

Research Methods

Seminar "Electronic Business Case Studies" Winter Semester 2008





To-Dos

- Registration for the Seminar: Questions?
- Our office is: Ziegelstr 13a, R. 301 and R. 306
- Fix a meeting with your supervisor
- Think which session is better for you.
- Now some small intro into methods....=>





Preparing for the Mid-Term Presentation

- Short Introduction into the Topic: Research Contribution
- Paper Structure
- Research Method
- Work Done So Far
- Relevant Literature
- Next Steps
- + Handout





Preparing for the Final Presentation

- Short Introduction into the Topic: Research Contribution
- The work done
- Research Method
- Results Conclusions
- Relevant Literature
- Further Research
- + Handout





Agenda

1	Research Methods (Thomas Hildebrand, Hanna Krasnova)
2	How to Write Your Paper (Christoph Goebel)





Research Methods in Information Systems (IS)

Information Systems (Wirtschaftsinformatik) combines two research fields:

Management Science

 \rightarrow "main focus is the observation of reality in a management / business context"

Technical Science

 \rightarrow "main focus is the development of new technical insights under the premise of known explanations in reality"





Examples of Managerial Research Approaches in IS

Management science research approaches:

- Experimental Research:
 - Researcher intervenes in reality, e.g. creation of a Web experiment
 - Advantage: control of condition, ceteris-paribus-clause, empirical
 - Disadvantage: may overlook important variables, sampling problems

• Surveys:

- Sample of subjects from a population are drawn and studied using interviews or questionnaires
- Advantage: generalize from small sample, empirical
- Disadvantage: sampling problems

• Non-experimental Research:

- Case Studies, Literature Review
- Advantage: secondary data can be used
- Disadvantage: generalizability







Examples of Technical Research Approaches in IS

Technical research approaches:

- Development of technical theories and scientific models (e.g. Client-Server-Model, IT Architectures, Algorithms)
- Implementation of theories in prototypical products (e.g. CRM software, cryptography tools, visualization techniques)
 - Single-Case Approach
 - Uses existing scientific insights
- Action-oriented/applied research
 - Examination of an application / a product in its environment, e.g. hardware performance in a company, scalability
 - Web log analysis





Research Principles: Induction and Deduction

Induction:

- Theory is developed from the generalization of single cases
- Observation of a part of reality
- Development of general theory

Deduction:

- Hypotheses are derived from particularities in general theory
- Tries to verify or falsify hypotheses through observations (empirical analysis on a significant number of cases)





Literature

Collection of books and links on research methods: http://gsociology.icaap.org/methods/books.htm

Link to lecture on research methods: http://www.sims.berkeley.edu/academics/courses/is271/f01/ (also on reading list)





Case Studies

The case study research method is an

"inquiry that investigates a contemporary phenomenon within a real-life context in which multiple sources of evidence are used."

(Yin, 1984)





Case Studies

- Sample Size = 1
- Opponents of the case study method criticize that
 - ...small number of cases infers low reliability of findings.
 - ...exposure of studying a few cases biases the findings.
 - ...case study research is useful only as an exploratory (hypotheses generating) tool.
 - ...case studies lack generalizability
- However, carefully planned and crafted case studies of real-life situations, issues, and problems have become a widely accepted research method in the literature





Case Studies Case Study Method



Source: Cosmos Corporation (Yin, 1984)





Case Studies Literature

- Eisenhardt, K. M. (1989). Building theories from case study research. Academy of Management Review, 14(4), 352-550.
- Emory, C. W., & Cooper, D. R. (1991). Business research methods. (4th ed.). Boston, MA: Irvin.
- Hamel, J. (with Dufour, S., & Fortin, D.). (1993). Case study methods. Newbury Park, CA: Sage.
- Miles, M. B., & Huberman, A. M. (1984). Qualitative data analysis: A sourcebook of new methods. Beverly Hills, CA: Sage.
- Patton, M. Q. (1980). Qualitative evaluation methods. Beverly Hills, CA: Sage.
- Stake, R. E. (1995). The art of case study research. Thousand Oaks, CA: Sage.
- Yin, R. K. (1984). Case study research: Design and methods. Newbury Park, CA: Sage.



Experiments

Definition:

"An experiment is a test under controlled conditions that is performed to demonstrate a known truth, or examine the validity of a hypothesis."

- Goal is to establish cause-and-effect relationships between variables.
- Assumption is that under certain conditions, the world works according to causal laws.
- In experiments you hypothesize that the Independent Variable(s) caused the changes in the Dependent Variable
- Experimental design should eliminate as many alternative hypotheses as possible; then we may argue that the independent variable is the cause





Experiments Literature

- Coolican, H., Research Methods in Statistics and Psychology, Hodder&Stroughton, London, 1990
- Couch, C.J., Researching Social Processes in the Laboratory, JAI Press Inc., London, 1987
- Campbell, D. T., & Stanley, J. C. (1966). Experimental and quasiexperimental designs for research. Chicago: Rand McNally





Further methods

Exploratory Qualitative methods:

- Focus Groups
- Interview
 - Content Analysis

More advanced methods:

• Questionnaire





Exploratory Qualitative Reserach: Focus Groups

- Group of people is asked about their attitudes towards a certain product, service or <u>concept</u>
- Advantages:
 - Sample size more than 1
 - Information right on the spot
 - Possibility to observe emotional reaction
 - Possibility to clarify

Disadvantages:

- Little control over what is discussed at the focus group: various "talking" styles
- Not representative biased
- Increased sensitivity towards the subject

from en.wikipedia.org







Exploratory Reserach: Interviews

• Different Types of the Interview

Advantages:

- Information right on the spot
- Possibility to observe emotional reaction
- Possibility to clarify

Disadvantages:

- Biased
- Influenced by the interviewer
- Increased sensitivity towards the subject





What to do with all this data? Content Analysis

- Make a transcript of a focus group or your interview (use a dictaphone)
- Identify keywords and then count their frequencies
- Do these keywords have something in common? Can they be summarized to some sub-categories and categories?





Questionnaire

Advantanges:

- relatively cheap
- easy to fill out and analyze
- possible to get a representative sample

• Disadvantages:

- questions are left for respondent interpretation
- often low response rate
- Etc.





When building a questionnaire:

- Make sure questions *can* be answered
- Make sure questions will be answered truthfully
- Make sure questions will not be refused
- Carefully think about questions and purpose





Questionnaire

Examples of bad questions:

- Do you think that the adiposeness of food ingested in academic facilities conflicts with the anticipatory expectations of your nutritional demands?
- Every student should have access to a laptop and the computer labs should be open for a longer time.
- In the face of high computer downtimes, you agree that more money should be spent on computer hardware?
- Do you have a criminal history?





Surveys

Fixed vs. open-ended questions

- Advantages of open-ended questions:
 - Deliver richer information
 - Respondent has more than a few answer options
 - Less chance of ambiguity
 - Questioning is more realistic

• Disadvantages:

- Not standardized
- Difficult to code or quantify → that is why most questionnaires use fixed questions





Attitude Scaling

Likert Scale

- produce a number of favorable and unfavorable statements about the attitude object
- 2) ask respondents to indicate, for each item, their response to the statement according to a five (or seven) point Likert scale:

Strongly			Strongly
disagree			agree

- use values for each field (typically 1-5) as scores for respondents' answers
- 4) carry out statistical analysis and perform tests for reliability and validity





Data Analysis

- Useful statistical tools: SPSS, Excel, Weka (http://www.cs.waikato.ac.nz/ml/weka/)
- Basic statistics tutorial: <u>http://www.statsoft.com/textbook/esc.html</u> <u>http://www.statsoft.com/textbook/stbasic.html</u>





Agenda

1	Research Methods		
2	How to Write Your Paper		



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Important: Preparing your seminar Institut für Wirtschaftsinformatik Humboldt-Universität zu Berlin

- Finalize a structure (Gliederung)
- Read "Formatting Instructions"
- Cite!
- Plan 2-3 days for just formatting the paper
- Everything you say in the paper should bring you closer to answering your main research question!
- Contact your supervisor!





Questions for Starting the Seminar Paper

- What is the main theme you are interested in?
- What do you know / not yet know about it so far?
- Why do you / others need to know this who cares?
 What's the value of finding out?
- How are you going to find the answer?







Types of Research Questions

- What kind of question are you after?
 - "I wonder what ..." (an exploratory, i.e. theory-building question)
 - "I wonder why/how ..." (an explanatory, i.e., cause and effect, question)
 - "I wonder if I'm right about ..." (a validation/theory testing question)
- Ask yourself why it is important?
 - "If only we knew ... we could ..."
 - Why should your target group care about answering this question?





The Conceptual Map

- Draw a 'map' of the topics that link to your research question or issue
- Start by brainstorming, then refine
- Try to choose a set of topics that shed light on your question from multiple angles
- Use the conceptual map to create a list of potential topics for background research





Purpose of Literature Review

- conceptualizes the research question
- is necessary to find and understand key variables
- is useful to avoid others' mistakes
- generates new ideas for improvements
- prevents from reinventing the wheel...





Writing Style

• Verb tense (Ensures smooth expression):

- Past Tense ("Smith showed...") or present perfect ("Researchers have shown...")
- Present tense to discuss the results and to present the conclusions
- Prefer active voice
- Use "this study" instead of "present study"
- Strings of nouns might be confusing (in English)
- Use Synonyms with care might suggest subtle differences (easy on the thesaurus)





Writing Style

• Economy of Expression:

- Only words that need to be said
- no redundancies
- short words and sentences are easier to understand
- technical terms, however, are necessary
- Eliminate ambiguity: "this", "that", "these", "those"





Writing Style

• Omit Redundancies (examples in brackets):

- They were (both) alike
- (A total of) 68 participants
- Four (different) groups saw
- Has been (previously) found
- (completely) unanimous
- (period of) time
- summarize (briefly)
- the reason is (because)





Plagiarism

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit

Plagiarism can be avoided. CITE your sources.





Citation

- "citation" is the way to tell your readers that certain material in your work came from another source
- it gives the information necessary to find that source again, including:
 - information about the author
 - the title of the work
 - the name and location of the company that published your copy of the source
 - the date your copy was published
 - the page numbers of the material you are borrowing





Why?

- giving credit to the original author by citing sources is the only way to use other people's work without plagiarizing
- there are a number of other reasons to cite sources:
 - citations are extremely helpful to anyone who wants to find out more about your ideas and where they came from
 - citing sources shows the amount of research you've done
 - citing sources strengthens your work by lending outside support to your ideas





Questions?



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