contribute to its development.
Session 7 (October 21 2009): Surveys

Surveys are undoubtedly the method most often used to test research models. Although widely used, the method presents certain problems. In this session we will take a look at these problems and discuss how they can be avoided. Based on a critical analysis of survey-type research in information systems, basic principles in how to carry out a survey, and articles on survey use in information systems, students will develop their own templates for evaluating this type of research.


Supplementary references


Questions:

1. Pinsonneault and Kraemer present key criteria to assess survey research - and that can be used when designing a survey. Update their list of criteria with (a) the discussions that we had on construct validation and (b) the recommendations from Sivo et al. In doing so, DO NOT FORGET TO INCLUDE the concepts that we have seen until: clarity of research question and objectives, clarity and importance of the contribution, completeness of the literature review and adequacy of the presentation of the review, soundness of the model proposed, and so on. Also include aspects of construct validation.

2. Using your list of criteria, assess the article that I will email you shortly. You do not have to submit the evaluation.

Session 8 (October 28 2009) Testing the model: second-generation statistical techniques

This week, we will continue working on our "template" for assessing research manuscripts. As I mentioned at the end of Session 7, please complete the template that we started developing on the basis of the Pinsonneault and Kraemer's and of the Sivo et al.'s article.

Do not forget to answer the question about Nasser's type of survey. Have an argument for a longitudinal design and an argument for a cross-sectional design.

On second-generation statistical techniques: The experimental method, with its emphasis on internal validity and variables that can be controlled and manipulated, has for all intents and purposes been the investigator's only means for testing causality hypotheses. Over the last few years, however, we have had data analysis methods that go further than providing simple correlations of inferences made from relationships between variables. These so-called second-generation methods are based on solving structural equations. Despite being very powerful, these methods must be judiciously applied; they cannot make up for a lack of rigour when designing the research model or settling on a methodology. The references listed below are numerous. We will, however, read only one of the documents, the Gefen, Straub and Boudreau's article. Please consider the other documents as advanced references that you might want to use in later work.

1. Read the Gefen, Straub and Boudreau (2000) paper (below). Prepare your participation as if you were
invited to teach a course to M.Sc. students on the statistical methods that are presented in this document. Illustrate with the article by Ragu-Nathan, Tarafdar and Ragu-Nathan (2008).

2. Update your evaluation template on the basis of what you now know on second-generation statistical analysis techniques.


Testing for Invariance: i.e. Groups comparison

Theory and general procedures:

- Vandenberg, R. J. "Toward a further understanding of and improvement in measurement invariance methods and procedures". Organizational Research Methods, 5, 2 (2002) pp. 139-158.

Applications for specific objectives:


Internet Resources:

- Exhaustive source of general information about SEM (and other statistical subjects) on North Carolina State University website:
  http://www2.chass.ncsu.edu/garson/pa765/structur.htm#extract
- Impressive scholar reference list on different topics related to SEM by Professor Jason T. Newsom:
http://www.upa.pdx.edu/IOA/newsom/semrefs.htm

- Professors David A. Kenny and Ed Rigdon introduce simply basic SEM concepts on their respective website:
  - http://davidakenny.net/cm/causalm.htm
  - http://www2.gsu.edu/~mkteer/semfaq.html

- SEMNET: A major SEM community with impressive archives on handlings and procedures.
  (Subscription Required)
  - http://www2.gsu.edu/~mkteer/semnet.html

## Book Resources

### Introductory book on statistics in research using software package (SAS, SPSS, MINITAB)

### Advanced books on statistics

### Books exclusively on Structural Equation Modeling

## Session 9 (November 4 2009)

### Testing the model: second-generation statistical techniques (continued) and Experimental Research

This week we will continue our work on statistical techniques. Please make sure that you can:

1. Interpret the table in Figure 2 of the Gefen et al.'s article.
2. Explain Figure 5 of the Gefen et al.'s article.
3. Explain the difference between second generation statistical techniques and first generation statistical techniques in terms of construct validation and theory testing.
4. Respond to the question that I am sending you via email (to be submitted before Midnight on November 3).
4. Please update your template on the basis of last week's discussion.

We will also discuss experimental research and contrast and compare it with survey research. Because we cannot devote much time to experimental research, we will discuss two articles only.


Questions:
1. What distinguishes an experimental research design from a survey research design?
2. On the basis of the two articles, update your evaluation template with a section on assessing experimental research. What are the key criteria that you will want to include?
3. What is the fundamental trade-off of the researcher, according to Mason?

## Theme 4: Qualitative Methods

### Description

The use of qualitative methods in information systems research is a relatively recent phenomenon. Although these methods used to be considered unreliable, they have gained credibility because of their successful application by some researchers. Furthermore, studies based on qualitative methods have not all shared the
same epistemological position; some have been positivist, and others have taken a more interpretive perspective.

Generally speaking, Mike Myers's Web site (http://www.qual.auckland.ac.nz/) is a good source of references on qualitative research.

Session 10 (November 11 2009): Qualitative studies based on a positivist or neo-positivist perspective: methodological issues


Please read the articles with an asterisk (*). Make sure that you extract "the essence" of each article in terms of which knowledge about qualitative research methods you can extract from it. I invite you to undertake the development of a new template that you would use to assess a qualitative study or as a check-list to develop a qualitative study of your own. Please reflect on whether there are elements that were also present in your template for assessing quantitative research.

Session 11 (November 18 2009): Qualitative studies based on a positivist or neo-positivist perspective: applications


We will continue discussing the main aspects of conducting qualitative research. In addition to the 3 articles that are assigned in the course outline, please read article Markus’ article "Power, Politics and IS Implementation."

When reading the articles, please try to answer the following questions:

1. How well did the authors follow the guidelines from Lee and from Dubé and Paré?
2. Tree of the articles refer to the notion of multiple templates: Langley, Lapointe and Rivard (Org. Science), and Markus. Yet, their use of the multiple templates varies. Illustrate and explain.
3. Lapointe and Rivard (MISQ) propose a multi-level model of resistance to IT implementation. Which levels were involved? Explain the notion of emergence from one level to the other? How different were those processes early in the implementation and later? How do the authors provide evidence for that?
4. Discuss the chains of evidence proposed in each of Lapointe and Rivard (2005, 2007) and Markus.
5. What is the usefulness of figures in qualitative research?
6. The Sherif, Zmud and Browne article differs from the others. Is it a case-based research? Is it a qualitative study? Is it a quantitative study?
7. Were all four articles theory building articles? Discuss the theories proposed by each article that proposes a theory.

Session 12 (November 25 2009): Qualitative studies based on the interpretivist perspective: methodological issues

Questions:
1. Barley describes the method he used to conduct his ethnographic study of the implementation of CT scanners in hospital. Because Barley's study is considered as exemplar in its domain, use the article to build a template - similar to Table 3 from Dubé and Paré's article - to assess this type of research.
2. Klein and Myers propose principles for conducting and evaluating interpretive field studies. Be prepared to explain each principle that they propose. Try to see how you would apply each in a study.

Session 13 (December 2 2009): Qualitative studies based on the interpretivist perspective: applications

Questions:
This week we will continue our discussions on interpretive research. Review the Barley and the Klein and Myers articles to make sure that their content is fresh in your mind. Prepare a review (not to be submitted) of Barley's article in ASQ and Schultze's article: strengths and weaknesses.

Other examples of interpretive studies (will not be discussed):

General references on qualitative methods

Session 14 (December 9 2009): Presentations
Our last meeting will be devoted to the presentations/developmental critiques of your term papers. Here is the modus operandi:
1. Each student sends his/her term paper to all other students and to me on December 6 at 5 PM at the latest.
2. Each student prepares a 10 minute presentation, sleek power points, of the key elements of their paper. After 10 minutes, the presenter will be interrupted even if the presentation is not finished.
3. A reviewer will be assigned to each paper. The reviewer will write a review, please remember the
templates and our discussions on reviewing manuscripts. The reviewer will also comment the paper for 10 minutes. The reviewer has to identify the key strengths of the paper, its key areas for improvement AND provide suggestions for improvement.

4. Another 10 minutes will be devoted to the other participant's comments, please do not read only the paper you have been assigned to. You will be invited to comment on other papers as well.

5. After receiving those comments students will revise their paper and submit it no later than December 21 at 5PM.