

# Case-Based Reasoning and Call Centers

Bill Cheetham

"Applying Case-Based Reasoning" by Ian Watson chapters 5 - 8

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## Contents

- Introduction to Help Desks
- Broderbund and Compaq
- GE Appliances "Save the Call"
- GE Appliances eMail Handling
- Customer Service Issues

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## Introduction to Help Desks

- What is a customer service help desk?
  - Companies provide telephone support for their products through 1-800 numbers
  - this is a multi-million dollar industry
    - Compaq
    - Broderbund
    - GE Appliances

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## Help Desk Challenges

- Growing complexity of products
- Extended warranties
- Corporate Image depends on service
- Limited supply of qualified people
- Training is expensive
- Low pay / high turnover (80% per year)
- Training when new products released

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## Help Desk Challenges

- Consistency among call takers
- Warranties for other manufacturers
- Need to store new problems so the correct solution can be determined
- Need to retain problems so they can be fixed in the next release
- Fair treatment for all callers

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## Help Desk Solution

- Old help desks
  - work from paper manuals
  - need to find proper manual / section
- New help desks
  - CBR tools
  - type question and perform keyword search
  - search uses model #, service info, ...
  - automated without call taker (Internet)
  - eMail Questions

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## General Help Desk

- Expand to any getting ANY information
  - question answering system
  - collaborative search
  - knowledge management tool
  - decision making tool



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## Compaq SMART System

- The problem
  - Compaq manufactures personal computers, laptops, servers
  - In early 1990's had group of support engineers for dealers
  - In March 1991 they opened a customer call center
  - Customer service aim was "elate every customer by being accessible, responsive, enthusiastic, courteous, helpful, and caring."
  - Received thousands of calls daily
  - Increased staff by 100%, but that was not enough

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## Compaq SMART System

- The new process - CBR system (Inference Corp.)
  - The call taker collects basic information (name, address, ...)
  - Asks for a brief description which is typed in
  - SMART uses the description to provide an initial search
  - The call taker is presented with the best matching cases and questions to distinguish between them.
  - As each question is answered a new search is performed
  - Once a sufficient level of certainty is reached, the call taker will relay the solution.
  - If no solution was found the call was transferred to a more experienced call taker with a log of all the answered questions.

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## Compaq SMART System

- Learning
  - problems that were transferred by SMART
  - solved by more experienced call taker
  - call taker updates the case-base
  - 1st level call takers can use the new case
- Impact
  - non-transferred solutions from 50% to 87%
  - engineers moved to other work

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## Broderbund

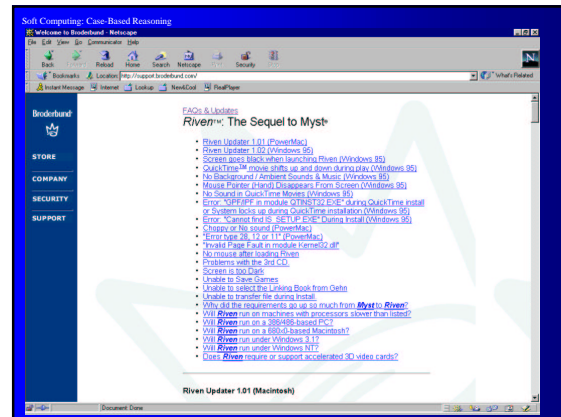
- The problem
  - Broderbund creates computer games and educational software
  - Their customer service answered questions about their software, hardware, operating systems, drivers, ...
  - Call takers were experienced technologists, not trained as service representatives. "They were surly, short-tempered, and occasionally insulting to the customers"
  - Releasing, MYST, for Christmas 1995
  - Expected large number of technical support calls
  - 1-800 call is expensive

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## Broderbund

- New process (1997) - CBR system
  - Internet based customer support
  - 3,000 cases went live Christmas day
  - Customers performed searches and answered questions
  - The same case-base is used when customers call the 1-800 number
- Benefits
  - In 1997 implemented for all products
  - 24 hour support
  - Web site handles work of 7 call takers
- Replaced by simple FAQ in 1999

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## GE Appliances

- The problem
  - GE Appliances sells all major household appliances
  - Their customer service answers more than 3,000,000 calls per year and has over 300 full/part time call takers.
  - There is 70% turnover per year
  - Training is difficult
  - Unnecessary service calls are expensive
    - each call costs about \$75
    - 15% of service calls are unnecessary
  - People would rather get the answer over the phone than wait at home

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## GE Appliances

- New process - CBR system (eGain)
  - Internal call takers use CBR
  - Internet based customer support
  - Mail out parts with instructions
  - Customers can schedule their own service calls on-line
- Future
  - Graphics, animations, and video available
  - Internet chat / Internet phone with call taker
  - Push the appropriate web site
  - CBR for remote diagnostics

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## eGain k-Commerce

- Case-Based Reasoning with Question Answering and Rule-Based System
- k-Commerce is the market leader for customer support applications
  - Authoring environment (CBR Express),
  - Search engine (CasePoint),
    - DLL, and API
    - WWW facility,

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## k-Commerce - Case data

- LOG: 7/29/96 14:19:15 - Lower cassette tray is installed improperly. The printer didn't print, and couldn't print a self test. On inspection the display message was: "14 Lower Tray" and the optional Lower Cassette tray was installed incorrectly. The action taken was to reinstall the lower Cassette tray.

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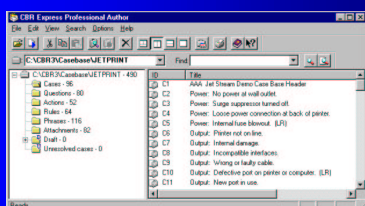
## K-Commerce - Case Format

• Case Title	Lower cassette tray installed improperly
• Case Description	Printer doesn't print, and will not print self test
• Questions Can you print a self test? What is the display message? Is optional Lower Cassette tray installed correctly?	NO 14 Lower Tray NO
• Action	Reinstall the Lower Cassette tray

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## k-Commerce- CBR Express

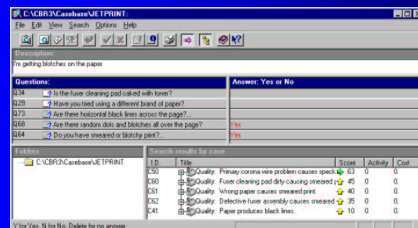
- Windows based case authoring tool



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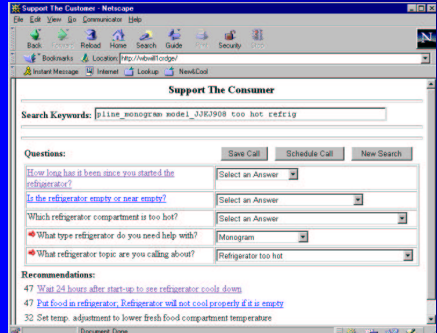
## k-Commerce - CasePoint

- Windows based case retrieval tool

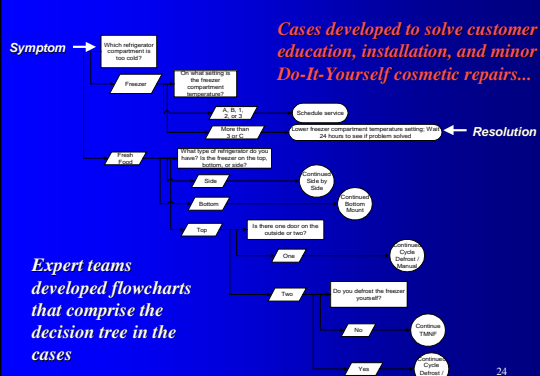


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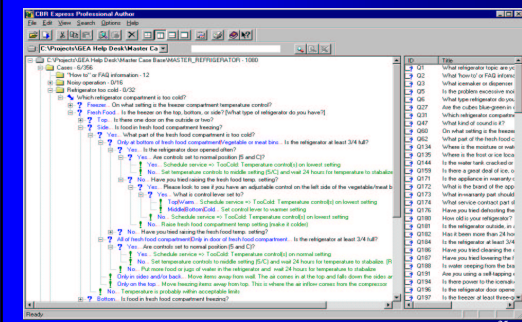
## k-Commerce - Webserver



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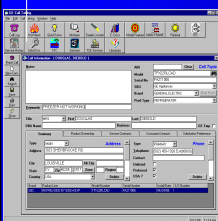
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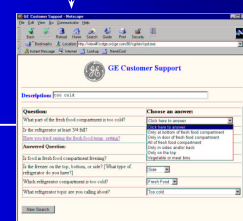
25

Desktop launches CBR and sends Brand, Product Line, Warranty Type, Model Number and Problem statement to CBR.

- Unlimited number of cases
- Only relevant cases displayed
- Attachments / Graphics

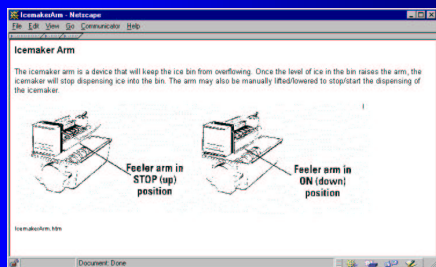


Calltaker collects Consumer Information and Product Information on call using Calltaking 32



Calltaker attempts to save the call using CBR

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Text attachments and graphics provide resolutions to Consumer Problems

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## GEA "Save the Call" - Benefits

Fully deployed for all product lines on June 1999

This effort saves \$2.5 MM / year (3.9 % to 12.3%)

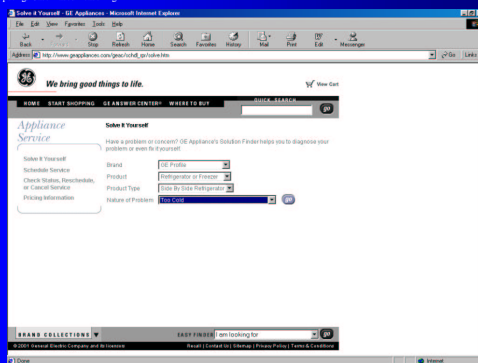
- reduce Service Call Rate (SCR) and spending on Customer Education & Installation (CEI) calls.
- CEI calls were 15% of all calls (1,400,000 per year)
- each service call avoided saves \$50
- increase consumer satisfaction (solve issues in one call),
- feedback issues to design teams
- we can enforce policies "Always ask question X if callers issue is Y"

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## Additional Uses of CBR

- Web Based Save the Call for Internet Service Application
  - Meets the Consumer expectation for total online service
  - Increases the Brand commitment for GE consumers
- Consumer Relations - controls concessions, reduces escalations, provides consistency
  - Resolves consumer complaints faster and to the consumers satisfaction more consistently than without CBR

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[http://www.geappliances.com/geac/schdl\\_rpr/solve.htm](http://www.geappliances.com/geac/schdl_rpr/solve.htm)

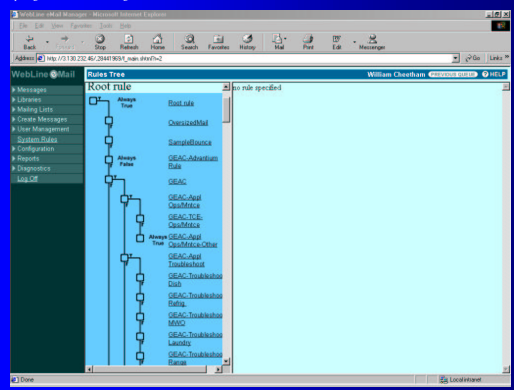
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## GEA eMail - Problem

- **Managing Costs/Productivity**
  - 10 min per email at 1.00 per minute
  - Increasing volume
  - Consistent miss on business commitment
  - Agent subjectivity
- **Content Consistency**
  - Inconsistent answers among team members
  - Inconsistent answers among GEA teams (GEAC/ASI)
- **Reporting**
  - Manual reporting (over/under 24 hours) lacking detail
  - No automated method to measure agent productivity or performance



The screenshot displays the McAfee ePO console interface. At the top, the navigation bar includes 'WebLine', 'Tools', 'Reports', 'My Recent', 'My Favorites', 'My Alerts', 'My Settings', and 'My Account'. The main content area is titled 'WebLine' and shows a list of links: 'Messages', 'Libraries', 'Monitoring Tools', 'Create Messages', 'View Messages', 'System Reports', 'Configuration', 'Support', 'Diagnose', and 'Log Off'. The central pane is titled 'EDIT RULE: GEAC-Thresholdless Rating' and contains a 'Written Checksum' field with the value '42800000000000000000'. Below this is a table with columns 'Rule Name' and 'Description'. The rule 'GEAC-Thresholdless Rating' is selected, and its description is 'Test This Rule'. To the right of the table is a 'OK' button. Below the table is a section titled 'Initializes' with a dropdown menu set to 'Form initialized'. A note states: 'What and when is initialized before using'. Below this is a section titled 'Rule Expansion: GEAC-Thresholdless Rating' with a sub-section 'Thresholdless type for anti-governance'. This section contains a list of rules: 'I don't want any of the patterns: "independent", "tiger", "catbox", "ice box", "hedge", "freedom", "side-by-side", "side-by-side", "ice machine", "ice machine"', 'FALSE when FALSE, when do this', 'Assign the next to Answer Center', 'Suggest templates with these keywords: GEAC-Thresholdless Rating', 'Assign these Categories: GEAC-Problem-Solve, DIY', and 'Return TRUE'. Below this is a section titled 'Matching Tests' with a sub-section 'Match Time'. This section contains a table with columns 'Match Time' and 'Match Time'. The table has two rows: 'Match Time' and 'Match Time'. The first row has a dropdown menu set to 'ignore' and a dropdown menu set to 'ignore'. The second row has a dropdown menu set to 'ignore' and a dropdown menu set to 'ignore'. Below the table is a section titled 'Match Test' with a dropdown menu set to 'ignore'.

File Edit View Format Tools Help

Address: http://193.102.40.204/WSA\_sam\_dre2C... C:\Docu... Links...

WebLink Mail

All Public Templates William Cheukon

TITLE	DESCRIPTION	LOCATION	STATUS
GEAC - Inquiry for Accounting Info	GEAC - Other	GEAC - Pkts New App Other	UnTested
GEAC - Release (Outgoing)	GEAC-Release	GEAC - Pkts New App Other	CanTest
GEAC - Stock	GEAC - Stock financial	GEAC - Pkts New App Other	CanTest
GEAC - Canadian Work, Plans, Q's	GEAC - Preparation	GEAC - International	CanTest
GEAC - Connection Road	GEAC - Ranges Size, Tech, CR	GEAC - App	CanTest
GEAC - CR Book	GEAC - CR Book	GEAC - App	CanTest
GEAC - CR Headquarters Address	GEAC - CR Headquarters	GEAC - App	CanTest
GEAC - Dash DS/Planning Work Arm	GEAC - Dash DS/Planning	GEAC - App	CanTest
GEAC - Dash DS/Planning White	GEAC - Dash DS/Planning	GEAC - App	CanTest
GEAC - Dash DS/Planning	GEAC - Dash DS/Planning	GEAC - App	CanTest
GEAC - Dash DS/Release Info	GEAC - Dash DS/Release Info	GEAC - App	CanTest

View

WebSite Editor - Microsoft Internet Explorer

File Edit View Favorites Links Help

Address http://193.132.42.204/8051\_main.shtml#2

WebSite Editor Edit Template "GEAC - Testimonial For Obsolete™" William Chatham

Save / Delete

LIBRARY

OWNER: GEAC/Agri/Mac

NAME: GEAC/Testimonial For Obsolete™

DESCRIPTION: Testimonials by Obsolete/Unique Appliances

TEMPLATE #: 09642271caneTest

TEMPLATE TEXT

Thank you for contacting us and for your interest in GE. When a wonderful thing is said, you (or GE) can retain a representative model from each year's production for advertising and display purposes. However, we do not have a public history museum where they can be viewed. If you are interested in displaying the model, you may wish to contact your nearest GE dealer or unique dealer in your area who may have some interest in your appliances.

If you would like to have your testimonial on file, please contact the following address:

GE Appliances Consumer Relations  
APA - 129

REMARKS

Assigned Keywords:  
GEAC-Ob  
GEAC-Over  
GEAC-Ob  
GEAC-Testimonial  
GEAC-Testimonial  
GEAC-Testimonial  
GEAC-Testimonial

ATTACHMENTS



