Introduction to MOT Research Methods

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November 2023

Mission of the course

Learn how to design a scientific research project in the area of Management of Technology, and to evaluate its results

What is (business) research?

An organized, systematic, data-driven, critical, objective, scientific inquiry or investigation into a specific problem

Types of (business) research

Basic / Fundamental	Applied
Generate body of knowledge on **class of problems**	Solve **specific** business problem faced by **someone** in work setting, demanding **timely** solution
New **contribution to** scientific knowledge	**Apply** existing theories to solve a problem

But:

- Not mutually exclusive! (e.g. case study, action research)
- Both need scientific method such that findings can be relied on as effective solutions

Learning goals: Part 1 (week 1-3)

1. Create a research design in MOT context
   a) Understand core concepts of research design
      (theory, population, sample, hypothesis)
   b) Apply the core concepts to design a project
      (topic → research questions → … → … → selection of analysis methods)

Learning goals: Part 2 (week 4-8)

2. Critically evaluate the outcomes of a research project in MOT context
   a) Interpret analysis findings
   b) Reflect upon findings / conclusions (validity, reliability, traceability, ethics)
   c) Suggest alternative / future research designs

- For qualitative (week 4-5) & quantitative (week 6-8)!

This course vs Thesis Preparation

This course (Y1)	**MSc Thesis preparation (Y2)**
Foundational knowledge	Prepare for MSc thesis
Detail research design for a given topic	Find the right topic to do a MSc thesis
Design research project **in the right way**	Designing **the right project**

Summary: Our mission

- Design scientific research
  in the right way

- Interpret and reflect on findings

Course team

- Mark de Reuver
  - Associate Professor
    - Digital Platforms Design
    - Ecosystems & Business Models
    - Data Economy, Digitalization
    - Qualitative & quantitative methods
    - Head of ICT Section
  - Course manager
  - Lecturer week 1-5

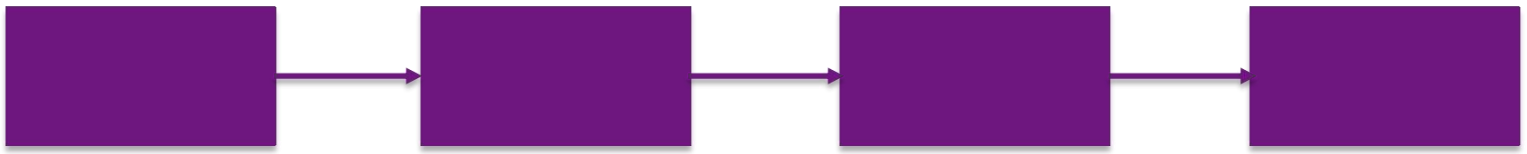
Course team

- Mark de Reuver
  - Course manager
  - Lecturer week 1-5
- Laurens Rook
  - Lecturer week 6-8
- Antragama Abbas
  - Co-lecturer week 1-5
- Teaching assistants
  - Chatarina Petra Salim
  - Pavlo Topalli

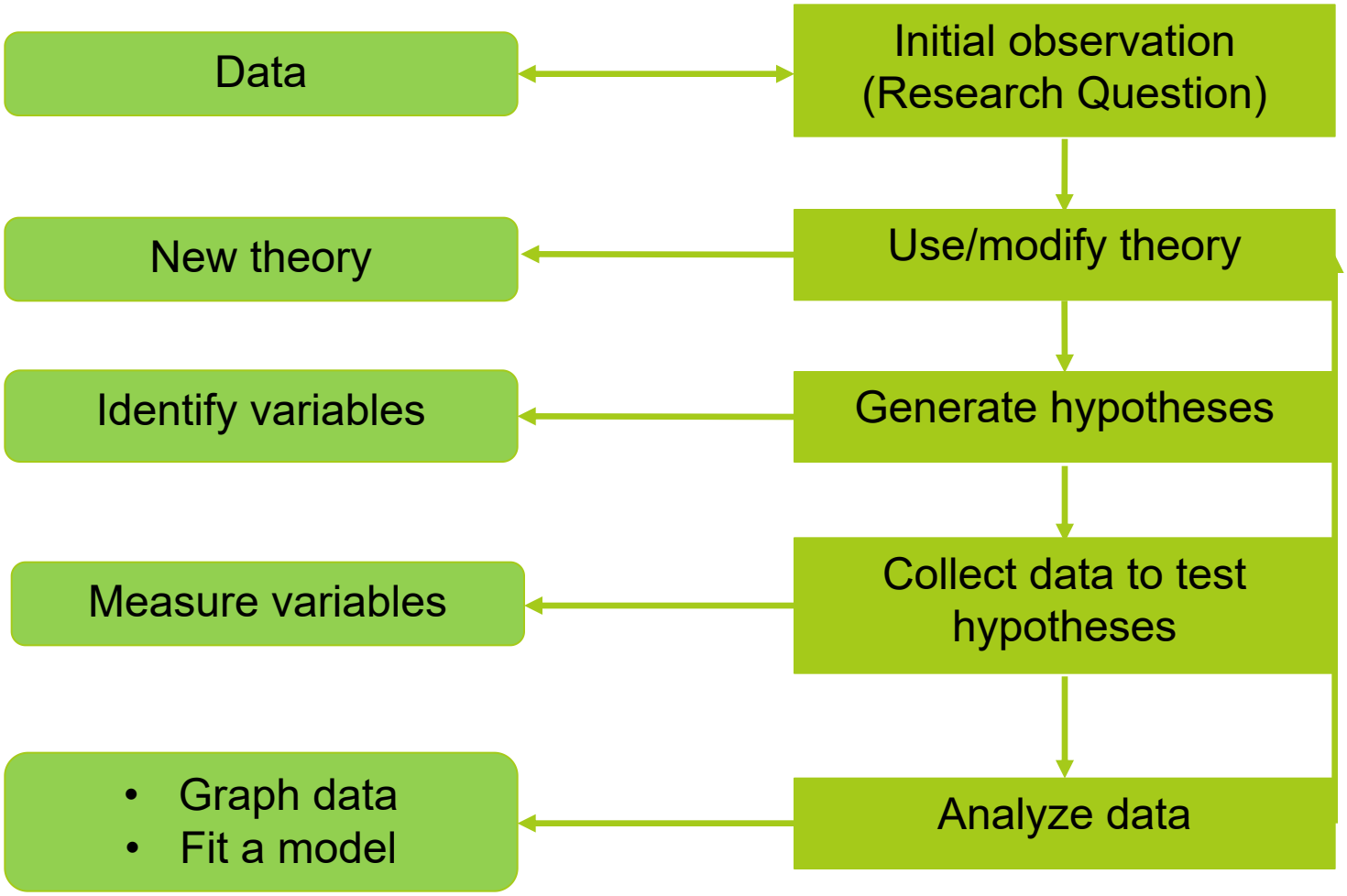
The empirical cycle

How to structure a research process?

- What are the steps of a research project?
- What should be the time order of the steps?

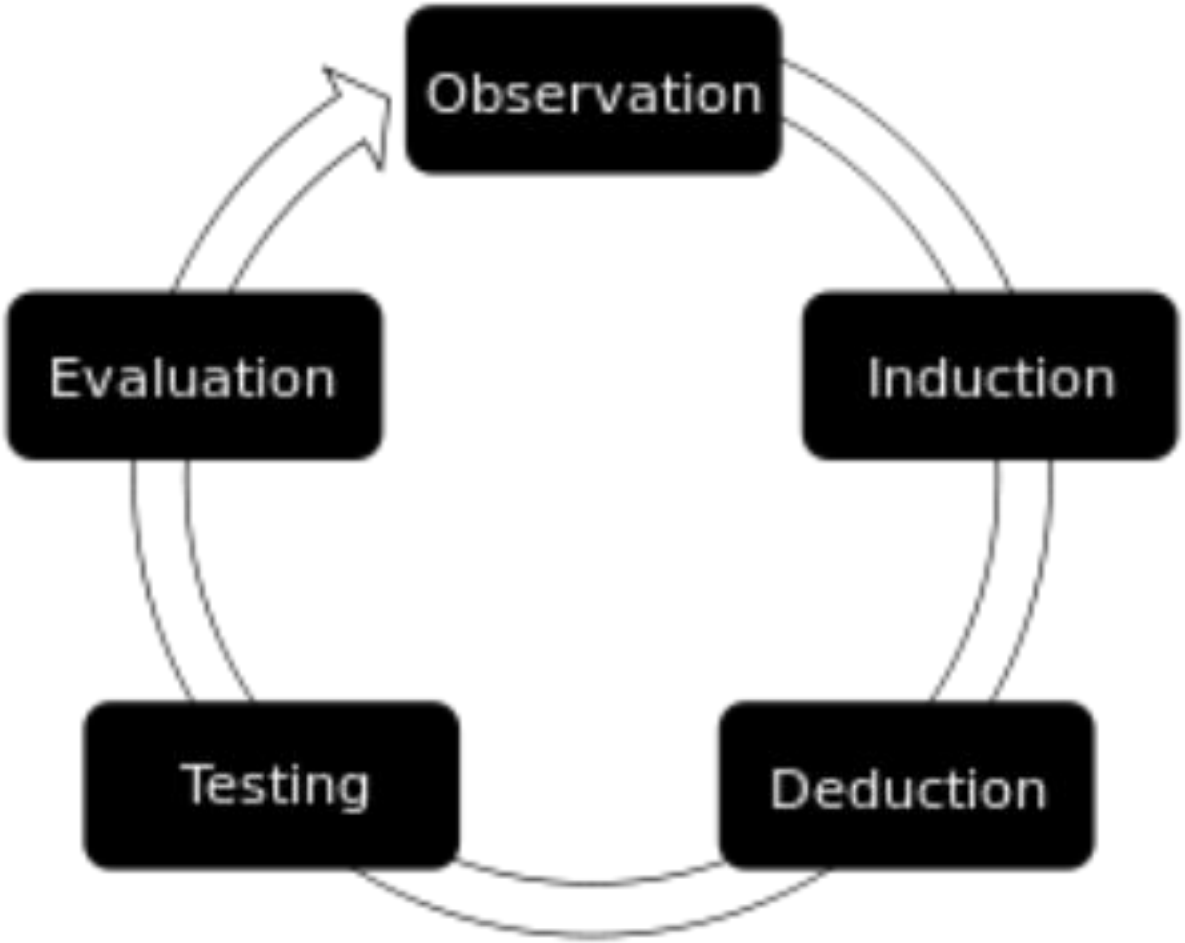


Research process



Source (*modified*): Field, 2009 (p.3)

Empirical cycle



Principle of verification = you should find observations in support of your claim and start reasoning from this empirical finding (i.e. to find “truth”) (through induction)

Principle of falsification = a claim remains “true” until proven otherwise (through deduction)

Week 1-3 of this course

Research problem	WHY you're doing this
Research objective	WHAT you will deliver to solve the problem
Research question	WHAT we need to know to reach the objective
Sub-questions	WHAT we need to know to answer the main question
Approach	HOW you will answer the sub questions

Research process

1. Identify (broad) research problem
2. Literature review
3. Research objectives, questions, hypotheses
4. Select research approach / research design
5. Create plan for research
   - Sample, instruments, data collection approach
6. Collect and analyze data
7. Interpret data and evaluate validity
8. Communicate findings / write report

Source: Adapted from Gliner et al. (2009), p.20

What's new in 2023-2024?

Call to action

- Participate in Evasys survey
- Better: give us suggestions *during* the course!

Materials and Examination

Materials

- Software
  - JASP (quantitative, open source, free)
  - Atlas TI (qualitative, student version suffices)
- Required readings
  - Week 1-5: Sekaran & Bougie (ed 7 or 8)
  - Week 4-5: Baxter & Jack (2008)
  - Week 6-8: Jackson (Statistics)
- Lecture slides

Study load

Component	Study load
Lectures (preparing / assignment)	2 x 8 x (2 + 2) = 64 hours
Studying the book (reading, summarizing, processing)	320 pages → 45 hours
Studying the slides (reading, summarizing, processing)	15 slide-packs → 23 hours
Practice exam	5 hours
Exam	3 hours
Total study load	139 hours EC: 5 x 28 = 140 hours

Examination

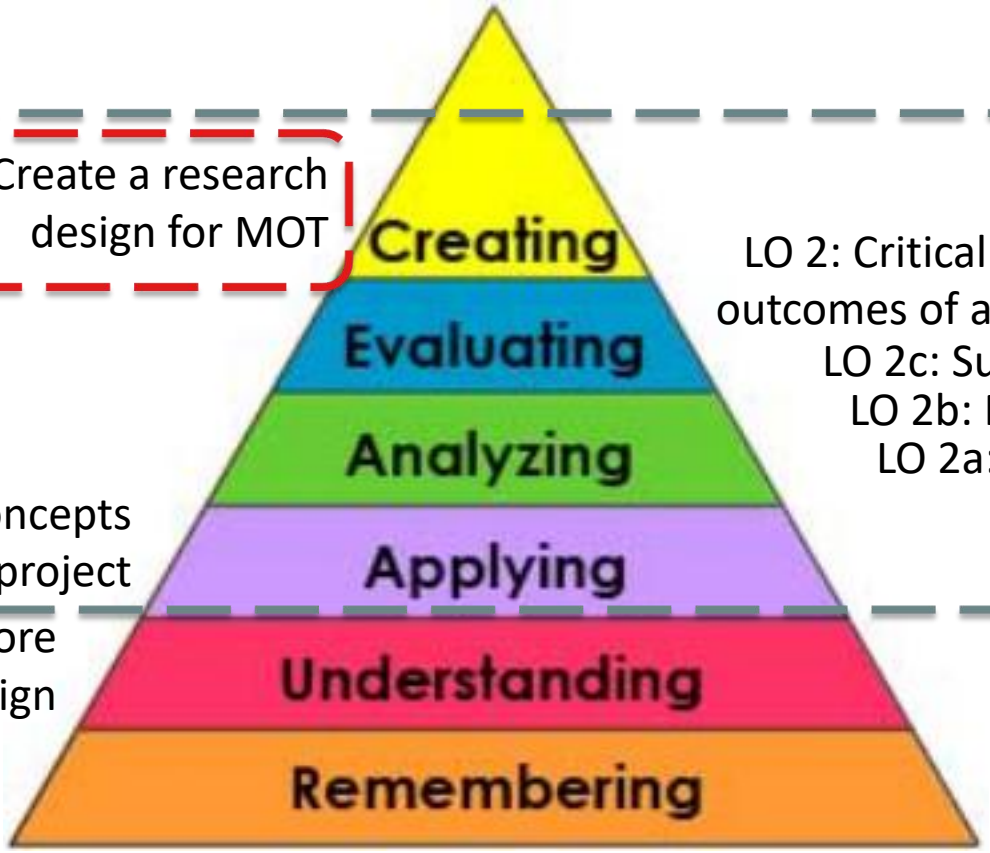
Assignments LO 1: Create a research design for MOT

Exam

LO 2: Critically evaluate the outcomes of an MOT project
LO 2c: Suggest alternatives
LO 2b: Reflect upon findings
LO 2a: Interpret findings

LO 1b: Apply core concepts to design a project

LO 1a: Understand core concepts of research design



Note: Need to understand core concepts before you can apply them!

Examination

- Weekly assignments (15%)
  - Week 1-5
- Written exam (85%)
  - Open questions (cases, excerpts)
  - See Course Information – Assessment specification
  - See Course Information – Sample questions

Summary

- Software, book and slides
  - Check Brightspace for specifics!
- Course load
  - It’s more than watching a few videos!

Teaching methods Week 1-5

Modules

Module	Topics	Week
1. Basics of research design	Research objective, questions Research ethics	1-2
2. Conceptual model	Constructs, variables Hypotheses	2-3
3. Research design	Causality, validity Research strategies	
4. Measurement	Measures Validity, reliability	3-4
5. Sampling	Inferential statistics Sampling, population	
6. Case study research	Case study protocol Practices of case research	4-5
7. Qualitative analysis	Qualitative vs quant Coding	5

Each module consists of…

- Online videos: Instruction
- Reading materials (e.g. book)
- Lecture: Practice with materials
- Assignment (graded)
- Lecture: Wrap-up, Q&A

Online videos

- Each module has 4-9 online learning videos
- Short intro to topics of the module
  - Not a substitution for reading the book!
- Illustrate and give examples

Weekly assignment (week 1-5)

- Goals
  - study and practice early;
  - experience to design a study;
  - reflect critically on research designs
- Deadline: Thursday 12.00, each week
- Evaluation
  - Rubric: yes/no on multiple criteria
  - TA reviews, course manager checks
  - Generic feedback given in live lecture
- 15% of final grade

Weekly assignment (week 1-5)

- ChatGPT
  - Can generate research questions, hypotheses – but often boring ones
  - Weekly assignment is to practice – ChatGPT is not available in your exam
  - Strong advice: Do not use unless instructed to do so (in later weeks)

Lectures (week 1-5)

- Tuesday: Practice lecture
  - Practice with cases, similar to exam
  - Prepare by watching the online videos of that week
- Monday: Wrap-up lecture
  - Wrap-up of contents of the past week
  - Prepare by reading the book chapters and completing the assignment
  - Q&A, quiz, generic feedback

Each module consists of…

- Online videos: Instruction
- Self-test: Multiple choice questions
- Reading materials (e.g. book)
- Lecture: Practice with materials
- Assignment (graded)
- Lecture: Wrap-up, Q&A

If you have questions any time

- Use the discussion board!
  - Students help each other answering questions
  - TA moderates and can send questions to the lecturers
  - Guaranteed answer within 2 working days
- Avoid non-moderated side-channels

Summary

- Prepare lectures
  - Use Brightspace as a checklist
  - Online videos
  - Reading materials
  - Weekly assignments
- Use discussion board
- Engage and participate

Weekly assignment topic

Your experience

Weekly assignments: Introduction

The weekly assignments are on a running case that you work on in week 1-5 of the course.

The assignments help you to attain the following learning objectives:

- Describe and apply notions in research methods (e.g. theory, population, sample, hypothesis) and research design / research strategy (e.g. qualitative versus quantitative)
- Design a research project in Management of Technology from initial topic to research design, including all intermediate steps (e.g. research question, conceptualization)

The goal of the assignments is to (1) facilitate you to study and practice with materials early in the course; (2) gain first-hand experience in designing an MOT research project.

The assignments are summative. That means that the assignments, in total, count for 15% of your final grade. There are 5 assignments, one in each week 1-5.

The deadline for each weekly assignment is on the Thursday in the respective week (e.g. Assignment 1 has deadline Thursday 12.00 in Week 1). Late submission is not allowed. Re-submissions are not allowed either, also not in case of an insufficient mark.

The assignment is to be done in groups of 2 students. You can enroll as a group using the Group tool in Brightspace.

Please note that the assignment description is concise. All the concepts and terms are explained in the lectures and the course materials. So, for instance, when you are asked about theories, please go back to the lecture slides to understand what we mean exactly.

Upload / Create Existing Activities

Drag and drop files here to create and update topics

Preparation assignment: Deadline 15 Nov

This individual task takes you 90 minutes. It has to be completed before you come to class on Tuesday 15 Nov 10.45!

It's not the assignment for this week - but you'll have to complete it to be able to execute

To do before tomorrow 10.45!

- See Brightspace – Content – Module 0 – Preparation assignment
- Preparation assignment
  - Define a topic for MOT research based on your prior experience (internship, job)
  - Describe your experience / problem
  - Define a problem area for your research
  - Submit the problem area in the assignment box
- Lecture is interactive, based on your submitted idea
  - Without preparing, you cannot participate in the lecture