



Aalto University
School of Science

Master's thesis

Everything you need to know

For Industrial Engineering and Management master students

4.12.2023

What you need to know about doing a master's thesis

1. What it is
2. How to find a good topic
3. How to manage the process
4. How to write a good thesis
5. How it is evaluated
6. How to use the results and make an impact

The master's thesis

What is the master's thesis?

- **The master's thesis is an independent engineering or research project completed by the student.**
- **The purpose of the thesis is to demonstrate capabilities in research, know-how in the topic of the major, and independence and maturity in intellectual efforts.**
- **The thesis is done from a topic within the area of the major.**
- **It's a six months full time project (30 ECTS credits)**
- **The final thesis is a public document.**

Finding a good topic

Who offers a thesis project

- **The majority of theses are done with a company**
 - Typically includes funding from the company
- **Professors/faculty sometimes offer thesis topics**
 - Typically part of a research project, then includes funding
- **Own topic of interest**
 - If you don't need a salary...

Requirements and evaluation principles are the same for all!

Master's thesis positions and topics

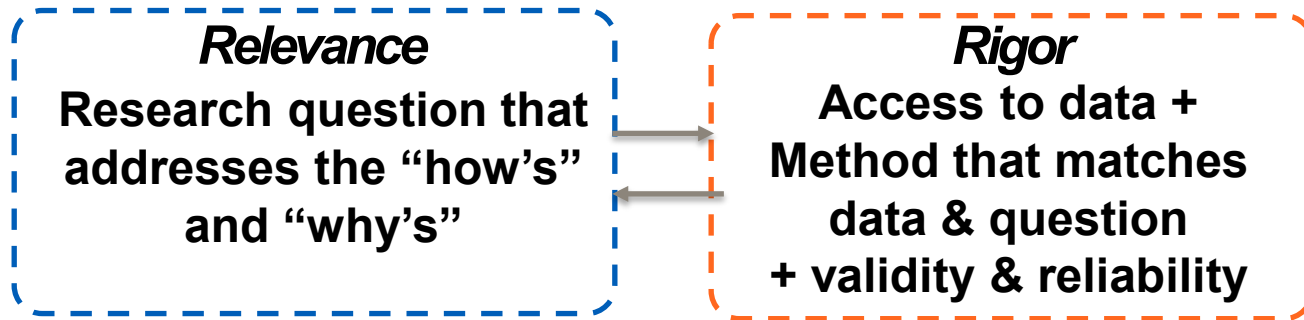
- *Aalto Jobteaser*: <https://aalto.jobteaser.com>
- *aTalent Recruiting*: <https://atalent.fi/en/>
- Guilds
- Own network

From company need to a good topic

- **Translate company need (problem) into a research topic, formulate research questions**
 - Understand company general need
 - Consider what is the more specific "problem" the company faces
 - Consider how to set up a research study to address the problem
 - *What do we need to know but don't yet know?*
 - *What is the expected deliverable that you can provide for the company?*
- **Balance between company and academic requirements**
 - Company requirement: Solve a practical problem (practical relevance)
 - Academic requirement: Rigor (scientific principles) and relevance (new knowledge creation)

Company vs. academic requirements

Is there a trade-off?



Messages to the company:

Rigor should increase (practical) relevance, so not necessarily a trade-off
Need commitment from company (time, data access) to be able to do rigorous study
You can exceed company expectation, deliver unexpected insights

Common issues when doing thesis for a company

Responsibilities typically include (sometimes large amount of) operational tasks that do not directly contribute the thesis project

- **If you have worked for the company before: Be careful in redefining roles and responsibilities, try to highlight the difference**
- **Some companies either cannot invest enough in long-term development or have different ideas about thesis projects**

Company has already decided on solution and seeks:

- **Implementation (e.g. go-to-market-plans, prototypes, strategies, etc.) or**
- **Information instead of understanding (e.g. market analyses, best-practice benchmarks, etc.)**
- **Need to go beyond these**

Managing the process

Starting

Find a thesis position, agree on the topic and advisor, and find a supervisor.
Familiarize yourself with the thesis instructions and the evaluation criteria.

Submit form 206 Thesis topic approval to the Student Services and start working on your thesis.

The topic will be confirmed in the programme committee meeting. You will be notified of the decision.

Working on the thesis

Follow the agreed schedule. Communicate regularly with your supervisor, also if the work is not proceeding as planned.

Supervisors are usually willing to comment on your thesis. You can send the thesis for comments e.g. when you have:

completed the first chapter
reached midpoint
almost completed your thesis

The thesis is ready

With the supervisor:

- When the thesis is nearly completed, agree on the thesis presentation.
- Send the final thesis.

With the Student Services:

- Submit form 207 Approval and grading of master's thesis.
- Submit Request for graduation (Sisu)
- Bring the signed Presentation of the master's thesis form.

From the supervisor to the Student Services:

- Statement of thesis assessment.

Approval of the thesis in the programme committee meeting. You will be notified of the decision through eAge.

Graduation

After the dean has awarded the degree, you will receive an email with information about the graduation, degree certificate and graduation ceremony.

Sign up for the graduation ceremony, collect your degree certificate from the Student Services, or request for it to be mailed to you. Instructions are in the graduation email.

Congratulations – welcome to the graduation ceremony!

General: Each process is unique

- **There is no master's thesis seminar in Industrial Engineering and Management. Each work is supervised individually.**
- **The process starts when you start it**
- **Writing the thesis is a process, not the last step – start early and have several feedback rounds from supervisor & instructor**
- **You are in charge of the process**

Writing thesis in major or minor

As a default, the master's thesis is written on a topic related to the student's chosen major. The supervisor should be a professor or lecturer from the field of the chosen major (within the IEM department).

- Professor from another field (within our outside of IEM department) can be a suitable supervisor, but this needs approval from head of major (by e-mail)

It is possible to write the master's thesis on a topic related to the chosen minor.

- Programme director needs to approve (by e-mail)
- IEM evaluation criteria are always applied

Finding a supervisor

Whom:

- **List of potential supervisors:**
<https://mycourses.aalto.fi/mod/page/view.php?id=1074110>
- **Check the specialties of each professor, and approach the one whom you perceive as the best first guess. However, if unsure you can contact any of the professors and lecturers in your major regarding your topic, and we'll then help to find the best fit.**

When:

- **Contact us early enough so that the supervisor can help in finding, shaping and scoping the topic.**

The formal process

Check
thesis page!

Prerequisites for starting

- Enrolled, BSc Degree finished and registered, HOPS for master studies approved
- Research assignment course completed
- No formal requirement about credits, but should have finished all or most courses by the time the thesis is started

Find topic, get supervisor

Apply for the topic as soon as you have agreed with your supervisor

- Approved by Program Committee, valid for 1 year
- NB! Time to completion is an evaluation factor

Once the thesis is ready:

- Deliver and apply for evaluation.
- Do maturity test: Press release / Article / Blog posting

Evaluation and approval

- Supervisor evaluates the thesis
- Final decision made by program committee

Official stages in the thesis process

1

Approval
of the
topic

2

Maturity
test

3

Submitting
the
finished
thesis

4

Evaluation

1. Approval of the topic

- **Apply for the topic as soon as you have agreed with your supervisor**
- The topic and supervisor are approved in the Degree Programme Committee meeting
- Topic \neq title of the thesis, the final title may change
- Topic is valid for one year
- Submit the form 206: *Request for approval of Master's thesis topic* to the Student Services (eAge or hard copy)

Note that ***the approval of the topic*** and ***the grading of the thesis*** must be done ***in separate DPC meetings!***

2. Maturity test

- A compulsory part of your thesis
- Graded pass or fail
- Usually done when you're close to finishing the Master's thesis
- Deadline is the same as thesis submission

The essay also at the same time counts as thesis presentation (since there is no thesis seminar in this program).

3. Submitting the finished thesis

- Submit the form 207: *Evaluation and approval of Master's thesis* and your thesis in pdf/a format (eAge)
- Send exactly the same version to your supervisor for evaluation
- Have you completed all your studies?
 - Also submit the form by SISU / SISU help,
<https://wiki.aalto.fi/pages/viewpage.action?pageId=118689795>

Checklist before submitting master's thesis

- ✓ You have had your *topic approved* and *it's valid*
- ✓ You are *enrolled* for the semester
- ✓ You have written *the maturity essay*
- ✓ You have got *a permission* for submission *from your supervisor*

4. Evaluation and approval of the master's thesis

- The thesis is approved and evaluated by Degree Programme Committee
- Evaluation is based on the supervisor's statement and grade proposal

Graduation schedule

Deadline for submitting degree certificate application = **Graduation date** on degree certificate

Deadlines 2023-2024

Recommendation for submitting the final version of the thesis to your supervisor for evaluation.	Deadlines for submitting applications (at 23:59 EEST)	Degree Programme Committee meetings 2023-2024
Week 30	31.7.2023	21.-24.8.2023 (week 34)
Week 36	25.9.2023	9.-13.10.2023 (week 41)
Week 46	20.11.2023	11.-15.12.2023 (week 50)
Week 49	29.12.2023	January 2024
Week 7	19.2.2024	11.-15.3.2024 (week 11)
Week 17	29.4.2024	20.-24.5.2024 (week 21)
tba	27.5.2024	tba
Week 30	31.7.2024	19.-23.8.2024 (week 34)
Week 39	30.9.2024	21.-25.10.2024 (week 43)
Week 47	18.11.2024	16.-20.12.2024 (week 51)
tba	31.12.2024	2025

Where to find information

- › Start here
- › 1. Getting oriented
- › 2. Planning your thesis
 - › 2.1. Finding a supervisor
- › 3. Working on thesis
- › 4. Finalizing the thesis
- › 5. After submitting the th...
- › Questions and answers
- › For the supervisors

All relevant information is on the master's thesis page
<https://mycourses.aalto.fi/course/view.php?id=41665>

Make sure to
read the special
instructions for
IEM

Check the
deadlines!

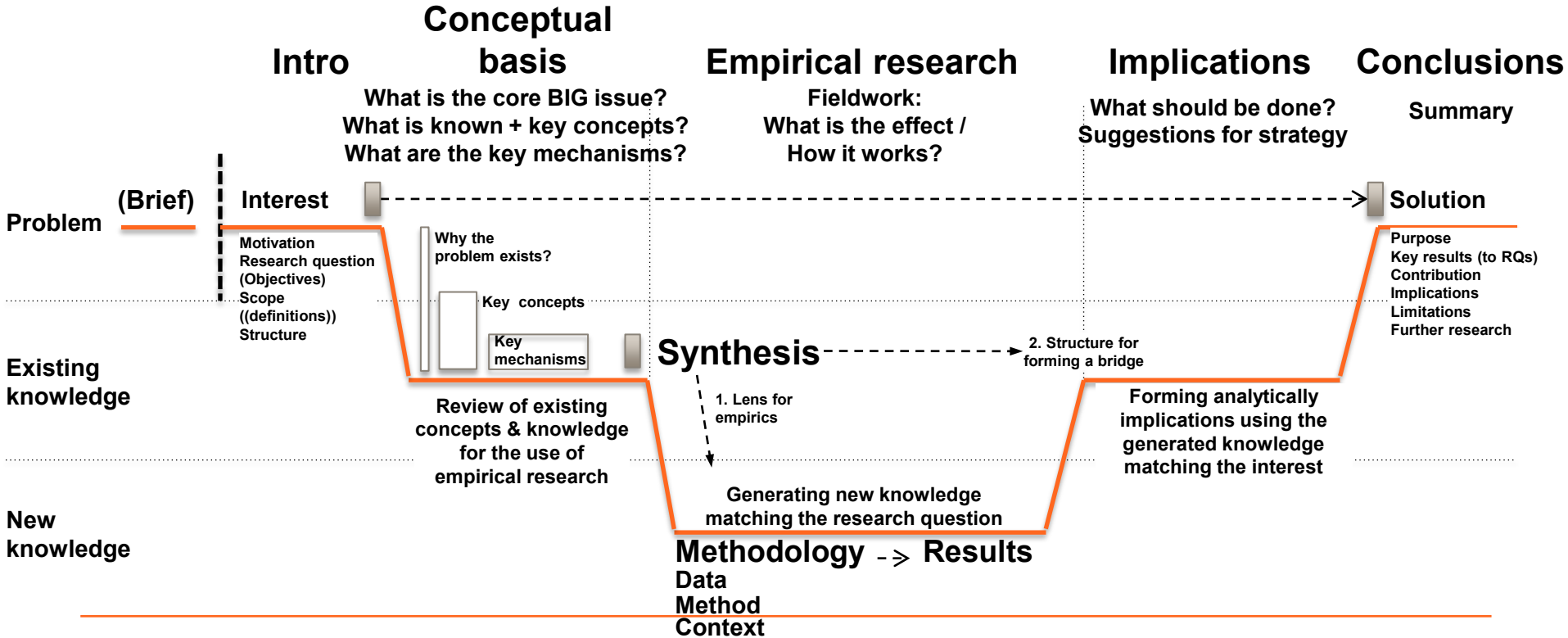
Writing a good thesis

The research process

- **Research question(s) and scope**
- **Read/understand Relevant literature**
 - Existing knowledge and concepts
- **Understand the empirical context (e.g., company)**
- **Study design**
 - Methods
 - Sampling and data collection
 - Data analysis
- **Draw conclusions and write the thesis document**
 - Report results of analysis
 - Clarify answers to the research question(s), identify implications
 - Limitations

This also gives
you a rough
structure for the
thesis

The generic thesis process



Best practice I

Plan the process but iterate

Formulate a focused research question and sketch the empirical study

- Get an overall view on the thesis in the beginning

Scope the thesis well and clearly

- Not too wide, not too narrow, but most importantly be clear about the scope

Think of research design before starting to collect data

- The impact and quality of your work is based on the accuracy of your data

Allow for iteration

- Incorporate learning as you go, adjust within the scope (if necessary)

Seek advise and feedback throughout the process!

Best practice II

Writing a coherent and impactful thesis

Grounding: Build a conceptual frame

- “Literature review” is more than a review of what others have done: it’s a systematic/insightful synthesis that acts as conceptual frame for your study

Coherence: Embed and link the results

- The results of your analysis don’t stand on their own: they must be embedded in your conceptual frame and linked to concrete implications

Impact: Derive concrete but valid and robust implications

- Make sure your results and implications answer your research question, but also show that they are valid and robust

Think of the “so what” question: Why are your results important?

Evaluation

Academic results

Academic evaluation has a single yard-stick:

Have you addressed a relevant issue and generated empirically justified and business-wise constructive understanding of the drivers of the issue?

- In an excellent thesis, each part serves this purpose, and none of the elements are there for any other reason than supporting your claim.**
- There is no other conflict with business interests than the insistence on robustness of thinking and long-term focus**

Evaluation

The grading is based on the delivered thesis

- Anything that is not in the thesis cannot be taken into account
- The thesis is a public document

The thesis is accepted and graded by the Program Committee

- The grading is based on the statement by the supervisor
- If grade is 1 or 5, an endorsement from another professor is required

Evaluation Criteria

Definition of research scope and goals

- *Clearly defined goals and scope // challenging and relevant engineering problems or research questions,*

Command of the topic

- *Demonstrates understanding of the relevant frameworks // command and understanding of the topic // appropriate, up-to-date scholarly literature*

Methods

- *appropriate methods, appropriately explained and justified // Applied in a logical way that fits the problem and research // The results are critically evaluated.*

Results and contribution

- *Results and justified conclusions // The goals of the thesis have been reached and discussed critically // The results have value and make original contribution*

Presentation and language and structure

- *Coherent, logical, readable, no errors*

Thesis process

- *Guidance has been sought // follows good and ethical practices // independence // not exceeding schedule*

Grades

Grade 1: The thesis fails to meet the evaluation criteria in multiple areas. Judged as a whole, it is nevertheless acceptable as a master's thesis.

Grade 2: The thesis meets the evaluation criteria in all or most of the six areas but also has some significant shortcomings.

Grade 3: The thesis meets the evaluation criteria in all six areas and has at most minor flaws. There are also areas that could have been improved.

Grade 4: The thesis meets the evaluation criteria in all six areas, has at most minor flaws, and is excellent in some aspects such as presenting important results.

Grade 5: The thesis fulfills the evaluation criteria in all six areas and is exceptional in some aspect. As a whole, the thesis is excellent.

Making an impact

Dissemination: For the company

- **Choose format and medium according to the audience**
 - The thesis document is unlikely to be the best way to report the key results for the firm
- **Presentations, summaries, discussions, shaping of practices etc.**
 - Arrange presentation session inside of company; deliver summary slide set
 - These are part of your project, but not part of your thesis
 - Presenting the results to one audience can help the presentation to another audience

Dissemination: For the public

Maturity test as a thesis summary

- The format is a summary of the thesis that is written as an essay in the format of an (executive) summary targeted at a defined audience

You are strongly encouraged to publish your essay (e.g. post on LinkedIn)

- Your supervisor should help you in formulating it to make an impact
- Inform IEM department communications people for promotion
- See <https://mycourses.aalto.fi/course/view.php?id=19277§ion=7> for detailed instructions

Published thesis summaries

How large corporations could unleash the potential of systematic startup engagement

- <https://www.linkedin.com/pulse/how-large-corporations-could-unleash-potential-startup-yrttimaa>

Building blocks of strategic decision-making – are you aware of strategic options that shape an organization’s strategy?

- <https://www.linkedin.com/pulse/building-blocks-strategic-decision-making-you-aware-options-mäki>

The Unbearable Irresponsibility of Being an Investor

- <https://eero-v-vartiainen.medium.com/the-unbearable-irresponsibility-of-being-an-investor-329e2543aado>

Make sure you are properly equipped to attract partners to your platform ecosystem - four key perspectives

- <https://www.linkedin.com/pulse/make-sure-you-properly-equipped-attract-partners-your-lappalainen/>

Published thesis summaries

Manufacturing SMEs to boost international growth through digital online strategy for B2B internationalization

- <https://www.linkedin.com/pulse/manufacturing-smes-boost-international-growth-through-juhana-harmanen>

Proven results maximize online advertising platforms' revenue

- <https://www.linkedin.com/pulse/proven-results-maximize-online-advertising-platforms-revenue-holkeri>

In designing market entry, managers should focus on finding matches between sources of competitive advantage and target segment characteristics

- <https://www.linkedin.com/pulse/designing-market-entry-managers-should-focus-finding-tatu-suontausta>

A unique organizational model for globally distributed network organizations and effectiveness of the organization's collaboration practices

- https://issuu.com/aaltodesignfactory/docs/dfgn_issuu (page 115-118)

Questions?