CS 497 Standards Manual

An Honors Thesis (CS/ID 499)

by

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Thesis Director

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Muncie, Indiana

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This thesis project consists of a revision of the standards manual used by the Software Engineering course (CS 497). The result of this thesis project will be used as a handbook for standard guidelines to the Software Engineering course until such time that it needs further revision.

This project has allowed me to combine my interests in Computer Science and English by utilizing the skills learned during my study in both my major (Computer Science) and my minor (Preprofessional English). I first thought of this thesis when taking the Software Engineering course myself and upon hearing that as a class we would be attempting to revise the standards manual during the next semester. By revising the standards manual as a team (co-written) project the revisions were much more extensive and in depth than if the class had attempted it as a 32 member group project.

Thus, this project has not only been an educational experience in both technical writing and software documentation techniques but also in the interaction of small teams—both the advantages and disadvantages of collaboration.
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B Group Evaluation Samples

C Allocation of Points

D Sample Letters of Thanks

E Blank Forms

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497-2 Weekly Team Reports
497-3 Project Task Schedule
497-4 Systems Project Proposal
497-5 Meeting Log
497-6 Comments on Project
497-7 Team Member Schedules
497-8 Composite Team Schedule
497-9 User’s Comments on Standards Manual
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Data Dictionary Forms
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NAME OF STANDARD:
Guidelines for Software Engineering I (CS 497)

CATEGORY OF STANDARD:
Computer Science Program, Systems Analysis (Requirements and Specifications) phase of the Software Life Cycle.

EXPLANATION:
This standards manual is modeled after systems standards manuals used in industry. The purpose of such a manual is two-fold:

1. To provide the student with exposure to and experience in using a standards manual.

2. To provide guidelines for performing and documenting of projects.

   This manual is meant to aid the student in achieving more professionalism in systems analysis.

There are three major parts to this manual. The first part is general information associated with the course. The second part is general information associated with the software engineering lab. The third part deals specifically with the major project.

There is a suggestion sheet at the end of this manual for future users to modify this manual by means of helpful comments. The professor will specify the due date for user comments.

APPROVING AUTHORITY:
Course Coordinator, Ball State University, Computer Science Department.
MAINTENANCE RESPONSIBILITY:

Scheduled maintenance of this manual may be performed by appointed student(s) in the course as a part of course requirements. The student(s) will be chosen by the professor teaching the course at the time. Updating will be done as often as deemed necessary.

ACKNOWLEDGEMENTS:

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INTRODUCTION

Part I of this standards manual provides general information about the course requirements. One should develop a general understanding for the scope of this course after reading Part I.

Part II of this manual is a general overview of Ball State University’s software engineering lab. It includes descriptions of the different tools currently being used at Ball State.

Part III of this standards manual provides a detailed outline and description of the requirements for the major project. It includes descriptions and examples of the forms which are submitted to the instructor, as well as, explanations of some of the systems analysis tools which will be used to complete the major project presentation and report.
PART I

OVERVIEW OF COURSE

1.1 GENERAL INFORMATION

This section presents an outline of course activities, an overview of the Final Report produced (Systems Analysis Document), and a time guideline to determine if the major project is on schedule.

1.2 COURSE ACTIVITIES

1. Each team will submit a Weekly Progress Report which includes:

   - Weekly Team Report
   - Meeting Log
   - Project Task Schedule
   - Weekly Progress Report (which includes an abstract from an article read from COMPUTERWORLD or a professional journal in software engineering). This report must be submitted for each team member.

   Part III contains a detailed description of each of the above reports.

2. A Major Project which involves the analysis of some system as a team. A team is not limited to selecting a business type of system. The Systems Analysis Document is the final document submitted as a result of the analysis. The Systems Analysis Document is described in detail in Part III. Below is a general outline of some of the items this document must include. This outline is provided to make the student aware of the scope of this course in the beginning.

   a. Executive summary.

   b. Narrative description of existing system, people, goals, problems, organization chart and functions.

   c. Narrative description of data flow diagram.

   d. Alternative system proposals.
e. Proposed system with new DFD (data flow diagram), justification and implementation of the new system.

f. Structured specifications.

g. Appendix
   lower level data flow diagram
   data dictionary
   mini-specs
   documentation of interviews and research
   pamphlets and materials collected
   samples of forms used
   bibliography

NOTE: The Systems Analysis Document MUST be turned in on the date stated by the instructor.

3. Presentations

   a. Each team member will give a milestone report over their part of the major project.

   b. The team will give the major project presentation.

1.2.1 OVERVIEW OF A SYSTEMS PROJECT

Phase 1. Study existing system.

Phase 2. Analysis to develop requirements and solutions.

Phase 3. Develop structured specifications.

Phase 4. Production of the systems proposal report for presentation and for approval by management of the system proposed for implementation.

Phase 5. Design of the proposed system.

Phase 6. Development of proposed system.

Phase 7. Implementation of the new system.

Phase 8. Operation of the new system.

The major project in CS 497 will involve the first four phases, not all eight, because of time, experience, and associated limitations. Phases 5, 6, and 7 will be done in CS 498. The activities involved with the major project include:
> Selection of a group leader.

> The systems project proposal.

> Documentation of the existing system (problems, personnel, and systems functions and user requirements).

> A preliminary class presentation, the Milestone Report.

> Analysis of the existing system and development of a model.

> Analysis and feasibilities of alternatives, including cost analysis.

> Producing the systems proposal report and structured specifications.

> Class presentation.

Refer to DeMarco for more detail on how to perform these activities.

1.2.2 ITEMS TO BE COMPLETED

The following is a list of items which must be done in order to successfully complete CS 497. The dates for most of these items will be determined by the professor.

> Taking two exams on the assigned readings.

> Turning in weekly progress reports (both team and individual).

> Attending and participating in all team meetings.

> Producing an acceptable system project proposal.

> Presenting a Milestone Report to the class which conforms to the standards outlined in this manual.

> Producing an accurate and thorough Systems Analysis Document.

> Performing a formal presentation of the major project to the class in accordance with the standards described in this manual.

> Turning in on the required date your evaluations and a division of the points.
Deliver the Systems Analysis Document to the professor and client-partner. If the package is late, points will be lost.

Following standards in all aspects of the project and final product.

Obtain a written statement from your client-partner stating that he or she has received the Systems Analysis Document and is in agreement with the report.

1.3 COURSE CHECKLIST

This checklist is a guideline to help you allocate the team’s time in order to complete the requirements of this course as scheduled. Detailed explanations of each topic are included in Part III. DO NOT POSTPONE!!

Week 1-3  Choose teams.
Select team leader.
Complete composite team schedule.
Find a suitable project.

Week 4-7  Conduct interviews and/or research to get an overview of the system being studied. Start to build detail of the system. Document all visits, phone calls, and interviews with your client-partner and employees. Keep a record using either Form 497-10 (see appendix) or any word processing system available to you. This documentation will be part of the final report.

Also, probably around the seventh week, each team member will be required to present to the class, a Milestone Report.

Week 8  Should be well into data flow diagrams. (All team members need to approve DFD names and representations.)

Week 9-10  Walk through DFD with client-partner.
Do the data dictionary.
Start considering alternative solutions. What does the system really need? Hardware alternatives? What’s available? What’s applicable?

Week 11-12  If required, conduct on-site visits of vendors to review equipment. Check magazines, journals and vendor manuals regarding applications, service records, physical requirements, etc. Check software packages (if applicable).
Week 13  Assign presentation responsibilities (if you have not already done so).
Rough draft of final report.
Narrative, analysis, and alternatives. Decide on best alternatives
and establish "why".

Week 14-15  Final copy of systems proposal report including Structured Specifications,
i.e. DFD, DD.
Get visual aids for presentation completed.
Do dry run of presentation.

Week 16  TOO LATE!!!  IT IS DUE!!!
PART II

AVAILABLE HARDWARE AND SOFTWARE

2.1 CASE TOOLS AND THEIR USES

CASE is the acronym for Computer Aided Software Engineering. CASE tools are software packages that aid analysts in such tasks as drawing data flow diagrams and keeping a data dictionary.

2.2 SOFTWARE ENGINEERING LAB

We have some CASE tools in the Software Engineering Lab, which is located in RB 356. There are ten IBM Personal System 2 (model 50Z) computers, a laser printer, two dot matrix printers, and other IBM machines in the lab. The CASE tools available are DesignAid, Excerlator, SA Tools, and EPOS. Due to their power and ease-of-use, the predominant tools used in our course are DesignAid and Excerlator.

2.3 MANUALS AVAILABLE FOR DESIGNAID

1. DesignAid Tutorial
   (a) Learning the basics
       - entering DesignAid
       - accessing a dictionary
       - moving through the menus
       - working with DesignAid files
   (b) Learning more about DesignAid
       - editing documents
       - working with a dictionary
       - additional word processing features

2. User’s Guide
   Shows how to apply DesignAid to your own systems project.

   (a) alphabetical listing of all DesignAid features and commands and how they work
   (b) explanation of error messages
4. DesignAid Quick Reference Guide
   (a) illustrates functions of the keyboard while in DesignAid
   (b) included is a list of expert mode key commands

5. DesignAid Menu Map
   (a) graphically illustrates DesignAid menu hierarchy
   (b) helps one recall from which menu a given command is available

2.4 MANUALS AVAILABLE FOR EXCELERATOR

1. Excelerator Tutorial
   (a) Introduction
      - general terminology
      - describing tutorial procedures
      - executing commands from the keyboard
   (b) Tutorial Sessions
      - getting started
      - using the mouse
      - using presentation graphs
      - working with data flow diagrams
      - using the dictionary facility
      - analyzing your project data
      - creating screens and reports
      - using the edit keys
   (c) After the Tutorial
      - documentation
      - XLD interface
      - housekeeping

2. User's Guide
   Shows how to apply Excelerator to your own systems project.

3. Reference Guide
   (a) Chapter 1 contains information that apply to Excelerator as a whole. It is divided into five sections:
      - description of documentation set
      - discussion of main menu and action keypad options
      - basic information (how to use the mouse, etc.)
      - how to use menus and respond to prompts
      - how to isolate subsets of data for reporting, analysis, and sharing
   (b) Each of the other seven chapters corresponds to a main menu option.
PART III

MAJOR CLASS PROJECT

3.1 INTRODUCTION TO PART III

The major objective of CS 497 is to produce a Systems Analysis Document for the major project. Included in the document will be the structured specification. The project should be reasonable in size - large enough to be meaningful but not impossible to accomplish. The proposed solution should be in the best interests of the studied system, whether it be to computerize or not to computerize, to purchase software packages, or to develop in-house software. The structured specification serves as the basis for designing and coding the proposed system in CS 498. It must be thorough enough to enable structured design to be completed.

3.2 OVERVIEW OF MAJOR CLASS PROJECT

The major project is intended to give students training in the systems analysis phase of software engineering. Students are given an opportunity to apply the knowledge acquired in the course to a "live" environment. Studying the network of interactions within a existing organization as a system, students are expected to analyze the systems process, find the problems, and suggest new and improved methods for performing the system operations effectively and efficiently. The major project must be a group project and not a collection of individual subprojects. The students are urged to exchange ideas and materials at their group meetings in order to inform the other team members as to the progress made since the last meeting. In this way the work flow is facilitated, and new assignments can be made to each team member by the team leader. The major project provides students with experience in working with other people and with all the difficulties and benefits involved. The student should learn some of the aspects of software engineering, in detail, such as:

> project planning
> determining user requirements
> defining the problem
> collecting data and analyzing it
> using the tools of systems analysis in order to build a model of a system
> determining alternative systems
> conducting feasibility studies
> determining system costs
> developing structured specifications
> conducting formal oral presentations  
  - planning and developing a presentation  
  - preparing visual aids (flip charts, slides, etc.)  
> writing reports  
  - structure and content  
  - planning and first draft  
  - final report production  
  - report copying and binding

The student should develop certain skills. He/she should acquire the ability to use the tools and methods of systems analysis, as well as gain a comprehensive understanding of data needs for a systems study.

### 3.3 HOW TO CHOOSE AND ORGANIZE A TEAM

(a) Try to put together a team with a mixture of skills, including some business or accounting ability, if a business system is to studied.

(b) During or prior to the first meeting, the team leader will direct each member to complete a Team Member Schedule form (497-7) and provide a copy to all other team members. The team leader will then complete a composite Team Member Schedule (497-8) using information from Team Member Schedule forms to simply X out blocks of time where one or more members have a schedule commitment. The resultant Composite Team Schedule will reveal all times that are open to the team, and provide the team leader with a ready reference as to when to schedule meetings. The team leader will provide each member with a copy of the Composite Team Schedule. You cannot have a super team if you are unable to find at least two hours to meet each week, early in the week!

(c) Determine who lives where, travel times and who has no transportation. Determine if anyone is without a phone.

(d) Determine quickly who has time to prepare the weekly team reports and who has the time and ability to interview.

(e) Determine the number of credit hours and work hours each potential member is carrying. Consider carefully the demands of other courses as well as other obligations such as family and work.

(f) Use wisely the minutes before and after class to get acquainted with one more person each day.
3.3.1 SELECTION AND RESPONSIBILITIES OF THE TEAM LEADER

The team must select a leader for the project. Consistent, uniform leadership demands having one person ultimately responsible for the team’s progress. Without such leadership, no one is able to make the difficult decisions as to the direction the team should take and which team member should be assigned which task.

The team leader is responsible for guiding the team toward solutions which will assist in project completion and dividing the project into tasks which can be equally allocated among the team members. Although the team leader is responsible for reporting the cumulative progress of the team each week, he can delegate some of the clerical duties to various team members. For more discussion of the responsibilities of group leader, see Semprevivo, Chapter 11. The weekly reports are the responsibility of the team leader as is the Systems Project Proposal.

The professor will work closely with the team leader to assist with any problems which may occur. It is the RESPONSIBILITY OF THE TEAM LEADER to contact the professor and set up an appointment, if this need should arise.

Although the team leader accepts more responsibilities, he/she will gain valuable experience which will benefit him/her in future job situations. Team leader experience would be an asset on a job resume.

3.4 GUIDELINES TO CHOOSING A PROJECT

The goal of the Software Engineering Sequence CS 497-498 is to produce a software system including all documentation. This system (package) can be of any type i.e. application or systems, but of sufficient size and complexity. Thus the system chosen should lead to a software system which meets these requirements.

This software will be developed on the Ball State academic system (VAX cluster) or on the microcomputer network in the Software Engineering Lab unless special arrangements are made with the instructor.

Guidelines:
(a) It is helpful to have a connection with an organization (firm or agency). Most Ball State operations are subjects of previous studies. Find an organization drawing on the experience and connections of team members. If you decide that your project will be to create a systems software package, you will still have to determine user requirements. Thus, it is helpful to find a sponsor. Oftentimes, teams are formed before the semester begins and potential projects are researched. If you cannot find a project, some MAY be available through the instructor.

(b) It is ideal to narrow down the problem specification to avoid too large a problem. Also, avoid a firm or agency situated far away unless a member is located nearby. No time should be lost in narrowing down the problem. It is not necessary to
limit this study to Muncie.

(c) Redefine the problem so it is manageable in twelve to thirteen weeks. Your team COULD be first to give the presentation.

(d) In order to get an organization or a sponsor to agree to the study, point out that you will give them a copy of the Systems Project Proposal and will make a presentation to them. The proposal and presentation should be given to them after it is given to the class.

3.5 REPORTS

Every week a set of reports must be turned in to the instructor so that he will be kept informed of the progress of the team. These documents should be submitted in the following order:

a) Weekly Team Report (497-2)
b) Meeting Log (497-5)
c) Project Task Schedule (497-3)
d) Weekly Progress Reports (497-1) - one per team member

Put them in a transparent binder. They do not have to be stapled in such a binder. The Weekly Progress Reports are easily returned in such a binder. An example and detailed description of each report follows. Copies of these forms are included in Appendix E.

3.5.1 WEEKLY TEAM REPORT (497-2)

1. Purpose

The Weekly Team report serves three purposes. It causes the group leader to review the team’s progress and articulate his/her conclusions, and it keeps the professor informed of the group progress in a efficient manner. This written report also provides the professor with an opportunity to comment about the project.

The Weekly Team Report should be based on the Project Task Schedule and the Weekly Progress Reports of the individual team members.

2. Description

Refer to the example after the following list.

(a) Assigned team number.

(b) Team leader’s name or that person preparing the report.
(c) Period of time that report covers.

(d) Present tasks* that have been completed, including comments, if appropriate.

(e) List delayed tasks* and give the reasons why they were delayed.

(f) List the newly assigned tasks* (i.e., those assigned since the last report). Do not give a description of the task on this form.

(g) List any special problems that have arisen.

* In referring to a particular task, use the number assigned to that task in the Project Task Schedule.
WEEKLY TEAM REPORT FOR MP-1

Prepared by: John Smith

Date Report Covers: 12/17/88 thru 12/23/88

A. Completed Tasks: 

Task 1:

B. Delayed Tasks and Analysis of Delay: 

Task 2 & 3:

J. Smith and S. Brown could not do their interview this week because of Mr. Jackson’s tight schedule.

C. New Tasks: 

Task 4 & 5:

D. Special Problems: 

It looks as if it may be difficult to meet with Mr. Jackson as frequently as needed. Bill Little reports that there is a huge amount of material on his subject and wants the problem defined more precisely.
3.5.2 TEAM MEETING LOG (497-5)

1. Purpose

The purpose of the Team Meeting Log is to keep an accurate record of the meetings and who attended. This form accompanies the project leader's weekly report on the progress of the project and must be turned in with the Systems Proposal Report.

2. Description

Refer to the example on the next page.

(a) Date, time - when the meeting was held, and length of the meeting

(b) Subject - topic discussed

(c) Members - Put an (A) by the name of members who were absent and an (L) by the name of members who were late.
### MEETING LOG

**TEAM NO. **MP-1**

<table>
<thead>
<tr>
<th>DATE/TIME (a)</th>
<th>SUBJECT (b)</th>
<th>MEMBERS ABSENT (A)</th>
<th>MEMBERS LATE (L)</th>
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<tr>
<td>4/1/88 10:00 am (2 hrs)</td>
<td>Composite Team Schedule</td>
<td>John Doe</td>
<td>Harry Smith (L)</td>
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<td></td>
<td></td>
<td>Susan Brown</td>
<td></td>
</tr>
</tbody>
</table>

497-5 (9/84)
3.5.3 PROJECT TASK SCHEDULE (497-3)

1. Purpose

The Project Task Schedule is designed to be used by the team leader for project planning and control. It provides a method of breaking down and outlining the tasks that need to be accomplished for the completion of the Major Project that is required in CS 497. This form accompanies the project leader’s weekly report on the progress of the team and should be retained throughout the entire period covering the project.

2. Description

Refer to the example on the next page.

(a) Assigned team number.

(b) Number of task in order of assignment.

(c) Name of individual to whom task was assigned.

(d) Description of the task in sufficient detail to adequately clarify the nature and extent of the task.

(e) Date when task was assigned.

(f) Date when task should be completed.

(g) Date when verification is received that the task has been completed, in the form of a written or verbal report.

3. All project tasks should be numbered sequentially from 1 to n as tasks are assigned throughout the course, NOT NUMBERED BY THE WEEK. The number of assigned tasks should be reasonable, not too many nor too few. Keep a running report, DO NOT leave any blank lines.

NOTE: Refer to Semprevivo, Chapter 11, to read about project tasks.
<table>
<thead>
<tr>
<th>TASK NO.</th>
<th>TASK DESCRIPTION</th>
<th>DATES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Director of Admissions at Small College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Interview with H. Jackson about Admissions</td>
<td>3/1/88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(with J. Smith)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(introductory session)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Prepare description of Small College</td>
<td>3/3/88</td>
<td>3/7/88</td>
</tr>
<tr>
<td></td>
<td>refer to college catalog) and list of questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admissions Office</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 24 -

PROJECT TASK SCHEDULE FOR MP-1

Assigned to: John Smith

Assigned to: Sara Brown

Assigned to: Gerald Taylor

Assigned to:
3.5.3 WEEKLY PROGRESS REPORTS (497-1)

1. Purpose

(a) Each student quantifies his own time at periodic intervals and evaluates the amount of progress being made.

(b) Students communicate problems and accomplishments to the professor without utilizing class time.

(c) Students plan their time for the next week.

2. Description

Refer to the example on the next page.

(a) Course number - CS 497

(b) Name - the student’s name

(c) Date report covers - period of time covered by report

(d) Activity or Project No. - general activities during the week. For example, include: major project (listed by project number), reading Computerworld, preparing for class presentations, etc. (an article from Computerworld must be read each week.)

(e) Hours spent - approximate number of hours spent during the week on each activity. For major project, differentiate between group time and individual time.

(f) Accomplishments for the Week - brief description of the achievements for the week

(g) Problems of the Week - short description of problems encountered in relation to each activity listed in (d).

(h) Plans for Next Week - short description of the tentative goals set for the next week.

(i) The Computerworld article should be abstracted on the back of the form.
WEEKLY PROGRESS REPORT

COURSE NO. CS497  (a) Date Report Covers: ________ thru ________ (c) NAME

COMPLETE REPORT AND GIVE AN ABSTRACT OF A COMPUTERWORLD ARTICLE ON THE BACK OF THE FORM

<table>
<thead>
<tr>
<th>Activity or Project No.</th>
<th>Hours Spent</th>
<th>Accomplishments for each activity</th>
<th>Problems for each activity</th>
<th>Plans for each activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP-3</td>
<td></td>
<td>Library--found a book on payroll systems</td>
<td></td>
<td>Group meeting-- plans will be made at that time</td>
</tr>
<tr>
<td>GRP-2</td>
<td></td>
<td>Prepared general guidelines for types of input and forms needed</td>
<td></td>
<td>Continue writing and rewriting</td>
</tr>
<tr>
<td>Sempervivo</td>
<td>6</td>
<td>Caught up!</td>
<td>Never enough time! Keep up to date</td>
<td></td>
</tr>
<tr>
<td>Computer-world</td>
<td>1</td>
<td>&quot;Vague Contracts Led to Problems with Fics&quot; (Abstract on back)</td>
<td></td>
<td>Continue</td>
</tr>
</tbody>
</table>

497-1 (Rev. 5/89)
"Vague Contracts Led to Problems with Fics"  
by Alan Taylor  
December 18, 1978

The article deals with the Financial Information and Control System (Fics) supplied by Arthur Anderson & Co. to the city of Detroit. The prime problem with the system stems from the vagueness of the contract which led to unspecified expectations on the part of Detroit's people. Further, the article points out that "the Fics project team decided on systems design before it contacted departments for input." The result was an extremely inadequate but expensive ($5 million) system.
3.6 HOW TO MAKE A PROJECT PROPOSAL

Once a project is chosen and approved by each member of the team, a Systems Project Proposal must be submitted to the instructor. All projects must be approved by the instructor.

3.6.1 SYSTEMS PROJECT PROPOSAL (497-4)

1. Purpose

The main project proposal on form 497-4 should provide a reasonable description of the systems project the team is considering. The project team should also enumerate the goals and objectives of the project. There are three main reasons for this form. They are:

(a) It forces the team to decide on a project and put it down in acceptable form in writing.

(b) The professor is provided with an outline of the project the group has chosen.

(c) The professor can make suggestions, recommendations, and additions or deletions to the team project.

The third reason is especially important. It is difficult for a student, during the first weeks, to have a firm grasp of what is expected of him in the course. This way, the instructor can give sufficient guidance.

2. Description

Refer to the example after the following list.

(a) MP-____ - A number given by the instructor to distinguish among teams. If there are three teams, one will be referred to as MP-1, one as MP-2, and one as MP-3.

(b) Course - The course number of this class, CS 497. Date report is submitted.

(c) Describe the purpose of the proposed system. State the basic goals of the system. When finished, what will be the major accomplishment?

(d) List the functions to be performed by the system. (These are the specific areas the project will entail.)
(e) Initial Problem Statement - List the appropriate goals and objectives associated with the proposed system.

(f) Team Leader - Name the selected project leader or manager who is responsible for all aspects of the project deadlines, clarification, and accuracy.

(g) Names - Name all team members.

(h) Approved - Each team member signs to inform the instructor that all members of the team have reviewed the proposal and agree to its contents.

(i) Date - Date each signature.

(j) Name of organization to be studied.

(k) Approved - The instructor signs the proposal informing team members that their project has been examined and they have clearance to proceed.

(l) Date - Date of project approval by the instructor.

3. It is important to note that any deviation from this proposal or changes after the project has been approved must be once again agreed upon by all team members, stated in writing, signed by all members, and resubmitted to the professor. All work must be suspended in the new area pending approval by the instructor.
SYSTEMS PROJECT PROPOSAL

MP-1 (a)

COURSE: (b) CS 497 DATE: 1/1/89

Supply the requested information. If necessary, use additional paper on one side only and staple to the back of this form.

(c) Describe the purpose of the proposed system.

Service bureau, handling the payroll of many companies.

(d) List the functions to be performed by the system.

1. Perform file maintainence.
2. Coordinate all companies.
3. Design priority pay service.

(e) Initial problem statement (i.e., goals and objectives of the proposed system).

1. Always have jobs done on time.
2. Minimize theft.
4. Maximize security.
5. Maximize profit.

(f) Team Leader

<table>
<thead>
<tr>
<th>(g)</th>
<th>(h)</th>
<th>(i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(f) Team Leader</td>
<td>John Doe</td>
<td>Approved</td>
</tr>
<tr>
<td>Jim Shoe</td>
<td>1/1/89</td>
<td></td>
</tr>
<tr>
<td>Bill Board</td>
<td>1/1/89</td>
<td></td>
</tr>
<tr>
<td>Candy Cane</td>
<td>1/1/89</td>
<td></td>
</tr>
</tbody>
</table>

(j) Name of organization to be studied: Payroll

******************************************************************************

(k) Approved: T.H.E. Prof (l) Date: 1/2/88

497-4 (rev. 2/81)
3.7 DOCUMENTATION OF THE EXISTING SYSTEM

The first phase of the systems project involves obtaining a representation of the existing system in order to identify problems, personnel and system functions and user requirements. The document is then used to build a model of the existing system as shown in DeMarco.

1. What is being done?
   This section identifies the current system's user community by use of the following:
   • Organization chart which establishes formal roles and communities in the organization.
   • Department functions which describe tasks and activities as well as who performs them in the organization.
   • Key contacts in the organization.
   • Inputs and outputs from the particular subsystem under consideration.
   • What responsibilities does the subsystem have, or what functions does it perform and for what is it not responsible?
   • What are the boundaries of the subsystem with the larger system, and how is the interfacing performed with the larger system?

   The information for the above will be obtained from visiting the organization being analyzed and interviewing the client-partner and employees (users). Each visit, phone call, and interview should be fully documented using Form 497-7. Extensive documentation assists in building an accurate model of the existing system.

   An experienced systems analyst, who is already familiar with his/her system, would possibly omit this phase or at least modify it.

   If your project is for systems software, certain obvious modifications are required.

2. How is it done? (i.e. build a model)
   A detailed description of processes, structure, and elements of the existing system is stated here. Some of the tools that must be used to make this description precise are the following:
   • Data flow diagrams
   • Data structure diagrams
   • Narrative general description of the system
   • Structured English
• Data Dictionary
• Mini-specs
• Decision tables or trees
• Organization chart
• Physical layout
• Narrative description of forms used with samples

DeMarco and Semprevivo contain examples of these tools.

3.7.1 EXISTING SYSTEM’S LIMITATIONS

The documentation of the existing system’s limitations often provides a good reference point for explaining why things are done in a certain way in the organization. The documentation should contain the following:

• The organization’s business policies, standards, forms, practices, and functions
• The procedures used in performing a given job or function
• Space within which a job is being performed (physical layout)
• Volume correctly handled in terms of workload distribution
• Current system’s cost
• Error rates in job performance
• Time needed for job completion
• User or customer frustration
• Excessive overtime
• Delays in the system
• Lack of efficiency
• Lack of job motivation
• Ease of use (user friendliness)

Write a precise problem statement. The identified problem or opportunity should be documented and analyzed since it warrants explanation. The documentation should be a narrative description of the problem. Some of the common problems encountered are:

* Job duplication
* Job overlap
* Frequent backtracking
* Job inconsistencies
* Job delays
* Poor workload distribution
After the documentation and a precise problem statement has been completed, an analysis of the system can begin. From the analysis of the system, its problems, and procedures, the specifications for a proposed system can be listed.

3.7.2 GENERAL SYSTEMS DOCUMENTATION STANDARDS

In system documentation for this project, certain standards must be followed for readability and completeness. Documentation standards for what should be included in the system documentation are that all facets of the system must be described in detail either within the documents themselves, or pointing to available literature describing certain operating procedures, equipment, task schedules, and requirements of the job. A new employee of the organization or a user of the system should be able to determine the nature of the (system) organization from the system’s documentation. The following are what should be included within the system documentation:

- The tasks (functions) to be performed, and in what order or sequence.
- Task Performance
  How to perform the necessary tasks, including a compilation of the errors previous personnel have encountered, and how the errors or problems were solved. Due to the dynamic nature of such errors, it would be good for the system documentation to be maintained on disk so that updating and adding errors would be facilitated, as well as providing the ability to quickly generate legible copies containing the latest revisions.
- Software
  A list of the software of the system, and user guidelines for each program which would be used. Also, for ease of program modification, program documentation should include what each program does and how. Without program documentation, revisions become costly in regard to the time needed to understand the program. Furthermore, the date the program documentation was written should be included as well as revision dates, and the names of the author and revisionist.
- Hardware and Maintenance
  A list of the hardware, including the maintenance companies (with contact names and numbers) should be included since nearly all equipment fails upon occasion. If appropriate the computer architecture should be given. Maintenance which has been done in the past should point out reputable maintenance companies from personal experience.
- Hierarchy
  An organization chart indicating the hierarchical structure of the system.
• Personnel
A list of personnel who are part of system and the tasks each are assigned, with the level of training required for each position for future hiring purposes. Such a list is useful in any system, and should be included in the major project report for the teams’ activities during the semester. The interviewer in each contact should be noted on the documentation form (Form 497-10).

• Data Flow Diagrams
Data flow diagrams should be part of the system’s documentation to explain how data flows through the particular system under study, and how the data is processed by the system. Data flow diagrams will be used at several locations in the system’s documentation depending upon their content as well as their level of detail.

• Data Dictionary
A Data Dictionary fully describing all the data items needed by the system should be included. A Data Dictionary would answer the hypothetical question, "What information do we carry on the invoice file?" Data Dictionary forms which should be used are in Appendix C. (If you plan to use a word processing system, then you can create these forms but the professor must approve them).

• Costs and Benefits
Costs of operations should be included to enable comparisons of current costs with those of previous years, and to show how the cost of the system is spread through the system’s personnel, software, and hardware. Tangible and intangible, direct and indirect, recurring and non-recurring costs and benefits should all be put into the system’s documentation so that costs can be studied. System overhead costs should also be included.

• System Forms Examples
Examples of all the forms of the system should be part of the documentation, because information flows through a system, at least in part, on the forms.

• Historical Records
In a system which is changing (and most do) historical records about the system should be kept to allow studies of where the organization was, and how it arrived at its present state.

The documentation of a system should be such that after reading and understanding that documentation, a person new to the (system) organization can understand what the schedules are, what is expected of him or her, and the methods for doing the necessary tasks. This is especially necessary in systems with a rapid employee turnover, since new employees must be trained in as short a time as possible.
3.8 MILESTONE PRESENTATION

The milestone presentation consists of a formal presentation of the group's project to that point. Each member of the team will be required to speak for approximately 15 minutes on some aspect of the group project. This presentation is to be treated as a preliminary project presentation to a group of peers in an organization to assure that the team is on the right track and is to be presented in such a manner as to solicit comments from the instructor and class members on how to better the project.

The purpose of this presentation is to describe the project and the progress that has been made up to the time of the presentation. Each team member will be graded based upon the following criteria:

(a) The method of the presentation including the eloquence of the speaker.
(b) The content of the presentation.
(c) The quality of visual materials used.
(d) The smoothness of transitions between speakers.
(e) How questions addressed to the group are answered.
(f) The ability to present the proposal in such a manner as to convince the listeners of its soundness up to that point and how the project will proceed from that point.

Some suggestions for improving the presentation are:

> Visual aids are a means of conveying detailed points quickly and accurately; therefore, visual aids are MANDATORY! Acceptable ones are
  - overhead projector slides
  - charts (18" x 24" charts on an easel)
  - opaque projector slides
  - maps
  - any other deemed necessary and approved by the professor before the lecture.

> All visual aids should be readable from various locations within the classroom and high enough so as to not be blocked by front row students.

> When drawing charts or highlighting aspects of a slide and using multiple colors, there should be no more than three (3) colors per page. The colors are to be limited to black, red, blue, green, and purple.

> When using flow charts to demonstrate a point, one should adhere to the standards indicated in the texts.

> Thorough preparation is necessary for the presentation to professional. Attention should be given to format and style of presentation.

> Dress for the milestone presentation may be casual but the general appearance should be neat and clean.