



6.111 Papers

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28 September, 2005

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Introduction

- Why documentation is important
- What is a document
- The elements of a 6.111 lab report
- How to write the report
- Focus on the *Overview*



Importance of Documentation

- Clarifies and fixes ideas and procedures
 - For designers
 - For others
- Record of project
 - For further modifications and adaptations
 - For troubleshooting
 - For avoiding needless repetition of work

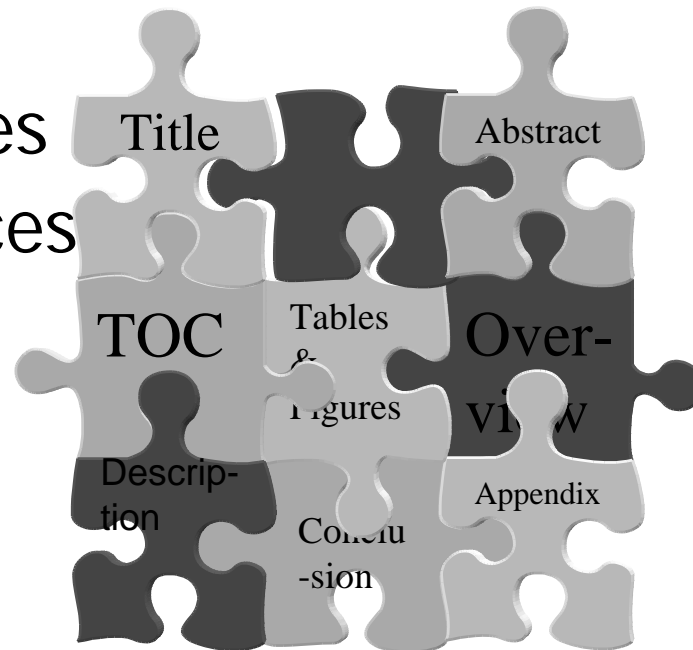
Importance of Precision

Sloppy facts and lack of precision can also destroy things

- Confusion over units of measure destroyed the Mars Lander
 - Engineers at NASA's Jet Propulsion Laboratory thought they were dealing in *metric* units -- or newtons per second -- when calculating spacecraft thrust,
 - The Lockheed Martin Corp. team that built the system had programmed the measurements in English pounds per second.
- The difference took the craft about 60 miles off course and into oblivion.

What is a document?

- Like your 6.111 Project, a document is an artifact that is designed and produced
- It is created
 - For specific purposes
 - For specific audiences
 - For specific uses
- It is modular





Elements of 6.111 Report

- Title
- Informative Abstract
- Table of Contents
- List of Figures
- List of Tables
- Overview
- Description
- Conclusions
- Appendices



How to Write the Report

- Write it in stages
 - Overview
 - Tables
 - Figures
 - Description
 - Conclusion
 - Appendices
 - Lists of Tables & Figures
 - Table of Contents
 - Abstract
 - Title



Overview

- Establishes the context and purpose of project
- Description of the whole before the parts
- Independent of abstract



Elements of the Overview

- Background and context
- Statement of problem
- Description of device's purpose
 - What does it do?
- Description of device's uses
 - How does a user use it?
- Brief description of subsystem organization
- Road map for reader



Sample Overview IA

In any business or multi-user environment where phone service charges are made on a per call basis, it is desirable to keep a log of phone calls so individual calls may be charged to the actual callers. In addition, it is convenient to be able to dial frequently called numbers easily and to redial the last number that was dialed. The intent of this project is to demonstrate a system which performs these functions.

Sample Overview IA



■ **Context**

In any business or multi-user environment where phone service charges are made on a per call basis,

■ **Problem and Main Purpose**

it is desirable to keep a log of phone calls so individual calls may be charged to the actual callers.

■ **Additional Objectives**

In addition,

- it is convenient to be able to dial frequently called numbers easily and
- to redial the last number that was dialed.

■ **Summary Statement of Project**

- The intent of this project is to demonstrate a system which performs these functions.

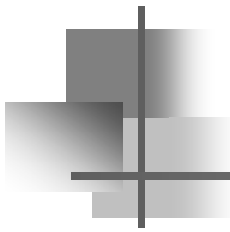
Sample Overview IB – User Perspective

The user of this system sees an ordinary telephone with a few additional switches and indicator lights. The attached keypad produces the standard telephone tones. When the user picks up the receiver, she is prompted by a light to enter her two digit identification code to gain access to the phone system before being prompted to dial a phone number. The user may, if she wishes, turn on the “set” switch to set a short code. She is then prompted to enter a one digit short code. After entering this digit, the user enters a normal phone number. When she is done, she turns off the “Set” switch. The user may dial normally, automatically redial the last regularly dialed number by entering a *, or may use the autodial function by entering # followed by the short code digit. The user may hang up at any time. If the user wishes to place another call without reidentifying herself, she may press the pre-redial switch.



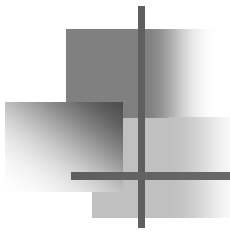
Sample Overview IC – Additional Functions

At any time when the phone is not in use, the phone call log may be produced. The “Bill” switch is depressed, causing a complete output of all previous calls. The record contains the user’s identification code, the date the call was made, and the actual number dialed. The day can be set to a number from 1 to 366, which specifies the day of the year. Two switches are available to change the date: one to simply increment the day by one, and the one which rapidly increments the counter while the switch is depressed.



Sample Overview 1D – Summary of Design

The project is divided into two main modules, called the “master” and the “slave”. The master monitors the actions of the slave and regulates the flow of information to and from the slave. The slave is responsible for all the interactions with the use, including auto-dial functions. A key element in the project is modularity. The master and the slave can be thought of as two semi-independent systems. For instance, the master has no way of knowing whether normal dialing or auto-dialing has produced a digit. A simple “ready-acknowledge” handshake is used to send digits to from the slave to the master. The two modules are in reality asynchronous, although for convenience they happen to run off the same clock. Because the two systems are modular and asynchronous, they can be tested independently.



Sample Overview IE – Advanced Organizer

This document describes the device's design and performance specifications followed by the testing and debugging procedure used in its development. Two minor technical problems are then noted and recommendations for further development are offered.