Major Studio 2
Data Visualization
Thesis Writing Guidelines

HOW TO WRITE A THESIS?

GENERAL PRINCIPLES
(based on the "Quick Guide" by Erkki Huhtamo)

- A thesis is an academic work. It is meant to demonstrate that you master a certain field of knowledge and are able to express this in written form.
- A thesis is based on **research**. It is not a work of fiction, a collection of random jottings, an informal essay, a diary or a magazine article.
- A thesis is an **organic whole**. Any detail must be related to all the others. No useless details or information should be included. Everything, even the smallest details, should have a meaning within the framework of the thesis itself (Erasing useless details and even chapters is one of the most difficult things to learn, but it is essential!)
- Thesis has to be **logical**. It is based on **argumentation**, which should progress in an orderly manner. You are arguing both for and against something, defending an idea or a project. Argumentation can be compared with creating a chain; each element is linked to the next one. The thesis begins with the presentation of certain PREMISES, precedes to their **investigation**, and ends with a **conclusion**. Although topics and approaches vary, there are no exceptions to this.
- Because a thesis is an academic work, all the claims must be justified by referring to **source material**, previous authoritative works that are considered relevant.
- The **language** of a thesis has to be "written language". It has to be formal, which does not mean it needs to be boring! Expressions and idioms from spoken language are usually not allowed (unless they have a special meaning within the thesis, for example when used as evidence).

SPECIFIC PRINCIPLES

- The thesis paper is associated with a practical creative project. The project and the thesis are usually closely related. However, they do not fully coincide. Rather, they are meant to support each other.
- The project part of the thesis is a data visualization project. It is subjective in the sense that it is springing from the mind of the creator. The written part, on the other hand, is more "objective". The creator has to be able to look at one's work as if through another person's eyes. The switching between subjective to objective points of view is the essential point. It is sometimes a very difficult challenge.
- The thesis paper provides the **context** for the creative work. It presents the principles underlying it, placing the work within a cultural, aesthetic, social, personal, statistical, and technological framework. It explains the principles and techniques of the project in an

objective way. It should also state, why the maker considers his/her project as important. It articulates the mechanisms for generalizing your work. Who/what does your work represent beyond the data points you used in the project? And how? It defends the technological architecture and infrastructure you developed for the project. Your code repository documents the "what and how," whereas the thesis expands on "why" and contextualize your choices. **Most importantly**: the thesis paper can also contain original research which expands and further develops the issues dealt with in the thesis project.

SCOPE

As a general guideline, the length of the thesis paper is about 10,000 words—including references. Data sources added to the Appendix are excluded from this word count.

THE TABLE OF CONTENTS ("The Outline")

A good way to start writing a thesis is to create a table of contents or an "outline" defining the scope. Here you should dissect all the elements and aspects mentioned in the abstract and re-arrange them in a logical order. The table of contents serves as a plan for the paper you are going to create, presenting your ideas in a linear, logical order. The first version you create is almost never the final one: it will change many times during the process. But it will give you something concrete, a guideline to follow (and to refine in the process!).

Although there are many ways to create a table of contents, the most basic structure remains the same:

1. Introduction
2. Treatment
3. Conclusion

These categories are the three main parts of the thesis. They should be further divided into **sub-categories**, often numbered as "1.1., 2.2.3.", etc. The division, and the actual structuring of the table of contents, depends on the topic, the method, etc. There is no custom made model that automatically fits to any case.

In addition to 1,2,3 the table of contents should include at least the following:

1. a list a references or endnotes
2. a bibliography (listing all the sources consulted)
3. an appendix (can be several), such as images, texts and other additional material, which provides some essential additional information, but is too "heavy" to be included in the text proper.

SYNOPSIS (ABSTRACT)

The synopsis is a kind of a condensed "overview". Its meaning is twofold: for the reader (another person) it is meant to give a quick, general idea about the task or the project in question. For you (the maker) it is a tool which helps you to focus on the essential elements of your project. ("What am I **really** trying to do?")

The synopsis should be a fairly short and condensed text (maximum one printed page). It should avoid too many details, and concentrate on the essentials.

The synopsis should cover at least the following things:
- What is the title of your project?
- What is its topic / subject matter?
- What are the most important features or aspects of your project?
- What kind of material you are dealing with?
- Why have you chosen just this topic?
- How do you approach the topic? (In other words, what is your method?)
  - What is the general (cultural, social, political, aesthetic, theoretical ...) meaning of your project?
  - What kind of a contribution does it give to the field in question?
  - How is your project related to earlier works on the field (who or what have been your most important influences)?
  - To whom is the project addressed?
  - Who/what does your project represent? How can the data be rigorously generalized to offer meaning beyond the data points you collected?
  - What are your primary data structures, how did you optimize, and does it sustain into the future?

Remember that you do **not** have to address these questions in this order! Also remember that a synopsis should not be just a boring list – it is a short and condensed text, a kind of mini-essay.

The synopsis that you write first is a kind of conceptual working tool. It will almost always change as the work proceeds. It is recommended to rewrite it after the paper is finished.

1. INTRODUCTION

The introduction usually contains at least the following issues (often classified in subcategories):
  - The presentation of the project (what is the project all about? How did you come to create it? Where did the inspiration come from? etc.). Note: it is often useful also to state what the paper is **not** going to deal with!

- The basic premises behind the project (The "questions" the paper tries to answer, the "problems" the project tries to solve)
- The cultural and historical background of the project
  - The sources consulted (literature, other influences)
  - The method (how, and from what point of view you will approach the topic). This may include a "preview" of the issues you will be talking about in the following chapters.

Beginning Formulas:
- There are two basic possibilities:
  - Ab ovo ("from the egg"). Such presentation starts with an overview, working towards particulars. ("The purpose of this thesis is to explore...")
  - In medias res ("in the middle of things"). "In August 1814 Napoleon Bonaparte woke up in St. Helena, just to remark that something had changed." Starts with a particular observation or fragment, and works towards a general statement of the aims of the thesis.

2. TREATMENT

- treatment is the **main part** of your thesis. This is where the main development and argumentation of the material takes place.
- treatment can be divided into several chapters, according to your needs and the tasks in question. The exact order of the chapters and their contents depends on the nature of your topic and your way of dealing with it. There is no pre-fabricated formula for it.
- **The treatment builds on the introduction**: it develops further and expands the issues already stated in shorter form in the introduction. In away, it "fulfills the promise" of the introduction. Always keep in mind your initial premises and the questions you promised to explore! The relationship between the introduction and the treatment has to be absolutely logical and organic!
- First of all, the treatment should contain a thorough **presentation** of the project and all the essential issues connected with it. Depending on your project, you may need to discuss the historical background, or you may need to explain some technical issues behind your project. Remember, don't try to retell the history of the universe! There should be just enough background information to make the argumentation solid and credible.
- Most importantly, the treatment should contain an **analysis/critical discussion** of this material. This is the core of the whole thesis paper. Here you will look at your project in the light of the questions presented in the introduction. You should also contextualize your argumentation by referring to literature / external sources / other related projects as points of comparison. The purpose of this is to support your argument and try to convince the reader about its viability: its design, its statistical/methodological credibility, and its technological architecture. You should both refer to authorities with whom you agree and then argue against those with whom you disagree!

3. CONCLUSION

The conclusion has basically two roles:
- To give a "final statement": in short form, repeating what you were trying to do and what were the results of your investigation. This serves the idea of "closure" (Like "**the end**" in the end of a movie.)
- To point out further areas of investigation that are relevant, but haven't been sufficiently covered by your research paper. This may include unanswered questions, or totally new issues raised by your project. This aspect serves the idea of "open end" (Like "**to be continued**" in the end of an episode of a TV series). The conclusion can never be left totally open!

STYLE

There are no set New School guidelines on style. It is recommended you use **Chicago-style** citations as it is also the style supported by the New School Learning Center. Make sure to include a title page with your thesis title, credentials and credits, and the following note: "**Submitted in partial fulfillment of the requirements for the degree of Master Science in Data Visualization at Parsons School of Design.**" As an extended manual for writing your thesis, please refer to:

- Turabian, Kate. A Manual for Writers of Term Papers, Theses and Dissertations. 8th ed. Chicago: University of Chicago Press, 2013.