Global Multicriteria Decision Support by Web-HIPRE

A Java-applet for Value Tree and AHP Analysis

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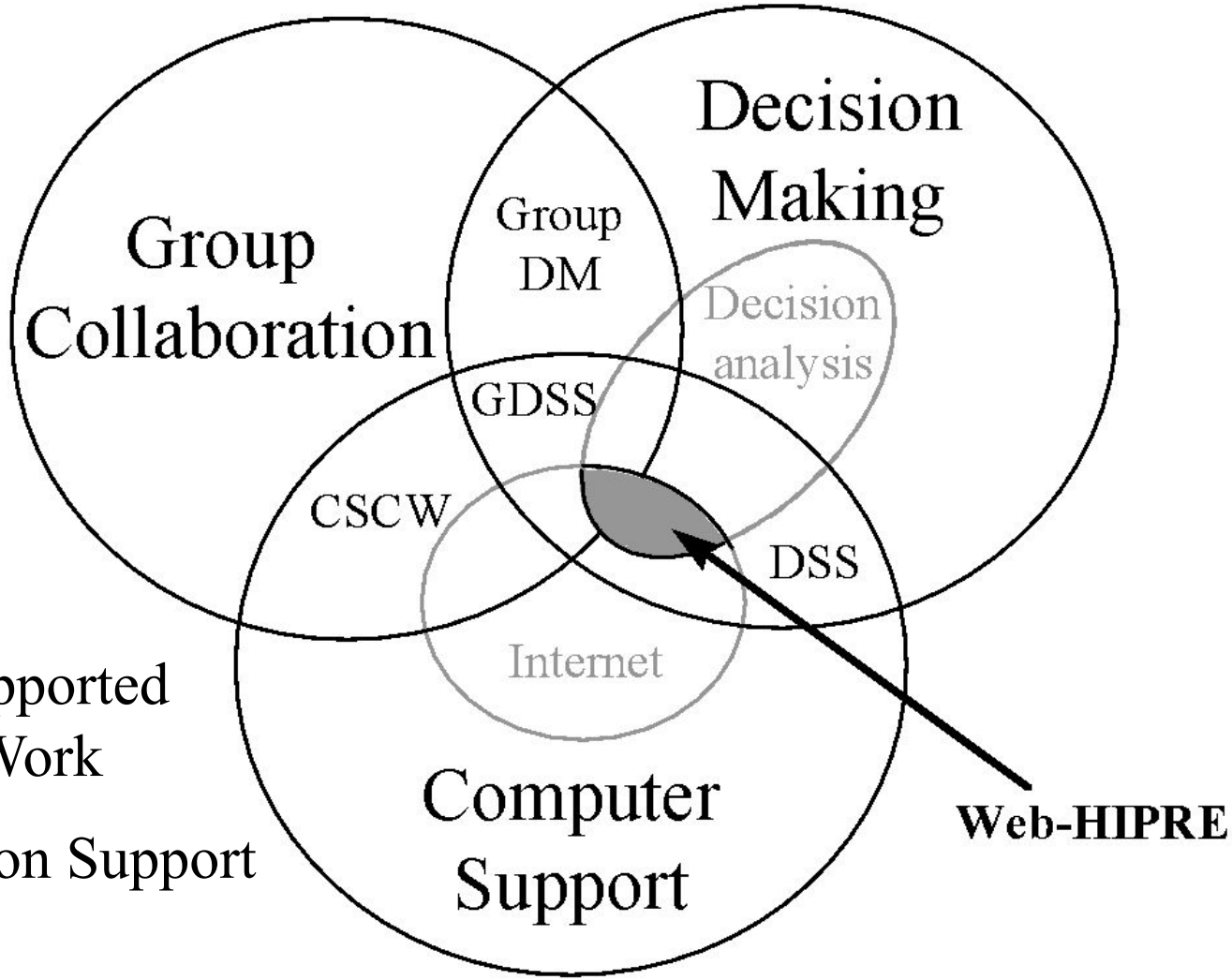
The first interactive MCDM software in the Internet

- Web-HIPRE = HIerarchical PREference analysis in the World Wide Web
- Successor of the the decision support software HIPRE 3+
- Unlimited global access
- Opens up a new dimension in decision support

Web-HIPRE on the DSS-map



CSCW = Computer-Supported Cooperative Work

DSS = Decision Support System

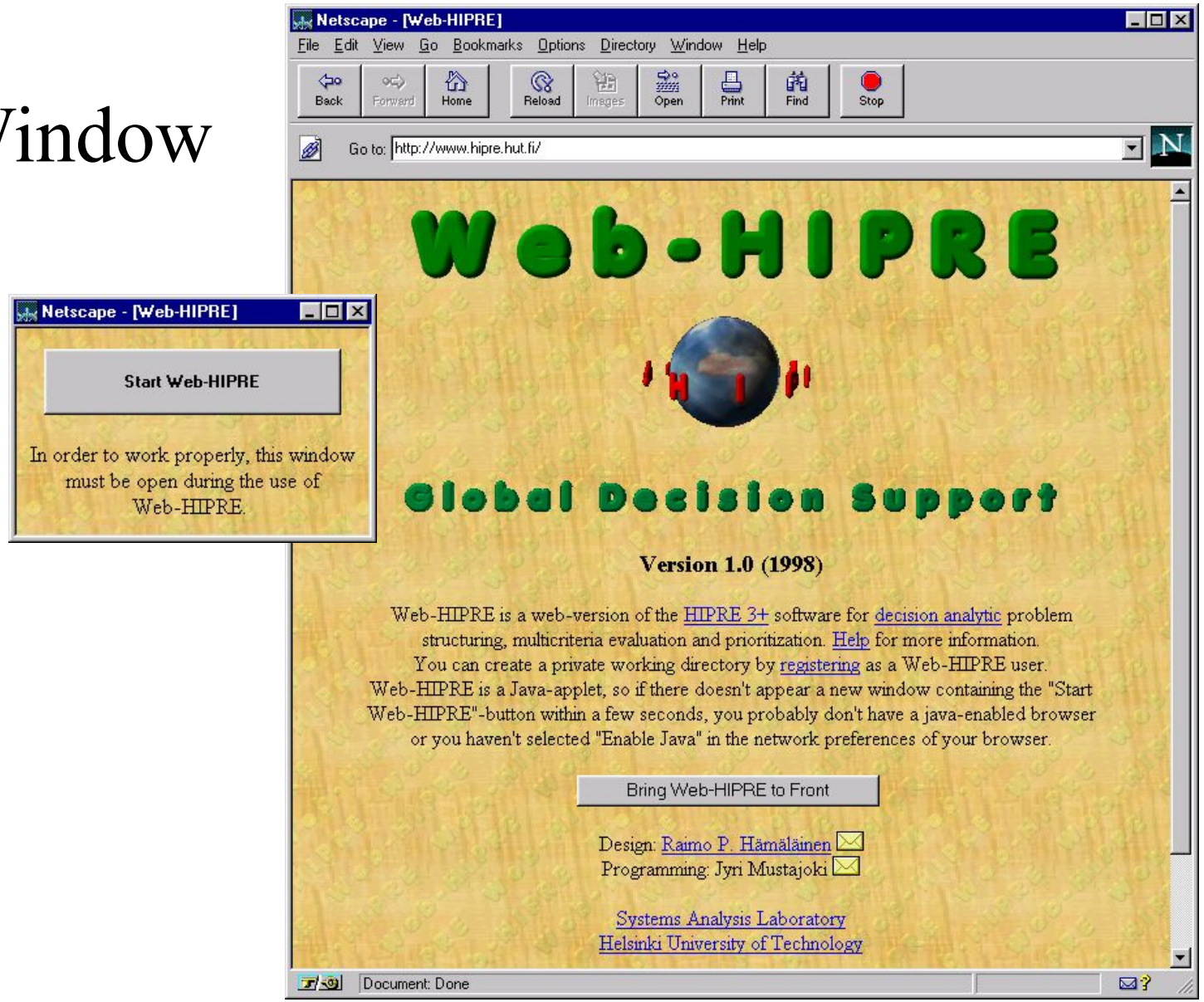
Global Platform for Individual and Group Decision Support

- Computer-Supported Collaborative Decision Making
- Physical distance is no longer a barrier
- Internet provides an easy way to communicate and share information
- Individual models can be processed synchronously or asynchronously
- Group results easy to combine

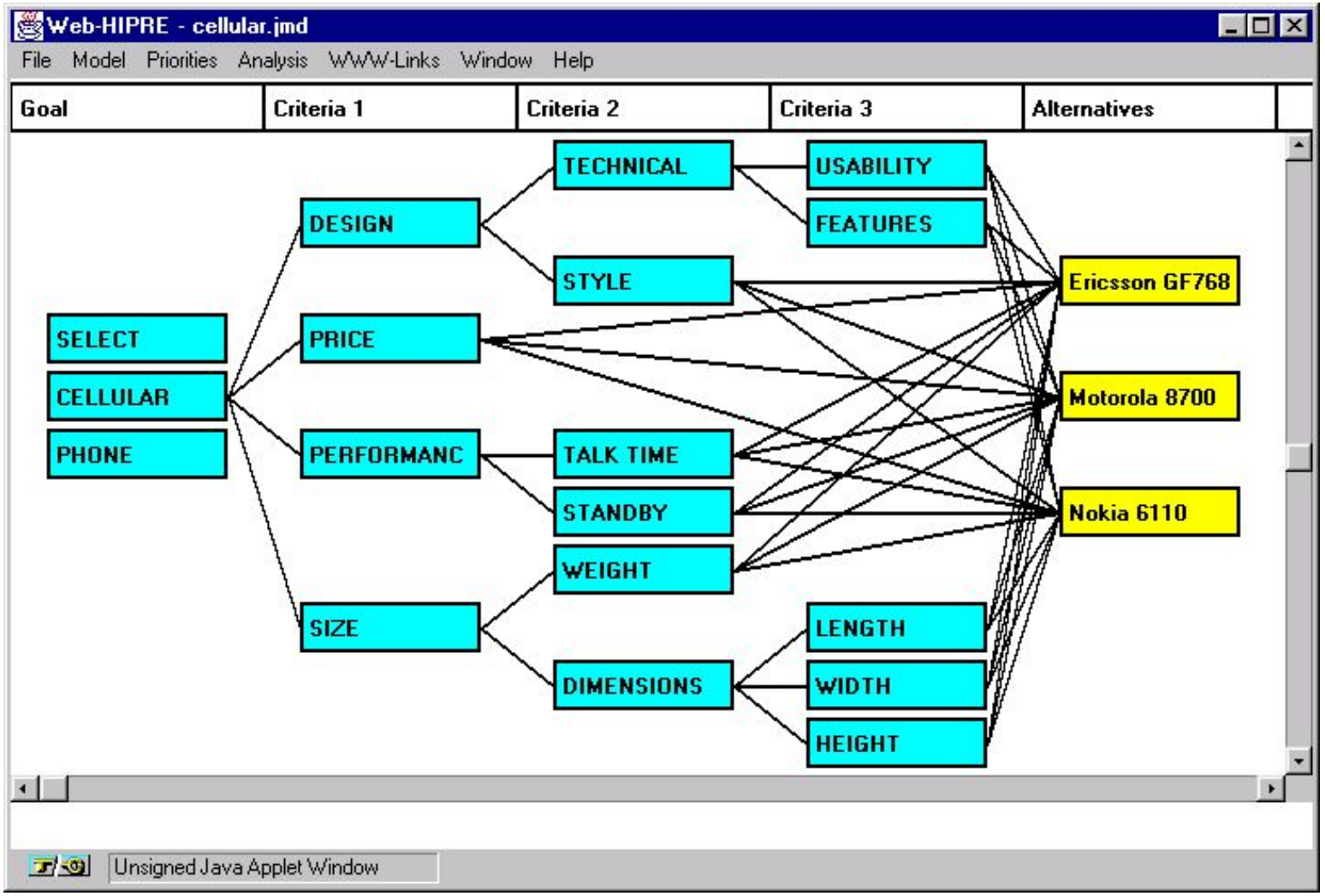
Web-HIPRE as a Java-applet

- Platform independent - works in different computer environments
- No installations on local computers - just a Java-enabled browser needed (e.g. Netscape 3.01, Internet Explorer 3.0)
- Updated version always available

Starting Window



Web-HIPRE Main Window

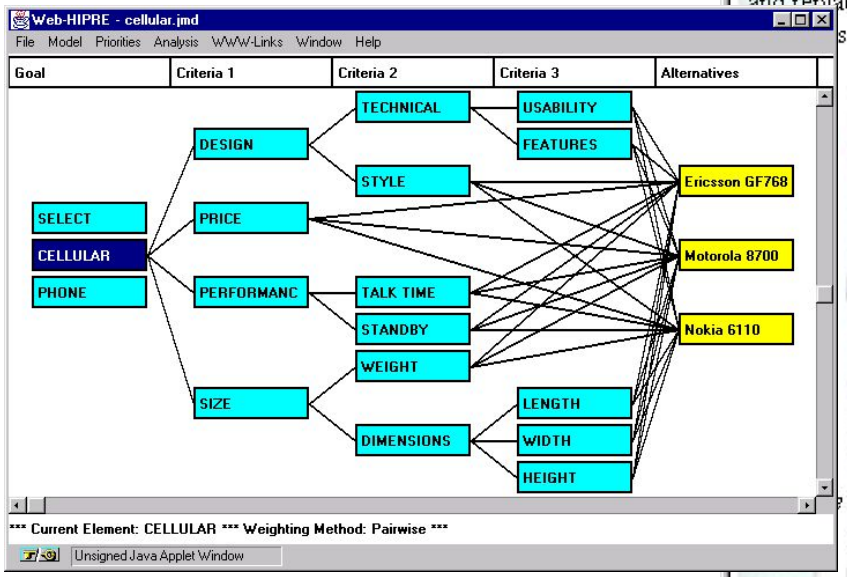


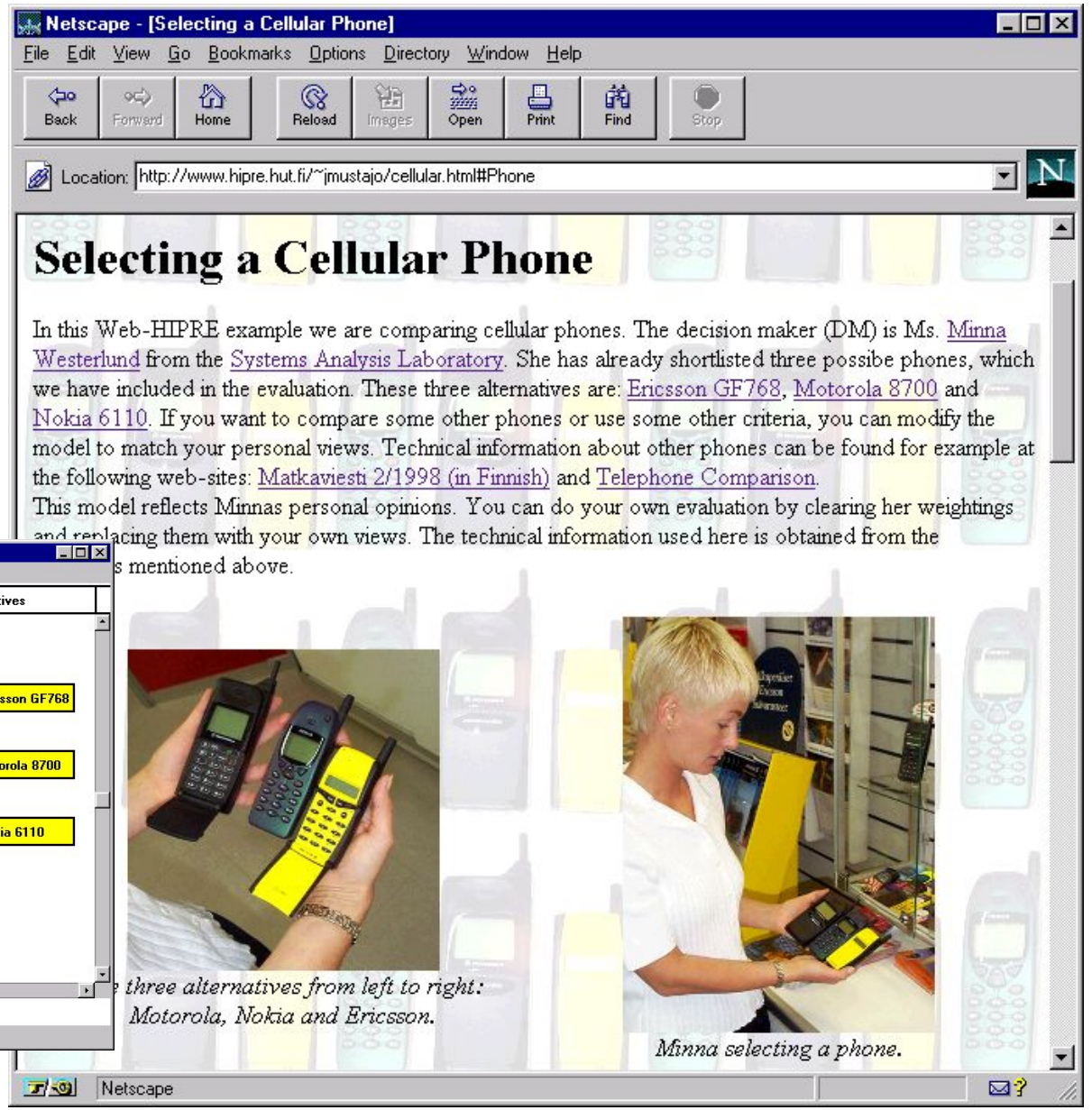
- Completely mouse-driven structuring of the value tree
- This example: Selecting a cellular phone

WWW-links in Web-HIPRE

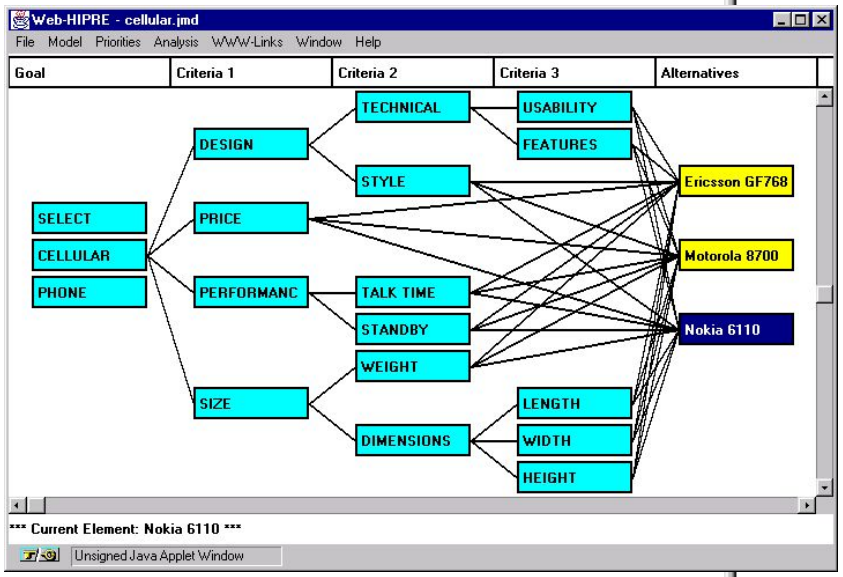
- Each element can be linked to a web-page
- Links can contain additional WWW-links, graphics, sound or video
- This can increase the quality of decision support dramatically
- On-line help also implemented by WWW-links

Web-HIPRE links can refer to any web-pages

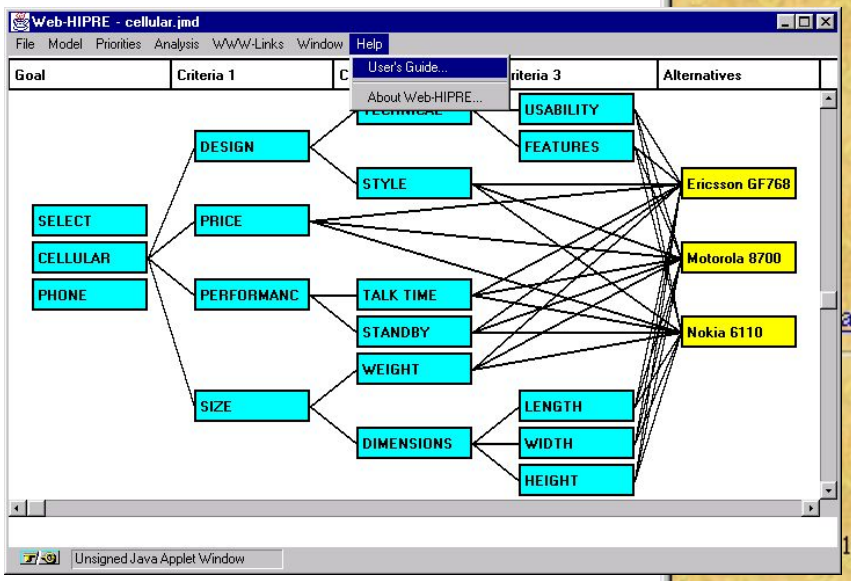


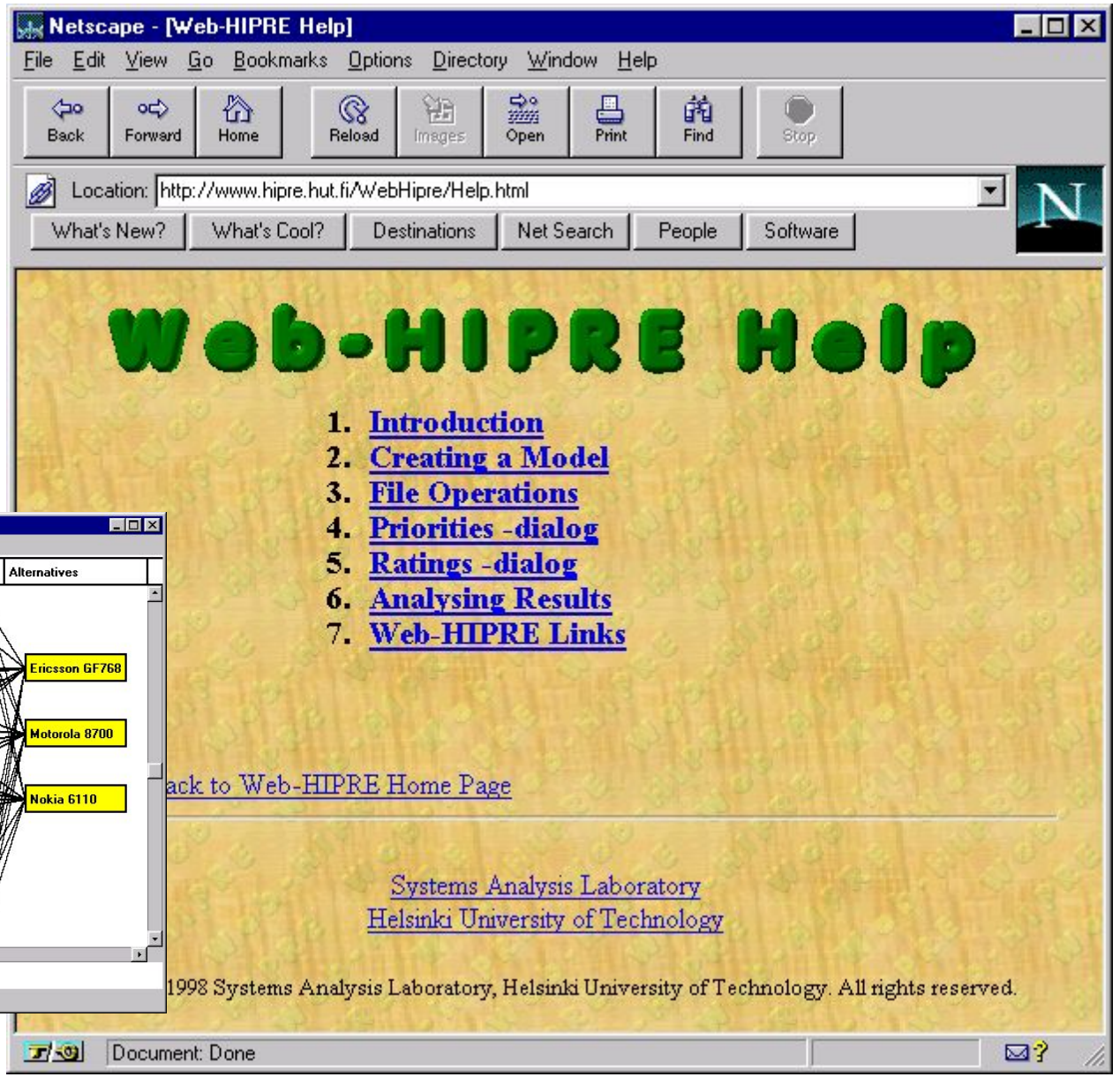


Web-HIPRE links can refer to any web-pages



On-line help


Web-HIPRE - cellular.jmd
File Model Priorities Analysis WWW-Links Window Help
User's Guide...
About Web-HIPRE...
Goal
Criteria 1
riteria 3
Alternatives
SELECT
CELLULAR
PHONE
DESIGN
PRICE
PERFORMANC
SIZE
STYLE
TALK TIME
STANDBY
WEIGHT
DIMENSIONS
USABILITY
FEATURES
LENGTH
WIDTH
HEIGHT
Ericsson GF768
Motorola 8700
Nokia 6110
Unsigned Java Applet Window


Netscape - [Web-HIPRE Help]
File Edit View Go Bookmarks Options Directory Window Help
Back Forward Home Reload Images Open Print Find Stop
Location: http://www.hipre.hut.fi/WebHipre/Help.html
What's New? What's Cool? Destinations Net Search People Software
Web-HIPRE Help
1. Introduction
2. Creating a Model
3. File Operations
4. Priorities -dialog
5. Ratings -dialog
6. Analysing Results
7. Web-HIPRE Links
ack to Web-HIPRE Home Page
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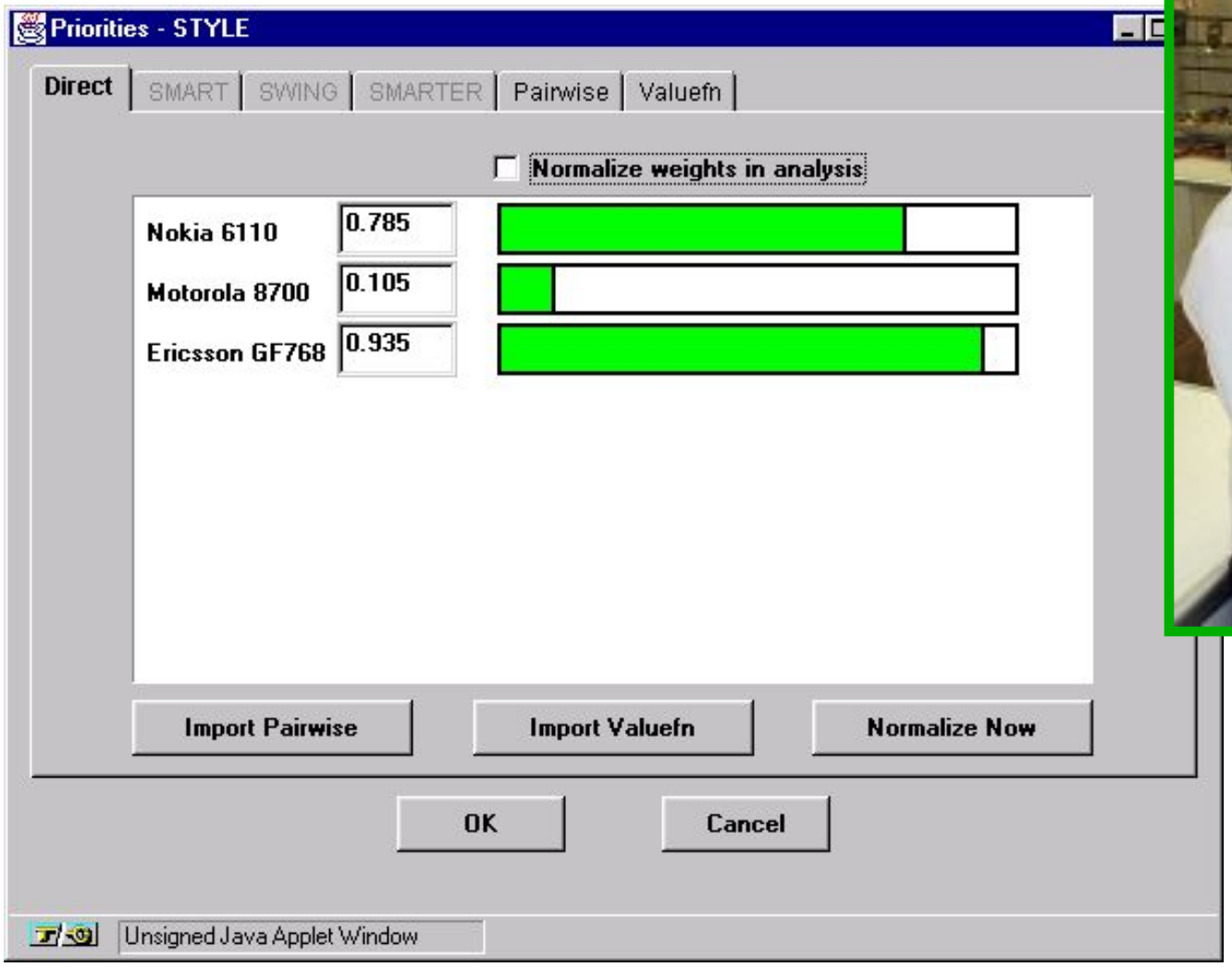
Document: Done

Weighting Methods supported by Web-HIPRE

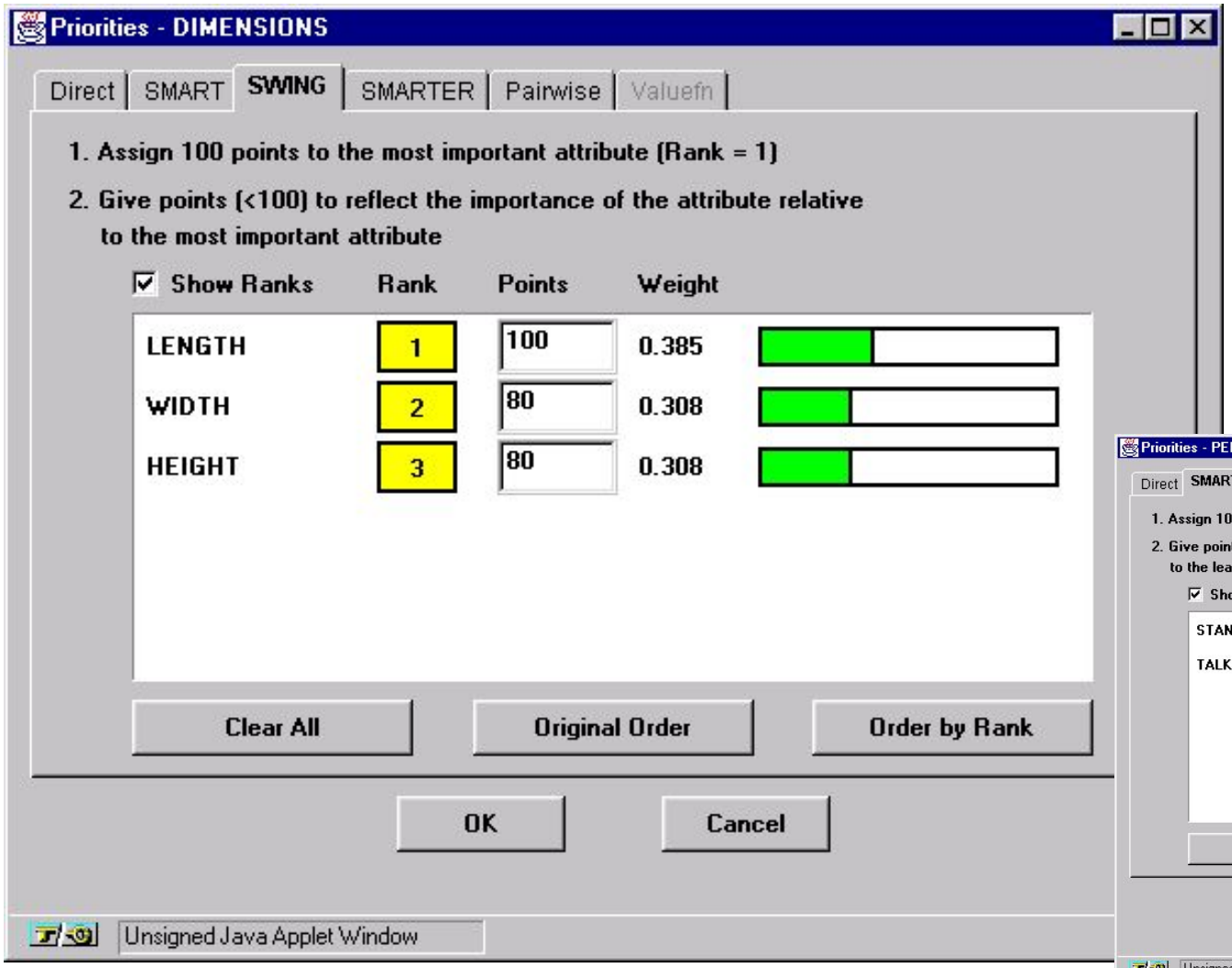
- Direct weighting, SMART, SWING
- SMARTER - rank based
- Pairwise Comparisons (AHP)
- Value Functions
- Any combinations of these

Direct Weighting

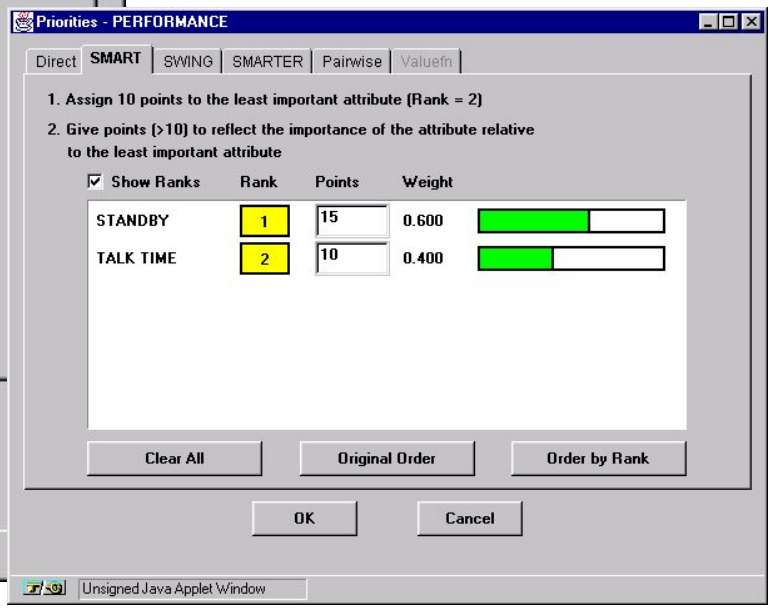


Note: Weights in this example are her personal opinions

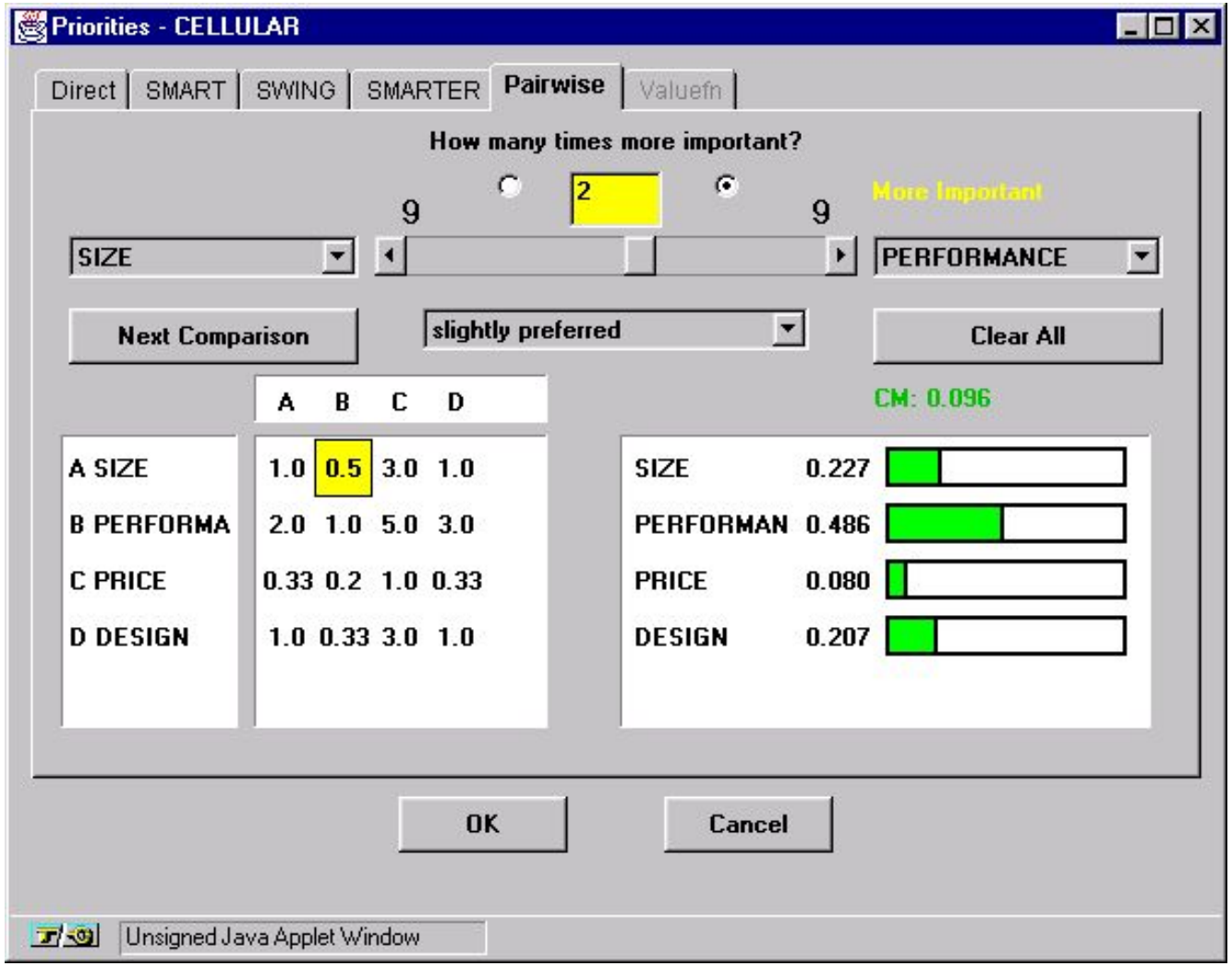
SWING,SMART and SMARTER Methods



- SMARTER uses rankings only

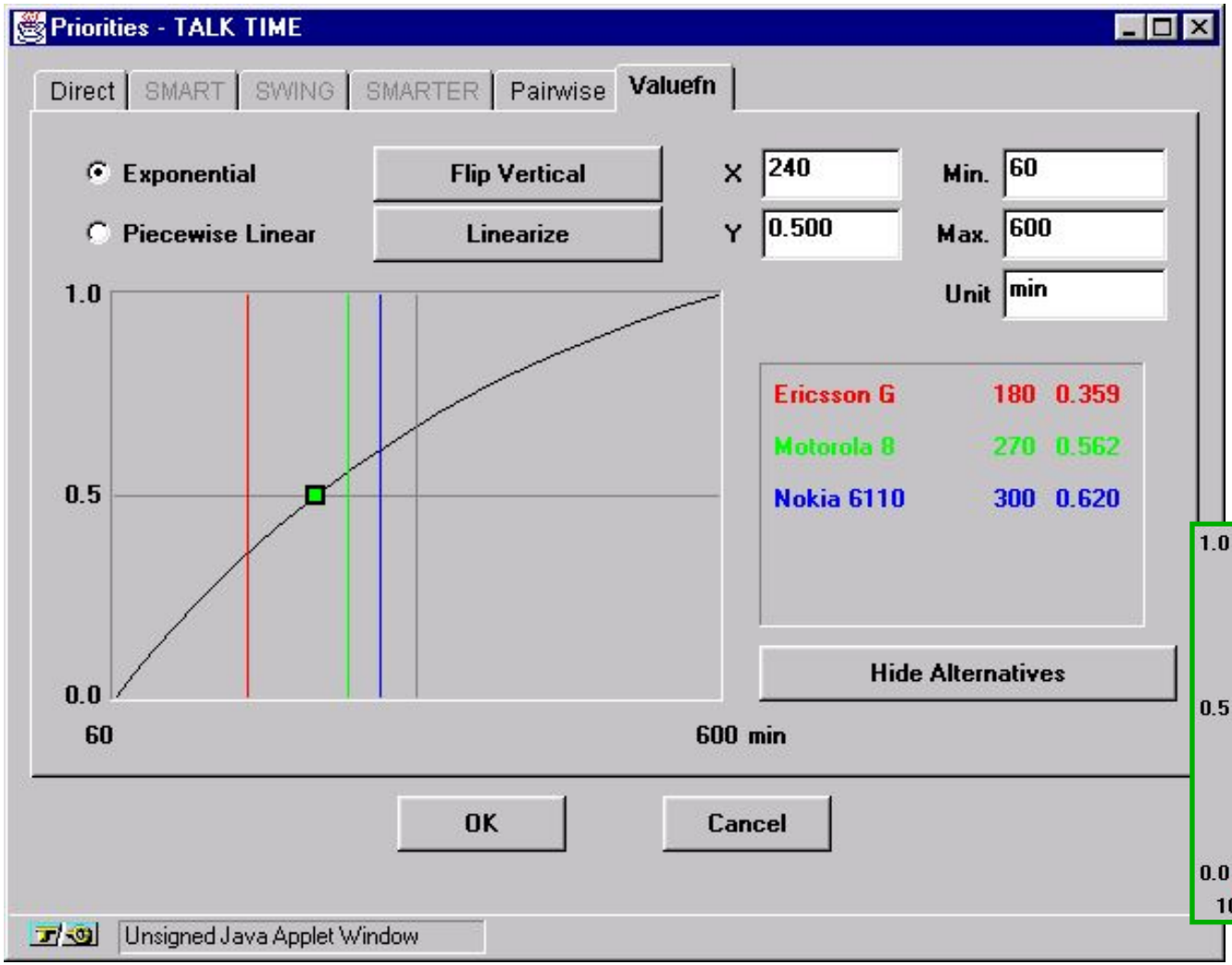


Pairwise Comparison - AHP

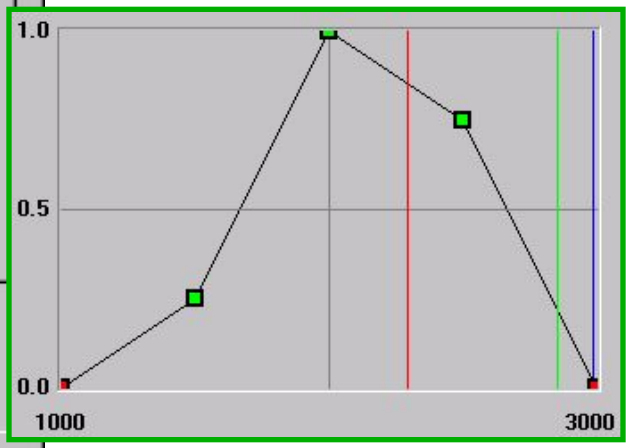


- Continuous scale 1-9
- Numerical, verbal or graphical approach

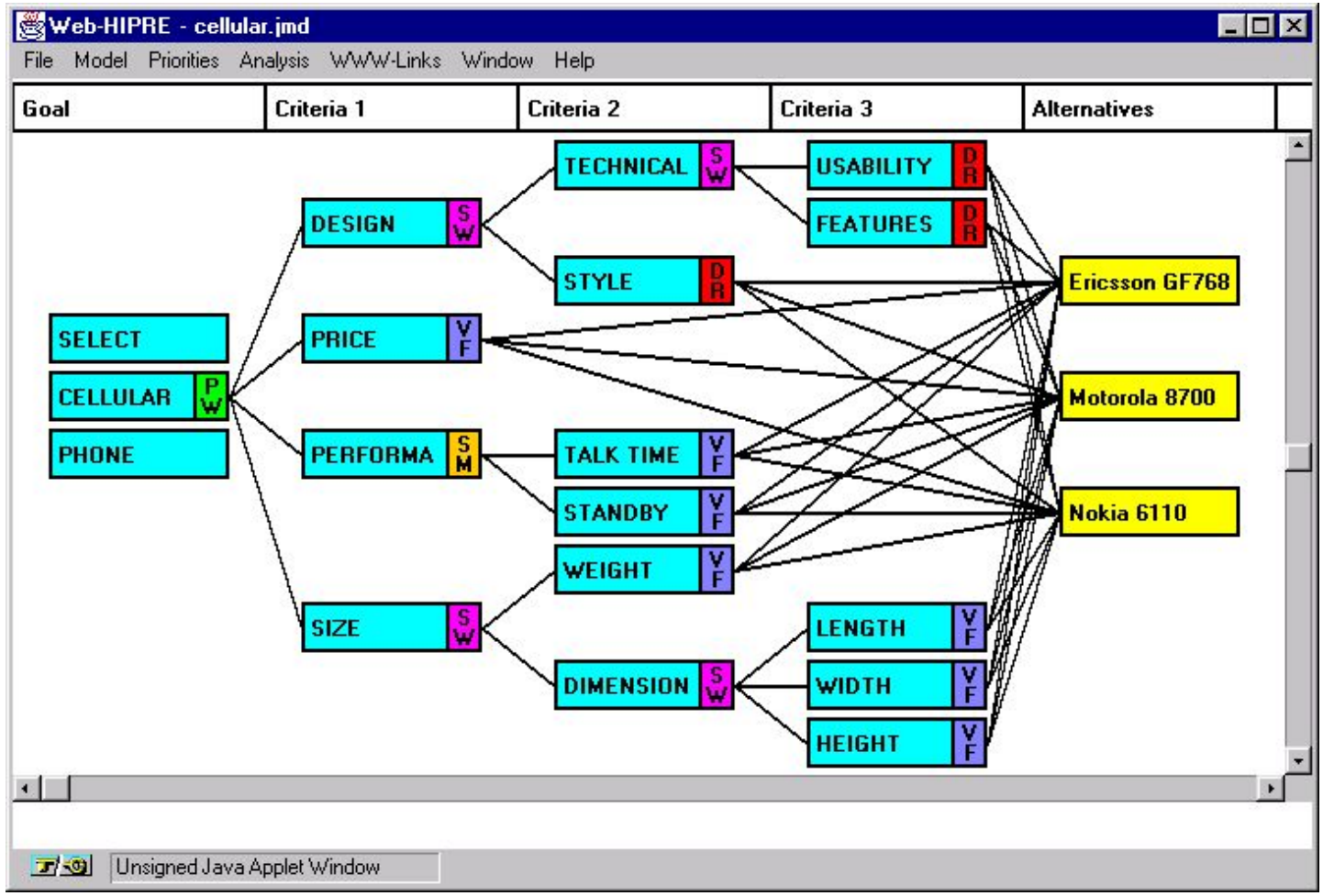
Value Function



- Ratings of alternatives shown
- Any shape of the value function allowed

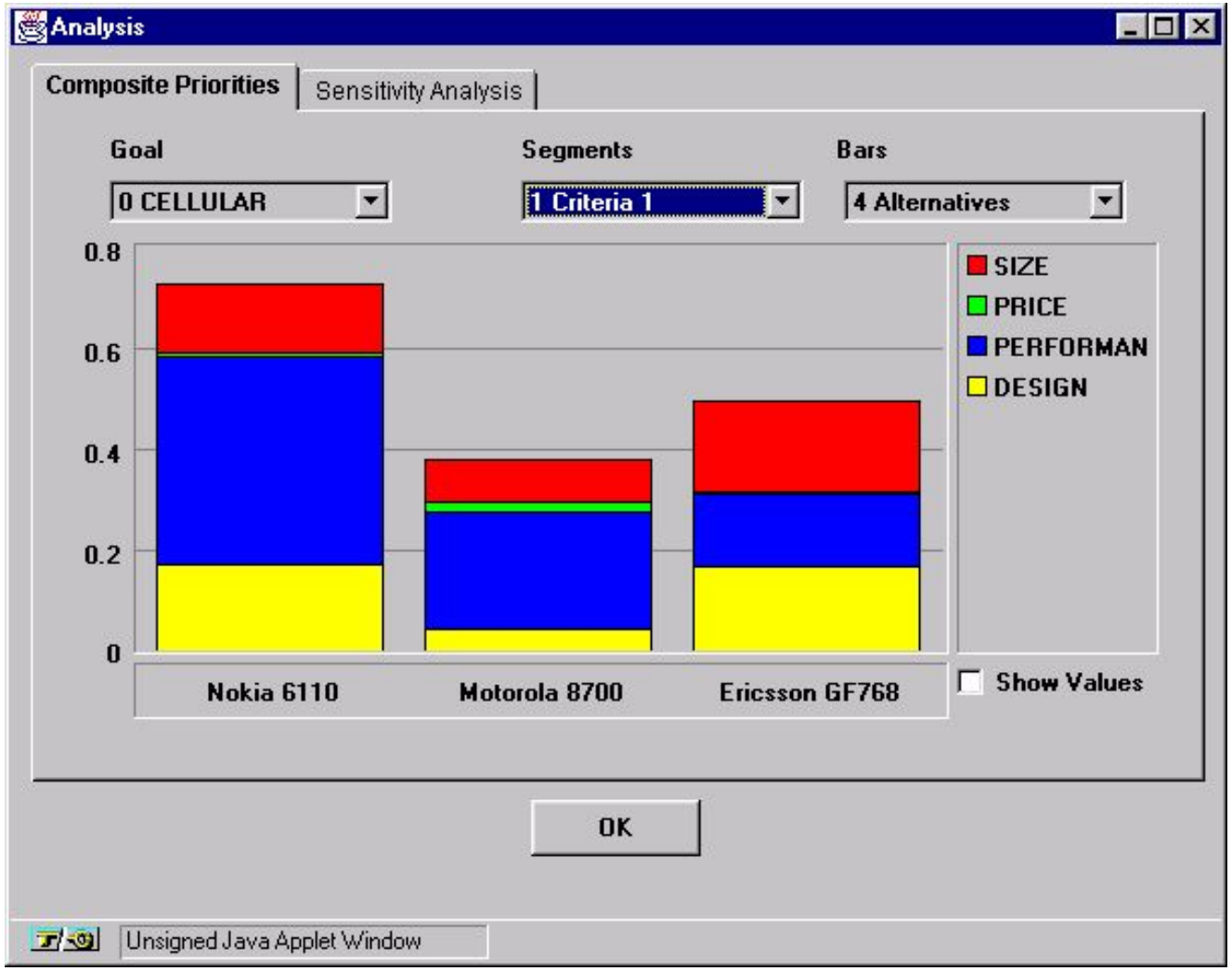


Combined Use of Weighting Methods



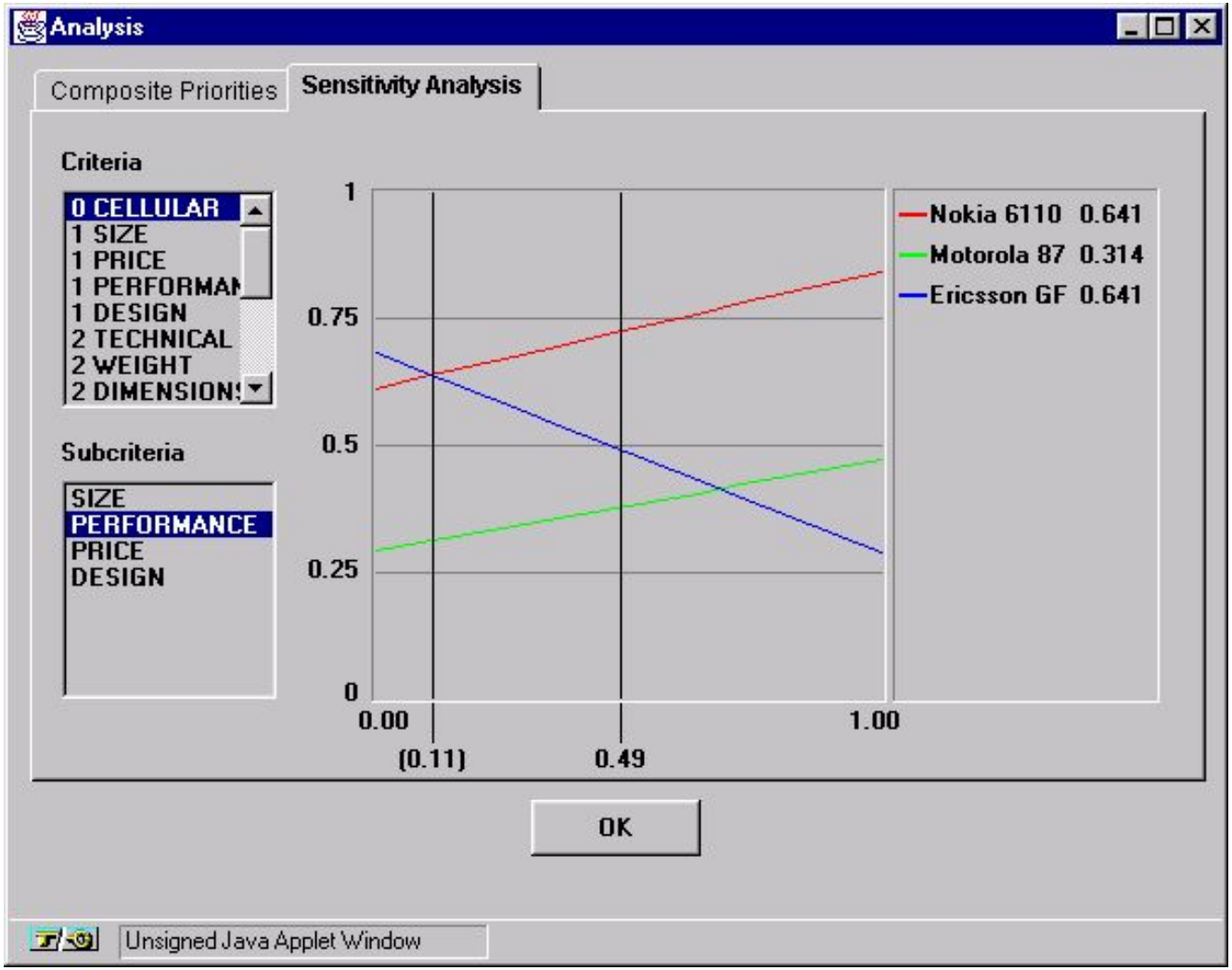
- Combinations of methods allowed
- Each element can store all methods
- Selections shown by indicators

Composite Priorities



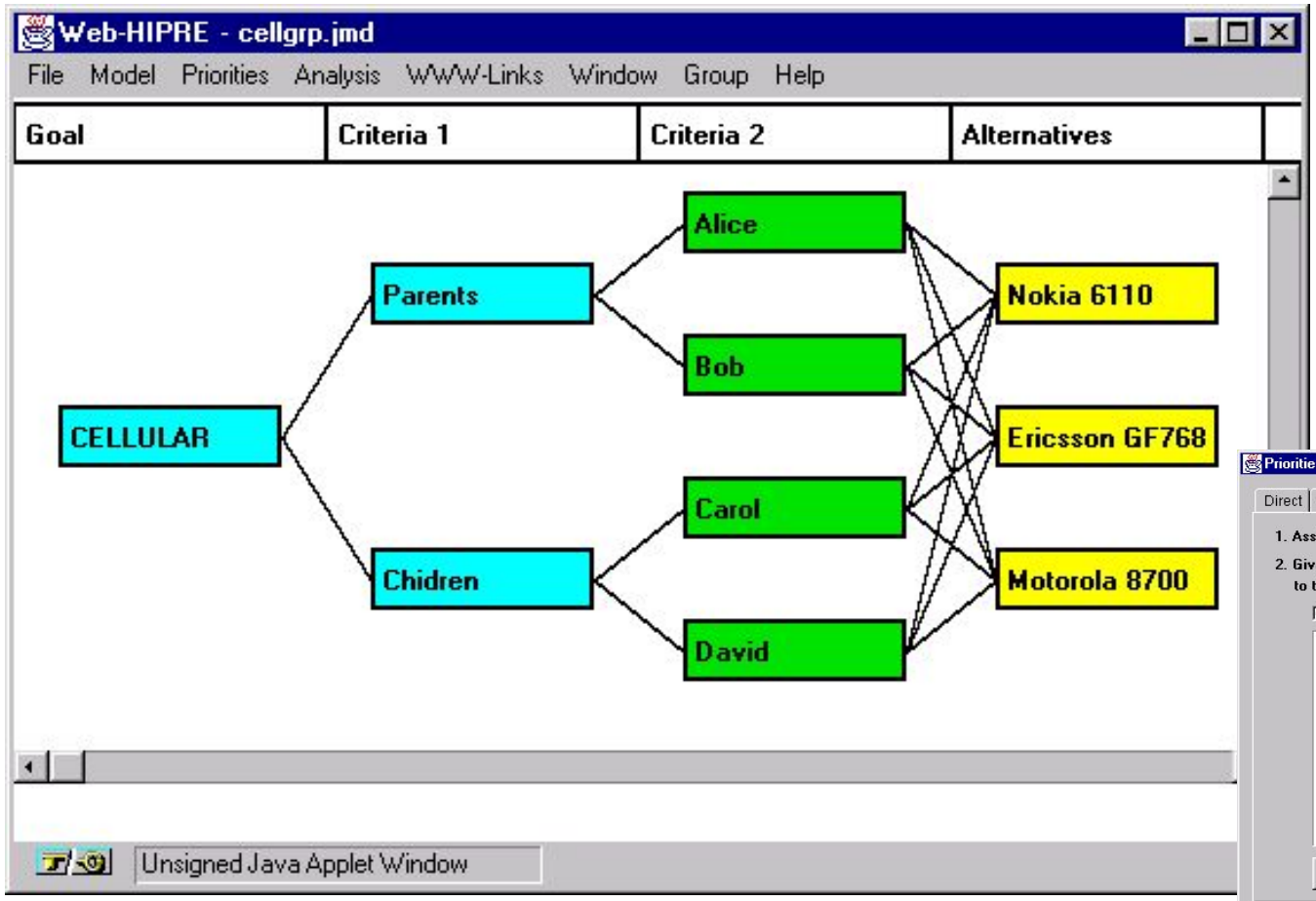
- Bar graphs or numerical values
- Bars divided by the contribution of each criterion

Sensitivitity Analysis

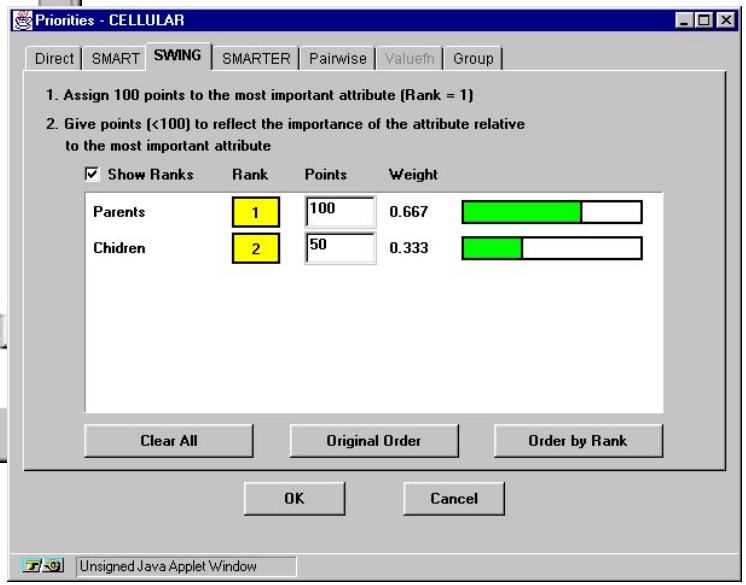


- Total weights of alternatives shown with respect to the weight of the criterion

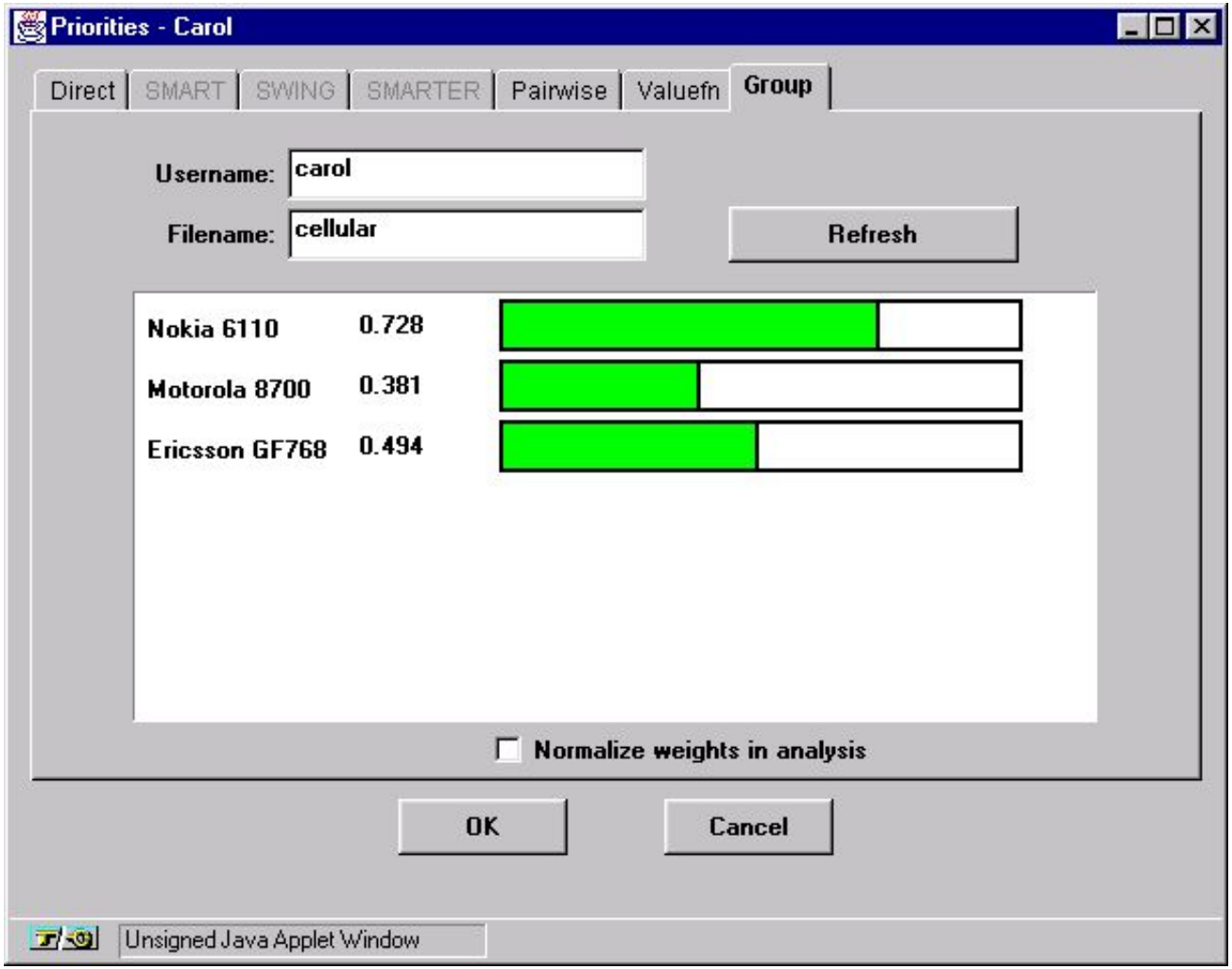
Group Decision Support



- Group model is the weighted sum of individual decision makers' composite priorities for the alternatives

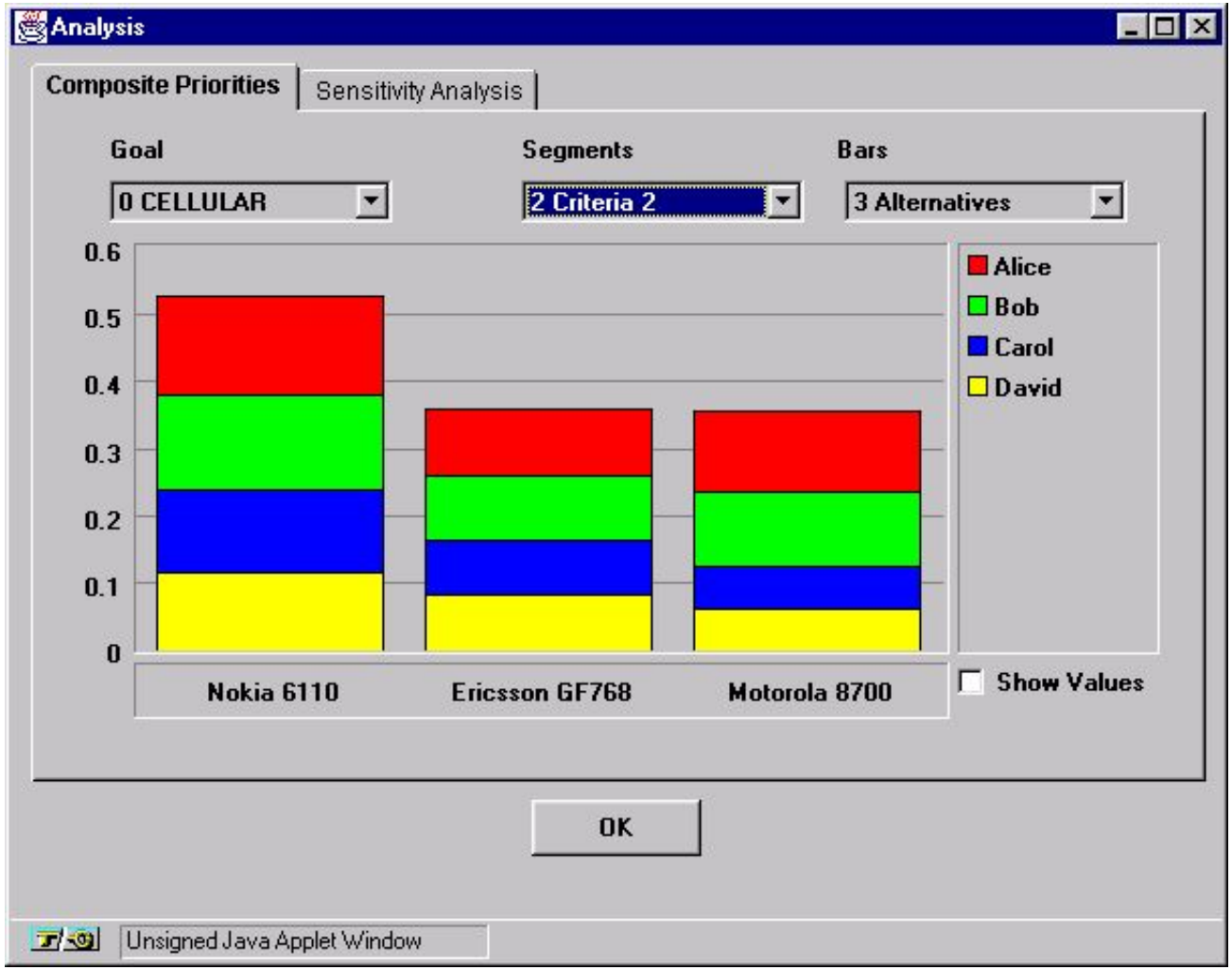


Defining Group Members



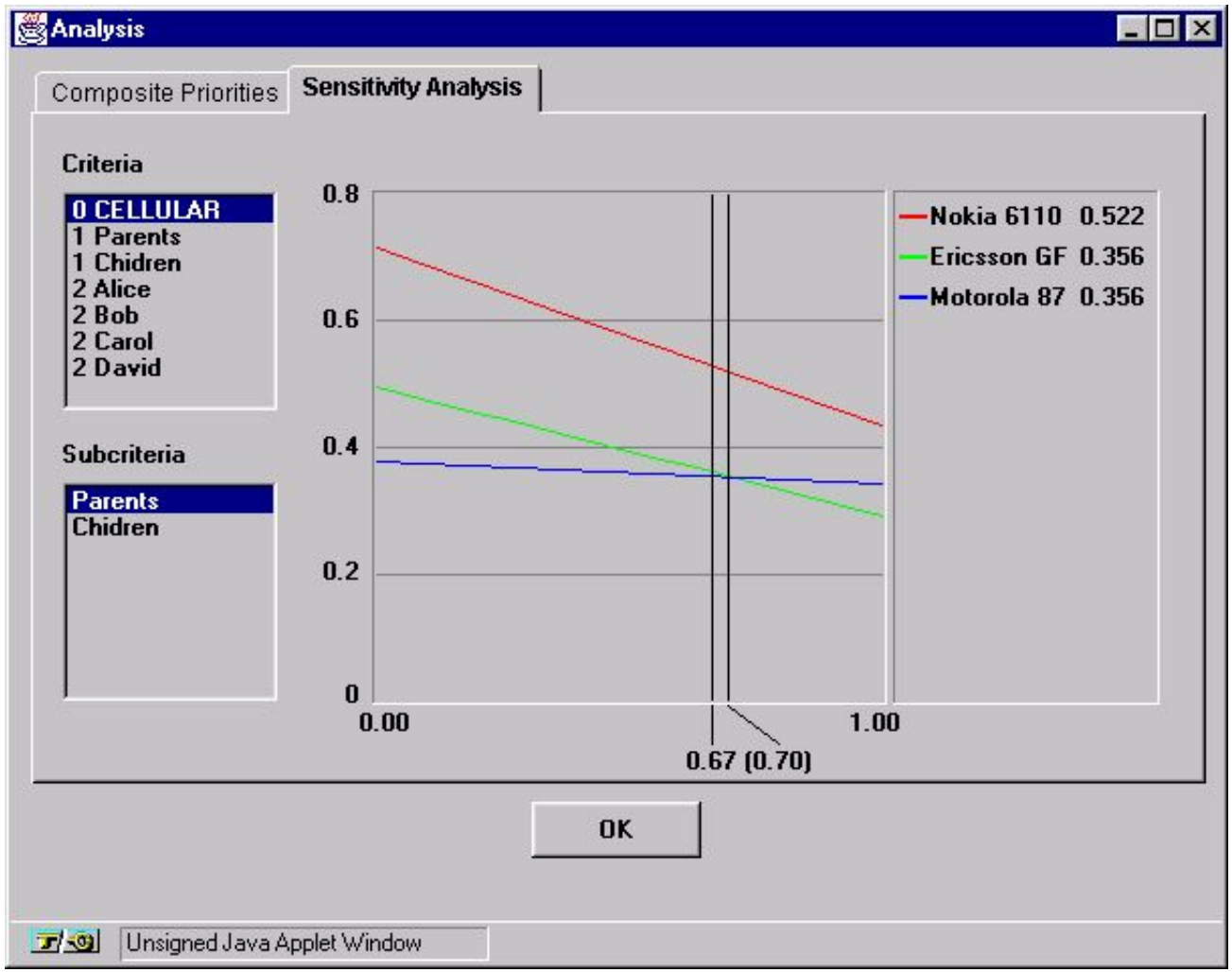
- Individual value trees can be different
- Composite priorities of each group member
  - obtained from their individual models
  - shown in the definition phase

Aggregate Group Priorities



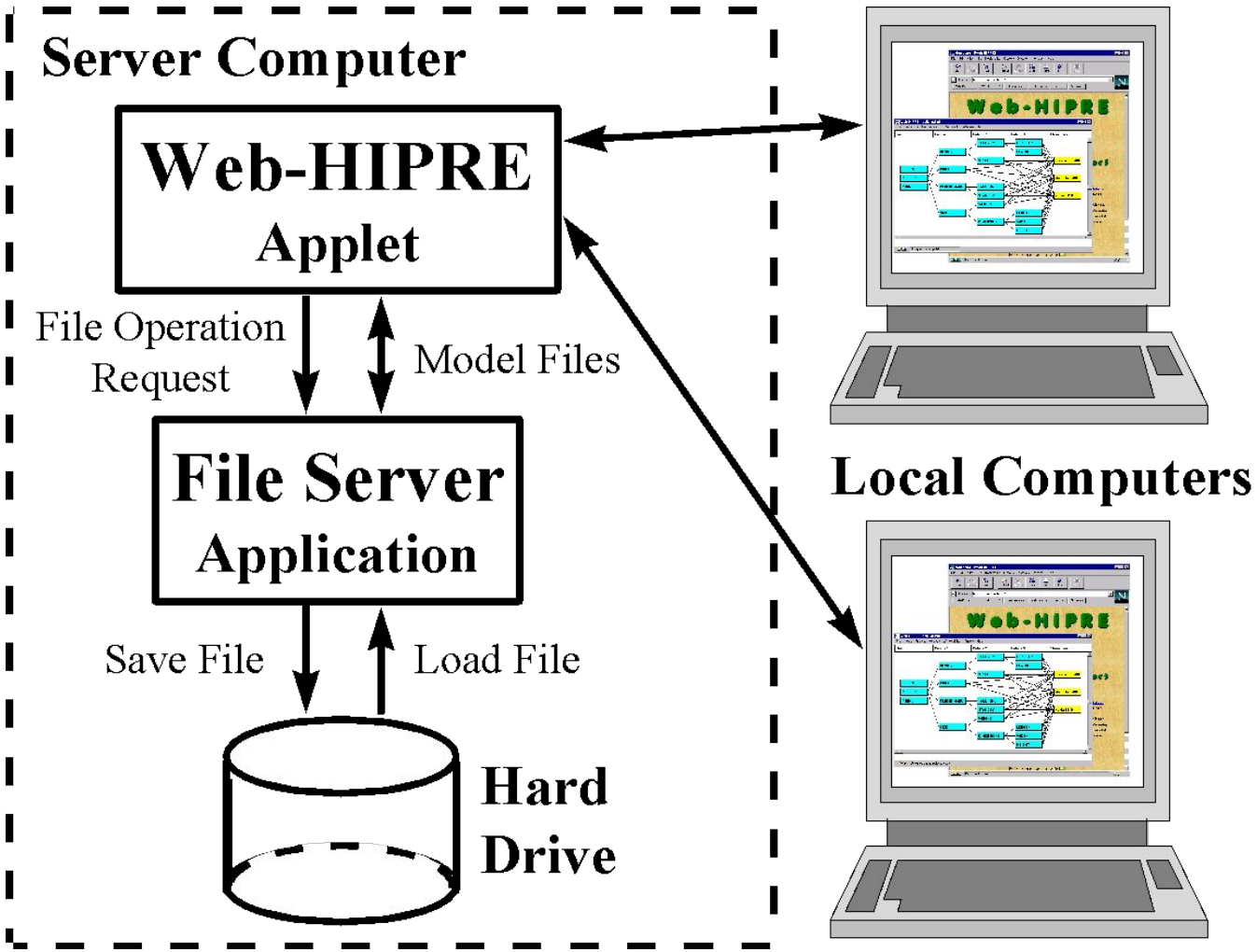
- Contribution of each group member indicated by segments

Sensitivity analysis



- Changes in the relative importance of decision makers can be analyzed

Web-HIPRE Architecture



- Browser loads Web-HIPRE -applet, which operates in the memory of the local computer
- Nothing remains on the local computer after closing Web-HIPRE
- Models are saved on the server computer and operated via file server
- Web-HIPRE can also be installed locally

Model Handling in Web-HIPRE

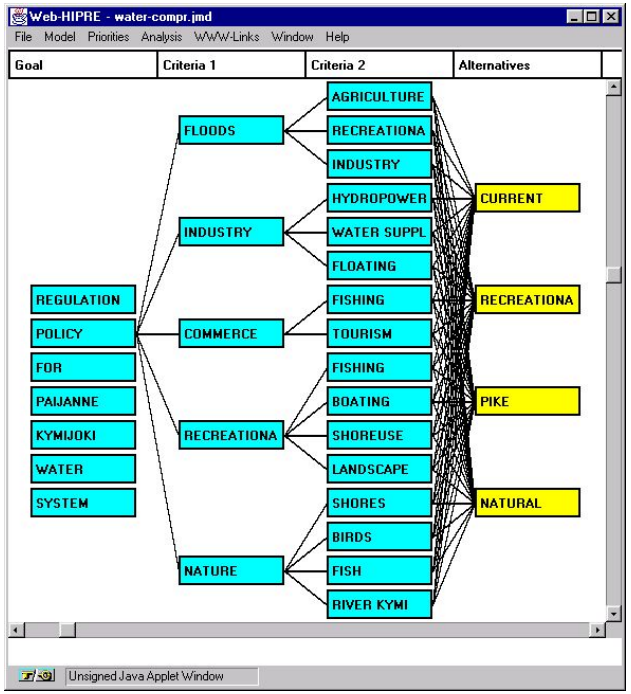
- Models can be saved on the Web-HIPRE server
  - to a public directory
  - to your own password protected directory
- On the Internet use models cannot be saved on user's local machine due to Java security reasons
  - A local server can be installed to save models locally
- HIPRE 3+ models can be imported

Local use of Web-HIPRE

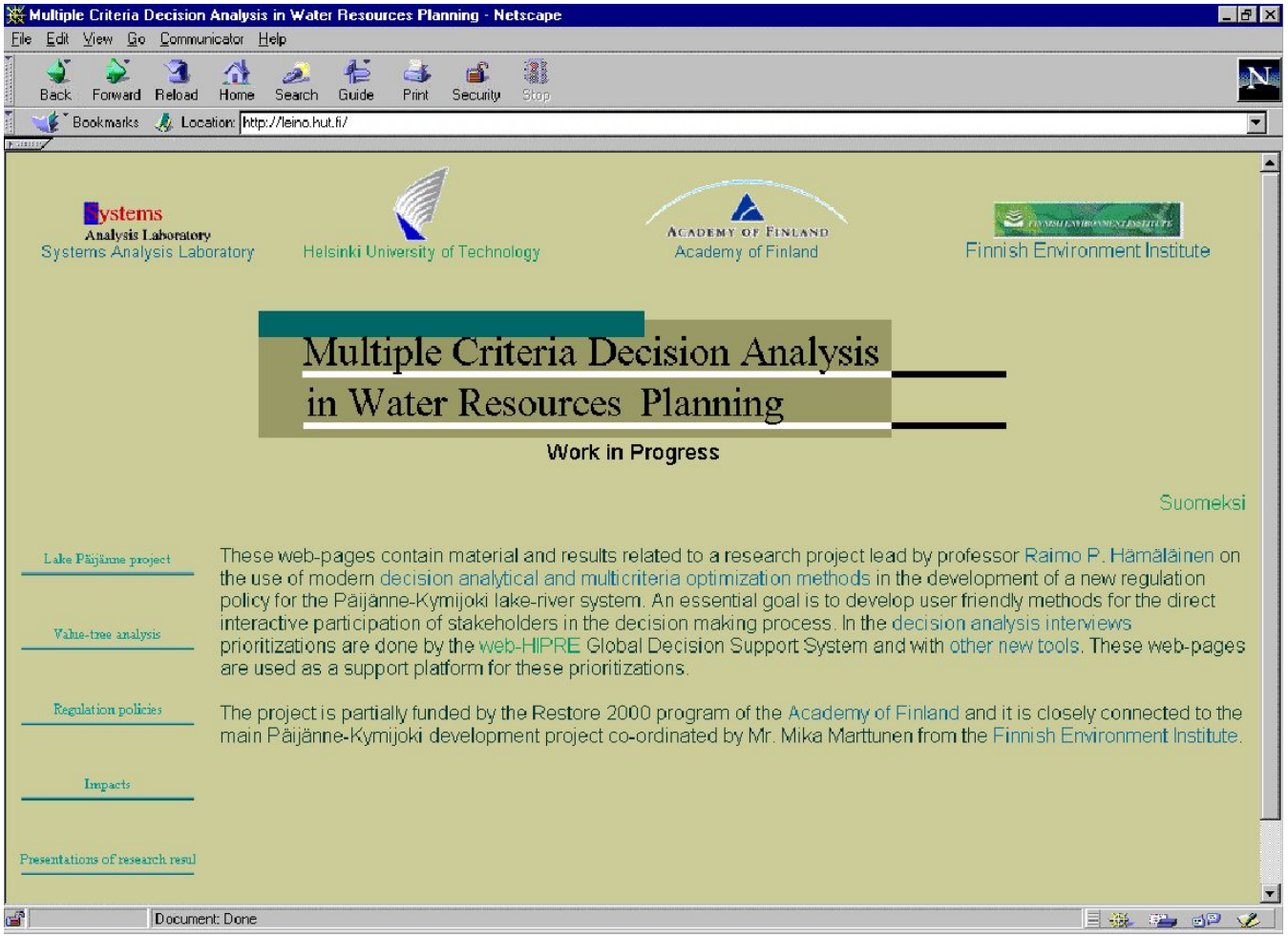
- Web-HIPRE can be installed on a local computer
  - The file server is on the user's computer
    → Models are saved locally
- Locally installed Web-HIPRE can also be used via the Internet or via Local Area Network (LAN)
  - Organizations can install Web-HIPRE on their Intranet

Real Life Use of Web-HIPRE

- Value prioritizations related to the regulation policy for Lake Päijänne
- Decision analysis interviews of stakeholders
- Open for public prioritizations



Web-Page for the Lake Päijänne Case



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The WWW-address of Web-HIPRE:

http://www.hipre.hut.fi

Model for cellular phone example: cellular.jmd

Site will be open free of charge for academic use.
Please, let us know your experiences:
raimo@hut.fi, jyri.mustajoki@hut.fi

Our DSS tools on the Internet

- Web-HIPRE

  http://www.hipre.hut.fi

- Joint Gains

  http://www.jointgains.hut.fi

- Opinions-OnLine

  http://www.opinion.hut.fi or

  http://www.opinions-online.com

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