

Using the Scientific Method for Model Document Design¹

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The ability to communicate oral or written management ideas is becoming more-and-more important. Modern executives have little time for verbose, poorly written memos or documents. They need well-organized information that may be quickly scanned for "kernels" of fact, important research findings or analytical points, and, most importantly, for the author's conclusions.

This paper is developed to help students overcome some of these problems by coupling word processing technology with professional management experience. The objectives of this paper are to: (1) present a brief methodology for paper and document design and preparation, (2) provide the reader with additional examples of document design and organization, and (3) include a variety of additional word processing commands in a practical working environment.

Using the Scientific Method In Document Preparation

Preparing a document for review and evaluation in economics and finance, or any other discipline is not a difficult task. However, some thought and preparation should go into the task. Writing a paper is another exercise in critical thinking, and the process can be aided by the use of the *scientific method*. These steps are generally regarded to be as follows:

- (1) Observation of a felt difficulty
- (2) Definition of the problem
- (3) Develop a problem statement and objectives
- (4) Gathering the evidence
- (5) Analyzing the evidence
- (6) Presentation of results
- (7) Summary and conclusions

A useful first step in the completion of the paper is to develop an outline embodying the prior principles. A useful way to organize this paper is as follows:

¹ Prepared for class presentation, September 9, 2002

- (I.) Introduction
 - A. Brief statement of the subject covered (encapsulate (1) above)
 - B. Review of important background material placing topic in perspective, i.e. a brief historical review. (2) above
 - C. A statement of the reasons for the paper. (3) above
 - D. A statement of that which is to be accomplished (the objectives of the paper)
- (II.) Presentation of Results
 - A. Main body of the paper
 - 1. Research or study results are presented
 - 2. Graphs, tables and/or charts may be included or referred to in the appendices to clarify points
 - 3. This section includes the analytic results
 - B. May be "sectioned" for clarity
- (III.) Summary and Conclusions
 - A. May also include recommendations
 - B. Verifies or rejects the major hypotheses expressed in the introduction to the paper
 - C. Encapsulates the main findings in a few sentences or paragraphs
 - D. Should be brief and to the point
 - E. May be in the form of an abstract for longer documents

Organization of the Introduction.

An introduction for an eight or nine page paper should probably be less than one page long. Too much historical review will cause the manager's mind to wander, or the individual may lose interest in reading. Remember, the person has a myriad of responsibilities and a limited amount of time to read the analysis. Your ability to write brief, concise and analytically sound reports will separate you from your peers.² The introduction for this paper is only two paragraphs, however, it includes the reasons for writing the paper, and in addition, includes the specific objectives of the analysis. Even though objectives may not be explicitly stated, as in the case of a single purpose paper, they should be kept in mind. Nothing is worse than a paper beginning on one topic and ending in another.

² Purchase of a good technical writing manual or reviewing technical writing references on the Web are both worthwhile investments. Practice and perseverance will pay off.

Organization and Presentation of the Results.

A seven or eight page paper will require at least one-half hour for a casual reading, and even more time will be required for critical analysis; however, the busy executive may elect to spend 10 minutes or less in the task! Therefore, you need to hone your skills and provide a mechanism for capturing the individual's attention when the document is being "skimmed."

Sections, Subsections, Special Effects.

An effective way of separating the major points in the document is through the judicious use of headings and subheadings. In this paper, the major headings are centered and boldfaced. The next major point could be a boldfaced-underlined-inset-left margin. Another subheading could be a left margin heading which is boldfaced-italics but not underlined. A third subheading might be a left margin subheading that might be boldfaced underlined italics and so on.

The technique accomplishes three objectives: (1) A table of contents may be easily constructed for longer documents, (2) Major ideas are highlighted for easy discovery and reading, and (3) the technique forces the writer to concisely capture the major ideas of paper in a phrase; moreover, key words may be accentuated. One caveat should be observed. The technique should not be abused by shredding the paper to bits with one or two sentence paragraphs.

Fancy Fonts:Phoo..!

While enhanced printing and alternative fonts are fun to use, they may evolve into a major distraction if they are employed too frequently, and/or without a sense of order. Use italics and boldfaced print sparingly in the text.

Many techniques in document design, layout and presentation are permissible. Consistency and clarity should be the bywords!

Integrating Tables.

Tables and graphics provide an effective way of presenting results. However, they should be of sufficient importance that data are described and summarized in the text of the document. In the case presented below, a table is used to summarize test scores of students of the arts as compared to their colleagues. It contains sufficient information of importance that only a table could be used to provide the information.

Students of the arts continue to outperform their non-arts peers on the SAT, according to reports by the College Entrance Examination Board. In 2001, SAT takers with coursework/experience in music performance scored 57 points higher on the verbal portion of the test and 41 points higher on the math portion than students with no coursework or experience in the arts. Scores for those with coursework in music appreciation were 63 points higher on the verbal and 44 points higher on the math portion.

Table 1. SAT Scores for Students of the Arts: 1999-2001

| Course Title | Verbal Mean Scores | | | Math Mean Scores | | |
|------------------------------|--------------------|------|------|------------------|------|------|
| | 1999 | 2000 | 2001 | 1999 | 2000 | 2001 |
| Acting/Play Production | 543 | 542 | 541 | 532 | 532 | 531 |
| Art History/Appreciation | 518 | 517 | 518 | 517 | 518 | 518 |
| Dance | 514 | 514 | 512 | 508 | 510 | 510 |
| Drama: Study or Appreciation | 534 | 534 | 534 | 521 | 522 | 523 |
| Music: Study or Appreciation | 538 | 538 | 539 | 534 | 537 | 538 |
| Music Performance | 530 | 532 | 533 | 531 | 534 | 535 |
| Photography/Film | 526 | 526 | 527 | 524 | 526 | 526 |
| Studio Art/Design | 525 | 524 | 525 | 527 | 528 | 528 |
| No Arts Coursework | 477 | 477 | 476 | 492 | 496 | 494 |
| Honors Courses | | | 565 | | | 564 |

Data for these reports were gathered by the Student Descriptive Questionnaire, a self-reported component of the SAT that gathers information about students' academic preparation.³

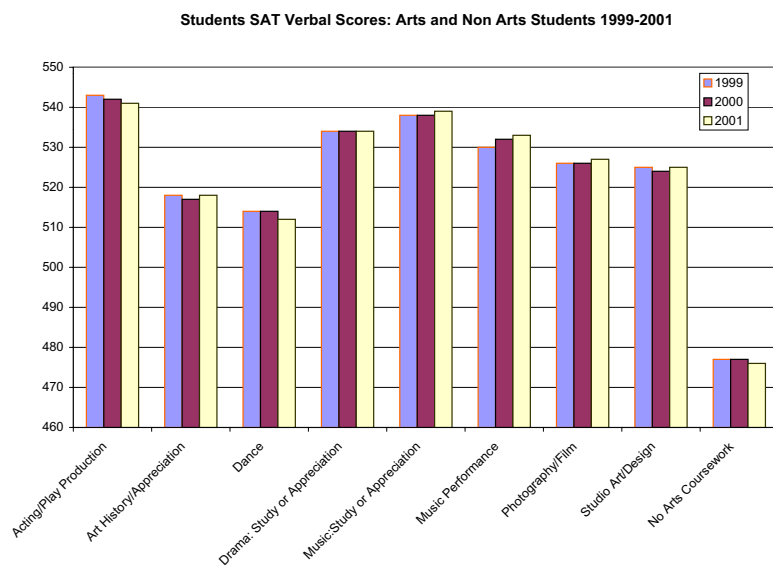
The previous table has some positive and negative attributes. While it contains interesting information, specific references to tabular entries are not made. In addition, the text makes reference to non-arts majors, but tabular information concerning relative performance is included as a one-line summary, which is easy to overlook in a table. These data might better be understood by presenting the data in graphic form. The choice of graph is important.

³ Reported by the National Association for Music Education, <http://www.namenc.org/information/advocate/sat.html>

Integrating Figures.

Graphics provide an effective way of presenting results. However, the choice of graph should be thought out before it is inserted in the text. Microsoft Excel© provides an excellent mechanism for generating graphs from data. It is easy to experiment with varying choices of graphs using Excel. These same data are presented in a different way in Figure 1. However, only three relationships are presented, since all six would provide a cluttered chart. A second graph could show the second set of test scores for math performance. The graphic presentation of these same data produces the dramatic difference discussed in the text, which would have been easily overlooked if the author had depended on it to prove the point.

Figure 1. Students SAT Verbal Scores: 1999-2001



Some cautions are advised, depending on how the graph is to be integrated and published. Particular types of graphics files publish better than others. Files saved as TIF, GIF or other formats may produce fuzzy results when printed. The best for formal publishing are those produced as EPS files.

Some dexterity is required in producing EPS files and integrating them with a Microsoft Word document. Adobe Acrobat© will produce good EPS files from Excel©, Word© or just about any program with which it is integrated. Word© is not a great page layout program. As an aside, Acrobat© also produces excellent documents if the results are going to be posted on the Web, because it effortlessly generates PDF files. Acrobat© is available on the College Web server, so it is accessible by all. These types of files are small and compact and can produce vivid Web color. Try it!

One of the best of the page layout publishing programs is Adobe PageMaker©. Another excellent program is Quark Express©. These programs handle graphics precisely and well.

Table of Contents and Figures.

A Table of Contents for a short paper, such as this one, is not necessary. However, for a paper of 10 pages or more, a Table of Contents facilitates reader's access to vital information. It is not difficult to build with a word processor. Several differing types of tables may be developed using style keys.

Summary and Conclusions

Document design, preparation and layout are facilitated by the use of the scientific method. This regimen forces the author to think about that which is to be written and how it is to be presented. The word processor aids in this task by allowing the analyst to develop a project outline from which the main document evolves. When the paper is written, it may be segmented into appropriate sections. Ideas may also be edited and at the same time, evidence central to the main argument may be developed and polished. Enhanced printing techniques may also highlight important findings and key words. The inclusion of tables also helps to provide in-depth information of data intensive results. However, they should be referenced in the text or not included. Graphics also produce vivid, easily understood results.

Expressing ideas, communicating with others, and organizing and managing staff who prepare documents and correspondence is a central executive responsibility. Every manager should master the basics of word processing, document design and layout. Acquiring this skill will pay off in increased individual and firm productivity.

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