

# TDT39

# Empirical Research Methodology

Autumn 2023

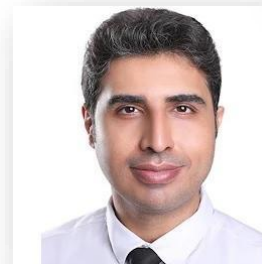


# Agenda

- Staff
- About empirical research
- About the course
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- How to submit
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- Schedule
- Workshop

# Course staff

- Marius Mikalsen, Room: 207 IT building ITV
  - Syed Sajid Hussain Shah
  - Nora Othilie Ringdal
  - Morteza Moalagh
  - Michaela Schmidt
- 
- <https://www.ntnu.no/wiki/display/tdt39/>



# About empirical research

# How do we know something?

# empiri

Store norske leksikon / Religion og filosofi / Filosofiens fagdisipliner / Vitenskapsteori

Empiri er erfaring, data - det som understøttes av eller grunner seg på erfaring.

**UTTALE** empir'i

**ETYMOLOGI** av *gresk empeiros*, 'noe som er opplevd eller erfart'

Begrepet brukes i forskning om kunnskap innhentet ved hjelp av systematiske observasjoner og undersøkelser (empirisk dokumentasjon). Dette står i motsetning til antakelser og kunnskap utledet av teoretiske overveielser, personlige inntrykk (såkalt anekdotisk bevis) eller ikke-systematisk innhentede observasjoner eller erfaringer.



# forskning

Store norske leksikon / Samfunn / Utdanning og forskning / Forskning c  
/ Begreper i høyere utdanning

Forskning er å undersøke noe ved hjelp av vitenskapelig metode for å frembringe ny kunnskap. Forskning foregår hovedsakelig ved universiteter og høgskoler, frittstående forskningsinstitutter, helseforetak/sykehus og i arbeids- og næringslivet. Begrepet vitenskap brukes særlig om akademisk forskning.

## Definisjoner

Forskning kan være vanskelig å definere, og i praksis legges ofte ulike definisjoner til grunn. Siden 1963 har Organisasjonen for økonomisk samarbeid og utvikling (OECD) operert med begrepet *forskning og utviklingsarbeid* (FoU) som grunnlag for internasjonal og sammenlignbar statistikk. FoU vil si kreativ virksomhet som utføres systematisk for å oppnå økt kunnskap om kultur, individ og samfunn, og omfatter også bruken av denne kunnskapen til å finne nye anvendelser.

*Grunnforskning* er eksperimentell eller teoretisk virksomhet som primært utføres for å skaffe til veie ny kunnskap om det underliggende grunnlaget for fenomener og observerbare fakta, uten sikte på spesiell anvendelse eller bruk.

*Anvendt forskning* er virksomhet som utføres for å skaffe til veie ny kunnskap primært rettet mot bestemte praktiske mål eller anvendelser.

*Utviklingsarbeid* er systematisk virksomhet som bruker kunnskap fra forskning og praktisk erfaring for å fremstille nye eller vesentlig forbedrede materialer, produkter eller innretninger.



**How can you know what social media does to users?**

# About the course

# What is TDT39?

The course is for students who are interested in research in 'real world' settings. You will learn methods for exploring *how* and *why* various information/computer systems are *designed*, *implemented* and *used*.

Two variants:

- IT3010 - Full course mandatory for master of science (Spring term)
- TDT39 (this course) - Elective course for M.Techn. (Autumn)
- You cannot take both courses!

**Based heavily on self-study!**

# The course textbook

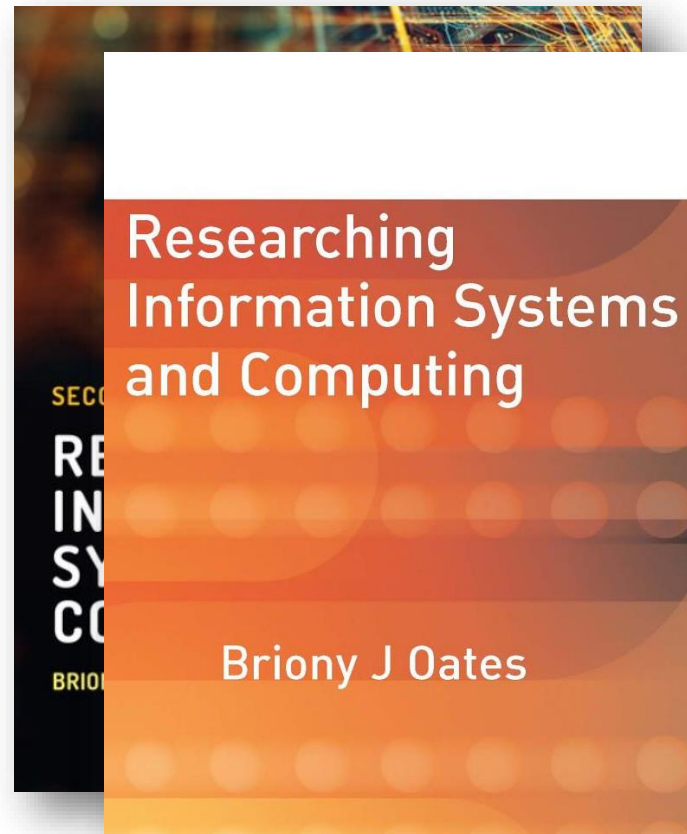
Briony J Oates; Marie Griffiths; Rachel McLean

*Researching Information Systems  
and Computing.*

London: Sage Publications,

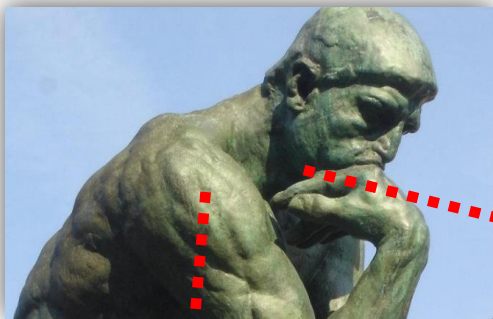
Second edition 2022

(or first edition 2006).



# **Key concepts in the course**

# The thinking man



You

Rigor



Other researchers

Relevance

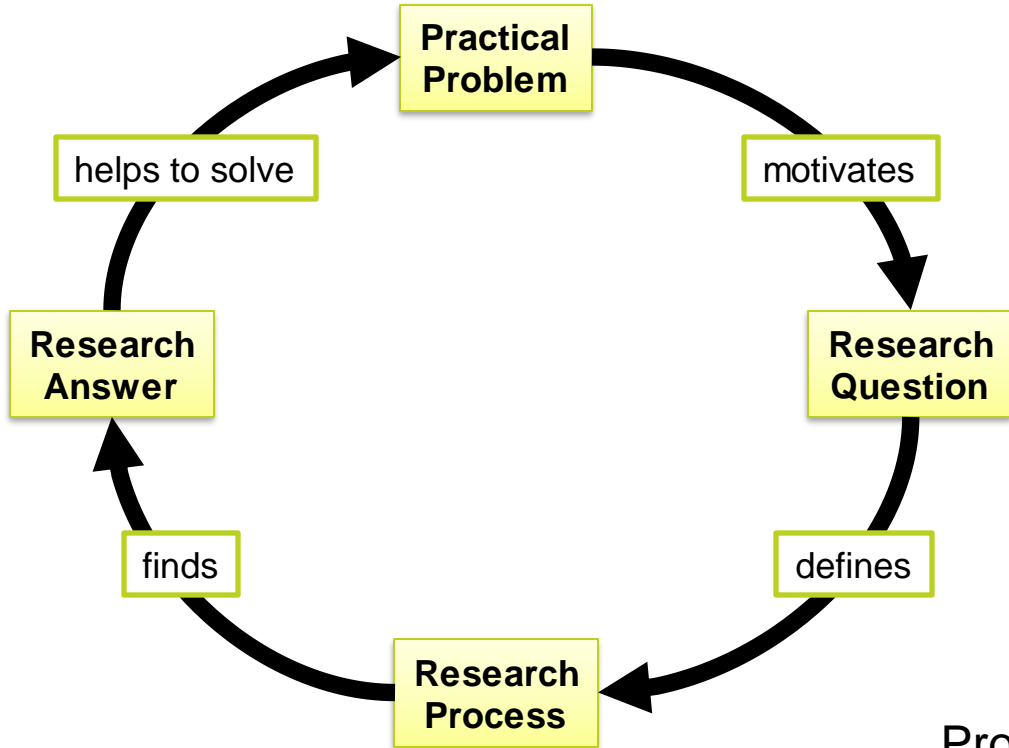


Your research



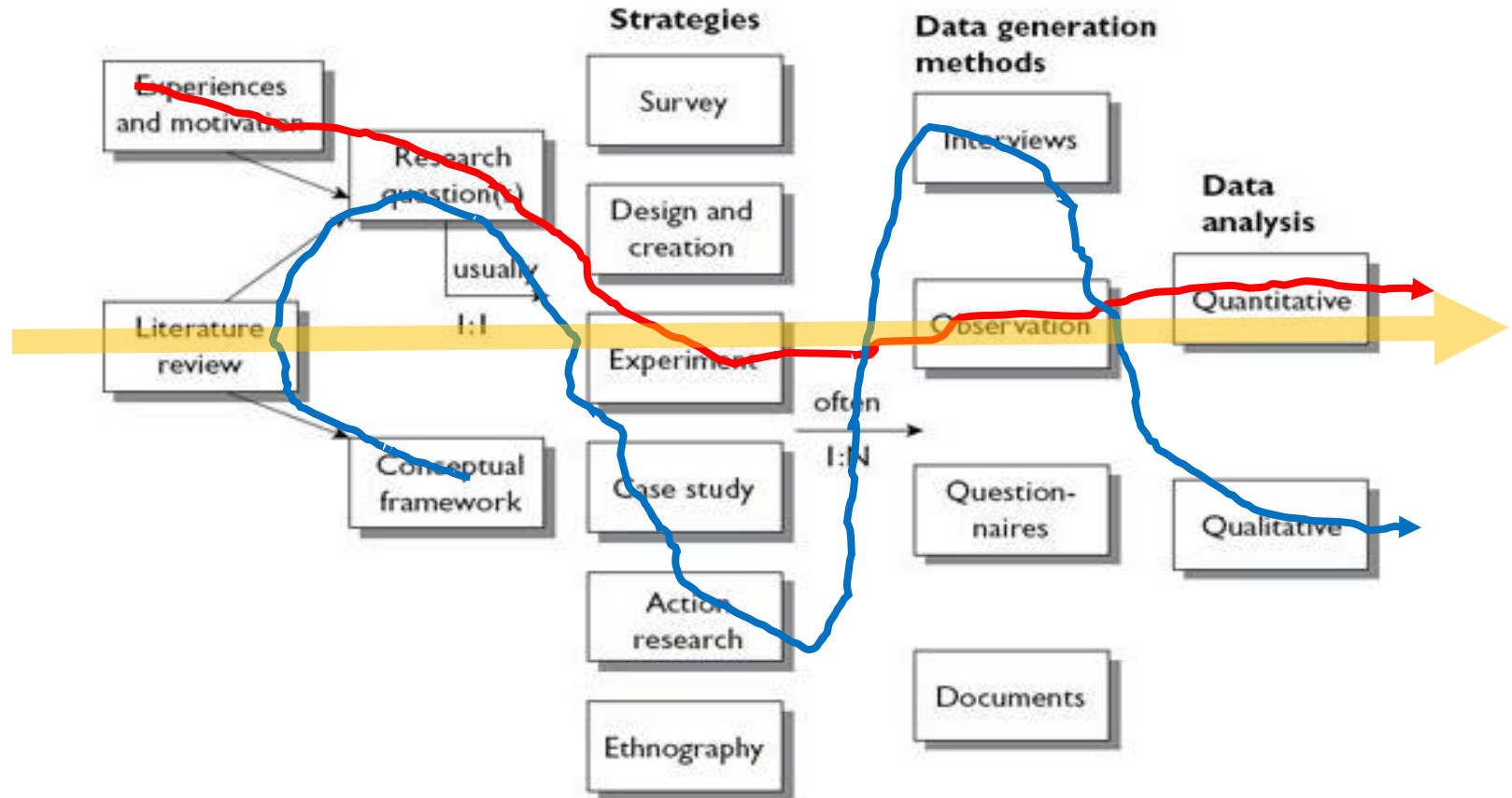
Practice

# Separating the problems from the questions



Problems need solutions  
Questions need answers

# The framework





# Examples

# An ex-student of the course



Hjem / Student

## Martes forskning om svake låsemønstre på mobil vekker internasjonal oppsikt

Marte Løge (23) analyserte 3 400 låsemønstre på smarttelefoner. Nå får den tidligere NTNU-studenten stor oppmerksomhet i internasjonale medier for svakhetene hun avdekket.



Selvi Waterloo Normannen  
Mobil: 469 19 530

Publisert: 25 august 2015 15:44  
Sist oppdatert: 25 august 2015 16:06

Det viser seg nemlig at valgene vi gjør for slike låsemønstre har like mange svakheter som de vi gjør når vi velger passord. Det gjør oss sårbare overfor hackerangrep, og det var nettopp på **Defcon**, verdens største hackerkonferanse, at Løge gjorde passordforskningen sin på Android Lock Patterns (ALP) kjent tidligere i sommer.

### På verdens største hackerkonferanse

Der var det 18 000 til stede, og nå er hun omtalt i en meget lang liste publikasjoner verden over (se nederst i saken)

Hun er glad for oppmerksomheten.

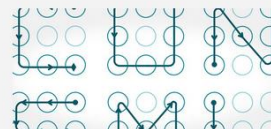
- Det er jo slik at når man sitter og jobber med en masteroppgave, så melder spørsmålet seg fra tid til annen om noen i det hele tatt bryr seg om dette. Men nå har det jo eksplodert. Etter konferansen i Las Vegas i juli tok det jo helt av, sier Løge.

I likhet med passord er låsemønstre en sikkerhetsmekanisme på skjermen. Mens passord gjerne er navn på familiemedlemmer, kjæledyr og/eller fødselsdatoer, er låsemønstret et visuelt eller grafisk bilde. Marte Løge har




FOTO: KAI T. BRAGLAND



**Avslørte svakheter.** - Jeg er ikke overrasket i det hele tatt, men det er interessant å se hvor forutsigbare vi er, sier Marte Løge til UA.



# An ex-student of the course




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**Chapter**  
 Ambient Intelligence  
 Volume 9425 of the series Lecture Notes in Computer Science pp 313-327  
 Date: 30 October 2015

## Designing an Application Store for the Internet of Things: Requirements and Challenges

Simon Stastny, Babak A. Farshchian ✉, Thomas Vilarinho



<a href="#">Buy chapter</a>	<a href="#">Buy eBook</a>
\$29.95 / €24.95 / £19.95 *	\$64.99 / €47.59 / £32.99*
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\* Final gross prices may vary according to local VAT.

### Chapter Metrics

	Readers 8
	Downloads 424

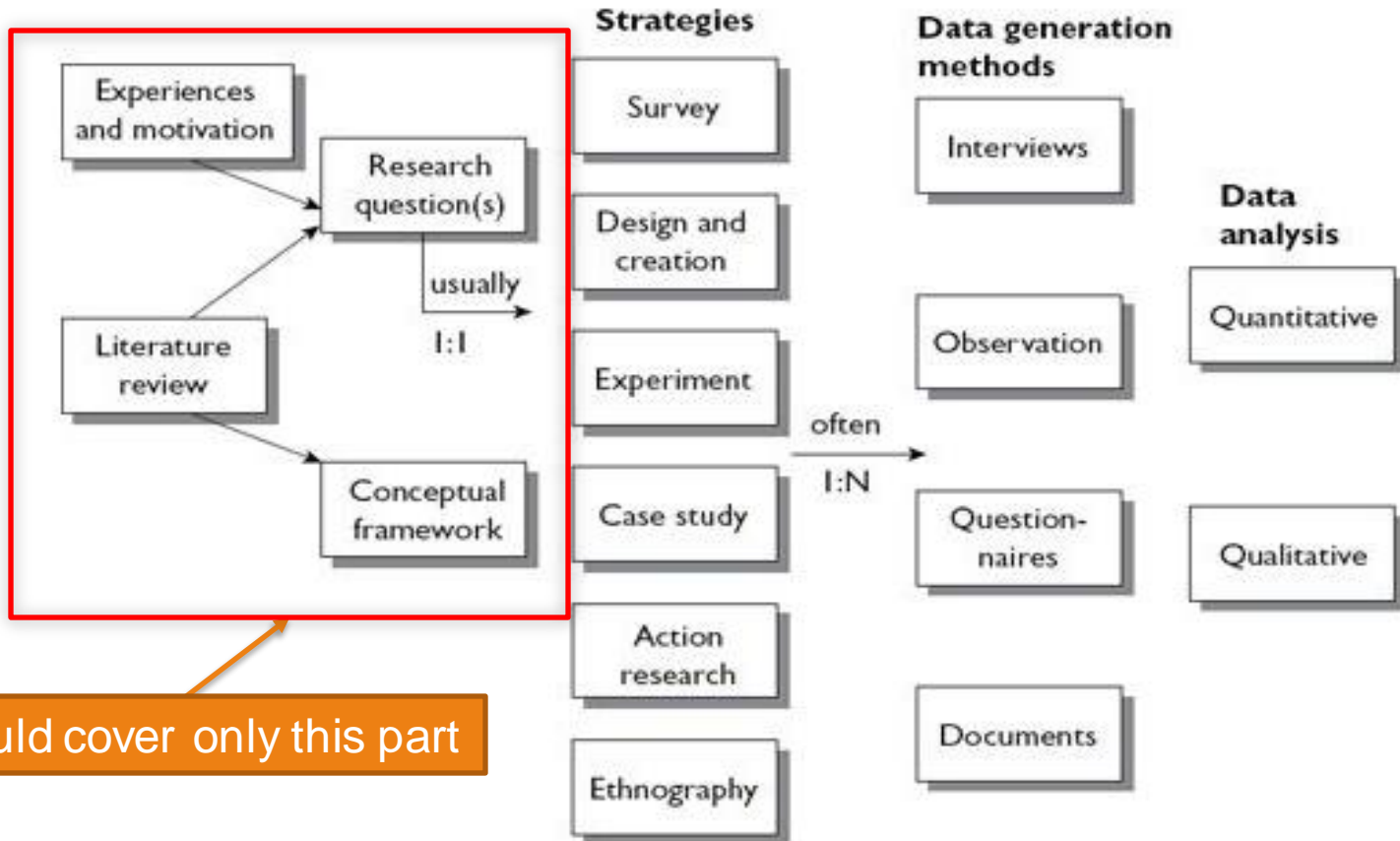
Provided by **Bookmetrix**

# Course deliverables

# Course deliverable

- A research plan for a realistic empirical research project.
- Voluntary version 1.0 ready by September 29.
  - Only the purpose section
  - Not graded
  - Can be submitted for review and feedback.
- A template is provided, along with some example plans. See [course web pages](#).
- Contents of the final deliverable:
  - **Purpose:** Why you want to do this research? What is the relevance?
    - Heavily based on research literature.
  - **Contributions:** What new knowledge/product will you produce?
  - **Research method:** What research strategy/method will you use?
  - **Participants:** Who do you need for your research? What resources do you need?
  - **Research paradigm:** Is this a positivist, interpretivist, or critical research project?
  - **Deliverable:** What is the form of the final deliverable?

# About version 1.0 (purpose)



Should cover only this part

# How to submit

# How to submit version 1.0

- Maximum 500 words, excluding the administrative front-page and references to literature.
  - Chapters 1-4 in the textbook are necessary reading for v.1.0.
- Version 1.0 is mainly the "Purpose" part of the final plan, but you can also deliver the other parts if you need feedback on those.
- Send v1.0 using the same procedure for the final deliverable [documented on course web page](#).
  - **Do not copy Berit for this one!**
- You will receive written feedback.
- This is **not mandatory but recommended**.

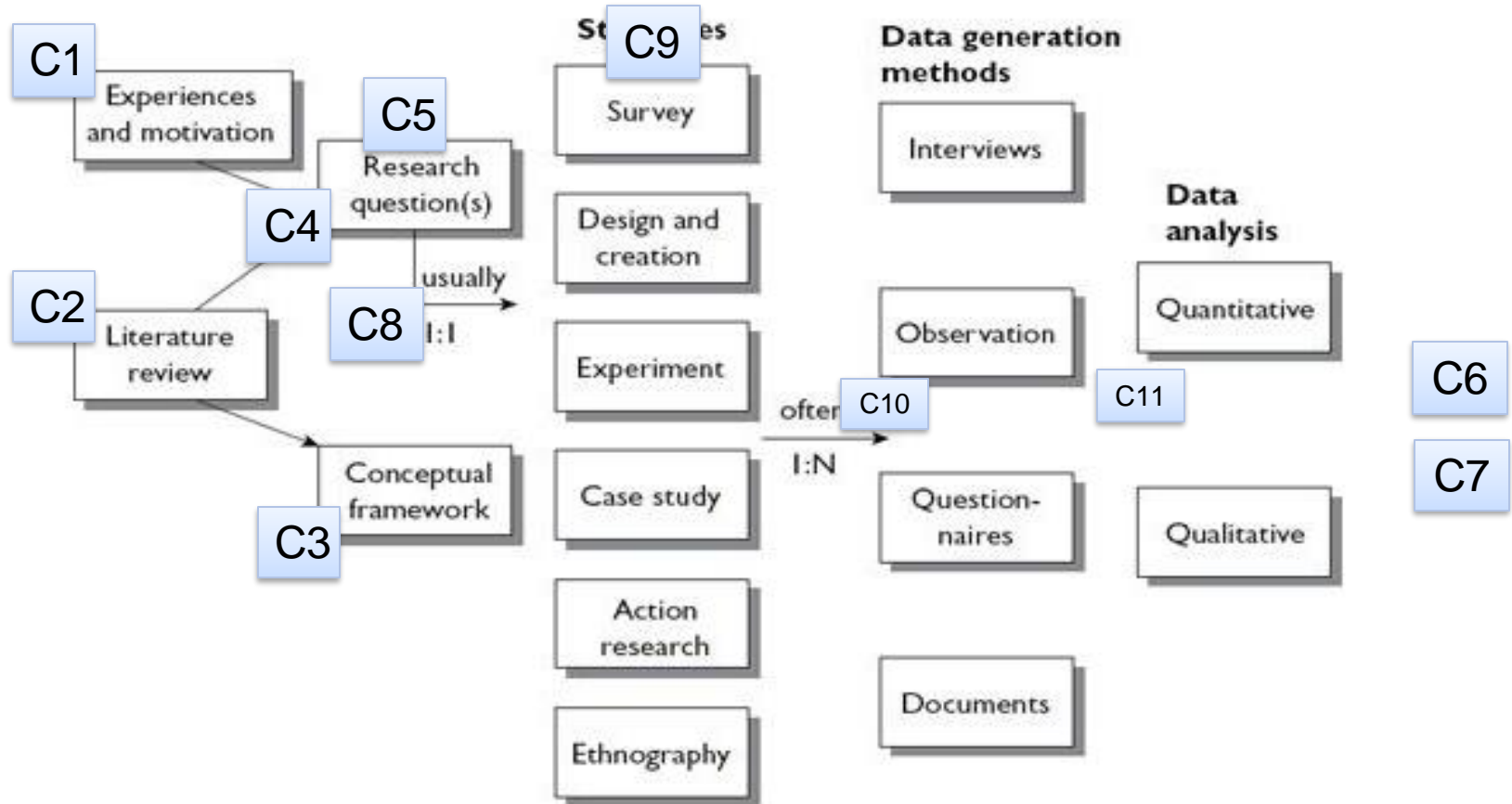


# How to submit final version

- Maximum 1200 words, excluding the administrative front-page and references to literature.
- Use procedure [documented on course web page](#).
  - Copy Berit for this one!
- Will be graded
- This is **mandatory**.

# Evaluation criteria

# Evaluation criteria final deliverable



# Overview and weighting

Section	%	Evaluation criteria
<b>Purpose</b>	30	C1: The motivation for the project is firmly developed in form of a practical problem with documented sources from both literature and media.
		C2: A gap in our knowledge is clearly stated with references to relevant research literature.
		C3: The objective for the research is clearly stated and leads clearly to the research questions.
		C4: The research questions are clearly stated and show how the research will address the gap in knowledge.
		C5: Main concepts are clearly identified and defined and belong to IS, SE, or CS.
<b>Contribution</b>	10	C6: The deliverables of the research study are clearly stated.
		C7: The new knowledge resulting from the deliverables is clearly described related to the knowledge gap and addresses the research questions.
<b>Research methods</b>	35	C8: The research strategy is described and argued for, and it is easy to see why your research questions demand such a strategy.
		C9: Other competing strategies are ruled out with good arguments.
		C10: Data generation methods are described and argued for based on strategy and RQs.
		C11: Data analysis methods are described and argued for, and show that the RQs can be answered.
<b>Participants</b>	10	C12: Main foreseen threats to internal validity are discussed.
		C13: Describe all participants and their roles in the research project.
		C14: Explain whether/why there is a need to involve non-researcher participants.
		C15: Discuss the ethical issues of involving non-researcher participants and how to address them.
<b>Research paradigm</b>	5	C16: Reflect on your own role as researcher in the project, and how it will impact the validity of your results.
		C17: Discuss and reflect upon the research paradigm you have employed, and why.
<b>Dissemination</b>	5	C18: Explain how your results could be disseminated beyond your final master thesis.
<b>References</b>	5	C19: Your list of references should be correctly formatted and include all bibliographical data of approximately 7-8 relevant scientific references that are actively used in the text
<b>Total</b>	<b>100</b>	

**For more info on criteria, see the  
assessment slide on course web  
page**

# Schedule

# Schedule for the semester

- Kick-off meeting: Thursday August 31, 09:00 - 10:00 in 454, IT-bygget (This meeting)
- Deadline for version 1.0 (optional): September 29, 16:00
- Feedback on first draft (for those who submitted):  
October 13
- Feedback workshop (optional):
  - Submit 31 October
  - November 2, 13:00 - 15:00 H1, Hovedbygget
- Deadline for final research plan (mandatory): November 30, 16:00

# Workshop



# REVIEW RESEARCH PLAN WORKSHOP

Workshop AIM: Going through candidate Research plans and review them anonymously based on evaluation criteria in the course

Workshop Date: **November 2<sup>nd</sup> 13:00-15:00 Hovedbygget H1**

Deadline for submitting research plans to review in the workshop: **October 31<sup>st</sup> 16:00**

## Workshop Plan

1. Attendees form the group of 4-5 people
2. Each group assigns an anonymous research plan to review and discuss- **30 minutes**
  1. Each group presents their findings based on course evaluation Criteria- **10 Minutes**
    1. Course Staff members provide their comments about the Research plan – **5 minutes**

