



ACQUISITION RESEARCH

HANDBOOK SERIES

An Analysis Planning Handbook for Thesis, Joint Applied Project, and MBA Research Reports

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Preface

This handbook is one of a series of four produced for the Acquisition Research Program at the Naval Postgraduate School. The series includes:

- *An Analysis Planning Handbook for Thesis, Joint Applied Project, and MBA Research Reports*
- *A Handbook to English Usage and Writing*
- *A Handbook to APA Citation Style*
- *A Handbook to Word Choice and Frequently Used Terms*

For additional copies, please visit the Acquisition Research Program Office at the Graduate School of Business & Public Policy in Ingersoll 372. Also see our website www.acquisitionresearch.org for additional research resources.



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Purpose

This guide provides the graduate student researcher with techniques and advice on creating an effective analysis plan and provides methods for focusing the data-collection effort based on the analysis plan developed. As a side benefit, this analysis planning methodology helps to properly scope the research effort and provides insight for changes in that effort.

Background

Most novice researchers have limited experience with single-issue topics of limited scope—such as class projects, point papers, decision briefs, etc. While all of these exercises are valuable and help in developing critical thinking skills, the research techniques for these smaller-scale efforts usually are less applicable to larger-scale efforts.

With small-scale single-issue research efforts, the researcher typically searches for any and all data that pertain, even remotely, to the research topic. Due to the limited size of such projects, it is fairly easy to sift through all of the data collected, keeping the most useful to the effort and discarding the rest.

The data retained is then analyzed and may actually drive the analysis effort. This method is known to most novice researchers and is the approach I see the most employed by graduate student researchers (and the methodology I used in researching my own thesis!). Based on my experience, this method creates several problems for larger-scale research efforts, including:

- a. **Wasted time and effort.** Wasting significant time and effort in collecting data that will not be analyzed, as well as sifting through volumes of collected data to glean what is needed.
- b. **Improper analysis technique.** Shaping the analysis to the data collected rather than collecting data supporting the analysis needed.



- c. **Mis-estimated research scope.** Discovering that the research scope is too broad after spending hours of effort collecting data beyond what is needed and manageable..
- d. **Incorrect research organization.** Organizing the research product around the data collected, making it very difficult for the reader to follow the intended analytical logic.

It is important to remember; each piece of data that you collect was composed by a different writer with a specific subject, purpose and audience in mind. Rarely—if ever—do all of those aspects of the writing situation run parallel to yours.

Because you have your own particular subject, purpose and audience for your project, **you must choose your data for its applicability to your topic—not your topic for its applicability to your data.**

Planning for Analysis and Analysis-centered Research

The purpose of the Graduate level Thesis/MBA Project/Joint Applied Projects is to demonstrate critical thinking through analysis, not data collection. Data collection *supports* the analysis plan, not the other way around!

Of course, effective analysis is dependent on accurate, unbiased data to be sufficient and persuasive to the intended reader; don't underestimate its importance to the effort. Just remember that the data in itself is useless without the synthesis of the data as it relates to your specific research effort. In fact, the synthesis of quality data into a logical sequence is the heart and soul of the analysis plan.

- a. **Research Topic.** Your research topic is always a good place to start your analysis plan. For illustrative purposes, I will use a notional research topic: **“An Analysis of the US Army’s use of**

Suggestions to Improve Research Quality

- Read aloud. This helps to identify sentences a reader may find awkward.
- Include complete information on your reference list; capture all details associated with each source’s publication. This will save time later.
- Review for term consistency.
- Check figure and table titles to ensure they are consistent with program guidelines.
- Check lists/series for parallel sentence structure.
- Verify that verb tense remains consistent throughout the document.
- Avoid using 2nd person (you) pronouns or point of view.
- Avoid passive voice whenever possible.
- Review the overall organization to ensure sentences/sections are cohesive and structured appropriately.
- Spell-out and define unfamiliar terms at least once before referring to them as acronyms.
- Ensure the central research topic is the focus throughout the document.
- Review citations. Make sure they are appropriately introduced and summed up. (For instance, use transition sentences to introduce/conclude a quote, and explain the applicability of a reference.)
- Introduce sources by the last name of the author/editor when possible.



34. Provide a forwarding address that will be valid after graduation or an accurate e-mail that will be valid after graduation so ARP can send a hard copy of report.

Thesis Organization

Cover

Report Documentation Page

Signature Page

Abstract

Table of Contents

List of Figures (only required if paper has figures)

List of Tables (only required if paper has tables)

List of Abbreviations, Acronyms, Symbols (if used)

Executive Summary (optional unless your department requests one)

Acknowledgments (optional)

Body of Paper:

Chapter I (Introduction/Background/Purpose/Research Questions/Scope and Organization/Methodology...)

Chapter II (Literature Review)

Chapter III (Introducing Topic/Analysis)

Chapter IV (Findings/Results/Recommendations)

Chapter V (Summary/Conclusion and Recommendations/Recommendations for Further Research)

List of References

Appendices (if necessary)

Initial Distribution List

All major sections/chapters will begin on an odd page number. If they don't fall on an odd number, a blank page should be added as the even-numbered page.

Chemical Agent Resistant Coating (CARC) on Tactical Wheeled Vehicles.”

As you probably noticed, this topic has several elements that limit the scope of the effort. In most cases a topic doesn't start out that way. A topic usually goes through *several iterations* before it gained its final configuration. It may have started out something like “An analysis of the use of Chemical Agent Resistant Coating (CARC).” Then, the researcher de-scoped it by adding the specific Service, “the US Army,” and further refined it by limiting the effort to “Tactical Wheeled Vehicles.” This de-scoping and refining process is a very typical part of the research planning process. **Do not be afraid to change the scope and focus of your topic** as you gain insight into the time and effort needed to effectively research the area. Of course, your advisors must agree and will likely help you in the scoping effort.

- b. **Research Questions.** You will then need to develop primary and secondary research questions to guide the research process. These research questions are “**key**” in designing the research analysis plan, and I will show you how they play a controlling role in the effort.

For our notional research project, the primary research question would be something like: “**Is the US Army gaining the desired advantages by implementing its policy requiring CARC on all tactical wheeled vehicles?**” The secondary questions are usually major subcomponents that need to be answered to address the primary research question. Think about what major elements your readers need to understand—and you, as the researcher need to present—before the primary question can be adequately answered. Here are the secondary research questions for our notional research project:



- i. “What are desired Army goals for tactical wheeled vehicle coatings?”
- ii. “How does CARC help facilitate Army chemical agent decontamination efforts on tactical wheeled vehicles?”
- iii. “What alternative coatings would be viable for the Army’s tactical wheeled vehicles?”
- iv. “What are the relative advantages and disadvantages of CARC and the viable alternatives?”

Again, your primary and secondary research questions will likely go through several refinements and iterations before settling in their final form. You may eliminate some; you may add to others to more fully support your analysis and address the primary research question. This is a very normal, and expected, process.

- c. **Analysis Planning Matrix.** The research questions are the beginning point for constructing your Analysis Planning Matrix. While sounding a bit daunting, planning the analysis is a further subdivision of the research questions—with a *focus on determining how you will draw your reader through the elements necessary to fully answer the questions*. Place yourself in your reader’s shoes and ask “*what are those elements or pieces of information that my readers would expect to see to have confidence that the question has been fully addressed?*”

Remember: To be successful, this planning matrix is constructed and filled in BEFORE data is collected. You must organize your analysis before you collect data to support it. I have prepared a matrix for our notional research project below:

15. Revise second draft/create final draft.
16. Submit to Advisors for final revisions.
17. Revise final as per Advisor’s suggestions.
18. Once Advisors have reviewed project, submit copy in Word format to Thesis Processors in the research department.
19. Revise final as per Thesis Processor’s suggestions.
20. Once Thesis Processors have signed off on project, submit thesis to Advisors for signatures.
21. Submit PDF to Advisor and to Thesis Processors (the latter must be submitted on SharePoint).
22. Complete an MBA Report Release Form (required), Signature Page (required), and Color Page Form (if required).
23. Obtain necessary signatures and approvals.
24. Create special abstract for Thesis Processors to use as they submit project to library.
25. Retrieve signatures from Advisor(s) for final copy.
26. E-mail final version of Report in one PDF file along with the Special Abstract_(MS-Word format) to Thesis Processor that reviewed your initial draft.
27. Submit final signature page and MBA Report Release Form to Thesis Processor.
28. Receive Green Card from Thesis Processor.
29. Show Green Card to Registrar to document completion of the MBA project requirement.
30. If working with ARP, submit final Word version of the project to the Acquisition Research Program for edit review.
31. Submit short biographies of the authors to the ARP for the final Sponsored Report draft.
32. Revise final ARP copy as per editors’ suggestions.
33. Submit poster of project to ARP for final poster show in May.



As you plan the analysis before conducting the data collection and research, you make it is less likely that there will be significant gaps in the logic and more likely that your conclusions and recommendations will be reasonable to your readers. A focused analysis plan also helps prevent unnecessary or trivial data from sneaking in to the effort, diluting or obstructing the main purpose of the research.

MBA Project/Thesis To Do List

1. Decide on Project/Thesis Advisor.
2. Discuss possible topics with Advisor.
(NOTE: The first two steps could potentially be reversed.)
3. Draft Thesis proposal (each discipline may have its own process for this).
4. Obtain appropriate signatures on thesis proposal.
5. Submit your signed project/thesis proposal for acceptance into the Graduate Student Acquisition Research Program (ARP) for travel funding/editor/transcription support. (If applicable)
6. Work together with Advisor to create an Analysis Plan (as per this booklet). Work with Advisor to revise Analysis Plan as necessary throughout research process.
7. Begin research on topic.
8. Conduct primary source interviews or whatever outside research is necessary.
9. Write a first draft of project.
10. Submit first draft to ARP for edit review. (if applicable).
11. Revise first draft/create second draft.
12. Submit second draft to Advisor for review.
13. Revise second draft as per Advisor's suggestions.
14. Submit second draft to ARP for edit review. (if applicable).

d. Matrix elements. The matrix consists of three major elements: The Secondary Research Questions, Analysis Elements Needed, and Supporting Data Needed.

Research Question	Analysis Needed	Data Needed
What are the desired Army Goals for tactical wheeled vehicle (TWV) coatings?	<ul style="list-style-type: none"> -Substrate Protection -Chemical Agent Resistance -Camouflage -Maintainability -Cost Effectiveness 	<ul style="list-style-type: none"> -Corrosion & environment protection performance spec & test/operational perf data -Absorption rates, Decon performance, & post-decon performance requirements & test/operational data -Detectability performance spec & degradation testing/performance -Req maint actions frequency, costs, & safety implications data -Initial coating & maintenance TOC
How does CARC help facilitate the Army's decontamination efforts on tactical wheeled vehicles?	<ul style="list-style-type: none"> -Decon operational scenarios -Specified absorption resistance & decon effectiveness (unprotected soldier-exposure guidelines) -Decon procedure scenarios -Non-CARC component decon (tires, seats, plastics, etc.) 	<ul style="list-style-type: none"> -Decon TWV test/operational data -Pre-decontamination absorption rate data & post-decontamination (off-gassing) exposure performance data -CARC operational decon procedure data -Non-CARC TWV item chemical resistance & decon effectiveness data
What alternative coatings would be viable for Army tactical wheeled vehicles?	<ul style="list-style-type: none"> -commonly used automotive coatings -Alternate coating viability for Substrate Protection, Chem Agent Resistance, Camouflage, 	<ul style="list-style-type: none"> -Automotive coatings data -Perf data addressing Army goals for TWV coatings (as in block two above)



Research Question	Analysis Needed	Data Needed
	Maintainability, & Cost effectiveness	
What are the relative advantages & disadvantages of CARC and the viable alternatives?	-SWOT analysis -Sensitivity analysis to Army goal prioritization	-Data collected above -Army-perceived or -specified coatings' performance priorities (may be derived)

Obviously, the development of the Analysis Matrix will be very evolutionary; in other words, the scope and need for analytical elements will become clearer as the matrix matures. Remember that this is an analytic *plan (a living breathing document)* and will likely need to be changed and adjusted as the research process continues.

- e. **Matrix Impact on the Research Effort.** The Matrix provides an overview of the architectural framework for your analytical research effort. The scope of the research effort is much easier to estimate, and the need to de-scope or modify the focus of the research typically happens much earlier in the effort (saving precious time and effort later) if a researcher constructs such a framework.

The use of the Matrix approach ensures there is data traceability to the Research Questions via intermediate analytical steps. The focus of the research is directed to the analysis—with the data-collection effort clearly supporting the analytical plan. Instead of collecting myriad data loosely connected to the topic, a researcher specifically identifies the data elements needed.

Thus, data collection becomes much more purposeful and focused. This approach could potentially save researchers dozens of hours in data collection and sifting and could deliver much more payback for the data-collection effort. It is much

easier to organize the research around the analysis plan than around a pile of unrelated data; such a plan should vastly improve the logic pattern and readability of the research product. As the data supporting specific portions of the analytical plan are collected, the data are arrayed in a manner supporting analysis—again, adding to the logic and readability of the research product.

In addition, your subject-matter expertise has the potential to estrange your readers. In other words, by performing the research, you become more expert in the subject area. Your newly gained expertise will likely enable you to mentally “fill in the blanks” that may exist in your research effort. Often, since the logic appears perfectly complete and obvious to you, you will neglect to explain it adequately to your readers.

Thus, your readers will be unable to understand or follow your path of reasoning. If you map out your logic before you begin writing your project, you will be more able to clearly explain your findings to your reader.

- f. **Flexibility.** As the research matures and data is collected, there will be opportunities (sometimes disguised as “challenges”) presented to improve the analysis by adjusting the plan or the focus of some part of the research. Don’t hesitate to adjust when needed. This is part of the “Critical Thinking” skill set that your graduate educators are trying to help you develop!

Summary

If you neglect to plan and map out your analysis, your writing will likely lose its logic, become lost in minutia, or require the readers to make a “leap of faith” to accept the offered conclusions and recommendations.

