



# Experimental Design

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April 3, 2003



# Project Description-Goals

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- better spatial representation for reading digital documents on a computer screen.
- Can a better spatial layout be delivered?
- by understanding if and why spreading paper out in front of you could be better than having it spread out on a screen.
- Why is this worth doing?
- It will help us design better applications for reading of digital documents on a computer screen.



# Project Description

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- Experimental Design
- 10 subjects per cell
- No training
- Between subject study
- Each subject will be given the same set of task
- And the same document



# Population

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- 40 undergraduates from Georgetown university.
- Average knowledge and experience with computers
- Age, race, gender are not important



# Hypotheses

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- Null Hypothesis: document format does not affect the speed at which user can reference details from a multi-page document.
- Hypothesis A: Subjects using unbound document will be able to answer the questionnaire in less time than subjects in the other groups because they have more formats.
- Hypothesis B: subjects referencing a document using Multipage views (digital across screens and unbound paper) will answer the questionnaire faster than subjects using single page views.



# Variables

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- Independent Variable: the format of the document(medium+layout) by which the document will be read
- Dependant Variables: the time it takes to complete the questionnaire.



# Tasks

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- Subjects will be asked to read a 4 page document through once.
- Subjects will then be asked to answer a questionnaire about the content in the document, in which they will be allowed to reference the document.



# Procedures

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- The subjects will first sign a consent form (sample attached)
- Subjects will be instructions on what will be expected of them.
- The subjects will be split into four different groups: bound paper, unbound paper, digital linear, and digital across screens.



## Procedures (cont)

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- In the paper group subjects will be sat down at a desk
- Subjects in the digital across screens group will be sat down at a machine with two computer screens.
- Subjects in the linear digital group will be sat down at a computer with one screen.



# Procedures (cont)

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- Subjects in the linear group will read the document linearly on a computer screen, using Adobe Acrobat 5.5.
- In the digital across screens group the subjects will be sat in front of two computer screens to read the document.
- Subjects in the bound paper group will be given the same document, which will be stapled.
- Subjects in the unbound paper group will be given an unstapled document.
- All subjects will be asked to read the document. This will be an un-timed exercise.



# Procedure

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- At the completion of this task, the subjects will be asked to fill out a questionnaire about the document that was just read, being able to reference the paper at will.
- Subjects will be timed on how long it takes to complete the questionnaire.
- At the completion of the questionnaire. Subjects will be asked to fill out a post-test questionnaire.
- This will give some feedback about the experiment and the background of the subjects.
- The study will take between 30 and 45 minutes including instructions and post-test questionnaire



# Apparatus

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- A history of computing essay will be used as the document. It contains names, dates, and tables with data.
- This document was picked because subjects will not retain information as easily with one read through. Because the subjects are unfamiliar with computer science hence not likely to remember names, dates, and table data.
- This will allow for the users to have reference the document to answer the questions on the questionnaire.



# Apparatus(cont)

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- The number of pages was chosen to be a 4 page document.
- 4 pages was picked because <4 page is too trivial(most likely no difference between bound and unbound) and anything greater than 6 pages, subjects even with a physical layout space is often limited.

# Apparatus(cont)



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- Printed paper
- Computer with Adobe Acrobat 5.05
- Two computer screens each showing document using with Adobe Acrobat 5.05