

The Bluebonnet Expert Help System

- 8 **An exploration of techniques for helping the user of a copier**
- 8 **Based on analysis of naive users by Suchman and Henderson**
- 8 **Bluebonnet demonstrates capabilities based on AI**
- 8 **AI programming techniques provide flexibility and portability**

The Copier As a Copying Expert

- 8 **Obtain description of task from user**

- 8 **Decide how to do the task**

- 8 **Direct the performance of the task**

Describing the Task

- 8 **The 8200 panel is deficient in that it:**
 - 9 **Requires knowledge of the copier,**
 - 9 **Provide no help for deciding on an input processor,**
 - 9 **Asks confusing questions when original is bound.**

- 8 **Only ask the user to describe the original and the desired copies.**

- 8 **Display only questions relevant to the particular task.**

(Demo Scenario)

Describing the Task

- 8 Only ask the user to describe the original and the desired copies.

- 8 Display only questions relevant to the particular task.

- 8 **Help user decide what he wants.**

- 8 **Task descriptions evolve because of unknown:**
 - 9 **Functionality (e.g., stapling)**
 - 9 **Costs (e.g., two-sided copies)**
 - 9 **Restrictions (e.g., uncollated two-sided copies)**

(Demo Scenario)

Topics

- 8 **Obtain description of task from user**

We Are Here 8=>**Decide how to do the task**

- 8 **Direct the performance of the task**

Basic Procedures

- 8 **1-sided copies from 1-sided RDHable originals**
 - 9 **Load RDH.**
 - 9 **If copies on nonstandard paper, then load top paper tray**
 - 9 **Press Start**
 - 9 **Unload output tray**
 - 9 **If copies on nonstandard paper, then unload top paper tray**
 - 9 **Unload RDH**

- 8 **Uncollated unstapled 1-sided copies using the BDA**
 - 9 **If copies on nonstandard paper, then load top paper tray**
 - 9 **Open the RDH.**
 - 9 **(L1) Place original on glass and close cover.**
 - 9 **Press Start**
 - 9 **Open cover and remove original.**
 - 9 **If finished, close RDH, else go to L1.**
 - 9 **If copies on nonstandard paper, then unload top paper tray**
 - 9 **Unload output tray.**

- 8 **2-sided copies from 1-sided RDHable originals**
 - (two passes using the 8200's built-in procedure)**

- 8 **2-sided copies from 2-sided RDHable originals**
 - (two passes using the 8200's built-in procedure)**

- 8 **Unstapled uncollated 1-sided copies from 2-sided RDHable originals**
 - (two passes followed by a merge by hand)**

Composite Procedures

- 8 **Either collated or stapled or 2-sided copies from a bound original**
 - 9 **[Make one 1-sided copy on standard paper from the bound original]**
 - 9 **[Make the desired copies using the copy from the first step as an original]**

- 8 **Multiple or stapled 1-sided collated copies from 2-sided RDHable originals**
 - 9 **[Make one 1-sided copy on standard paper from the 2-sided RDHable originals]**
 - 9 **[Make the desired collated 1-sided copies using the copy from the first step as an original]**

- 8 **Copies from originals too thick for the RDH, but otherwise RDHable**
 - 9 **Divide the original into sections of less than 50 pages each.**
 - 9 **For each section:**
 - **[Make the desired copies of the section]**
 - **Unload the output tray.**
 - **Append the copies to the copies of the earlier sections.**

Generator for 1-to-1 Using the RDH

8 Enabling conditions

**#OfCopies > 0 AND
#OfOriginalImages > 0 AND
InputProcessor = 'RDH' AND
OriginalTooThick = 'No' AND
TwoSidedOriginals = 'No' AND
TwoSidedCopies = 'No' AND
(Staple = 'No' OR Collate = 'Yes') AND
(Staple = 'No' OR CopiesTooThickToStaple = 'No')**

8 Parameters

**Collate CopyBrightness CopiesOnStandardPaper NumberOfCopies Reduction
Staple**

Derivation Rules

8 Input Processor

**(OriginalsBound = 'Yes' AND Unbindable = 'No') IMPLIES
InputProcessor = 'BDA'.**

i.e., use the BDA for originals that are bound and not unbindable.

**[OriginalsPaperTooFragileOrThick = 'No' AND
OriginalsTooLarge = 'No' AND
OriginalsTooSmall = 'No' AND
(OriginalsBound = 'No' OR Unbindable = 'Yes')] IMPLIES
InputProcessor = 'RDH'.**

i.e., use the RDH for unbound or unbindable originals that are not too fragile, too thick, too large, or too small.

**[(OriginalsBound = 'No' OR Unbindable = 'Yes') AND
(OriginalsTooSmall = 'Yes' OR OriginalsTooLarge = 'Yes' OR
OriginalsPaperTooFragileOrThick = 'Yes')] IMPLIES
InputProcessor = 'Glass'.**

i.e., use the glass for unbound or unbindable originals that are either too small, too large, too fragile, or too thick for the RDH.

**OriginalsStandardSize = 'Yes' IMPLIES
(OriginalsTooSmall = 'No' AND OriginalsTooLarge = 'No').**

i.e., standard size originals are not too small nor too large for the RDH.

**OriginalsOnStandardPaper = 'Yes' IMPLIES
OriginalsPaperTooFragileOrThick = 'No'.**

(i.e., originals on standard paper are not too fragile nor too thick for the RDH.

Derivation Rules (continued)

8 Original Too Thick for RDH and Copies Too Thick To Staple

**IF #OfCopySheets > 35 THEN CopiesTooThickToStaple = 'Yes' ELSE
CopiesTooThickToStaple = 'No'.**

(i.e., copies having more than 35 sheets are too thick for the 8200 stapler.

**IF (#OfOriginalImages > 50 AND TwoSidedOriginals = 'No') OR
(#OfOriginalImages > 100 AND TwoSidedOriginals = 'Yes') THEN
OriginalTooThick = 'Yes' ELSE OriginalTooThick = 'No'.**

(i.e., originals having more than 50 sheets are too thick for the RDH.

TwoSidedCopies = 'No' IMPLIES #OfCopySheets = #OfOriginalImages.

i.e., the number of sheets in a 1-sided copy is the number of images copied.

TwoSidedCopies = 'Yes' IMPLIES #OfCopySheets = (#OfOriginalImages / 2).

i.e., the number of sheets in a 2-sided copy is 1/2 the number of images copied.

Help Units For Tasks Without Procedures

8 Collate = 'No' AND Staple = 'No'.

Comment: The 8200 cannot staple uncollated copies. It can make unstapled copies, which you can then staple.

Action: Change Staple to 'No'.

8 TwoSidedCopies = 'Yes' AND Collate = 'No'.

Comment: The 8200 cannot make uncollated two-sided copies. It can make collated copies, which you can then uncollate.)

Action: Change Collate to 'Yes'.

8 Staple = 'Yes' AND CopiesTooThickToStaple = 'Yes'.

Comment: Your copies will be too thick for the 8200 to staple. It can make unstapled copies, which you can then staple.

Action: Change Staple to 'No'.

8 OriginalTooThick = 'Yes' AND
InputProcessor = 'RDH' AND
Staple = 'Yes'.

Comment: The 8200 cannot staple copies of an original that is too thick for the RDH. It can make unstapled copies, which you can then staple.

Action: Change Staple to 'No'.

8 ~(#OfCopies > 0).

Comment: Indicate number of copies desired.

Action: None.

Topics

8 **Obtain description of task from user**

8 **Decide how to do the task**

We Are Here \Rightarrow **Direct the performance of the task**

(Demo Scenario)

- 8 **Press the Start button.**
(to make the 3 copies)

- 8 **Your copies are now being made. Each sheet of the original is being taken into the copier by the RDH, copied once, and returned. When all sheets have been returned, a copy will be stapled and put into the output tray. Each copy is made in the same manner.**

- 8 **Remove your paper from the top paper tray.**

- 8 **Remove your originals from the RDH.**

- 8 **Remove the copies from the output tray.**

- 8 **Thank you. Your job is completed.**

Job State

8 Machine State (93 fields)

AddPaper

Copy

CopyMode

DocumentInRDH

OffsettingCatchTray

Output

PaperTray

RdhOpen

Ready

Reduction

ShadeOpen

State

StatusCodeSeeInstructions

.
. .
.

8 Plan Execution State

FirstPageCopied

CopiesMade

Pass1Done

PlanIntroduced

1-Sided to 1-Sided on Nonstandard Paper

- Step 1:** SetPanel.
- Step 2:** TellUser "Place the paper ... in the top paper tray".
- Step 3:** TellUser "Place originals in RDH".
- Step 4:** MakeReady.
- Step 5:** TellUser "Press Start". Requirements:
 Panel Set (if not, try Step 1)
 "Add Paper" light off (if not, try Step 2)
 DocumentInRDH (if not, try Step 3)
 Ready State (if not, try Step 4)
- Step 6:** CompletePrintingStep. (sets CopiesMade) Requirements:
 Printing State (if not, try Step 5)
- Step 7:** TellUser "Remove paper from top paper tray".
- Step 8:** Select BottomPaperTray. Requirements:
 "Add Paper" light on (if not, try Step 7)
- Step 9:** TellUser "Remove originals from RDH".
- Step 10:** TellUser "Remove copies from output tray".
- Step 11:** TellUser "Thank You. ... ". Requirements:
 CopiesMade (if not, try Step 6)
 BottomPaperTray selected (if not, try Step 8)
 ~DocumentInRDH (if not, try Step 9)
 OffsettingCatchTrayEmpty (if not, try Step 10)
 Ready State (if not, try Step 4)

Basic Procedure For Bound Original

- Step 1:** SetPanel.
- Step 2:** TellUser "Pull BDA latch forward." "Raise the RDH."
- Step 3:** TellUser "Place first page of original face down on the glass, ..." "Slide document cover left over original ..." Requirements:
RdhOpen (if not, try Step 2)
- Step 4:** MakeReady.
- Step 5:** TellUser "Press Start". Requirements:
Panel Set (if not, try Step 1)
~ShadeOpen (if not, try Step 3)
Ready State (if not, try Step 4)
- Step 6:** CompletePrintingStep. (sets FirstPageCopied and CopiesMade) Requirements:
Printing State (if not, try Step 5)
- Step 7:** TellUser "Press Start". Requirements:
Panel Set (if not, try Step 1)
Ready State (if not, try Step 4)
- Step 8:** CompletePrintingStep. (sets CopiesMade) Requirements:
Printing State (if not, try Step 7)
- Step 9:** TellUser "Slide document cover right." Requirements:
CopiesMade (if not, try Step 8)
- Step 10:** TellUser "Remove original from glass." "If more originals ... then place next ... on the glass. Slide document cover left Otherwise, lower the RDH ..." (clears CopiesMade) Requirements:
ShadeOpen (if not, try step 9)
- Step 11:** TellUser "Remove the copies from the output tray."
- Step 12:** TellUser "Thank you ..." Requirements:
FirstPageCopied (if not, try step 6)
~RdhOpen (if not, try step 10)
~OffsettingCatchTray (if not, try step 11)
Ready State (if not, try step 4)

Bluebonnet is Flexible and Portable

- 8 **Procedure enabling conditions determine:**
 - 9 **Questions to ask,**
 - 9 **Legal tasks,**
 - 9 **Procedure to use.**

- 8 **Derivation rules define relationships among task features.**

- 8 **"Help Units" indicate actions for helping with illegal tasks.**

- 8 **Procedure structure is easy to specify and allows flexible monitoring.**

Summary of Bluebonnet's Behavioral Features

- 8 **Frees user from knowing mechanical details of copier.**

- 8 **Asks only relevant questions.**

- 8 **Provides time estimates for tasks.**

- 8 **Suggests task changes to save user time.**

- 8 **Recognizes illegal tasks and advises user how to make them legal.**

- 8 **Determines the procedure for a given task.**

- 8 **Provides instructions for doing the task.**
 - 9 **Includes purpose of step.**
 - 9 **Describes what copier is doing.**
 - 9 **Indicates assumptions.**

- 8 **Monitors progress of task.**
 - 9 **Notifies when steps have already been done.**
 - 9 **Requests steps to be redone when needed.**