Wizards, Advisors and Websites, Oh My! Interactive Electronic Tools for Compliance Assistance

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Presented at

National Compliance Assistance Providers Forum
December 3-6, 2002
San Antonio, Texas

Cosponsored by

U.S. Environmental Protection Agency
and Texas Commission on Environmental Quality

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Interactive Electronic Tools For Compliance Assistance

National Compliance Assistance Providers Forum 2002

December 4, 2002

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What‘s the short story?

- What are interactive tools?
- Components of electronic tools
- Why are expert systems different?
- Elements in the development of a successful tool

What are interactive tools?

- Tools that accept user input, ask follow-up questions engaging the user in a dialog or exchange.

What’s the advantage?

- Provide visual or audible reinforcement
- Focus the user on critical decision points
- Keeps the attention of the user

Components of Electronic Tools

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It ‘s only ones and zeros

(but I like it...)

Toolkit of Internet Technologies

- Programming Languages, RAD, Web design software & shells
- Search Engines
- Databases
- Video,Audio & Graphics
- Servers

Programming Languages, RAD & shells

- Perl, PHP, TCL, Python
- Visual Basic, Delphi
- Cold Fusion, FrontPage
- HTML
- XML
- JavaScript
- Java, Java applets
- Exsys, RuleMachines

Search Engines

- Google
- AltaVista
- Yahoo
- Lycos
- Atomz
- Your own homebrew

Databases

- MS – Access
- Oracle
- mySQL
- PostgreSQL

Video, Audio & Graphics

- Windows MediaPlayer
- QuickTime
- RealOnePlayer

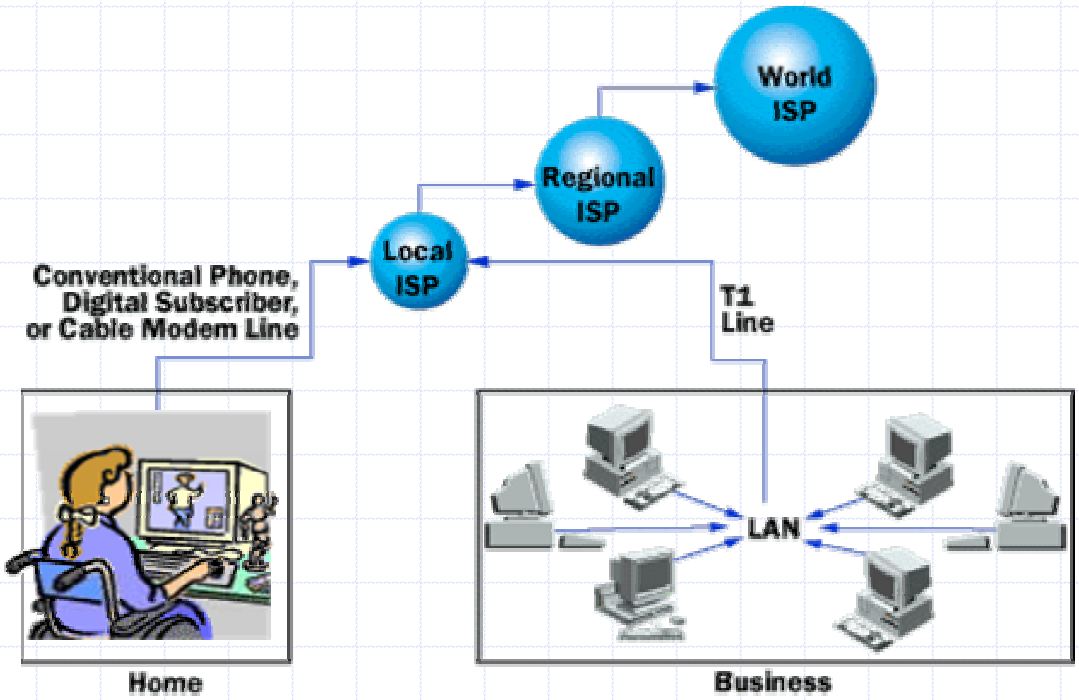
- Formats: .gif, .jpg, .bmp,
- “Thinking” graphics: Flash, .pdf

Servers and their clients

- e-mail
- web
- database
- application
- streaming video & audio

The Internet

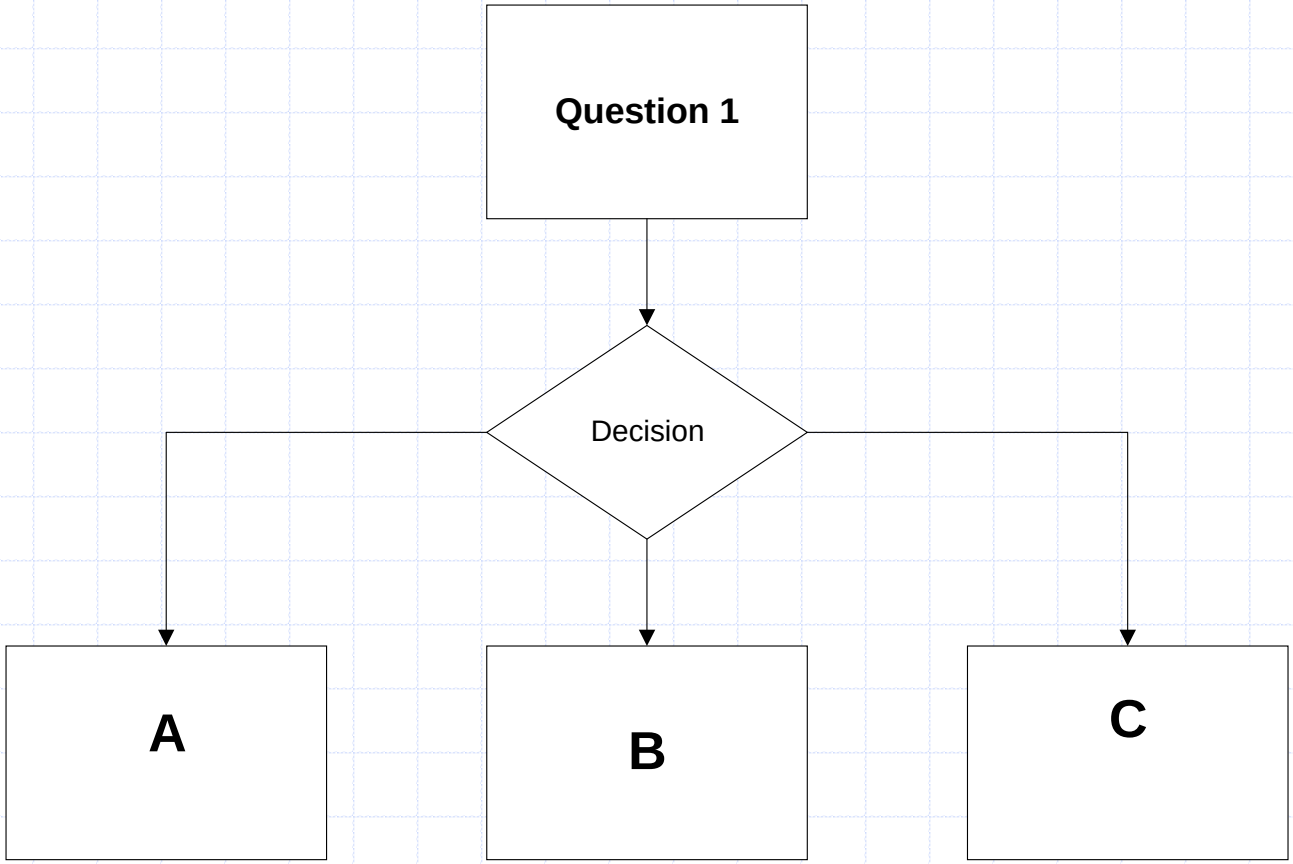
What happens when you click?



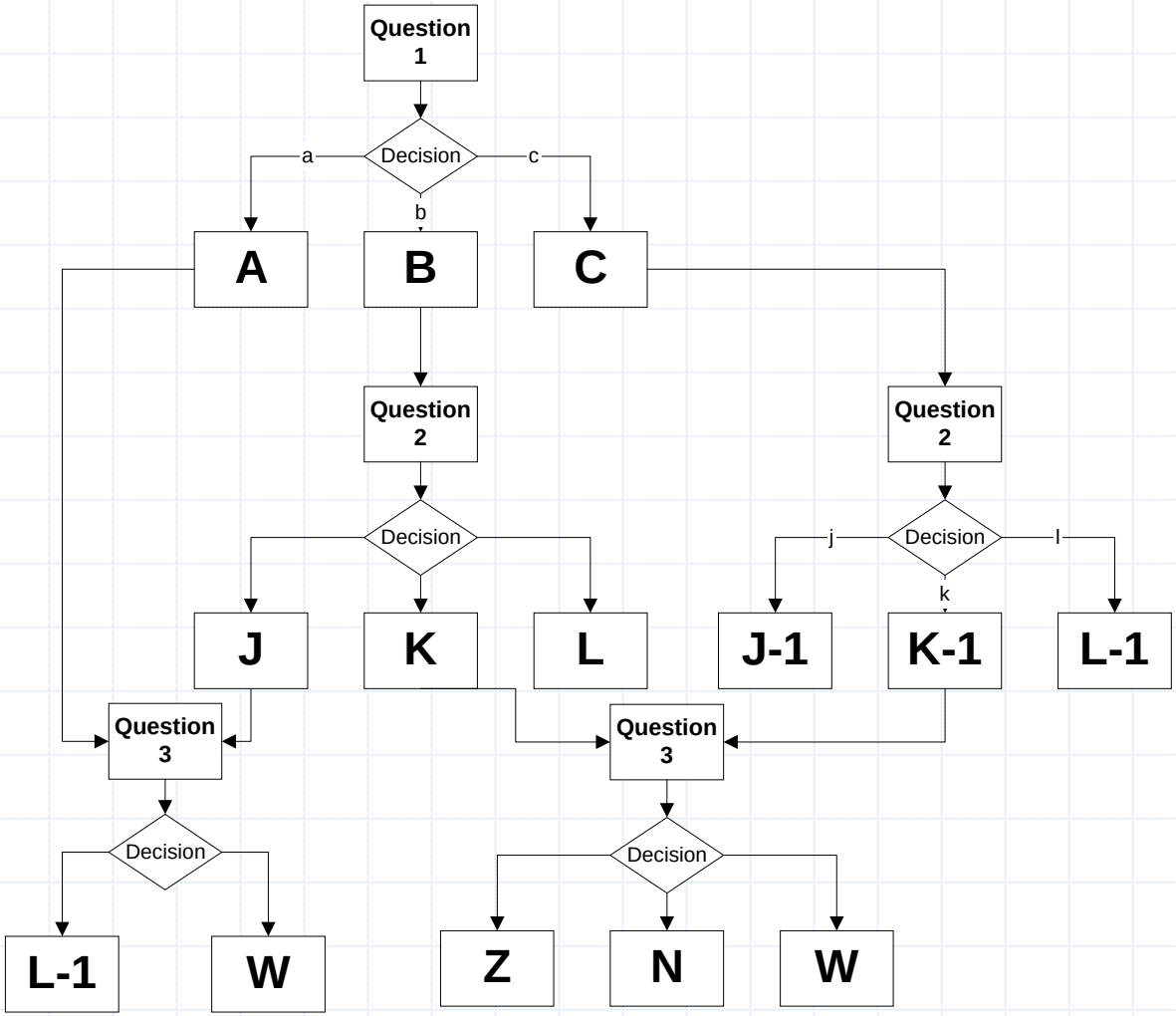
What are expert systems and why are they different?

- They can make a decision, by emulating human problem solving
- Capable of codifying complex knowledge
- Can respond to incomplete knowledge with probabilistic decisions or ranking
- Based on “If...then” rule statements.
- Knowledge, in the form of rules, is separate from the execution of the program

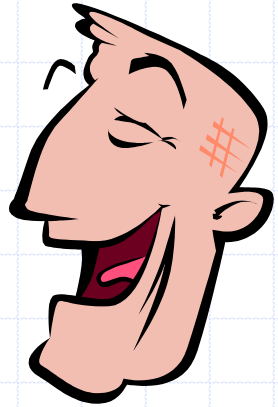
Simple Decision

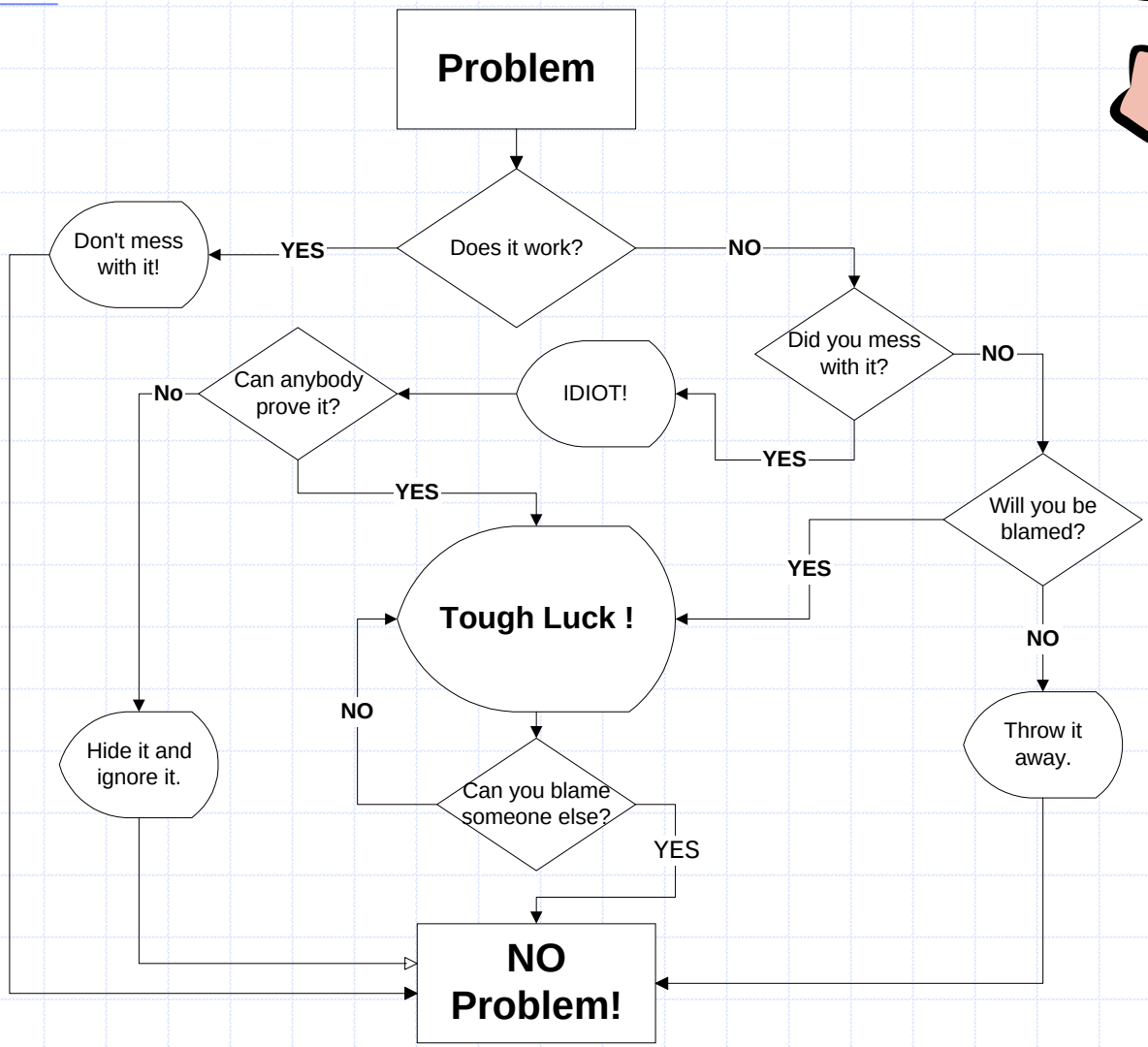


Not so simple



Modern Decision Making





Limitations

- Cannot provide solutions for problems outside its “domain.”
- Cannot “learn.”
- Requires a computer & access to the Internet, CD-ROM.

Advantages

- Makes “tacit” knowledge “explicit.”
- Allows the recording of expert knowledge.
- Provides repeatable and verifiable expertise.
- Self-service, available anytime.

What type of problems can be addressed with expert systems? (paradigm)

- diagnosis or classification
- configuration or selection
- detection, monitoring, prediction
- design
- scheduling and planning

What are the purposes?

- Advisory
- Consultancy
- Tutorial
- Search
- What-if simulation

Advisory

help supplement the average person's knowledge

Useful when:

- support personnel do not have expertise
- support personnel are highly trained but are scarce and overbooked.
- the training time or cost are overwhelmed by new problems
- the range of problems is so broad that personnel can't learn them

Consultancy

Responding to crises - time is of the essence.

- Real time response systems
- Fault Detection, Isolation, Recovery
- Problems occur so rarely that expertise can’t be maintained.

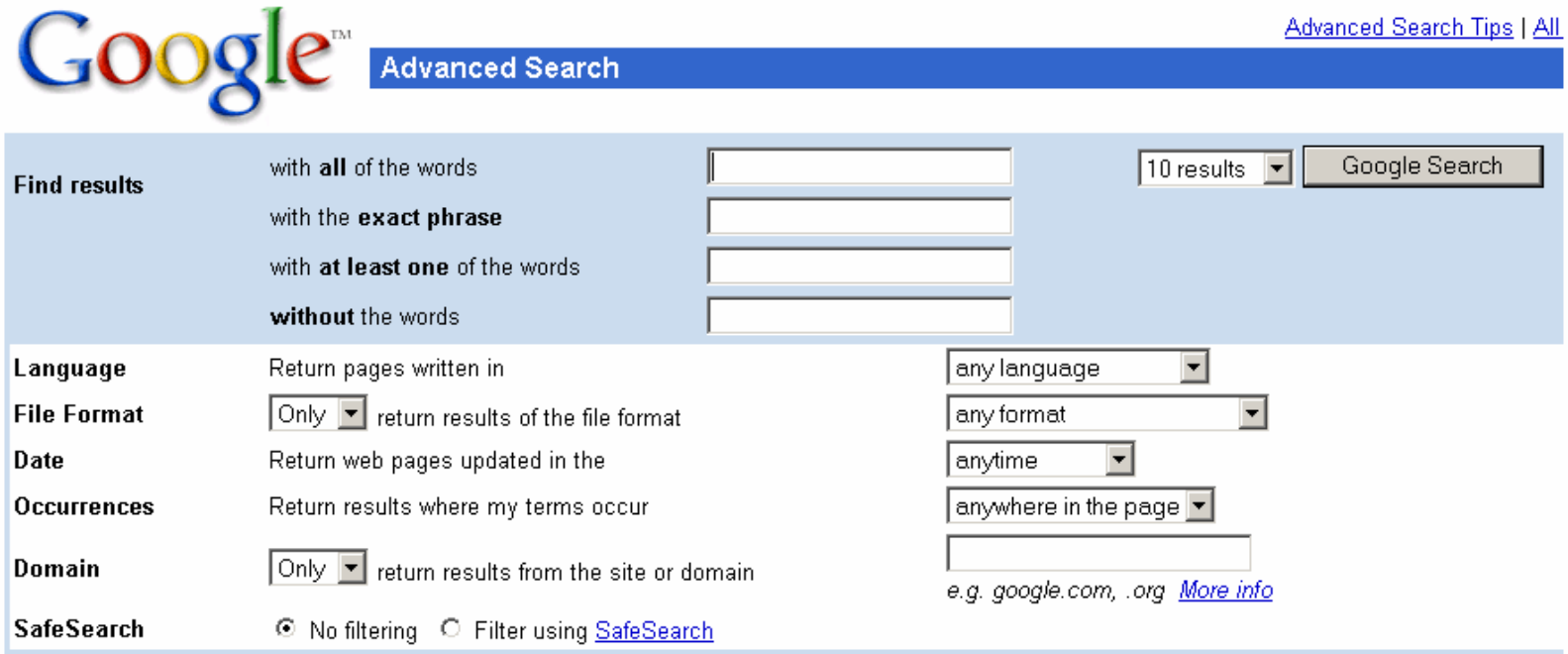
Tutorial

Teaching and training

- Distance learning
- Training new experts
- Evaluate user responses and suggest alternatives

Search

Defining the conditions for information retrieval



What-if simulation

Creates representation of new events

- Oncologic – Is substance carcinogenic?
- How did the World Trade Center Collapse?
- How many more (or fewer) patients will live if regulations on liver transplantation are changed?

Creating the expert system

Knowledge Engineering

- Collecting the knowledge
  - Documents
  - User manuals
  - Regulations
  - Interviews

Creating the expert system

- Interpreting
  - Reviewing collected materials
  - Reviewing transcripts or tapes

Creating the expert system

- Analysis
  - Comparing different sources
  - Looking for gaps
  - Identifying “meta” issues
  - Flow-charting components

Creating the expert system

- Prototype the system
  - Prototype the system
    - Prototype the system
      - Prototype the system
        - Prototype the system
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  - Prototype the system
    - Prototype the system
      - Prototype the system
        - Prototype the system

Let’s do some knowledge engineering!

Woo - Hoo!

Creating the successful tool

- What is the problem to be addressed
- Who is the audience for the information
- Who does what – *aka* the RFP
- Review panels and advisory committees
- Creating the schedule
- Planning for maintenance

What is the problem to be addressed?

- Is there an answer to the problem?
- Purpose of the expert system
- Paradigm that seems appropriate
- Domain knowledge
- How finite do you want the answer to be?

Who is the audience for the information?

- How is the problem being resolved now?
- How are they likely to gain access the expert system?
- What is their frame of reference – language, attitude, understanding?

Who does what – *aka* the RFP

- **Domain expertise**
- Visual & web design
- Ancillary materials
- Promotion and distribution
- Advisory committee
- Education of participants
- Who carries the hammer for the other parties?
- How do you know that the project is over?

Review panels and advisory committees

- Review panels provide the “Good Housekeeping Seal”
- Advisory Committees represent the user and the other stakeholders
- How to educate, how to involve, how to break down barriers.

Creating the schedule

- Kick-off presentation on experts systems or interactive strategy.
- Initial information exchange
- Advisory panel meeting
- Initial interviews & analysis
- Prototype
- Follow-up review, interviews, analysis
- Expanded prototype
- Repeat as needed (aspirin optional)
- Public or internal preview

Planning for maintenance

- Regulatory change
- Court challenge
- State by state changes
- Links, reference & ancillary materials change
- OOPs

And in conclusion ...

Resources

Examples of Expert Systems

- OSHA eTools and Electronic Products for Compliance Assistance
  - http://www.osha.gov/dts/osta/oshasoft/index.html
- Small Business Division EPA – Class V Advisor & Auto Recycler
  - http://www.smallbiz-enviroweb.org/compliance/exsys.html
- DOL e-Laws Online - OSHA and Others
  - http://www.dol.gov/dol/compliance/compliance-comptools.htm
- Small Business Administration
  - http://app1.sba.gov/exsysweb/client/bizform/bizformmenu.html