

Master Thesis Guide

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Writing and completing your master thesis

Writing your master thesis is one of the greatest challenges you will confront during your studies. The prospects of facing 5 months of thesis writing may incite anxiousness and stress in you. But it is also an opportunity to learn, and to demonstrate that you master the tools of your trade: That you can complete a research project on time and with a satisfying result.

What sets the academic apart from other professions are the abilities to reason critically, apply theoretical know-ledge, and investigate complex problems with a toolkit of advanced methods. Your master thesis is the capstone project where you demonstrate that you master academic skills. You show that you can identify a critical problem, investigate that problem, and come up with novel insights and creative solutions.

But the master thesis is also a learning process where you get to refine the skills you have accumulated during your studies. Many students struggle with the process of writing a thesis. Writing a master thesis often takes longer than it should. It is common that thesis writers get stuck in the process - and some even drop out of before they are able to complete their thesis.

The purpose of this thesis guide is to give you some good and practical advice on how to start, write, and complete your thesis. Thesis work is a great learning experience, and when you learn how to overcome the minor obstacles you are likely to confront before and during thesis writing, you are in for a lifetime experience that you will treasure for many years ahead.



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WHY IS IT SO HARD?

The challenges of writing and completing a master thesis project

Few students have ever tried their hand at writing a master thesis – or even something remotely similar to that. The requirements for completing a thesis are much more extensive than writing exams, term papers, and seminars. While these prepare you for thesis work, writing a thesis is very different. In the master thesis project, you demonstrate your ability to use what you have learned from your education in an independent project. This project is also substantially larger than the projects you have done in previous academic work.

A thesis is an independent project where you are expected to be self-directed. You cannot expect that your academic advisor will give you assignments to complete, plan the project for you or give you a neat cookbook solution that you can just follow. You are on your own now, and you are writing a thesis that is longer than anything that you have ever written.

All these characteristics of writing a master thesis can sometimes intimidate students. Nevertheless, it can also be a very rewarding process and a well-executed thesis will give you almost infinite satisfaction. You get to define what is interesting to study and learn about. You get to decide how to pursue the project. In addition, you reap the rewards of learning. The intention of this small guide is to help you gain control over the process and help you reduce anxiety and stress over the challenges that lie ahead.

Making your commitment

The first thing you need to do is to make a realistic assessment of your commitment to the project. Some students underestimate the amount of resources they need

to devote to the project in order to be done in time. Extracurricular activities like work, sports, cultural activities as well as friends and other social obligations take time away from writing. A similarly large number of students overestimate their own ability to deal with such resource constraints.

If your goals regarding completion of the thesis are unrealistic, you may experience stress. A significant source of stress is that students sometimes fail to make tradeoffs between their other activities and thesis work. Before you embark on the project, you should therefore take a hard look at what you spend your time on and make a commitment to scheduling your extracurricular activities to fit the requirements of the thesis work – not the other way around.

In practical terms:

- Make a commitment to a daily schedule that includes a significant time of thesis work, for example:
- Allocate time for daily reading or writing where you shut down the phone, do not answer e-mails, do not keep company.
- Schedule thesis work when you are most productive and other activities when you need a break.
- Go away from home to work – e.g. the university library.
- Set realistic goals for each day – e.g. “I have to write one page” or “I have to read 3 chapters”.
- Do not be too hard on yourself if you think that the one page you actually produced during the day does

not meet your quality standards. It is better to write one bad page than no page. In addition, you can always revise it later.

If your employer or friends question your choices, explain to them that your thesis is important to you. If you spend 8 hours per day 5 days per week working on your thesis, you will still have time to go to the cinema or sit at the cash register in the local supermarket. When you get a real job – would you leave your desk to go to the cinema on a sudden impulse? Well – probably not!

If you do not have your priorities straight from the beginning – your schedule is suddenly negotiable. Moreover, your project deadline will start to move into the distant future day by day. With that comes stress and dissatisfaction with your own lack of progress.

So make a firm commitment to writing your thesis, and remember that future employers will not only value your academic skills but also your ability to get things done.

In real life, your boss does not have the well-developed patience of an academic. An American professor, who was also a layman preacher, visited my department while I was writing my Ph.D. He told me that there are only two kinds of theses: Those that are done – and those that are not done. Consider that!

On a final note – also take breaks and leisure time. However, use them as rewards for thesis work – not as substitutes.



PREPARING FOR THE THESIS

Finding a good topic to write about and making the topic researchable

The process of writing a master thesis begins with a research topic. This assertion should not come as a surprise even to a writer who has little experience in crafting research papers. A topic is more than a title but is not a research problem or research question. Your goal as an academic writer is to develop your topic into a clear, concise and well motivated statement about your research question.

While your choice of topic is the basis of your thesis, a topic is not particularly informative regarding the research problem you want to focus on - but developing your topic is an important first step towards identifying a good research question. The process of developing your topic helps you motivate your research, and is a crucial step towards deciding your research question and research design.

You communicate your motivation, your research question, and your research design in your problem statement. What does this mean? Simply put - you need a relevant question to answer that you can answer using relevant theory, relevant methods, and relevant data. The key word here is relevance.

What does relevance mean? According to The Oxford English Dictionary, the word relevant means, "Bearing upon, connected with, pertinent to, the matter in hand." This dictionary definition is probably not easy to digest and interpret in thesis terms, but it indicates that you need a subject matter "to bear upon".

You may derive your subject from a company that wants you to do a project for them, or alternatively, develop your project independently. Regardless of the origin of your project, it is unlikely to be more than a topic at this stage. You need to work on transforming your project into something that is researchable and doable - and will end with a satisfactory outcome.

Many will write master theses that are oriented towards a practical problem, and

you have to get a good idea of why that practical problem exists in the case you are investigating. This means that you need some sort of theory or model to help you interpret your observations of reality. Similarly, you also need to get an idea of how to analyze that particular problem. This means that you need some sort of theory or model to help you analyze your future observations of reality. You should also have at least a vague idea of what you will end up concluding from your analysis, which typically includes for example policy implications or suggestions for implementation. Again, you will need some theory or

In practical terms, at this stage you should produce a 2-3 page document outlining the problem, explaining why the problem is relevant, and how you will analyze the problem. This document is a research proposal that will help you narrow the topic down to something actionable and sensible. You may have to rewrite this proposal several times before you and your academic advisor are satisfied with it. Nevertheless, do not despair. If you have a good proposal, the activities that lie ahead will be easier to plan and execute because the proposal will be a good roadmap for your project.

Finding a topic ...

Many students find it challenging to identify a topic that is worthwhile. So how do you find a worthwhile topic?

The topic is *important to someone*, and your framing of the problem and your analysis aims to *improve outcomes* that some care about.

There is something *we do not fully understand*, that is, if we learn more about certain things, we are able to improve on existing conditions.

Reflect on whether and how it is *possible to change the existing conditions* so it is likely and possible to change outcomes.

model to help you define the playing field. While the details of writing a theoretical thesis differ from writing a practical thesis, the format is roughly similar. You need to define a subject matter, identify the key problem(s) in that subject matter, and identify the relevant theory (-ies) and the key premises of that theory (-ies). You need to state the key propositions derived from the theory you use, and to propose a way forward. The way forward may be a review that states the state-of-the-art of a field and derives implications for further research. An alternative can be to provide a synthesis of two or more theories. Other possibilities exist. If you consider a theoretical thesis, you should probably discuss the options with a potential advisor before you make the final commitment.

You should acknowledge up front that there is limited time to accomplish the project. When you register for the project, you have 5 months to complete it, although exemptions are possible to obtain. This is explained in the course description for the master thesis, which is available on the faculty web pages. At the end of this guide, you will find a list of useful links where this is included. In practical terms, the timing restrictions mean that you should have a good idea of what the theory you need to master, the methods you need to master, and which data you need to complete your analysis as well as how to get these.

DEVELOPING YOUR PROPOSAL

What do you want to contribute?

Masters theses in Strategy & Organization can be either theoretical or practical. Theoretical theses usually contain no empirical analysis but analyze a theoretical problem in some way. In contrast, practical theses contribute by providing an empirical analysis of some phenomenon.

There is no requirement that you chose one or the other. Nevertheless, all (good) Strategy and Organization theses are anchored in sound theory. This means that you should have a well-defined theoretical foundation for the thesis work that can help you frame the problem, select the research methods that are appropriate for the research question, and develop a good research strategy.

Academic writing is different from merely writing a letter, an email or even a longer text. The purpose of academic writing is to engage your desired audience and convince them that what you argue and conclude is valid and important.

This means that academic writing is centered on identifying important problems, explaining why these are important, explaining how we should understand and analyze these problems, and, of course, providing an analysis of that problem that leads to new and important insights.

Therefore, if academic writing can be summarized in one word that word is justification. You have to justify the problem you attack in your work. You have to justify your choices of theory, methods, and data collection. You have to justify your conclusions and recommendations. In the Strategy & Organization thesis, theory will be your anchor in achieving justification. Just remember that.

So what do you need to do to write a good proposal? Regardless of whether your analysis is theoretical or empirical, there are some things you need to do:

Observe: What are the symptoms of an undesirable state? The firm might be losing

A practical example...

A medium-sized manufacturing firm decided to overhaul and upgrade its enterprise resource planning system (ERP system) to a modern state-of-the-art system. The provider of the system promised potential productivity gains because the system made better use of the firm's transaction data, enabling better production planning, forecasting, financial control. The firm spent considerable financial resources and man-hours on implementing the system. The total implementation costs were about 7 million DKK.

The implementation process was a text-book example of what to do to achieve successful implementation: They did all the right things in the implementation process. The firm included users in specification and implementation decisions and they spent resources on training users. Yet despite doing everything right, the promised gains failed to materialize. In fact productivity went down compared to the days where the firm used its old system. One example of this problem was that the firm got behind its production schedule. When the summer vacation was nearing, the firm had accumulated a considerable production backlog due to delays. To solve these delays, the firm had to schedule after-hours production which increased production costs because they had to pay overtime wages.

If this is a potential topic, what is it? We can perhaps state the topic as "how does a firm realize the productivity benefits of implementing a new ERP system?" Is the topic important? Well, yes! The firm fails to achieve its desired goals and experiences lowered productivity in spite of expectations to the contrary.

Is there something we do not understand? Well, yes! If the firm understood why gets behind on its production schedule, it would probably fix it. And if we learn about why the delays happen, we can maybe help fix it and the firm can obtain the desired benefits of its ERP system investment.

Is it possible to improve on existing conditions? Well, the example does not tell us much about that. So what is missing? First, we need some kind of understanding why things are not working. We need facts about what is going wrong, and we need a theory that will help us find and interpret these facts.

market share or is underperforming in its key markets.

Engage: Why is it important to solve these problems? For example, what are the consequences of declining market shares? If market share increases, will performance increase?

Interpret: Theories are mostly about the real world - but they are abstract representations of the real world. So you need

to make observations about the real world and compare these observations to theory. What do the facts tell us about the key problems we are interested in when we use different theoretical lenses? In other words, what are the real problems? Is declining market share a result of poor channel management, lack of brand identity, high production costs or...?

Justify. You need to compare competing explanations for the phenomenon you ob-



serve. Which theoretical lens provides the best representation of the problem? Which explanation seems more credible? Why?

Finding a research question

In the example above, the management team was interviewed and the researchers went on a tour of the factory to observe production and talk to workers and supervisors. The result of this initial observation phase was that researchers learned about what went wrong.

One frequent problem was that the ERP system would automatically intervene in the production schedule if, for example, there were insufficient stocks of raw materials in the warehouse. But since the ERP system would also order new raw materials based on forecasted demand, such problems were not supposed to occur. It nevertheless turned out that supplies would often arrive late in the afternoon the day before they were needed, and the logistics assistant would leave the delivery note in the inbox for later processing. So even if the raw materials were in fact available in the warehouse, the data were not in the ERP system which would consequently

stop the planned production batch. The researchers also noted that failure of one department to notify other departments of changes would cause disruptions in the production schedule. For example the sales department did not communicate its sales forecasts clearly to the other functions in the firm (this primarily appeared to affect production planning).

Based on the initial observations and interviews, researchers reflected on the root causes of the firm's productivity problem. Upon this reflection, the researchers decided that the root cause of the productivity problem was coordination failure. The researchers consequently focused attention on theories of coordination and knowledge sharing to frame the problem, outline the scope of their analysis, and possible interventions in the firm.

Their research question was relatively straightforward. They used their initial observations in the firm and interpreted these observations using theories of coordination to identify the key research question:

"Can the firm improve its productivity by changing the way it coordinates production among the different functions in the firm?"

To justify their framing, the researchers further explained why they believed that their observations indicated that coordination failure was the root cause of the problem, and further explained what kinds of benefits better coordination would entail.

An iterative process

Finding a good research question is an iterative process where you need to develop your understanding of the research context. During this process, you test alternative frames for the problem, alternating between observation and reflection, until you settle on a feasible and well motivated research question.



STRUCTURING A THESIS

What a thesis should contain

Academic writing is a form of purposeful communication that is part of a particular genre. Like any genre of writing, the audience of your academic writing have certain expectations regarding the contents and style of writing you present. You should meet these expectations.

While there are many opinions about how to compose a thesis, there is probably no consensus regarding one particular approach. Despite this, I offer the suggestion that a master thesis will normally have a good structure when it includes a number of generic parts:

- A summary
- An introduction
- A literature review
- An analysis
- A discussion of the analytical results and implications of these
- A discussion of limitations and perspectives
- A full reference list

You can choose to deviate from the suggested template if you wish. Regardless of the approach you chose, your mastery of the subject is the object of evaluation, your ability to demonstrate it is.

The introduction

The introduction will be the first impression the reader gets of your work. You therefore need to pay special attention to this part of the thesis. When your writing is poor, people will get a negative impression of your work. Therefore, you need to pay attention to seemingly mundane things like spelling, grammar, and organization as well as whether it is engaging and concise.

Your introduction helps the reader understand what to expect. In the introduction, you can communicate the essence of your topic, why it is important, and how you plan to proceed with your analysis.

The introduction should contain a statement of your main argument. Ideally, the reader will get a sense of the kinds of infor-

Developing your research question ...

Nordic Widget International faces increasing competition in its main line of business, the manufacturing, distribution, and sale of widgets worldwide. In the global market for widgets, some competitors have introduced new and better performing widgets and others have found better ways to manufacture widgets resulting in improved price performance of low cost widgets. Nordic Widget International has been slow to recognize the importance of these events, and has failed to adapt its strategies. Consequently, over the last few years, the financial performance of Nordic Widget International has deteriorated rapidly.

The purpose of this thesis is to provide an analysis of Nordic Widget International that diagnoses the situation the firm faces in its key market, and offers recommendations of how Nordic Widget International should address the key challenges it faces in the global market for widgets.

The performance of a firm depends on its ability to align its internal strengths and weaknesses with the opportunities and threats it faces in its environment and in particular its industry (Porter 1980). Therefore, a diagnosis of the key problems that Nordic Widget International faces in its main market depends on understanding the structure of the global widget industry and the alignment of the internal resources of Nordic Widget International with the industry structure.

mation you will use to make that argument. The reader should have a clear understanding of the purpose and contents of the thesis after reading your introduction.

Try reading the three paragraphs in the text box. Then think for a moment about what they are trying to communicate.

Have you thought about what the three paragraphs above are trying to communicate?

OK - here is what these are intended to communicate:

The first paragraph tries to establish that there is a problem for Nordic Widget International, and that this problem is due to poor adaptation of its strategies.

The second paragraph spells out the purpose of the thesis in terms of the analysis the thesis offers the reader and in terms of providing an expectation of some kind of remedy to Nordic Widget International's

situation.

The third paragraph states the key theoretical assumption the thesis is based on. These three paragraphs are part of a justification exercise that identifies the key problem and offers a perspective on its diagnosis and solution. While the three paragraphs are very brief, they illustrate the essence of a thesis introduction:

- Establish a problem (increased competition, failure to adapt, poor financial performance).
- Explain the purpose of addressing the problem (identifying how to adapt).
- Explain why it is a problem (a theoretical lens).
- Explain how a solution will result in benefits relative to status quo (performance will increase).

These four elements will not be sufficient for a good introduction. In the introduction you also need to address the choice of theory (including alternative theoretical

lenses), the choice of methods, and discuss why your chosen theories and methods are appropriate for solving the problems you have identified. Regarding the example above, a more contemporary perspective on strategy may be an alternative to Porter's framework or the resource-based view of strategy could be a better way of proceeding. Such discussions as well as a discussion of methodology are appropriate in an introduction chapter.

The literature review

A thesis may include a literature review. The purpose of the literature review is to establish the current positions within a theoretical field, and to position your own work relative to these positions. For the master thesis, you should:

- Explain and summarize the position of (relevant) theoretical fields and state your position relative to this field
- Explain and discuss why you have chosen a particular position
- Identify the most relevant sources within the field you refer to
- Explain the key contribution of each source
- Summarize the key developments in the field
- Discuss the relevance of the theory to the question(s) you investigate

In the example in the section above, the author could explain different approaches to competitive strategy, including among others the resource-based view, Porter's view, and the dynamic capabilities view. The choice of the Porter view should be justified by arguments beyond "...because it is used in practice" or similar platitudes. The discussion should also include an evaluation of strengths and weaknesses of the different theoretical approaches that are used. The example draws on Porter's view. However, the source is old. Porter published the first version of his model as a teaching note in 1976 or so – more than 30 years ago. Has something perhaps changed in the study of industry structure since then? Your literature review should reflect the most recent developments in the field(s) you draw upon.

A literature review can easily take control of the author. So remember that you should not cover all the literature in the field. You should include the most important contributions in the review and make sure that the review is current. Obtaining a recent literature review from a journal or a book will be useful for you.

The outcome of the literature review should be a clear statement of the theoretical basis of the field or fields that you are working within and a similarly clear statement of the cumulative knowledge about a phenomenon, theoretically and empirically. A literature review should also state the

implications for your work, i.e. how you will carry out your analysis.

Technology will help you to craft a good literature review. First, you should familiarize yourself with the different databases available through the university library. Web of Science should be of particular interest to you. This database will allow you to search for relevant literature that have appeared in peer reviewed scientific journals as well as help you gauge the importance of individual contributions. Important contributions to the field receive more citations than less important contributions, and you can track the citation trail of different contributions that will generally give you a good idea of the scope of the field.

The analysis

The meat of your thesis lies in the analysis. There are no precise guides on how to write this as it will depend on the focus on your thesis. Nevertheless, the analysis should contain some generic parts.

A methods section. The purpose of the methods section is to describe how you will analyze the problem you have defined in the introduction. In the methods section you have to demonstrate that you can relate the problem to a relevant method, i.e. a method that will allow you to produce an answer for the problem you have stated. The methods section will also reflect on the data you need to complete the analyses, and on the limitations of your chosen analyses to provide that answer. No single method is likely to provide more than a partial answer, and you have to reflect on the implications thereof. The methods section should address the choice of method on a more detailed level than e.g. distinguishing quantitative and qualitative methods and justifying one of these as appropriate. You should be familiar with the methods you will be using before you embark on the thesis project. You do not have the time to get whimsical about your methodological choices. Designing a good empirical study is not possible as an afterthought. In essence: You cannot pick up on method as you go along.

A data section. The purpose of this section is to describe the data you use, how you got it, and how reliable the data are. The data discussion should also address whether the data you gather can bring you closer to fulfilling research goals and whether the data have any limitations vis-à-vis the methods you use. For example, some statistical methods require that the data live up to certain distributional assumptions while others are more robust. What is the consequence if your data does not live up to the underlying statistical assumptions? You need to discuss that. In terms of completing the thesis, please be aware that data collection can take a long time. Therefore, the better prepared you are, the better use

of project time you will make.

An analysis section. The purpose of this section is to provide the analysis using the methods and data you have discussed in the previous sections. Here you must demonstrate that you know how to analyze data with an appropriate method. This is partly a matter of acquiring the necessary technical skill. It is also a matter of devoting attention to presentation.

Sometimes data analysis can involve substantial amounts of data from many different sources. This means that your task is to condense the information contained in your data in a sensible way. For example, statistical measures such as the mean and standard deviation carry some information about a sample of observations on a variable that provide essential information in a condensed way. A typical advertisement (e.g. a magazine ad) may provide essential information about the brand identity so you do not have to display all the available ads to present a credible interpretation of the brand identity. This way you can present one ad to represent your condensed analysis of all the ads. The message is that you should present necessary and sufficient information to make a convincing case – but you should not overdo it.

Besides condensation of the available information, you should also pay attention to presentation. Presentation often makes the difference between good and excellent. This is no different from the presentation making the difference between "haute cuisine" and cooking. Tables and figures should be as simple as possible – both graphically and in terms of content. Very large and/or complex figures and tables can be difficult to understand. So make sure that you use these wisely and with some prudence.

You also have to deal with conflicting results. If you perform a quantitative survey of widget customers satisfaction that show that Nordic Widget Internationals customers are very dissatisfied, but have interview data obtained from the head of widget marketing in the company who states that their in-house surveys show that customers' are very happy about things, one of the analyses will be wrong. Clearly, you have to reflect on this. (Perhaps you should investigate whether one of the samples studied is biased.)

A concluding section. The purpose of analysis is to arrive at a conclusion. Your analyses and the presentation of the results should support your conclusions, and your conclusions should address the problems you have defined in the introduction. The conclusions should not go further than the analysis can support. If you for example compare financial performance among a group of widget makers, and conclude



that Nordic Widget International is a poor performer, this is just about the extent of what you can conclude. You cannot conclude about the reasons for such poor performance without supporting analyses. For example, if you view industry structure and the firm's position within the industry as a cause for performance differences (as in Porter's model), you need an analysis that relate performance differences to structure and position.

The concluding section should also point forward to the discussion of the results and their implications. This means that you should use the conclusions as essential components of the discussion to follow.

Discussion and implications

An analysis without a conclusion and a conclusion without implications is a no go. For example, if you conclude that Nordic Widget International's customers are dissatisfied with the widgets they can buy from the

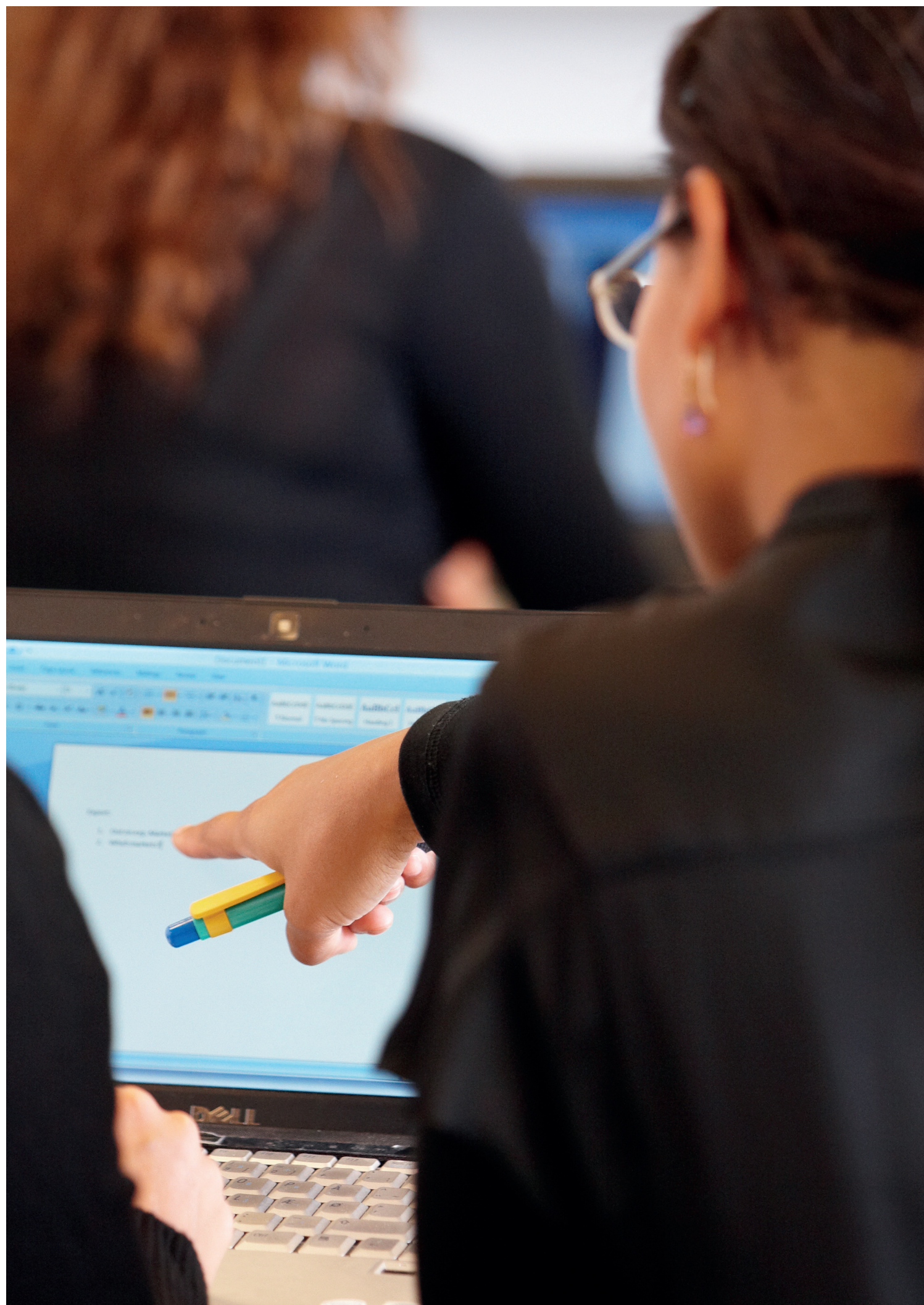
company, then you need to identify ways of dealing with this challenge. You might infer that that Nordic Widget International should increase its commitment to product innovation because or you could suggest that they lower the price of their widgets and compete on cost. These strategies are different responses, are consistent with Porter's model, and have different advantages and drawbacks. (Please take notice of the way the conclusion ties in with the choice of theory to analyze Nordic Widget International.) You should compare the alternatives and reflect on which one is most appropriate.

Limitations and perspectives

You may end up suggesting that Nordic Widget International should increase its commitment to product innovation. What does it take to implement that? Does Nordic Widget International have the resources? Does Nordic Widget International need to reorganize in order to become more in-

novative? Such questions are natural to address in this part of the master thesis. Some of the issues will not be things that you have considered in your analysis, will belong to another theoretical domain, and a proper analysis of the issue you raise in this section can be a master thesis project in itself. The purpose of this section is not to provide a detailed analysis of the issues that emerge as implications of your analysis but to indicate that you are aware of the limitations and perspectives of your analysis.

You might also want to reflect on your choice of theory and methods. Do your choices cause limitations in what you can address and conclude? If you used different methods and theories, what would be the consequences?



PLANNING FOR THESIS WORK

Managing your thesis project

This may be the first time you try thesis writing, indeed, for most you, the first time you embark on an academic project on this scale. You need to be organized throughout the project, and this entails careful planning, editing, and polishing of your analyses and recommendations.

Keeping track of references

You also need to keep track of your sources, that is, books, journal articles, websites, interviews, and so on. Keeping track of these as your thesis expands is difficult. Therefore, you should use some reference management software. A number of commercial packages are available (e.g. End-Notes and Reference Manager), but www.zotero.org provides a free, open source program called Zotero.

A reference management system can be used to organize your research sources such as books, articles, items found on the web, your own analyses, interviews that are stored electronically, and every other thing that could possibly be used in a master thesis. In practice this means that you can put the bibliographic information into your system. Furthermore, systems allow you to attach files to the bibliographic information, for example a PDF-version of a journal article, a word-file containing your own notes, an MP3-file with your oral comments on an article, or some other file. Moreover, you can enter references in your Word file (or OpenOffice file), and automatically build a complete reference list at the end of the document. Some systems include online collaboration functions that allow you to share bibliographies and other data online.

It takes about 10 minutes to install and about the same time to learn to use a reference management system, and, if you use it, you will find it much easier to manage your project as you can organize sources in folders that relate to for example chapters in your thesis.

Planning your work

Before you really start working, you should

establish a clear time frame for the project and develop a plan for its execution. Although there are many different and very elaborate techniques for managing a project, a basic approach to managing your project will be enough for you. In the following, I will provide a basic structure that will help you plan your project.

Develop an idea of the activities your project involves: You should try to identify the different activities that you need to complete in order to finish your project successfully. This is not the same as writing the table of contents. What you should do is state the basic activities that are necessary to ensure completion of the thesis. These can for example be:

1) Writing the research proposal. To plan this activity you should assess how much time you need for background reading of theory, material about the industry, material about the company, etc. and how long time you need for writing a concise research proposal of 2-3 pages. The goal of this activity is to produce a proposal that clearly motivates and states the problem you want to analyze and how you want to analyze it.

2) Theoretical framing. To plan this activity you should assess how much time you need for reading and reviewing the theory that you are going to use in your research. The key goal of this activity is to produce a literature review that motivates the relevance of the theory and theories you use and that relate this/them to the problem you attack.

3) Methodological framing. To plan this activity you should assess how much time you need for reading and reviewing the research methods you want to use. The key goal of this activity is to produce a review that motivates the relevance of the methods you use and that relate this/them to the problem you attack and to the theoretical frame you have established.

4) Developing the research instrument(s). To plan this activity you need to assess how

long time it takes to translate your theoretical framing and practical challenges into a practical plan for collecting data. Outputs could be a questionnaire or an interview guide. The goal of this activity is to produce a precise guide that you can use for collecting data (qualitative or quantitative).

5) Interviews/field trips. To plan this activity you need to assess how long time it takes to gather data in the field and then organize and document these in appropriate format (e.g. transcription of interviews). During this activity, you will be dependent on others. Interview subjects can have tight schedules, they may cancel with short notice, and therefore you may experience delays in your data collection. You may also have some loose ends that require you to go back into the field and gather more data. The activity is also interdependent with the analysis and synthesis activity, which can make both difficult to plan. The goal of this activity is to document and organize data in a form that allows for a structured analysis.

6) Analysis & Synthesis. To plan this activity, you need to assess the time it takes to analyze and synthesize the data into robust conclusions. This activity is interdependent with the data collection phase. Results may not seem robust, you may discover things that entail more data collection, and therefore this activity can be difficult to plan. The goal of this activity

7) Write-up. This activity refers to writing up the conclusions of the analysis and synthesis your project, and you need to assess how much time it takes to write a discussion of the results that includes things like a discussion of the analytical results and implications of these, and a discussion of limitations and perspectives

8) Feedback & Finalization. This activity refers to the point where you have a draft version of the final manuscript, and need to get feedback. You need to assess how much time your advisor needs to read it and how long time you need to revise the manuscript based on the comments you re-

Project Week	1	2*	3	4*	5	6*	7	8*	9	10*	15	...
Research Proposal	X											
Theoretical Framing	X	X	X	X					X	X	X	
Methodological Framing		X	X	X	X							
Developing the research instrument(s)			X	X	X	X						
Interviews / Field Trips					X	X	X			X		
Analysis & Synthesis							X	X	X	X		
Write-up										X	X	
Feedback & Finalization											X	X

* Meeting with advisor

ceive. The goal of this activity is to produce a thesis worth submitting.

How do you write a plan?

You do not have to produce an elaborate plan. Just write down the activities in a spreadsheet as shown in the table.

Identify dependencies

Try to identify where you are dependent on others, where activities are interdependent, whether the plan is too ambitious, and whether you have put enough slack into the plan to absorb delays due to unforeseen events. If you make the schedule too tight, you may put yourself in a situation where you have to revise too often, and where you lose motivation because you fail to live up to your own goals. Also try to evaluate points in time where you are most dependent on others and points in time where you may have too many concurrent activities. You should allocate more time to these points in time because these are where your plan starts to slide.

Making an explicit plan early in the thesis process may also help you to define a good and doable scope for the thesis. If your plan for example shows that you are depending on too many things going right, or there is too much simultaneous activity certain weeks in the schedule, these may be indications that your plan is too ambitious. Maybe you should narrow the project to make it doable?

Put in milestones and deliverables

Activities in your plan should also have a milestones and deliverables. A milestone is the main goal of the activity whereas

the deliverables are tangible evidence of meeting the activity's goal. For example, the milestone of an activity can be "Feedback & Finalization" and the deliverable is the finished thesis. It can also be a good idea to monitor the quality as well as the quantity of your progress by trying to assess the milestones and deliverables. Monitoring your progress will also give you an idea of whether you are in trouble in terms of meeting the time schedule or your own aspirations. You can add a simple task breakdown to your plan where you assess your overall progress and the quality of each of the deliverables in a given phase. The table below provides a simple example from the early stage of the project where the research proposal is broken down into a first draft and a second draft, and you assess both the overall progress in meeting the milestone as well as the quality of each deliverable. Please bear in mind that such a breakdown of the task structure can be more or less elaborate, and in some phases of your project, you may want to have more detail than in others.

When do you need support?

As part of your plan, you should put in meetings with your academic advisor when you need him/her the most. As the advisor's resources are limited, you take great care in when you seek his/her advice. You may also need the help of other people, for example when you need proofreading of the manuscript. You should also reflect this in the plan.

Breakdown of Tasks	
Milestone	Quality assessment/degree of goal achievement
Research proposal	Unacceptable/Acceptable/Good
Deliverables	Quality assessment/degree of goal achievement
First draft of the research proposal	Unacceptable/Acceptable/Good
Approved research proposal	Unacceptable/Acceptable/Good

STRUCTURING YOUR THESIS

Style, structure, and substance

A master thesis belongs to a special genre, just like romance or mystery novels.

Editing the thesis

While the object of evaluation at the exam is the substance of your thesis, the diligence that you have shown in preparing the manuscript will invariably affect its reception. Ideally, your goal should be to achieve proper academic writing style. The following paragraphs will help you identify what that is, and how you can achieve it. If you want a more elaborate guide, you can consult one of the books listed at the end.

Language and style

First and foremost, your writing style should be clear and concise, and your focus should be to communicate ideas comprehensibly. The clarity with which you communicate your ideas will make an impression on the reader, not the use of long, inappropriate words from your dictionary. While you should demonstrate variation in your vocabulary, it is imperative that you use the right words, and the most precise expression of the subject matter you are trying to communicate.

- Avoid the use of contractions (e.g. it's, he'll, don't, etc). Always use the full form (it is, he will, do not).
- Avoid the use of colloquialisms or slang.
- Try to avoid the use of so called "phrasal verbs" (these are a verb plus a preposition or adverb, which creates a meaning different from the original verb such as "ran into" or "showed up").
- Write in complete sentences.
- Paragraphs, sections, and chapters should be organized logically.
- Pay attention to corrects grammar and spelling.
- Avoid the use of passive tense - it becomes a dreary experience to read.
- Avoid repeating yourself - surprisingly often this occurs even within a single paragraph. So you should really avoid repeating yourself.

Structure

Apart from the little details of the grammar, spelling and clarity of your writing, you should also pay some attention to how you structure the thesis. You should organize the thesis logically in chapters, sections, and paragraphs. Each chapter should have a clearly stated purpose and a clear outcome. So consider adding the following opening phrase to your chapters: "The purpose of this chapter is to..." While this may appear to be a rigid exercise, its benefit is clear: You summarize the purpose of the chapter and give the reader as well as yourself a roadmap for navigating through the chapter. At the end of each chapter, you should address the outcome of the chapter. Just consider these related phrases, "This chapter looks at..." (meaning analyzes, reviews, explains, etc.), "This chapter concludes that...", "The implications of these findings are..." Each of these statements, when completed, will help the reader understand, appreciate, and digest the contents of a chapter.

My main message here is that you should force yourself to summarize the purpose and outcome of each chapter so you understand your own work better and help readers understand it as well. If you are worried that your format becomes too repetitive and tedious, you can always revise the statements and add more poetry to them.

Length

One of the questions that I often get is how long a master thesis should be. As in many academic matters, there is no definitive answer. A single authored thesis will typically be about 70-80 pages and a thesis with two authors will be about 110 pages. There is no or weak correlation between length and grade. What matters is the skill you demonstrate in the thesis. A well-written thesis can be short or long, the numbers of pages have secondary importance.

Using references in the text

Using references to prior academic work and to sources is the hallmark of academic

work.

It is important that you take care in referring where this is appropriate, and here "appropriate" means that you use prior work actively in the text to acknowledge the intellectual debt towards your peers and show the reader where to find the information that you use. Failure to provide proper references and plagiarism in general are considered a serious academic offense and can result in relegation (which means you will be kicked out of the program and not graduate). The University of Southern Denmark subscribes to "SafeAssign" which is an effective anti-plagiarism program that will easily identify if you have plagiarized a source. If you are in doubt about what constitutes improper use of sources and plagiarism, even after reading this guide, you should ask your academic advisor.

There are different ways of referring to other works in the text. The first example below is indirect. Here the author says that Armstrong's definition of strategic planning is used, and summarizes the essence of that definition.

Strategic planning can be viewed as a process whereby the firm obtains and evaluates information about its competitive environment, its resources and capabilities, and other factors that are relevant to its strategic decision-making (Armstrong, 1982). Another possibility is to quote directly from a source. When you provide a quotation from a source, you must provide the exact page number(s) as well. The second example below shows this.

"If production requires the integration of many people's specialist knowledge, the key to efficiency is to achieve effective integration while minimizing knowledge transfer through cross-learning by organizational members (Grant, 1996, p. 114)."

Another alternative is to state a quote in the text, for example:

Making the reference list

When you write your thesis, you have to supply a complete reference list at the end of the manuscript. Do not provide references in footnotes or endnotes. There are different reference styles out there that are equally valid. Make sure that you use the same way of listing references throughout the reference list. If you use reference management software, you can easily switch between different formats for referencing, and there are many to choose among. Below, you find a possible way of making references.

Reference to a book

Nunnally JC, Bernstein IH. 1994. Psychometric theory, 3rd edition. New York: McGraw-Hill.

Reference to a book chapter in an edited volume

Duncan R. 1976. The Ambidextrous Organization: Designing Dual Structures for Innovation. In Kilman R, Pondy L (eds.). The Management of Organizational Design, 167-188. New York: North Holland.

Reference to a chapter in an annual volume

Hambrick DC. 1994. Top management groups: A conceptual integration and reconsideration of the team label. In Staw BM, Cummings LL (Eds.). Research in organizational behavior 16: 171-214. Greenwich, CT: JAI.

Reference to a journal article

Lubatkin, MH, Simsek Z, Ling Y, Veiga JF. 2006. Ambidexterity and Performance in Small to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration. Journal of Management 32(5): 646 - 672.

Reference to a working paper or unpublished manuscript

Knudsen T, Christensen M. 2007. The Human Version of Moore-Shannon's Theorem: The Design of Reliable Economic Systems. Available at SSRN: <http://ssrn.com/abstract=996311>.

Reference to a web page

Mejeriforeningen. 2007. World's top 20 dairy companies. www.mejeriforeningen.dk.

According to Grant (1996, p. 114), "If production requires the integration of many people's specialist knowledge, the key to efficiency is to achieve effective integration while minimizing knowledge transfer through cross-learning by organizational members."

If you cite several books journals, or other sources, you can cite like this (Rommer, 2009; Barnes, 2008; Taleb, 2007).

When you use references, you should do so because it is relevant. Not because you want to impress the reader with the lar-

ge number of articles, you have read (or perhaps not read, sic). Only refer to works that you actually use in your analysis. Name-dropping is not encouraged. Provide references in the body of the text. Under no circumstances should you use footnotes or endnotes to show references. Some academic journals still do it, but it is annoying to read.

You can use a reference management system to generate an automatic reference list in your word processor. The advantage for you is that your reference list is always updates. In other words, you do not need

to run through your pile of Post-It notes or illegible scribbles on the back of envelopes.

Using a program such as Zotero also makes it more likely that you have a complete reference list. It is a requirement that your reference list is complete, and failure to supply a complete reference list may influence the evaluation of your thesis negatively. (That is, you get a lower grade, and, in severe cases where you are trying to pass off others' research for your own, you may be relegated by the university president.)

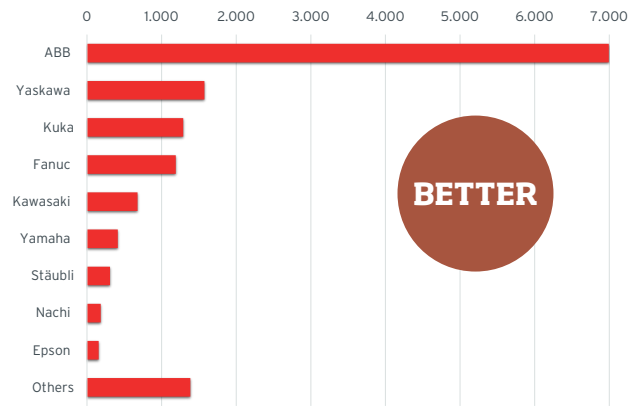
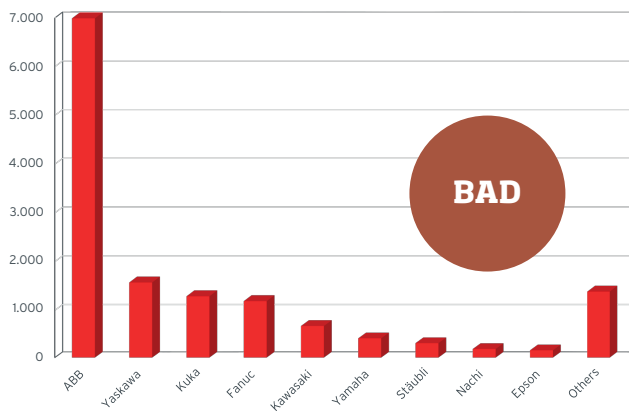


Figure 1. The distribution of sales among manufacturers of industrial robots (2015).

Source: ABI Research (2017)

Presenting numbers

Many of you will use different types of numbers in your analyses. It is important that you take care in presenting information readers to avoid misunderstanding of your message. The bar graph at the top left is difficult to read because of the use of 3-D effects and fancy shading. The use of 3-D makes it more difficult to distinguish observations that are close to one another. Even worse, there is no source provided for the data, the chart does not have a title, and the measurement units are not stated.

The second bar graph without the fancy effects is easier to read. The bars have been rotated 90 degrees to get the category names in a horizontal position. It does not use 3-D imaging, and provides a source for the data. As an extra feature, the graph has been numbered and given a title. Most word processors offer the opportunity to compile such information in a list of figures in connection with the table of contents.

ts. Despite the figure being easier to read, you should note that you still have trouble in distinguishing observations of similar size and assessing the magnitude of each observation. Maybe you should consider using a table instead.

Most of your readers will be numerate, and have no difficulty in digesting numbers, and will find a table appropriate. In fact, a table with usually be a better choice than a graph when you want to present complicated details with little space to spare.

You can present more information in one single table that will otherwise require several graphs to achieve. This gives a table a clear advantage over a graph. If you look at the table below here, that table not only shows the level of sales in million US\$ for each firm but also the percentage distribution. The first of these numbers tell us about the absolute magnitude of the observations while the second number tells us something about the relative size of each

firm in the global robotics industry. The table provides the reader with more information but does not strain his/her cognitive ability extraordinarily. In this case, the use of a table instead of a graph allows you to communicate your findings with greater clarity and impact. This may not always be the case - sometimes a graphical representation will allow you to reduce complexity and communicate better than a table.

Use the data actively

When you present numbers, regardless of whether you are using graphs or tables, the golden rule is to use the information actively. You must comment and discuss every figure, table and graph you present be commented and discussed in the body of the text, and the contents of these should have some bearing on what you are trying to analyze. Consider removing the graphs or tables you do not use.

Table 1. Distribution of sales and market shares in the global robotics industry 2015

Firm	Sales (million US\$)	Market share (percent)
ABB Robotics	6.993	49,3%
Yaskawa Electric Corporation	1.573	11,1%
Kuka Robotics Corporation	1.290	9,1%
Fanuc Corporation	1.190	8,4%
Kawasaki Precision Machinery Company	678	4,8%
Yamaha Robotics	413	2,9%
Stäubli International AG	309	2,2%
Nachi Fujikoshi Corporation	184	1,3%
Epson Robots	156	1,1%
Others	1.386	9,8%
Total	14.172	100,0%

Source: ABI Research 2017



Presenting qualitative evidence

Many of you will perform interviews and make other forms of data collection that does not result in data that are as easy to manipulate as numerical observations. This presents a challenge for you in terms of presenting because you on the one hand need to analyze data, and on the other hand need to summarize the data to provide empirical evidence for your conclusions. In order for your conclusions to appear valid, you need to present and summarize your observations in a succinct form.

Summarizing from interviews

There are several options for summarizing interview data. One is to use quotes to exemplify.

Consider this example:

The director of marketing at Nordic Widget International tells that, "...we have conducted careful studies of customer satisfaction among our customers. Our sales people regularly provide us with reports of their experiences with customers that indicate that our customers are indeed very satisfied with our products and the service we offer." This quote shows that Nordic Widget International relies on reports from their sales people to indicate customer satisfaction. Their procedure results in biased reports that will tend to overstate customer satisfaction, and therefore the procedure is flawed. There is theoretical support for this conclusion in ... [indicate relevant theory, compare to others' findings].

Another example is to summarize from different interviews as done in the table below here. In this case, you extract the essence of what you have observed from the interviews to provide evidence for a conclusion similar to the one in the example above. This way of presenting information also contrasts different sources, in this case from three interviews. It is good form to try to get evidence from more than one source in order to strengthen the inference made from each. The conclusion in this case would be similar to the previous case, but backed up by an interpretation of the evidence that considers all three sources in conjunction.

Using narratives

Another way to present qualitative data is to provide a narrative. This is a short story or summary of the object of your interest. For example, you can describe the process that Nordic Widget International employs for assessing customer satisfaction. A narrative differs from quotes and extraction by being a self-contained text

Summarizing interview data

Interviewee	Key indicator
Director of Marketing	Reports that all customer satisfaction data are reported by sales people
Key account manager	Reports that it is hard to find time to talk systematically to customers, and that he often relies on his own impression when he reports to his immediate boss.
Head of market research	States that the reports obtained from sales people are verbal, and that reports tend to be very positive.

that used for presenting an integrated picture of the object of interest. If you use the narrative form, you can also use e.g. quotes within the text.

Validating evidence-based conclusions

A main concern for business research - as any other form of research is the validity of the findings. Regardless of the methodology and theoretical point of departure, when you are deriving conclusions from empirical analysis, you need to demonstrate that your conclusions are valid. Validity is an important subject in the philosophy of science and in scientific methodology. You can find treatments of the pertinent issues concerning validity in most books on research methods for business or social science.

At the end of the guide, there are references to a few books on method. This guide only offers a cursory treatment of validity issues and you are strongly encouraged to consult a methods book when you design your research project.

Methodological concepts

In the literature on scientific methods, there are several methodological concepts you should familiarize yourself with. These are reliability, replication, and different forms of validity. Below is a brief introduction to some of the important concepts based on the treatment given in Bryman and Bell's (2003) book. There is a precise reference to the book below.

Reliability

Reliability of your research instrument is concerned with the issue of whether you can repeat the measurements you obtain can with similar results. For example, will the same respondent provide a different answer for the same question at two different times if the basic condition of the research context has not changed? If you ask a respondent to rate her job satisfaction on two consecutive occasions and get different results, and nothing in her job situation has changed, the measure may be unreliable. On the other hand, the changes in response may be due to something you do not observe, which relates to the validity of your research design. The respondent may experience personal distress on one of the occasions that lead her to express lower job satisfaction, and failure to control for the extent of personal distress of the respondents may pose a serious threat to the validity of the subsequent analysis. The question of reliability is a prominent issue in quantitative research in experimental settings and in survey research.

The best practical way to deal with reliability issues is to use established research instruments and designs that have shown high reliability and validity in past research. For example, you should try to find appropriate measurement scales in the literature instead of devising your own scales.

Replication

The ability to replicate your findings with the same research instrument is a similar concern. You have to provide a description of the research instrument and method you have used to obtain observations and it has to be possible to repeat the procedure, and in principle, obtain similar results. If not, the conclusions you can draw are less valid. This also applies to qualitative studies where you should follow a well-established procedure for obtaining, coding, and analyzing data. The quality of your reporting the findings also affects whether it is possible for others to replicate your study.

Validity

Scientific validity is a central concern for both the philosophy of science and for the design of a research project. You should make an effort to familiarize yourself with the different validity concepts. Measurement or construct validity refers to whether you are measuring the right thing. Internal validity refers mainly to the matter of causality - whether A causes B. External validity refers to the possibility to generalize the results of the study beyond the context of the study, i.e. from the sample to the population level. Ecological validity refers to whether it is possible to apply the conclusions to real life settings. If you perform an experiment as part of your thesis work, is the experimental setting too artificial for it to have any bearing on the real world? Some practical methodological considerations

Measurement and data collection

You need to pay attention to what and how you measure and collect data. Are you sure that you are measuring the right thing, and whether the measurement instrument is reliable?

For example, if you ask a person "are you satisfied with your work conditions", the context in which you ask the question may bias the answer. If your respondent's boss sponsors the project, he may answer "very satisfied" if he thinks his boss can identify his response. This also relates to the way you obtain data. For example, you may implement procedures to heighten the respondent's perception that you will treat his responses in confidence or that he can be sure of anonymity.

To analyze job satisfaction, you could instead use the number of sick days as a quantitative measurement of satisfaction. Such numbers easily generate from the IT system in the organization you study. Here you may not be measuring the right thing and the numbers are most certainly biased. A large number of sick days could be due to persons' having small children that carry diseases home from day care and things like that.

A third possibility for assessing job satisfaction can be to interview the respondents face to face. This procedure is useful when you want to get a nuanced picture of an individual's perceptions and feelings. There is a catch, however. Interviewing a person face to face is much more obtrusive than e.g. a questionnaire. Therefore, the interview setting, the way you ask questions, and similar issues become important. For example, if you provide evaluative statements in conjunction with your question, you may prime the interview person so she activates a specific representation or association of the question that will bias her response. Consider the following question:

"As everyone knows, having a clear generic strategy that focuses on either cost or differentiation advantages is imperative. What is your strategy in Nordic Widget International?" With your question, you have indicated that having a generic strategy is desirable, and you may lead the interviewee to search for an answer that will give the impression that her company has a clear generic strategy. This is not what you are after.

Ask for facts

To avoid a biased answer like this, you should ask for facts instead. At least up to the point where you feel that you have the facts you need. Only when you have the facts, you should ask evaluative questions if you want to steer the interviewee in a particular direction.

An alternative approach would be to ask a series of factual questions:

- "How does the price of your widgets compare to competitors'?"
- How are your widgets different from competitors' widgets?
- How much do you spend on your widget advertising?
- What are the unit costs of your different widgets?
- What are competitors' unit costs?

When you get sufficient answers on questions like these, you have empirical evidence you can use to infer Nordic Widget International's generic strategy, and the means by which you reach this inference are much less obtrusive than the evaluative statement. The interviewee may not accurately be able to represent the concept of a generic strategy because she does not have the theoretical knowledge. The result may be that she provides an answer driven more by the desire to provide an answer to the nice interviewer than by the desire to provide a correct answer.

Common methods bias

Common methods variance emerges when you use the same method to assess both dependent and independent variables of interest in a quantitative study. For example if you have the same respondent indicating both cause and effect variables. Common methods variance can inflate correlations between variables of interest. The observed correlation can then be decomposed into a method component and a "true" score. Common methods variance applies to e.g. the use of accounting numbers as dependent and independent variables as well as the use of perceptual data (i.e. questionnaire data) as dependent and independent variables.

Spurious correlation

Spurious correlations occur if two conceptually unrelated variables exhibit a correla-

● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

Triangulation

Triangulation can help overcome some of the problems associated with collecting and using data. One way of demonstrating that you have drawn valid conclusions about your object of interest is to use triangulation. Triangulation is the use and combination of several research methodologies to study of the same phenomenon. When you combine different methods, you

You cannot solve all problems

- Maybe your results are uncertain because of the way you measure things.

- All research has its limitations - but what sets serious academic research apart from other types of inquiry is that academics are supposed to reflect on the consequences of the limitations they face and the choices they make. What you need to do is to discuss and state the connections among your research context, your research question, and your choice of scientific position and methodological approach.

Tell the reader what you do, why you do it, and convince the reader that your chosen approach leads to valid and reliable conclusions.



FINDING DATA

Getting secondary data for your research

When you write a thesis with a practical or applied focus you need to gather data. You can collect the data yourself, primary data collection, or you can collect data from existing data sources, secondary (or archival) data.

Collecting primary data

There are quite many methods of gathering primary data and the scope of this guide does not allow for an introduction to these techniques. The available methods include but are not limited to direct observation (e.g. observing meetings), interviews, quantitative surveys, participant observation, and scores of other techniques. Before you plan the study, you should familiarize yourself with business research methods using a methods book such as one of those that listed in the section "Further reading". Your design of an empirical study should be ready very early in the project, given the tight work schedule of 5 months.

Interviews

If you conduct a research project in a firm or an organization one of your key ways of gathering data will be interviewing employees and possibly external stakeholders as well.

Interviewing requires careful preparation to be successful. First, you need a sponsor in the organization who will help you gain access to interviewees. The sponsor should help you identify key personnel in the organization as well as getting them to participate in the study. Second, you need to clarify whom you need to talk to, what kind of information you want to elicit from interviewees, and how much of their time you need. You should also reflect these considerations in an interview guide or questionnaire for each interviewee that specifies the questions and information you are after. Third, you need to reflect on your own role as researcher when you are interviewing members of an organization.

You should always keep information confidential and you should never reveal the identity of an informant to other informants.

If you cannot convince interviewees about this, you will be less credible and the value and amount of information you can extract will be limited. Fourth, you should make sure that the interviewees are motivated to participate by explaining to them what you get out of the interview, and what they and the organization get out of your research and the interview.

In your dealings with interviewees, you should always act as a professional. Be courteous before, during, and after the interview. You should always record an interview electronically but only if the interviewee gives you permission to do so. Remember to send each person a thank you note after the interview by e-mail or letter. If you have doubts about some of the information, an interviewee has provided during the interview, you should contact him/her for clarification.

Observation

Observation is another way of gathering primary data. This way of gathering data requires more time as well as good access to the organization you are participating. The book by Bryman and Bell (2003) contains a chapter on different observational methods that you may consult and other method books have similar chapters.

Internal archives

Some organizations have archival data they store for many years in paper or electronic format. For example, minutes of meetings, memos, decisions, plans and similar documents can be relevant to obtain. You should always ask for permission to look at the archival data. Transaction systems such as the enterprise resource planning systems contain data that can be useful to access. You can ask for reports on various performance indicators and other variables of interest to your study.

Dealing with confidentiality

When you conduct research for a company, you may be required to sign a confidentiality agreement. The student contact point can provide you with a standardized agreement that your advisor will also sign.

Only the advisor and the external examiner will know the identity of the company, and the confidentiality agreement covers both. Moreover, the thesis will not be available in the library afterwards.

Collecting secondary data

Secondary data are important for most applied or practical research projects even if you also collect primary data. As a university student you have several ways of obtaining secondary data - right at your fingertips.

The university library provides access to a vast number of on-line databases. If you experience trouble using the university library's facilities, ask a librarian how to use them. Second, you may have to gather primary data to serve the purposes of your research question.

The following databases are available from the university library:

- Infomedia contains full text articles from Danish newspapers and trade magazines that you can use to research companies that enjoy some media coverage in Danish media, i.e. typically Danish companies.
- Lexis-Nexis contains more than 35,000 sources and more than 4 billion documents from international, regional and local media. You can find just about everything that is worthwhile to know about a company using Lexis-Nexis.
- CD-Direct contains information about Danish firms, and records include things such as financial data, address, industry participation (NACE codes), and employment data. Greens Online is an alternative to CD-direct and contains roughly the same information.
- Amadeus from Bureau van Dijk contains accounting information about companies in Europe. This database is particularly useful for conducting industry and competitor analysis on a European scale.
- Orbis from Bureau van Dijk contains



accounting information about larger companies world-wide. This database is particularly useful for conducting industry and competitor analysis on a global scale.

- Marketline Advantage from Informa contains reports on industries and companies as well as market share and distribution channel information. The database covers many different industries.
- Kompass contains information about 1.8 million firms in 75 countries, 750,000 brand names, and 3.6 million names of contact persons in the registered companies.
- Source OECD is the online library of the Organization for Economic Co-operation and Development. The

database comprises Book collections by theme, containing all their monographs and reports, periodicals, a reference title, and the OECD statistical databases.

- WDI Online (World Development Indicators) contains statistical data for over 600 development indicators and time series data from 1960- for over 200 countries and 18 country groups. Data includes social, economic, financial, natural resources, and environmental indicators. You can scale results, index them against a particular year, view them by percentage change, and chart your result. You can export data in e.g. Excel format.
- Also included is an e-book version of the World Bank yearbook, World De-

velopment Indicators.

- Statistikbanken contains detailed official statistics about the Danish society from Statistics Denmark, and you can generate customized reports and export these in Excel format.

These databases provide you with qualitative and quantitative information that you can use for many different types of analyses including documentation of social and economic trends, financial analyses, market research and competitor analysis.

Identifying appropriate methods

Your ability to use appropriate scientific methods - and use them well - are among the key criteria for evaluating your thesis. This is where you demonstrate your grasp of the tools of your profession.

Most students will have had little formal training in selecting and using research methods. It is therefore advisable that you read up on how to conduct an empirical study before you make decisions about how to gather data and how to analyze these. Remember that you have to justify your choices in the thesis, and if you do not have a good reason for choosing the methods you use in the thesis, it is not a plus on your report card. Consulting a method textbook before you design the study is a wise choice.

Sample and case selection

When you work with empirical analyses, you must consider which methods fit your research question. Some research questions are best answered using qualitative methods, others quantitative methods. Some require combination of both sets of methods. Even so, you must justify why you select the case or sample in question.

Case selection

A case is never representative of the population, and we use cases to learn something useful from the particular circumstances of our unit of analysis. When you conduct a case study, you should therefore reflect on the role your case will play in your analysis. Yin (2003, reference provided below) describes three types:

- A critical case. This type of case is useful for examining boundary conditions of a phenomenon, for example when a relationship holds and when it does not hold. For example, this could be a study that helps us identify circumstances when motivation benefits of individual incentives are overshadowed by social comparison costs.
- A unique case. This type of case is useful for examining extreme or

outlying cases, for example extremely high performing firms or firms that have unique business models.

- A revelatory case. This type of case examines a phenomenon that is new to the world - something we have not experienced before and need to know more about. This could for example be a study of how Apple was able to develop and launch its iTunes store in a complex legal context (considering the copyright issues).
- Reflecting on what type of case you have is very important for communicating your results: What can we learn from your case and why is that useful?

Sample selection

When you analyze quantitative data, there are in essence two approaches. In one approach, you merely want to describe statistical relationships, for example characterize the moments of the distribution and describe differences in the means of different groups in your data. In other approaches, you want to test hypotheses, for example if high levels of R&D investment are associated with better performance. We might even want to estimate the magnitude of the return to R&D.

Regardless of approach, your sampling strategy is important, and you need to understand the fundamental issues regarding sampling. First, for the majority of the phenomena in the broad area of management, organization, and economics, you will not be able to conduct a randomized experiment. This is a setting where you select the units (firms, individuals, plants and so on) and you assign the treatment to these units at random. A treatment is the intervention you are interested in, for example the effect of administering a reward to randomly assigned subjects. Most of the time, you will gather archival data from databases such as Amadeus or primary data for example by administering a questionnaire to a sample of individuals. That type of study is called observational, and its drawback is that you lose randomization, often in two steps.

Sampling bias in databases

The first problem you face is selecting a random sample. When you use databases, you can often get data that includes almost the whole population although there may be some biases, for example underreporting by small firms or lack of information about privately held firm. Even so, your chances of drawing a representative sample with respect to key criteria are fairly good.

Sampling bias in primary data collection

When you collect primary data, you will often rely on some database to identify the units you want data about. But in addition to the sample selection problems above, you get an additional problem, namely that of response bias. Some individuals may not wish to participate in your study, and will cause bias in your analyses if these reasons are systematic. Therefore you need to reflect on the likelihood and magnitude of potential biases. There are also some methods that allow you to correct for sampling bias when you conduct your analyses. Non-random treatment. Even if you manage to get a sample which is representative and has no sampling bias, the treatments which you are interested in are not random. For example, firms are likely to select their level of R&D based on an evaluation of which level is optimal conditional on their strategy, market characteristics, and so on. When treatments are non-random, you get a risk of bias. Dealing with this type of "selection problem" is somewhat involved, and depending on the type of data you analyze, there are different methods.

If you want to learn more about sample selection and how to deal with selection bias in its different guises, Angrist and Pischke (2009) provide a very clear discussion of these issues. Econometrics textbooks like Greene (2000) or Wooldridge (2010) have loads of advice on how to deal with these problems although some of their advice may be hard to follow for the less technically minded. References are provided below.

Do you have the right answer?

One of the aims of your thesis work is to come up with the - or at least an answer to an important question. In Douglas Adams' book *The Hitchhiker's Guide to the Universe*, there is a powerful computer called Deep Thought which in chapter 28 states the following:

"I checked it very thoroughly," said the

computer, "and that quite definitely is the answer. I think the problem, to be quite honest with you, is that you've never actually known what the question is."

While it is certainly mildly amusing, Deep Thought's exclamation is also insightful as the answer to any question depends on the quality of the underlying question, regar-

dless of the precision and methodological rigor by which the result is presented. So do you ask a well justified research questions and do you use methods that can actually provide an answer to that question. These are important considerations for your overall research design. Your research design should always fit the research question, and your research questions should always be well justified.



**In theory there is no difference
between theory and practice.
In practice there is.**

Yogi Berra



FINDING YOUR PERSPECTIVE

Identifying appropriate theory

Your literature search is as crucial to writing the thesis, as is data collection. Finding good theory can be challenging to students as there are many books and journals out there, and sorting between these can be difficult.

Textbooks will usually provide you with the basics of a subject. Normally, you should go beyond the textbook level in your treatment of the theory you use. That is, you should review primary literature in the form of relevant books, book chapters, and journal articles.

This does not generally apply to researching the methods you want to use. Method textbooks are probably the best sources you can use, and some method textbooks are very advanced. If you encounter the need to use a particularly specialized method, journal articles are probably the best bet depending on how well established the method is.

Monographs and edited volumes are found in the library although some publishers make their books available online through the university library. For example, this applies to Springer. Monographs and edited volumes can provide a good overview of a field but their quality can be hard to assess. Beware of practitioner-oriented books. These usually are long on advice but often fall short in terms of sound theory and logical arguments.

Scientific journals are the premier outlet of scientific work in the form of articles that analyze a theoretical or empirical problem. There are a vast number of journals out there, and not all of these meet good academic publishing standards.

Good general strategy and organization journals include:

- Academy of Management Journal
- Academy of Management Review
- Administrative Science Quarterly
- Management Science
- Organization Science

- Strategic Management Journal

There are also some good specialist journals such as:

- Industrial and Corporate Change
- Journal of Economic Behavior and Organization
- Journal of International Business Studies
- MIS Quarterly
- Organisation Studies
- Research Policy
- Strategic Organization

If you look for practitioner-oriented journals, you should consult:

- Harvard Business Review
- California Management Review
- Sloan Management Review
- Academy of Management Perspectives (formerly Academy of Management Executive)

Additionally, you can look at well-established journals such as:

- Human Resource Management Review
- Information Systems Research
- Information and Organization
- Journal of Human Resources
- Journal of Information Systems Research
- Journal of Business
- Journal of Management
- Journal of Business Research
- Journal of Evolutionary Economics
- Journal of Management Studies
- Journal of Marketing
- Journal of Marketing Research

The journals listed above are available online through the university library. If you experience trouble using the facilities, ask a librarian how to use them.

Evaluating theory can be difficult because of the trouble in determining “what constitutes good theory and what constitutes bad or less good theory.” There are no objective criteria for this. It is helpful if you do two

things. First, you need to identify and delineate the field you are looking at. Second, you need to identify landmark studies within the field. For the second question, you can get some help to validate whether a study is important or not by using the database Web of Science. For example, Robert Grant's article “Toward a knowledge-based theory of the firm,” from Strategic Management Journal (1996) received 606 citations by March 17, 2008. This means that it is probably an important article in the field relating to the knowledge-based theory of the firm. To compare, Johan Roos' article “Exploring the concept of intellectual capital (IC)” from Long Range Planning (1998) has been cited twice. Grant's article has had an impact on research in the field, while Roos' article has not. Generally, Web of Science is a very good source for finding literature published in the form of peer-reviewed articles. This database will allow you to search for relevant literature that have appeared in peer reviewed scientific journals as well as help you gauge the importance of individual contributions. Important contributions to the field are generally cited more often than less important contributions, and you can track the citation trail of different contributions. This will generally give you a good idea of the scope of the field.

As an example: of those that have cited the above mentioned Grant-article, the one most cited has been cited 543 times, the second most cited has been cited 425 times, and so on. From place number 336, one or fewer have cited the article in question. (Numbers apply to March 17, 2008.) You should probably restrict attention to the most cited articles in the beginning of your literature search although you should also look at recent contributions in good journals. Articles that are more recent will tend to receive less cited compared to more distant articles - for obvious reasons.



What is a good strategy & organization thesis?

A purpose of this guide is to give you a sense of the qualities members of The Strategic Organization Design unit look for in a good master thesis.

First, in the program we try to provide a learning experience that gives you a solid grounding in the disciplinary bases of Strategy & Organization (economics, economic sociology, and organization theory). In the thesis, you should build upon the knowledge you have acquired during your coursework. "Building" means that you have to use the theory and methods you have learned as well as acquire new related theory and methods that are appropriate for your thesis work. We expect theses based on solid theory and methods. This means that you should base your thesis work on theory in economics, economic sociology, and organization theory, and you should make a careful argument regarding the usefulness of your selection in solving the problem you address. Members of The Strategic Organization Design unit value methodological rigor. This means that you have to use the correct methods and use them correctly.

If you base your thesis on solid theory and methods, we expect that you will derive implications that are important and make a long lasting impression.

Evaluation criteria

When you are done with the exam you will have presented your written thesis in an oral exam, and you will receive your grade.

The grade will reflect the quality of the written product as well as the oral exam. But what are the key evaluation criteria - the difference between a low and a high grade?

The bottom line is fairly simple: Do you produce a clear, concise, and comprehensive thesis?

For students in Strategy & Organization, this means that you need to demonstrate skills in the theory and methods that are characteristic of this program. I have tried to demonstrate above what we emphasize in a Strategy & Organization thesis in a more practical and elaborate way than what you can inform yourself about from reading the official course description.

The points of evaluation differ between theoretical and practical theses. I have derived the summary points listed below from the official course description. The points are not entirely identical.

- Identify and frame a relevant research problem
- Distinguish between relevant and less relevant problems, theories, and methods
- Investigate a research problem using relevant theory and methods
- Summarize and communicate your theoretical, methodological, and empirical choices
- Summarize and communicate your theoretical, methodological, and empirical findings
- Reflect on the implications of your

findings for theory and practice

- Reflect on your research process, and on what you have learned while writing the thesis
- Demonstrate clear, concise and comprehensive communication of choices and findings
- Present your findings in an oral presentation

If you follow the advice offered in this document, and its interpretation of the requirements for a good thesis, you should easily be able to live up to the official evaluation criteria.



FURTHER READING

Inspiration for getting started

At this point, you should have a good impression of what it takes to write a master thesis in Strategy & Organization. You have really only scratched the surface on some of the problems related to starting, writing, and completing your thesis.

You should consider the examples I have used as appetizers, and therefore I suggest some additional reading for the different topics in this guide.

Writing style and academic writing

A good guide to writing clearly and concisely in the English language is provided by The Economist. "The Economist Style Guide" is legendary and can be accessed online in an abbreviated version at www.economist.com or bought online in several outlets including the aforementioned website.

Several guides focus on academic writing. Here are a few of them that are also available at the university library:

Kate L. Turabian revised by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams 2007. A manual for writers of research papers, theses, and dissertations: Chicago style for students and researchers. Chicago: The University of Chicago Press.

Patrick Dunleavy 2003. Authoring a PhD: How to plan, draft, write and finish a doctoral thesis or dissertation. New York: Palgrave Macmillan.

Gail Craswell 2005. Writing for academic success: a postgraduate guide. London: SAGE.
Booth, W. C., Colomb, G. G., & Williams, J. M. 2008. The Craft of Research, Third Edition (3rd ed.). Chicago: University of Chicago Press.

Books about project planning

There are literally tons of books about managing projects. If you do want to elaborate on this dimension to plan your own, Tom Kendrick has written a book called the "Project Management Tool Kit: 100 Tips and Techniques for Getting the Job Done Right". You can access this very hands-on guide as an e-book through the university library. (Full reference: T. Kendrick 2004. Project Management Tool Kit: 100 Tips and Techniques for Getting the Job Done Right. New York: Amacom.)

Research methods in general

Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao 2004. The Sage encyclopedia of social science research methods. Thousand Oaks, CA: Sage
Alan Bryman 2001. Social research methods. Oxford: Oxford University Press.
Alan Bryman, Emma Bell 2003. Business Research Methods. Oxford University Press: Oxford.

Conducting qualitative studies

Robert K. Yin 2003. Case study research : design and methods, 3rd ed. Thousand Oaks, CA: Sage Publications.
Evert Gummesson 2000. Qualitative methods in management research, 2nd ed. Thousand Oaks, CA: Sage publications.

Conducting quantitative studies

Naresh Malhotra 2007. Marketing Research: An Applied Orientation. Prentice-Hall: Upper Saddle River.
J. F. Hair, R. E. Anderson, R. L. Tatham and W. C. Black 1998. Multivariate Data Analysis, Fifth Ed., Prentice-Hall: Upper Saddle River.
Thomas D. Cook and Donald T. Campbell 1979. Quasi-experimentation: Design and analysis issues for field settings. Chicago, Ill.: Rand McNally College Publishing.

Donald T. Campbell, M. Jean Russo 2001. Social measurement. London: Sage Publications.

Angrist, J. D., & Pischke, J. S. 2009. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton: Princeton University Press.

Greene, W. H. 2000. Econometric Analysis. Upper Saddle River NJ: Prentice Hall.
Wooldridge, J. M. 2010. Econometric Analysis of Cross Section and Panel Data, 2nd Edition (2nd ed.). Boston, MA: The MIT Press.

THESIS GUIDE

Thesis work will challenge you and this guide helps you to start, write, and complete your thesis. The guide helps you gain control over the process, helps you reduce anxiety and stress over the challenges that lie ahead and helps you to turn the process into a lifetime experience that you will treasure for many years ahead.

