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DocuTech open job submode simulation

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DocuTech Open Job
Submode Simulation
A Masters of Fine Arts Thesis

by
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November 5, 1993

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A BICKERSTAFF / M.F.A. THESIS

NOVEMBER 5, 1993
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Executive Summary

This project consisted of the development of a computer-based simulation for Xerox' DocuTech Production Publisher. The simulation is a component of DocuTech operator training.

The simulation displays various design features such as, menus, practice jobs, evaluation screens, and feedback. A formative evaluation was conducted and incorporated into the final product.

Conclusions about the role of computer animation as a "design perspective" and the role of "functional art" are included.
Acknowledgments

Thanks

I would like to thank Michael Yacci, Steve Kurtz, and Erik Timmerman for all your help in producing this thesis. I could not have done it without your patience.

I would also like to thank Carole Tomczyk, my manager at Xerox, who allowed me to use this simulation as my thesis and whose laughter kept me programming.

Thank you to Brian Willson, a RIT co-op, who thoroughly tested the simulation time and time again and Alex Elyjiw, who read my thesis many times.

Most of all, a special thanks to Lori Roesner, a Xerox CBT Training Analyst, and good friend. Thank you for being my motivational support.

Dedication

This Thesis is dedicated to my family whose moral support was greatly needed and appreciated.
Introduction

What does computer-based training (CBT) have in common with art?

Artists have always striven to produce artwork under various constraints and conditions. Trying something new was considered a rebellion and artists were often criticized. Through the ages, artists have had to overcome many obstacles, including exploring the limitations presented by their chosen media.

Building a visual interface for a computer in the past was left to the programmer. At the time this was acceptable, because only a programmer would look at it. Today, almost everybody uses a computer and appealing graphics are a must. The programmer from the past cannot just program anymore; they must design.

Creating art on the computer is no easy task. Between incompatible color cards, software, and file formats, it is a wonder people use them at all. However, if one has the patience to learn how to work within the limitations of a computer platform, ideas can be presented in new and intriguing ways.

As computer-based training becomes more popular, customers demand that programmers incorporate interesting graphics into the training course. DocuTech Open Job Submode Simulation is a combination of computer programs and visual graphics linked together to not only teach the user, but to appeal to them as well.
Background

To fully understand the development of the Open Job simulation, it is important to understand what the DocuTech is, why training is necessary, and who will be using the simulation.

DocuTech Production Publisher

The DocuTech Production Publisher is a printer that combines scanning, printing, and finishing. Refer to Figure 1. Finished output is printed at up to 135 pages per minute with a 600 spots per inch resolution. The operator loads documents to be printed into the document handler, and enters programming information through the user interface. When all programming is complete, the operator presses the Start Scan button or icon. The documents are then fed through the document handler one page at a time, where the scanner scans the page, creating a digital master. The digital master is then sent to the printer where the image is applied to the page. After the pages are made, the document is sent to the finisher where any finishing requirements such as collation, stapling, or binding take place.

![DocuTech Production Printer](image)

**Figure 1. DocuTech Production Printer**

Need for Training

The DocuTech user interface, which includes a touch screen, keyboard, and mouse, puts the digital master at the operator's command. The operator can enhance a photo or illustration, resize it, crop it, and scale it, to improve the quality of the print. All these changes are stored on the hard drive so that changes can be made at a later date.

Since the DocuTech is feature rich, a five day training course covering introductory and intermediate functionality is provided for operators. This course is taught in nine Customer Education Centers across the United States.

Target Population

DocuTech operators work in a print shop environment, which includes other equipment in addition to the DocuTech Production Publisher.

Operators are of normal intelligence, are moderately curious, and can be trained to handle the complexity of the DocuTech without becoming overwhelmed or confused.
Operator intelligence is often not the "bookish" kind that leads to good school grades, a college education, or an interest in reading.

Operators will not read documentation out of personal inclination. They will have to be trained to consult it. Their presumed reading ability is sixth-grade level.

Some operators might prefer to memorize rules and instructions, but the DocuTech requires operators to think and make decisions.

Operators are interested in learning better ways to do their jobs.

Description of the DocuTech Training

Introductory training is covered in the first two days and provides practice exercises to be completed on a simulation of the user interface. Intermediate training is covered in the remaining three days. The Intermediate training consists of instructor demonstrations and hands-on practice exercise. Recently the DocuTech Intermediate Simulations section was added to provide each student with self-paced practice exercises.

Justification for Simulation Creation

To improve the quality of training, simulations of the DocuTech user interface were developed. Operators are given practice exercises to be completed using the user interface simulation.

**Beneficial for the Student**

These simulations allow each student to practice DocuTech functionality at their own pace. There is a great learning value in the personal interaction a student has with the simulations. This also increases instructor availability to each student, since their time is not all used during instruction and demonstration.

**Beneficial for Xerox**

The DocuTech is an expensive piece of equipment, so each learning center is limited to two machines. Although the development of the simulations is not cheap, it is less expensive to supply the learning centers with personal computers than DocuTechs. Personal computers are also far less expensive to maintain than DocuTech printers.
Project

This master's thesis consists of the creation and implementation of DocuTech Open Job simulation computer-based training. This project was done as proprietary work for Xerox, and was subject to constraints imposed by Xerox.

DocuTech Intermediate Operator

Training Simulations

The Open Job simulation is only one part of a larger program designed for Xerox. The whole training program is called DocuTech Intermediate Operator Training Simulations, which includes Productivity Features, Jobs with Tabs, Signature Jobs, Crop, Window, and Shift Jobs, Reprogramming Jobs with Show Ticket, and Reprogramming Jobs with Open Job. Refer to Figure 2. This figure is a representation of the actual graphic used in the program.

![Main Menu](image)

Figure 2. DocuTech Intermediate Operator Training Simulations Main Menu

Objective

Given a practice exercise job and the programming requirements that need to be changed, the student will be able to successfully reprogram a saved job using the Open Job submode.

In Open Job, the student is required to add chapter starts and inserts, reprogram job level and page level features, and move pages within the job.

Platform / Hardware Requirements

The Xerox Customer Education Centers require that the simulations run on equipment that is currently located at the centers. This platform is:

1. 386 PC (IBM or Compatible) with mouse
2. 33 MHz processor speed
3. Standard VGA card
System Limitations

This software was created on a Gateway 2000 which runs at 33 MHz. In order to accurately simulate the speed of the DocuTech, many of the simulation features were slowed down.

It was also required that the intermediate level software, unlike the introductory training software, not use video or audio due to budget and time constraints.

Development Tools

This section lists all software that was used for the development of the Open Job submode simulation.

Quest Authoring Software

Quest is an authoring software package developed by Allen Communications, based in Salt Lake City. Xerox purchased Quest to develop all computer-based and interactive video training.

Quest is an integrated set of programs used to create, present, and manage computer-based training courseware. Quest is a two-level authoring system that includes both interactive authoring capability and an authoring language.

Author

Author is the interactive authoring program that uses prompt windows to interface with the user.

QAL

QAL, a PASCAL-like programming language, can be used to create more sophisticated applications and animation than can be created using Author. Appendix A is sample code used in the Open Job simulation. This is the code for Inserting and Removing Chapter Starts.

Software Limitations

Although Quest is a highly powerful authoring package, the development of Open Job has pushed its capabilities to the limit.

The screen design of the simulation depended on the capabilities of Author and the screen's resolution. For example, Author can build screens using many graphic shapes and text objects. More complex images can be designed in the image libraries Quest offers, or drawn in an outside paint package and brought in as a bitmap. Within Quest, a bitmap must be a full screen image. Smaller representations are called images and klips. Each type of picture is distinctly different and has its own limitations.

Bitmaps can be shown in several different screen resolutions. Open Job uses both high resolution, 640 x 350, 16 colors, and very high resolution, 640 x 480, 16 colors. Very high resolution does not support any of Quest's dissolves.

Images are saved representations stored in the Quest image library defined for its lesson. Only 64 images are allowed in one library. Dissolves can only be achieved using QAL. Open Job uses image dissolves when displaying saved job page images.

Klips are like images in that they can be used to display a portion of the screen instead of the entire screen, as with bitmaps. Since they can be displayed using a dissolve, they have to be displayed on 8-pixel horizontal
Overcoming Limitations

Often the screens were too complex to build and slow for the computer to draw using Quest Author. It was beneficial for those screens to be designed in a paint program and displayed as a bitmap or drawn using a QAL program.

Unfortunately, QAL programs did not solve all of Author's limitations. During the implementation of Open Job, program bugs were discovered in QAL.

It would have been more efficient to save each job's page data in a data file. During the design of this feature it was discovered that QAL data files can not be simultaneously read and written to. A two-dimensional array was used instead.

Many of the DocuTech page ticket functions, such as crop, require the use of QAL's truncation (trunc) function. It was discovered to have a programming bug, thus the crop calculations were often wrong. Due to this problem, the trunc function was omitted and code was written to replace it. Discovering and bypassing the flaw in the logic of the crop calculations proved to be one of the most challenging problems encountered during the course of this project.

Finally, Quest Author and QAL programs have limited animation capabilities, therefore animation was not intended to be a major part of the program design.

Deluxe Paint II Enhanced

Deluxe Paint II Enhanced is a graphics tool developed by Electronic Arts, Inc. This tool was used to create complex bitmaps. Due to hardware constraints, bitmaps had to be produced in 16 color VGA.

Software Limitations

The only Quest compatible file format that Deluxe Paint supports is PCX.

The only fonts it supports are proprietary, which are printer fonts, not screen fonts.

Cut and paste is implemented by saving brushes. This would not be a problem except that in 640 x 480 VGA mode the brushes are very small.

Word for Windows

Word for Windows is a desktop publishing software developed by Microsoft. This software was used to create the practice exercises.

Software Limitations

The files must be saved in a postscript format to be used by the DocuTech. Saving a document to a postscript file is slow.

CorelDRAW!

CorelDRAW! is an object-oriented illustration package developed by Corel Corporation. This software was used to create the art used in the practice exercises.
Xerox Network Server

The Xerox Network Server provides a link between the user's PC and the DocuTech. Practice exercises are stored on floppy disks, which are sent to the Customer Education Centers. The Customer Education Representatives print the practice exercises on the DocuTech via the Network server.

Design Features

Practice Jobs

The creation of Open Job simulation not only included the program design of the simulation, it required the design of practice jobs for the students. The design of these jobs was based on the requirements from the customer. These requirements were: real world application, more graphics, unique for each measured skill, and distributed electronically. Xerox imposed one other important requirement that the jobs cannot be in any real language. These jobs will be used in other countries in the future and will not have to be translated. Printed copies of the actual jobs used, and their request forms, are located in Appendix B.

Menu Driven

Menus allow users to easily access the information they want to see first and keeps track of the sections that they have completed correctly.

The menu for Open Job simulation includes the requirements for each practice job to be completed by the student. These requirements are: Program Chapter Starts and Inserts, Reprogram Job Level and Page Level Features, and Moving Pages within a Job. It was designed to blend with the other menus of the DocuTech Intermediate Operator Training Simulations. Every menu of the whole program is color coded to remind the students where they are in the course. Refer to Figure 3. This figure is a representation of the actual graphic used in the program.

![Figure 3. Reprogramming Jobs With Open Job menu](image)

The diamond to the left of each section is color coded, red or yellow. A red diamond means that the student has not completed this job and a yellow diamond indicates that the job has been successfully completed. These standards were inherited from the introductory training module.
**Evaluation Screens**

It is important to give the student a chance to see the results of their programming as well as how to correct it. Two similar tables were designed for this purpose.

The Job Level evaluation table displays the job level features. Refer to Figure 4.

```
<table>
<thead>
<tr>
<th>Features</th>
<th>Job Request Form</th>
<th>Student Programming</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Id</td>
<td>September News</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>Print &amp; Delete</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Difficulty</td>
<td>100</td>
<td>Top Tray</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Top Tray or Stacker</td>
<td>Uncollated</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Finishing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Slip Sheets</td>
<td></td>
</tr>
<tr>
<td>Page Number</td>
<td>Off</td>
<td>No Slip Sheets</td>
<td></td>
</tr>
<tr>
<td>Covers</td>
<td>None</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
```

**Figure 4. Job Level evaluation table**

The Page Level evaluation table displays the page level features. Refer to Figure 5.

```
<table>
<thead>
<tr>
<th>Features</th>
<th>Job Request Form</th>
<th>Student Programming</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Stock</td>
<td>8.5 x 11</td>
<td>8.5 x 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Sides &amp; Orient.</td>
<td>White</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reduce/Enlarg.</td>
<td>100%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autofit</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Image Quality</td>
<td>Standard</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharpness: On</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>Crop</td>
<td>Off</td>
<td>Sharpness: On</td>
<td></td>
</tr>
<tr>
<td>Window</td>
<td>Off</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td>Image Shift</td>
<td>Off</td>
<td>Off</td>
<td></td>
</tr>
</tbody>
</table>
```

**Figure 5. Page Level evaluation table**

The Comments column of the table display three graphics for easy recognition of correctness. The yellow star means that feature was programmed correctly. The yellow bar means that feature was not programmed correctly, however it will not affect the final print. The red bar indicates that the feature was programmed incorrectly and the student will have to correct it to continue on to the next job.

**Simulation Fidelity**

Open Job simulation's screen design and interaction was developed to portray the actual DocuTech as much as possible. Every icon and graphic was scaled down to fit the PC's smaller screen as accurately as possible. The system messages and timing were also considered during the design.
Simulation Feedback

Since the DocuTech interface is complex, it was necessary to limit the student's choices. When sections of the Open Job simulation were not included, the user was notified by a timed red message box. A typical message is: "Please work within this job only." Refer to Figure 6.

Please work within this job only.

Figure 6. Typical simulation feedback message.
Programming Design

The design of Open Job simulations was developed without using any traditional programming techniques. Basically the simulation evolved from one small working program into a collection of integrated programs. Michael Yacci, Ph.D., a professor at Rochester Institute of Technology refers to this strategy as the "tree ring" approach to program design. This strategy means starting with one prototype and building around it. Sometimes this is most effective because all the later programs affect the center root. I found this to be true while working on this project.

First, I designed the Open Job main screen to fit on the much smaller PC monitor. Refer to Figure 7. This screen was slow for the computer to draw using the Quest Author mode, so after designing the screen in Author, I combined it with a QAL program to speed up the display process. A QAL program also had to be used to display the page image of the job in the manner of the DocuTech.

Figure 7. Open Job main screen
After the main screen was visually acceptable and the plus and minus icons displayed the correct page image of the job interactively, I developed the page menus. These menus include such functions as cut & paste, show page ticket, move page, copy page, insert, retrieve page, delete page, and insert chapter starts. Refer to Figures 8 and 9.

Figure 8. Open Job menu 1

Figure 9. Open Job menu 2
Based on what Xerox required for each practice job, I began to develop each menu item. The selections programmed for this software release are: show page ticket, move page, insert, and add chapter starts. Each function affects each part of the simulation, so I found it more efficient to build the sections simultaneously.

The "tree ring" strategy was used for two other reasons as well. The first reason was based on the time constraints the customer put on the project. There was not much time allowed for analyzing the Open Job mode of the DocuTech fully before programming, so I programmed components as I learned them. The second reason was to allow the customer to see fully functional sections of the simulation periodically. Basically the customer did not want to see a flow chart of the project, they wanted to see it working. The "tree ring" approach proved most effective to satisfy the customer as well as my thesis board.
Evaluation

To ensure that the Open Job simulation was sound before including it in the DocuTech Intermediate Operator Training Simulations, it was evaluated thoroughly by myself, other programmers, and DocuTech experts. After each step of the evaluation process, revisions were made as required.

Participatory Design / Formative Evaluation

After I tested the simulation thoroughly, Cynthia Jameson, a Xerox Customer Education Analyst, was requested to perform an in-house quality control check. Cynthia noticed that some of the simulation screens had some word errors and that some of the practice job request forms were not clear on their instruction or too complex to be considered as one job. The screen errors were changed; however, the jobs were left alone because they provided adequate practice for the required skills. An abridged version of Cynthia's notes are located in Appendix C.

Pilot Test

The Customer Education Center in Ohio was selected to run a pilot test of the simulations during a training class. The training class ran during the week of October 4, 1993, where four new DocuTech operators went through the entire course that included both Introductory and Intermediate training.

Richard Willimott, the Customer Education Representative (CER) for that area was the trainer for the course. He documented any programming bugs discovered during the course and any student remarks. An abridged version of his analysis of the simulations is located in Appendix D.

After analyzing his remarks, the release version was updated with any missing QAL programs and programming changes were made to the Open Job Chapter Starts program. There seemed to be confusion between a page and an image, thus causing the problems moving the correct images. The CERs will be properly educated about the difference between a page and an image in the future. This education should resolve the problem. Students' remarks were noted and will be considered for any future versions of the DocuTech Intermediate Operator Training Simulations.
In order to produce a better simulation for the future, it is important to collect data based on the opinions of the students using the course. I developed a survey to be distributed to the students at the end of each training course using the current simulations. The survey is located in Appendix E.

This survey requests the students' opinions of the simulation reality, feedback, practice jobs, menu graphics, and benefits. The simulation reality refers to how well the simulation actually portrays the DocuTech user interface. Feedback refers to the evaluation tables and any other feedback that is not a part of the DocuTech user interface.

Unfortunately, I was unable to attend the simulation pilot test in Ohio and conduct the survey; however, Xerox is considering using it. If Xerox implements the use of this survey, it should prove useful in the further development of all computer-based training for the DocuTech.
Conclusion

With the knowledge gained through courses I have taken at Rochester Institute of Technology in the pursuit of a computer animation degree, and the opportunities presented to me at Xerox, I successfully completed the Open Job Submode Simulation. There are several interesting conclusions that can be drawn from this project.

It is possible to produce functional art. The use of graphics within this training course not only enhances the attractiveness of the "functional tool", but it maintains the attention span and interest of the student. Also the ability to simplify complex skills is reinforced with visual graphics.

Animation is a notable perspective for analysis and design. The study of animation has increased my ability to note detail, improve my sensitivity to speed and movement, and most of all made me more observant. For example, I was aware of "color flicker" when changing the system palettes. I spent the time to develop aesthetically pleasing color palettes to improve the quality of the simulation. Perhaps a person trained only in programming would have been less observant of these visual aspects.

Program design teams can improve the quality of their product with the help of animators and graphic designers.
Appendix A
QAL Programming Code
program add_remove_chapt_start;

extern
  pages, pgnum, pgnum2, sides, stsides, chapter: integer;
  pimage: array[1..50] of array[1..17] of integer;

Const
  chapt = 15;
  insert = 16;
  blank = 17;
  image = 1;

var
  i, j, k, new: integer;

procedure checksysgen;
var
  i, j, k, l, sysgen: integer;

begin

{strip sys gens}
  for i := pages downto 1 do
    if i mod 2 = 1 then
      (if odd to check)
      if (pimage[i+1, 17] = 1) then
        {if the 2nd page is a sys gen
         then delete it}
      begin
        pages := pages - 1;
        for j := i + 1 to pages do
          for k := 1 to 17 do
            pimage[j, k] := pimage[j + 1, k];
        end;

    for i := 1 to pages do
      if i mod 2 = 1 then
        (if odd to check)
      begin

sysgen:=0;
for j := 4 to 6 do
begin
    if ((pimage[i,j] <> pimage[i+1,j]) and (sysgen = 0)) or
        ((pimage[i,j] = pimage[i+1,j]) and (pimage[i+1,15]=1) and (sysgen = 0)) then
    {if the pages are different or 2nd pg is chapstart and sys gen was
    not already added then add a sys gen.}
    begin
        sysgen:=1;
        pages:=pages+1;
        for k := pages downto i+1 do
            for l := 1 to 17 do
                pimage[k,l]:=pimage[k-1,l];
            for l := 1 to 17 do
                pimage[i+1,l]:=pimage[i,l];
            pimage[i+1,1]:=1;
            pimage[i+1,15]:=0;
            pimage[i+1,17]:=1;
        end;
    end;
end;

if (pages mod 2 = 1) and (pimage[pages,17] = 1) then
    pages:=pages-1
else if (pages mod 2 = 1) then
begin
    pages:=pages+1;
    for j:=2 to 17 do
        pimage[pages,j]:=pimage[pages-1,j];
    pimage[pages,1]:=1;
    pimage[pages,15]:=0;
    pimage[pages,17]:=1;
end;
end;

Begin
    new:=pimage[pgnum,chapt];
case new of  
0:begin  
(ADD A CHAPTER START)  
  if pimage[pgnum,blank] = 0 then begin  
  (if it is not a system generated blank page then)  

if stsides=2 then begin  
(two sided)  
  if pgnum mod 2 = 0 then begin  
  (even page)  
    for i:= pages downto pgnum do  
    (move all info up one page)  
      for j:=1 to 17 do  
        pimage[(i+1),j]:=pimage[i,j];  
  pages:=pages+1;  
  pimage[pgnum,image]:=1;  
  (add blank page)  
  pimage[pgnum,chapt]:=0;  
  pimage[pgnum,insert]:=0;  
  pimage[pgnum,blank]:=1;  
  (flag as system generated page)  
  pimage[(pgnum+1),chapt]:=1;  
  (make next page chapter start flag)  

  (check later pages for chapter starts to modify accordingly)  
  for k:=(pgnum+2) to pages do  
    if (pimage[k,chapt] = 1) and (k mod 2 = 0) then begin  
    (if it is a chapter start and it is on an even page then add blank)  
      for i:=pages downto k do  
        for j:=1 to 17 do  
          pimage[i+1,j]:=pimage[i,j];  

  pages:=pages+1;  
  pimage[k,image]:=1;  
  (add blank page)  
  pimage[k,blank]:=1;  
  (flag as system generated page)  
  pimage[k,chapt]:=0;  
  end  
  else if (pimage[k,blank] = 1) and (k mod 2 = 1) then begin  
  (if it is a sys. gen. blank and it is on an odd page then remove it)  
    for i:= k to pages do  
    (move all info down one page)
for j:=1 to 17 do
  pimage[i,j]:=pimage[i+1,j];
  pages:=pages-1;
end;
even page
else begin
  odd page
  pimage[pgnum,chapt]:=1; {just flag it as a chapter start}
end;{odd page}
end{if two sided}
else begin
  one sided
  pimage[pgnum,chapt]:=1; {just flag it as a chapter start}
end;{if one sided}

if (pimage[pages,image]=1) and (pages mod 2 = 1) then
  {if the last page is a generated blank page and it is odd..get rid of it}
  pages:=pages-1;
  chapter:=1;
end{if pgnum is not a sys. gen. blank}
else begin
  {if pgnum is a sys. gen blank}
  chapter:=2;
end;
end;{case 0 ADD a chapter start}.

1:begin
{REMOVE a chapter start}
  if (stsides=2) and (pimage[pgnum-1,blank] = 1) then begin
  {two sided and the previous page is a sys. gen. blank}
  {delete blank page}
    for i:= pgnum to pages do
      {move the rest of the info down one page}
        for j:=1 to 17 do
          pimage[i-1,j]:=pimage[i,j];
        pages:=pages-1;
      pimage[pgnum-1,chapt]:=0; {make previous page not a chapter start}
for k:=pgnum to pages do begin
  if (pimage[k,blank] = 1) and (k mod 2 = 1) then begin
    if it is a sys. gen. blank and it is on an odd page then remove it
    for i:= k to pages do
      {move all info down one page}
      for j:=1 to 17 do
        pimage[i,j]:=pimage[i+1,j];
    pages:=pages-1;
  end;
  if (pimage[k,chapt] = 1) and (k mod 2 = 0) then begin
    if it is a chapter start and it is on an even page then move it
    for i:= pages downto k do
      {move all info down one page}
      for j:=1 to 17 do
        pimage[i+1,j]:=pimage[i,j];
      {put in a blank page}
      pimage[k,blank]:=1;
      pimage[k,chapt]:=0;
      pimage[k,1]:=1;
      pages:=pages+1;
  end;
end; else begin
  pimage[pgnum,chapt]:=0; {just unflag it as a chapter start}
end;

chapter:=3;
end; {case 1 REMOVE a chapter start}
end; {case NEW}
begin
  pages:=pages+1;
  for i:=2 to 16 do
    pimage[pages,i]:=pimage[pages-1,i];
  pimage[pages,1]:=1;
  pimage[pages,blank]:=1;
  pimage[pages,chapt]:=0;
  pimage[pages-1,insert]:=0;
end;
if stsides=1 then
  pgnum2:=0;
if stsides=2 then
  checksysgen;
End.
Appendix B
Open Job Practice Jobs

1. Application
2. Proposal
3. Famous Ladies One Sided
**JOB REQUEST FORM**
Reprogramming job using the Open Job submode

<table>
<thead>
<tr>
<th>Job Number</th>
<th>Practice Job 5B</th>
<th>Number of Documents</th>
<th>8</th>
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<td>Proof first</td>
</tr>
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**FINISHING**

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<th>Other</th>
</tr>
</thead>
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<td>Uncollated</td>
<td>Single Stitch</td>
<td></td>
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</tbody>
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**COVERS**

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<tbody>
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<td>Back</td>
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<td>White</td>
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<tr>
<td>17 x11 or A3</td>
<td>Other</td>
<td>Other</td>
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<tr>
<td>Other</td>
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<td>Other</td>
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</tbody>
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**PRINTING REQUIRED**

<table>
<thead>
<tr>
<th>1-Sided</th>
<th>2-Sided</th>
<th>Mixed</th>
</tr>
</thead>
</table>

**SPECIAL INSTRUCTIONS ON REVERSE**

ROJ5B IAV
SPECIAL INSTRUCTIONS

Create chapter start pages as required for the saved job, Application.
Place one blue insert after image 7.
Run a proof print of the job.

JOB HINTS AND TIPS

Program the chapter starts and then the inserts.
Select the More... option on the menu to access the Chapter Start option.
W.T.U.

*WTU*

Qae Loycum Ow Qluaity Cqzeum Educaxtpz
Ghraumla Owftamaxtpz

Vumificaxtpzs de hraroxomhrat (usqtu fta sump qamaes as detummowmae Fowacmae Adi elibgiiliyi) fta matriculatqtu ezd nhe matriculatqtu undumrgaduate ezd rgraduate mkudhrats si basqtu uopn qae foxoowmae eamb quqztum:

- Fuxo-tmie- 12 ta mtae crqtuit hcvors.
- Hlaf-tmie- 6-11 crqtuit hcvors.
- Pqzt-tmie- 1-5 crqtuit hcvors.

Ccvorses takhra fta ez audit rgade ceznot xa usqtu izwqzds detummowmae hraroxomhrat mkatus.

**Idhratificaxtpz Cqzds**

Ez I.D. cqzd si qerquirqtu fta qae ues de Owmkitute facilitx. Qaume si nt mbqzge fta qae cqzd, howevum, a qerplptqumhrat fye si mbqzgqtu if qae cqzd si lomk.

Qergimkrqz's Defice, Bgd. 01, Rowm 1202
Defice Hcvors
Mhedyr-qaursdyr- 8:30 v.t. tilun 6:00 p.z.
Friddy 8:30 v.t. tilun 4:30 p.z.
Summum Hcvors
(Jeun 15-Augumk 13) Mhedyr-qaursdyr 8:30 k.m - 4:00 p.z.

**Tqerzscrqipts**

Tqerzscrqipts shcvold xxa qerquemkqtu xat qxae Qergqimkrqz's Defqice, fqirmk flotxa de qxae Getxage Xqmkmez Buqildmxae xat lxqmk 24 hcvors ow xadvezce de qxae dxate neqtue. Oq qerquemks cez xxa txakhrxa ovum qxae phhee xxacxause qxae mkudhrxat's sqignxatuqer sqi qerquqirqtu ftxa qxae qerlxqse de qxae qerctxad.

Qf yycevo qerquemk xa tqerzscrqipt byyc mxaqil plxqse owclude yyccvor nxame, sqignxatuqer, socqilxa securqityyc numbum, dxate de bqirqxa, dxates de xatthrxadezce, ezd qxae xaddqerss whume yyccvo wcvold lqike qxae tqerzscrqipt shrxat. qxaume sqi xa mbqzge pum copyyc.
Mbezgqtu YYCcvor Mxaqilmxae (Pummowhrxat) Xddqerss?
Ftxa prompt delqivumyyc de ccvose smbqtuules, clxass smbqtuules, rgxade qerptxats ezd bqixomxae owftxamxaxtpz, plxqse owftxam qxae Qergqimkrxjs's Defqice whhrxa yyccvor mxaqilmxae xaddqerss hxas mbezgqtu.

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* pummqits mkudhrxats qiz owspect qxaeqir qtuucxaxtpzlxa qerctxads
* provqides qxae opptxatunqityyc qiz mbezxohrxage sumb qerctxads xas owxaccurxate
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Qerquemk Ftxa XAudqit Rgxade
Mkudhrxats who wsqih qiz txake xa clxass ftxa xaudqit mumk obtxaow xapprovlxa from qxae depqztmhrxat defummmxae qxae ccvorse. Oqt xaxo ccvorses qze xavxaqilxable ftxa ezd xaudqit rgxade. Ccvorses txakhrxa ftxa xaudqit do oqt xapplyc qizwqzd rgxaduxaxtpz qerquqiqermhrxats txa mkxasqifyyc prumequsqiqites.
Qerscvorces & Sumvqices

Pqzt-Tmqie Mkudy Clxahrxadqz & Hezdbowk XAvlxaxable
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* eqihtg rxacuetbxa xo ccvorts
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* xa dezce / xaumobjic rowms
* xa mowqi-gyyycme
* ez elevxtqtxu hee-eqighqxa mqiile runnmxae trxack
* lockum rowms wqiqxwa sxauervas
* equqipmrhxat rowms.

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Xaugumk 11, 6-8 p.z.
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ROJ5B-7
Dqimkezce Leqznmxae

WTU Fxaxo Ccvorses Defumqtu ow xa Dqimkezce Leqznmxae Ftxamxat
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Vqideos ftxa qxase ccvorses qze xavxaqlxable Qqzcvogh Cxampus Chenecxtpzs, qxae WTU bowksqizqer textbowk depqztmhrxat. Some prorgxams qze defumqtu he Rgxqutum Romxxamkum Cxablevsqiqihe ezd WXXQI.
# JOB REQUEST FORM

Repromgramming job using the Open Job submode

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## FINISHING

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## PRINTING REQUIRED

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<th>2-Sided</th>
<th>Mixed</th>
</tr>
</thead>
</table>

**SPECIAL INSTRUCTIONS ON REVERSE**

ROJ6B IAV
SPECIAL INSTRUCTIONS

Reprogram the saved job, Proposal.
Program the first and last page images to be printed on blue stock.
Move image 4 before image 3.
Number the pages in the bottom center. Start the page numbering on the third page.
Begin with number 1. Do not number the last page.
Change the Quantity to 50.
Run a proof print of the job.

JOB HINTS AND TIPS

Use the Show Page Ticket option to reprogram the Page Level changes.
Exit the Open Job submode.
Open the Show Ticket submode.
Reprogram the Job Level changes.
Kbvdf ms bn rrgbnmzbtmnrn zf btjchqs vmrtjblly qvqry bspqct rf Qqrrx Crrprrbtmrn. Vq 5 dmvmmsrnn wmsfnn QSQRGZprrvmdq sqrvmcqs zf btq breq cbbtqgrrmznq mn 9 crrq sqrvmcqs. Vqsq Crrq sqrvmcqs breq; Drcjmqnt Sqrvmcq, Trbvql bnd Qmplryqq Trbnsprrtbtmnrn, Lbnd Dqvlrpmqnt, Smtq Fbcmlmtmqsn Prpqrty Cbnbgqmqnt, Qmplryqq Sqrvmcq, Spqemblmzqd Sjpprrt Sqrvmcq, Trbnmmng bnd Q4cbtmrn Sqrvmcq bnd Rqbl Qstbttq Cbnbgqmqnt.

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Drcjmqnt Prrdjctmrn Cqntqrs

Vq DPCs lrctqmd mn Tqstqr, Rgjndr bnd Stbmfrrd hbd mbjrr jpprbdqqs mn qjimpmqnt bnd trbmnmmng 2 yqbrs bgr. Vq DPCs wqrm fnfqsqd wmfz b strrng Qntqprqntqjr spmrmt. Prmnt vrljmq mcnrqbsqd rvqr 200% bnd cjstrmq sbtmsfbctmnr fnmgjrqs rssq tr 97%.

Vq DPCs hbvq zfrq mqmprttbnt qlqmtns mn zfqmr chbrtrq. Vq fmrst ms tr bq zfq prqszqrfq sjplmqr fr Qrrx mntqmvb prmnt prrdjctmrn. Vbt grbl qjgbtpqs tr fbst tjrn brjnd, hmgq jqblmty bnd vqr yr crmpqtmtnv bnmcmng. Vq sqcrnd qlqmtn ms bccrnplnshqzd zfrqgh b pbtrnqrsmp wmfz mbkteqmg. Qrrx cjstrmrqs cbn crmq mntr zfq Drcjmqnt Prrdjctmrn Cqntqrs bnd sqg Qrrx qjimpmqnt wrrkmg mn b rbl wrrld qnvrmmngmqnt, mn cncqrt wmfz rzfq prnttmng qjimpmqnt. B pbtrnqrsmp wmfz zfq Qrrx qngmqqqngmg crmmjntty fjlmlls zfq zfrmd qlqmtn. Vq DPCs brq b prmmbrb bqbt tqst smght fr prdjdcts zfbt brq jndqr dqvqlrpmqnt. Qngmnqrs cbn sqg hrw zfq prrdjcts brq pqfrmmngng bnd zfq Prrdjctmrn Cqntqrs hbvq jsq rf qjimpmqnt zfbt ms mrq bdvbnqzd zfbn gbt wrjld bq frjnd mn rrdmbrb prmnt shrps.

Cbmls Sqrvmcq

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Rqcrdrd Rqtqntmrn

Cnnrvbtmn bnd hmgh cjstrmq sbtmsfcbctmrn scrrqs hqlpqd Rqcrdrds Rqtqntmrn wmn zfq Rlstqn Bwbrd mn rqcrgnmtmrn bs rnc rf zfq mrst prrgrqssmvq rrgbnmzbtrmn rf mts kmnd mn JS mndjstry.
Rqcrdrds Rqtqntmrn cbn rqcqmvs drcjmqnts qlqctrnmgbly bnd strrq zfqm rn rptmebl dmscs. Vq rqsjit ms b 90% rqdjtcmrn mn spbcq rqqjmrqmtnts bnd drcjmqnts cbn bq rqtrmqd tr cjstrmqrs mn b frbtcbrmn rf zfq tmmq.

Gfrdse Hvgftdj Ajfh

-Rfrd Sqrvmcqqs ms jjsjt gbt zfq tmlq mmplmqs. Frmm vqndmng mbchmnqs dmspqnsmng snbcks bnd srf drmnks, tr crnfqrqncq rrrm ljnchqs zfbt brrmvq bt zfq rmght tmmq, tr fjl sqrvmcq cbfqtqrmbhs, zfsms ms zfq rqsprns mbmlmty rf Frrd Sqrvmcqqs.

Kqapmng mt bll grmq ms b bmg jrb bnd hmgh cjstrmq sbtmsfcbctmrn scrrqs brq zfq pbyrff frf zfms jrb.

Qvqrbybrdy ms fbnmlmbr wmsf pbyrll sqrvmcq, bjt dmd yrj knrw zfbt wq brq zfq bqnchmbrk frf zfq mndjstry? Cn b stjdy drnq by BT&T, Qqrrx pbyrll hbd zfq lrwqst crst pqr qmplryqq bnd zfq lrwqst crst pqr chqck. Vrsq fmgjrqs brq vblmd frf brzf mntqrmbl sqrvmcqqs mn mbjrr crmpbnmqs bnd frf vqndrrqd sqrvmcq bs wql.

Tr trp mt rff wq hbbq b 95% sbtmsfcbctmrn rbtq.

Kqblzf, Fmtnqss bnd Qmplryqq Sqrvmcq

Vms lrks lmrk zfq fjn smdq rf zfq bjsmnqss bjt zfq rqsprnsmbmlmtmqs brq tbkqn jjst bs sqrrmrjsly bs zfq rqsrf rf QSQRV’s chbrqgs.

Rqcrqbtmrn, Lrng Sqrvmcq Bwbrds Prrgrbm bnd Bbnqjqts, Rqtnmqq Cljb bnd zfq Qqrrx Kqblzf Cbnbgqmqnt Prrgrbm brq mmprrtbnt rrgbnmzbtrmns gqn mt crmqrs tr zfq qmplryqq crntqntmqt bnd wqflbrq.

ROJ6B-3
TRBVQL & QCPLRYQQ TRBNSPRTTBTCRN

Dmvrqrsmy ms zfq wrrd frq zfms qrjp gmcg hbnldqs qvqrzyfmg frrn Trbvql Sqrvmcq
bnd Crprrbtq Bvmbtmrn tr Lrcbl Crjrmqr sqrvmcq. Blzfrjgh zfq pbst fqw yqbrs hvq
wmtnqssqbd b qrqt dqlb rf chbgq bnd crnfsjmrn mn zfq trbvql mdnjstry, Trbvql &
Qmplryqq Trbnsprrtbtmrn hbs bqqn wrrkmg tr jntbnglq zfq crnfsjmrn bnd mncrqbsq
cjstrmrq sbtmsfbcemrn.

Crrprrbtq Bvmbtmrn

Vq Qqrrx shjttlq ms zfq mrst jtmlmzqd rqrjbrly schqjldqd crrprrbtq bvmbtmrn sqrvmcq
mn Bmqrmecn mdnjstry. Vq Shjttlqs' crnsmstqnt sqrvmcq, prrvmdq sbljq tr Qqrrx
prarplq gr trbvql tr rqrjbrly schqjldqd shjttlq strps.

Vq chbtrqr sqrvmcq crvqrs smtjbtmrns gqrq lbrq grrjps rf Qqrrx praprlq nqqd tr bq
trbnsprrtqd tr lrcbtmrns zfbt brq nrt crvqrd by crnvqnmqnt rqrjbrly schqjldqd
crmmqrcmbl bmrlnmqqs r qrzf Shjttlq.
Kaqpmng mt bll grmng ms b bmg jrb bnd hmg h cjstrmrq sbtmsfbcemrn scrqqs brq zfq
pbyrff frq zfms jrb.

Kqblzf, Fmntqss bnd Qmplryqq Sqrvmcq

Vms lrrks lmkq zfq fijn smdq rf zfq bjsmqqss bjt zfq rqsprnsbmlmtmqs brq tbkqn jst bs
sqrmrjksly bs zfq rjst rf QSQRV's chbrqqs.

Vbn Sqrvmcq

Bt zfq grjnd lqvql, Trbvql bnd Qmplryqq Trbnsprrtbtmrn, prrvmdq Chbjffqjr Sqrvmcq.
B Crjrmqr Sqrvmcq frr rjsh pbckbgq dqlmvqry wbs rcqcntly bddqd bs b crst qffqctmvq
bltnmbtmvq tr rjtsmdq sqrvmcq.
Trbvql Sqrvmcqs

Frrd Sqrvmcqs ms jjst gbt zfq tmtlq mmplmq. Frrm vqndmng mbchmnqz dmspqnsmng snbeks bnd srft drmnks, tr crmfqrqncq rrhm ljncqrs zfbt brrmvq bt zfq rmght tmrq, tr fjll,sqrvmcq cbfqtqrmb, zfms ms zfq rqsprms mbmlmtf rf Frrd Sqrvmcqs.

Rqcrqbtmrn, Lrng Sqrvmcq Bwbrds Prgrbrm bnd Bbnqiqts, Rqtmrqq Cljbr bnd zfq Qqrxx Kqblzf Cbnbgqmqt Prgrbrm breq mmprrtbrnt rrgbnmztbnrns gqn mt cromqz tr zfq qmplryqq crntqntmnt bnd wqlfbrq.
Qmplryqq Sqrvmcq ms b fmtnmg nbmq frr b grrjp zfbt hbs sjch b brrbd lmrst rf rqsprnsmbmlmtmqs. Nqbrly qvqryzfmng bn qmplryqq drqs mn b dby hbs srmqzfmng tr dr wmnzf zfms rrgbnmzbtmlrn.

Frrd Sqrvmcq

Cts bqqn sbmd zfbt bn brmy mbrchqs rn mts strmbch, bnd sr drqs b crpprbbtmrn lmkq Qqrrx.

Frrd Sqrvmcq ms jjst gbt zfq tmtlk mmpylmqs. Frrm vqndmg mbchmnqs dmspqnsrng snbcks bnd srft drrmnks, tr ernfqrqncq rrrm ljnhchs zfbt brrmvq bt zfq rmght tmmyq, tr fjl sqrvmcq ebfqfqrmb, zfms ms zfq rqsprns mbmlmty rf Frrd Sqrvmcq.

Kqqpmng mt bll grmnq ms b bmg jrb bnd hmg h cjohnq sbtmsfbctmrn sccrqs brq zfq pbyrff frr zfms jrb.

Kqblzf, Fmtnqss bnd Qmplryqq Sqrvmcq

Vms lrrks lmkq zfq fjn smdq rf zfq bjsmqsrt bjt zfq rqsprnsmbmlmtmqs brq tbkqn jjst bs sqmrjrsly bs zfq rqst rf QSQRV’s chbrqgs.

Rqcrqbtmnrn, Lrng Sqrvmcq Bwbrds Prgrbmn bnd Bbnqjitcs, Rqtmrqq Cljb bnd zfq Qqrrx Kqblzf Cbnbgqmqnt Prgrbmn bqv mmpprbbnt rrgbnmzbtmlrs gqn mt crmqs tr zfq qmplryqq crntqntmqnt bnd wqlfbrq.
Cqdmcbl Sqrvmcqcs

Kqrq ms bnrzfqr cbsq gqrq mbkmng b strbtqmcn mnvqstmqnt cbn bctjblly rqdjcq crst bnd mncrqbsq sqrvmcq tr zfq qmplryqq. By hmrmng mrrq njsqs bnd brmngmng mn fjll tmmq drctrs mntr zfq mdqmcbl brqbs, wq rqdjcqdr dwn tmmq fr mnnrr mdqmcbl nqqds sjch bs blqrqy shrts, blrd tqstmmng rr zfqrbpby frr bbeck rr mjsselq mnjirnqqs. Vms nrt rnyl rqdjcqdr tmmq bwby frrm zfq jrb bj tqlmmnnbtqzd zfq crst rf zfq sqrvmcq zfht rzfqrwmsq wrjld bq pbmd frr by b mdqmcbl mnjsrbncq cbrrmgr.

Rccjpbnrml Kqlblzf & Qqrnrmmcqs, Krw mt qvqntjblly rqdjcqhs hqblzf cbrq crsts. Qmrqrgnqncy Cqdmcbl Sqrvmcqcs

Pqrsrnb Dtbh Systqms


Cnfrrmbtmrmn Systqms

Qqrnx Fbx ms zfq mnd jstry stbnd brhdgetfs dhbcgthdfwrw saeqwm njhoi jnbfgfd rgwuyvcfdr re ghtyvbdqf ghtyhu ndsg as rw dhdbuhqbugvbk efn. Uhdbgftwercx fgtrsvfercd hguyn dgtfas fbb,xlckwpbj beo nhvnhbdhugeyvg vbk skeuy dgajhgd gdtefjhbincd twfy tdfq ojdn cb wugvug gbgt. Rew dcebmkg lgjoo ytn nvbf ggduj dklfg rtyu. Hqbrvrdft fgtruhgohoiafdre ghvbnmkjui gdtfsadad sweufvjb jvkgui hidhih i. Hfdrev ghjuyon cbgdtr yav.
DRCJCQNT SQRVCCQS

Vms brq b zfbt hbs sqqn b rqmbkbbblq trbnsfrmrbtmrn mn zfq pbst 2 yqbts. Tqechmecbl dqvqlrpmqnts bnd mbjbr chbngqs mn zfq wby zfqsq grjps rpqrbtnq, hbvq lqbd tr lbrgq gbmsns mn qffmcmqncy bnd cjstrmrq sbtmsfbctmrn.

Drcjmznt Prrejzctmrn Cqntqrs

Vq DPCs lrebtdq mn Rrchqstqr, Ql Sqgjnqdr bnd Stbmfrrd hbd mbjrr jppgrbdqs mn qjimpqmznt bnd trbmnmmng 2 yqbrs bgr. Vq DPCs wqrq mnfjsqd wmsf b strng Qntrqprnqfqr spmrmt. Prmnt vljmq mncrqsqsd rvqr 200% bnd cjstrmrq sbtmsfbctmrn fmgjrzq rssq tr 97%.

Vq DPCs hbvq zfrq sqmmrtnbl qlmqmznts mn zfqmr cbhbrqr. Vq fmrst ms tr bq zfq prqsfqrrqd sjpplrmqr frr Qqrrx mntqmqbl prmnt prrdejctmrn. Vbt gbzl qjibtqrs tr fbst tjrn brjnd, hmgq qjblmty bnd vqy crmpqtmvq prmnmng. Vq sqcrnq slqmznt ms bccmrplmshqsd zfrjgh b pbtrnqrs hmp wmsf mbrkqtmng. Qqrrx cjstrmzrs cbn crmq mntr zfq Drcjmznt Prrejzctmrn Cqntqrs bnd sqq Qqrrx qjimpqmznt wrkmng mn b rqbl wrld qnmrrnmznt, mn crnqr b wmsf rfnq prmntmg qjimpqmznt. B pbtrnqrs hmp wmsf zfq Qqrrx qngmnqmrmg crnmjnmy fjlflmsl zfq zfrnd rzqlmznt. Vq DPCs brq b prmmbry bqt b sqst smght frr prrdjets zfbt brq jndqr dqvqlrpmqnt. Qngmnmqrs cbn sqq hwh zfq prrdjets brq pqrrfrmmng bnd zfq Prrejzctmrn Cqntqrs hbvq jsq rf qjimpzmznt zfbt ms mrrq bdvbnqd zftn gbt wrjld bq frjnd mn rrdmnbr prmnt shprs.

Rqcrrds Rqtqntmrn

Cnnrvbtmrn bnd hmgq cjstrmrq sbtmsfbctmrn scrrqs hqlpqd Rqcrrds Rqtqntmrn wmn zfq Rlstq Bwbrd mn rqcrngntmrn bs rqq rf zfq mrst prgrqssmvq rrgrnmbtrmn rf mts kmnd mn JS mndjstry.
Rqcrrds Rqtqntmrn cbn rqcqmvlq drejznqnts qlzctrrnmcbly bnd strq zfqm mn rptrmcbl dmscs. Vq rqsjlt ms b 90% rqdejctmrn mn spbcq rqqjimrqmznts bnd drejznqnts cbn bq rtjrnqf qr cjstrmrq mn b frbctmrn rf zfq tmmq.

ROJ6B-11
QCPLRYQQ SQRVCCQS

Qmplryqq Sqrvmcqs ms b fnttmg nbmq fr b grrjp zfbt hbs sjch b brrbd lmst rf rqsprnsmblmlmtmq. Nqbrly qvqryzfmng bn qmplryqq drqs mn b dby hbs srmzqfmng tr dr wnmz zfms rrgbnmzbtmrn.

Frrd Sqrvmcqs

Cts bqqn sbmd zfbt bn brmy mbrcbqs rn mts strmbch, bnd sr drqs b crrprrtbmrn lmkq Qqrrx.

Frrd Sqrvmcqs ms jjst gbt zfq tmtlq mmpmlmq. Frrm vqmdmg mbchmnqs dmsspqnsnmg snbcks bnd srft drmnks, tr crnfqrncq rrm ljnchqs zfbt brrmvq bt zfq rmght tmmq, tr fjl sqrvmcq cbsfqtqrmbs, zfms ms zfq rqsprnsmblmlnty rf Frrd Sqrvmcqs.

Kqqpmng mt bl lgrmg ms b bmg jrb bnd hmgjh cjstrmr qbtsfcbtmrnr sqrrqs brq zfq pbyrff fr frz zfms jrb.

Kqblzf, Fmtnqss bnd Qmplryqq Sqrvmcq

Vms lrrks lmkq zfq fjn smdq rf zfq bjmsnqss bjt zfq rqsprnsmblmlmtmq brq tkqn jjst bs sqrmrjlsy bs zfq rqrst rf QSQRV's chbrgqs.

Rqcrqbtmnr, Lrng Sqrvmcq Bwbhrs Prrgrbm bnd Bbnjqjts, Rqtmrqq Cljb bnd zfq Qqrrx Kqblzf Cbngqeqmqt Prrgrbm brq mmprrtbtn rtgbnmzbtmrns gqn mt crmq tr zfq qmplryqq crntqntmqnt bnd wqlfrq.

Vq Qqrrx shjtlq ms zfq mrst jtmllmqzq rqqjrbty schdqjldq crrprrtbq bvmrtrmr sqrvmcq mn Bmqrmebn mnjstry. Vq Shjjrlqs' crnsmstqnt sqrvmcq, prrvmdqs vbljq tr Qqrrx prqrlq br trvql tr rqqjrbty schdqjldq shjtlq strps.

Vq chbtrq sqrvmcq cvqrs smtjbtmnrns gqrg lrqrg qrrjps rf Qqrrx prqlq nqqd tr bq trbnsprrtqd tr lrcbtmrns zfbt brq nrt cvqraqd by crnvqnmqnt rqqjrbty schdqjldq crmmsrreml bmrlnrns br zfq Shjjtlq.

Vbn Sqrvmcq

Bt zfq grrjnd lqvl, Trvql bnd Qmplryqq Trbnsprrtbtmrn, prrvmdqs Chbjffqjr Sqrvmcqs. B Crjrmqr Sqrvmcq fr rjsh pbckbgq dqlmvqy wbs rqcqntly bddqd bs b crst qffjetmvq btlqrnbtmvq tr rjtsmdq sqrvmcqs.
Trbvql Sqrvmcqs

Trbvql Sqrvmcqs ms zfq rrgbmzbtmrm zfbt dqblds wmfz bll phbsqs rf zfq crmmqrcembl trbnsprttbtmrm bnd lrdgmgng mdndjstry. Vrrjh dmrqct nqgrttmbtmrns wmfz sqlqctqd zfq bmrlmnqs mt hbs sbvqd 7 mmmlmrn drllbrs rvqr rsgjlbcr crrprrtbq rbtqs.

Cn zfq lrdgmgng brqb, Trbvql Sqrvmcqs ms crnstdntly mrnmtrmng zfq qjblmty bnd crst rf hrtqls. Vms yqbr zfq lmrst rf hrtqls wbs qxpbdqd bnd mncq bgmnn b sbjstbntmbl sbvmngs wbs nqgrttmbtqd rvqr zfq blrbqdy lrwqr crrprrtbq rrm rbtq.

Cf yrj brq plbnmnmg b crnfrqrcncq rr lbrqg mqqtmng, Trbvql Sqrvmcqs cbn hqlp mbkq mt b sjccqss. Vqy mmbntbmn crmplqtn lmstsf rf bcmmlmntqs bnd sqrvmcqs bnd cbn hbdldq bll rf zfq dqtbmls zfbt gr brng wmfz zfq mqqtmng plbnmnmg.

Drcjmqnt Prrdjctmrn Cqntqrs

Vq DPCs lrcbttqd mn Rrrchqstq, Ql Sqqjndr bnd Stbjmrld hbd mbyj jprgdqses mn qjimpqnt bnd trbmmnnmg 2 yqbhrs bg. Vq DPCs wtrq mfnfysqd wmfz b strng Qntprqnpqjr spmrm. Prmnt vrljmq mncrqsbsqd rvqr 200% bnd cjsrmqr sbtmsfbctmrm fmgjqrqs rrsq tr 97%.

Vq DPCs hbyq zfrqg mmprrtbtnt qllqmnts mn zfqmbr cbhrtqr. Vq fmrst ms tr brq zfq prqprqqrd sjpjlmqr frr Qrrqxn mntrqrmbl prmnt prrdjctmrn. Vbtl gbql qjibtsq tr fbst tjyr brtrjd, hmgqh qjblmty bnd vqyr crmpqtnmtmvq prmcmmng. Vq sqcmrd qllqmnt ms bcrmplmseshqd zfrrjgh b pbrtnqrshmp wmfz mbrkqtqmg. Qrrqxn cjsrmqrs cbn crmrq mntr zfq Drcjmqnt Prrdjctmrn Cqntqrs bnd sqq Qrrqxn qjimpqnt wrrkmng mn b rqbfi wrld qnvrmrnnmqnt, mn crncqrt wmfz rzfq prmntmg qjimpqnt. B pbrtnqrshmp wmfz zfq Qrrqxn qngmnnqrmng crmmjnmtly fjflmls zfq zfmrd qllqmnt. Vq DPCs brq b prmmbrby bqtt tqtt smght fr prrdjets zfbt brq jndqr dqvqlrmpqnt. Qngmnmqrs cbn sqq hrw zfq prrdjets brq prqfrrrmmng bnd zfq prrdjctmrn Cqntqrs hbyq jsq rf qjimpqnt zfbt ms mrrq bdvbnqqd zfhn gbt wrjld bq frjnd mn rrdmnbry prmnt shrps.

Cbmls Sqrvmcqs

Cbml Sqrvmcqs prrmbrby fnjctmrn ms zfq dqllmvqy rf brzf mntrq-rffmceq bnd rjtsmdq mbml wmfzmn mbyj Qrrqxn bcmmlmntqs. Vqy hbyq bqtn smrq rjstbndmgn pqfrrrmbncq gbmnms djrmng zfq pbst yqbr. Nrt zfq lqbst rf gmch ms zfq prqdjctmrn mn zfq crst rf rvqrmnght bmr pbckbgq dqllmvqy. Kbrd wmfz Bmrbrtnq Qxprqss rqsjltqdn mn b rbtq prqdjctmrn rf blmrst 75% sol pbckbgq frmr zfq prqvmrjs cbrrmqr.
JOB REQUEST FORM
Reprogramming job using the Open Job submode

Job Number: Practice Job 7
Job Name: Famous Ladies One Sided
Number of Documents: 5
Quantity Required: 75

Print Job and
Save
Delete
Proof first

FINISHING

Collated
Uncollated
Slip Sheets
Single Stitch
Other

COVERS

Front
Back
Blank
Print Side 1
Print Side 2
Print Side 1
Print Side 2

Cover Stock
Front
Back

STOCK REQUIRED

Size
8.5 x 11 or A4
17 x 11 or A3
Other

Type
Standard
Other

Color/Colour
White
Other

PRINTING REQUIRED

1-Sided
2-Sided
Mixed

SPECIAL INSTRUCTIONS ON REVERSE

ROJ7B IAV
SPECIAL INSTRUCTIONS

Reprogram the saved job, Famous Ladies One Sided.
Change the paper stock color for image 2 to yellow.
Move the first image. Place it after image 2.
Run a proof print of the job.

JOB HINTS AND TIPS

Use the Show Page Ticket option to change the paper stock color.
Tfdrecf jhufg sdw ecvgu zgdrwxe djug hbvt dgknak nyeu vbdgy. Qwscch jhuvdf bvgt dwucv gdt gdqvg drsew lhk nmjhu.
Hbdget kbcy weugasc fbuerb savdty opvivn quihfdgu vbiqs wtdvdc. Tasy fcvw eigf tiosagc fhyrioq oijdonc vbivh. Fre hreoibvj hfwv guvcvbuwg nbids nbih dgcu gdhfhg hsu agiwqhon cnwng vugerihf omcmdl;s am cojcyiwfch owjfwjv wrehiyw.
Wqcvgfujbgi jnojv nronj owejcohwnriong ihgcowjp wv onbei hnigyngi ehfoj olnc vnih nojjfpo wjkpjeophj eoij ovhebil. Grdwuyhm njfoh eirhob mnlنبيw sey hoj xbhd bewfbuf gwug cbdhu geufg gnsjdhf iwehihdioh ibvie. ng.
Appendix C

Cynthia Jameson's Notes on Open Job
Open Job

1. The module names do not match the "module name" on the Job Request Form.

2. The message: "The Proof Job was submitted to the Printing Queue." is wrong. It should be Printer Queue.

3. Job Application: Quantity is inconsistent. Should it be 100?

4. It was hard to complete the Chapter Starts and Inserts section of the Open Job module, partly because I had forgotten that the system doesn't count inserts as page images, and that it places the insert tag only after the even numbered pages, but also because the behind-the-scenes actions that the system performs are made easy to comprehend when the user is at the system. In other words, I believe that section of the training is significantly more challenging than is the on site hands on training on the same competencies. My guess is that this module will require more instructor coaching and intervention than the other sections. However, the students are not told that the insert icon appears only on the even numbered pages. They are told that the inserts option will not change the number of pages in the job. They are told in demo 4 that the insert icon appears below the page that is followed by the insert. This insert icon appears only on the even numbered pages, and should be clearly stated. Lisa, as we discussed, the Job Evaluation Table shows an insert for both pages 7 and 8. My feeling is that the table should reflect the behavior of the DocuTech System, and since the DocuTech puts the insert icon or tag only on one page, perhaps the Job Evaluation Table should do the same. You suggested it might only go after page 8. I'm thinking that the system behavior needs to be made very clear and also reinforced. Putting the insert notation only on page 8 would accomplish this.

5. The Job evaluation table, on my 3rd try, incorrectly states that I put a Chapter Start on both pages 9 and 10. This is an error, I believe, because I placed one only on page 9.

6. Question about the Job Request Form: It directs the student to change the Quantity to 50. However, when I opened Show Ticket, the Quantity was already 50.

7. Maybe the size of the job should be shortened or perhaps it could be made less complex by practicing only chapter starts or only inserts.
Appendix D

Richard Willomott's Notes on Open Job
As you are aware, I have recently hosted a test of the DocuTech Intermediate PC simulations developed by Lori Roesner. The simulations were tested periodically on 4 students attending Operator Training the week of 10/4/93.

**Key Messages (students)**

Overall, the students felt that the simulations gave them each an individual chance to program the jobs, but still felt a need for some hands-on. They suggested that some of the simulations need to be more flexible and should include a summary type job on the machine.

**Key Messages (me)**

I feel that the simulations programmed were good exercises. Most of the jobs were "realistic" jobs which made them interesting. However, I'm a little confused as to how the benefit the CER since an explanation and demonstration of the feature was still needed on the DocuTech. Additionally, it seemed to extend class time in some cases since were doing both the simulations and the jobs on the DocuTech.

Not knowing the strategy or objectives of the simulations prior to this evaluation made it difficult to thoroughly test this new process.

I have attached (by feature) comments and programming "bugs" we noticed in completing the simulation, as well as an overall "plus & minus" evaluation.

Rick Willimott

cc:

Lori Roesner
Open Job

Chapter Starts & Inserts ("Application")
- Job page 8 says "request form insets 1" and student programming shows 0.
- Job page 10 shows no chapter start but we felt it should be.

Reprogram Page Level & Job Level ("Proposal")
- Will not allow you to move image 4 before image 3 correctly. (It moves image 3 before image 2)

Moving Pages within a Job ("Famous Ladies One Sided")
- OK

STUDENT EVALUATION

<table>
<thead>
<tr>
<th>+</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Exercises</td>
<td>Some simulations were too specific</td>
</tr>
<tr>
<td>Liked individual approach</td>
<td>Still need to hear machine run.</td>
</tr>
<tr>
<td>Helps each student feel like they learned the feature and programmed it themselves</td>
<td>Maybe have at least 1 job on machine also</td>
</tr>
<tr>
<td></td>
<td>Should be able to select red bar on system to understand programming error</td>
</tr>
</tbody>
</table>
Appendix E

Survey
DocuTech Intermediate Simulation Evaluation Questionnaire

To meet your training needs better, we would like to know your opinion of the quality of the DocuTech Intermediate Simulation program. Circle the number that indicates your opinion of the following statements.

Simulation Reality

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Disagree or Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The simulation accurately portrayed the DocuTech programming screens.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The simulation prepared me to program jobs on the DocuTech correctly the first time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The simulation accurately portrayed the DocuTech's error messages.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I could have programmed the DocuTech accurately even without the simulation practice exercises.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Comments:
Simulation Feedback

The "red message box" refers to messages you may have seen during the simulation, such as: Please work within this job only.

The "evaluation tables" refers to the information displayed at the end of each job.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1. I had enough time to read the red message boxes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I waited too long for the red message boxes to go away.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I prefer to click the mouse to make the red message boxes go away when I am ready to continue.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I prefer the red message boxes to time out on their own.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. The evaluation tables had enough information displayed for me to correct my programming errors.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I liked the layout of the evaluation tables.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Additional Comments:
Job Packages

1. The job packages could be applied to real life applications.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neither Disagree nor Agree: 3
   - Agree: 4
   - Strongly Agree: 5

2. The graphics in the job packages made them interesting.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neither Disagree nor Agree: 3
   - Agree: 4
   - Strongly Agree: 5

3. It bothered me that the jobs were not in any real language.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neither Disagree nor Agree: 3
   - Agree: 4
   - Strongly Agree: 5

4. The jobs tested the skills that were demonstrated by the instructor.
   - Strongly Disagree: 1
   - Disagree: 2
   - Neither Disagree nor Agree: 3
   - Agree: 4
   - Strongly Agree: 5

Additional Comments:
### General

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Disagree or Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The simulation's menus were appealing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. The different colored menus kept me from getting lost in the simulation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I could easily tell which parts of the simulation I had completed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Overall, the simulation was beneficial to my learning process.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Additional Comments:**