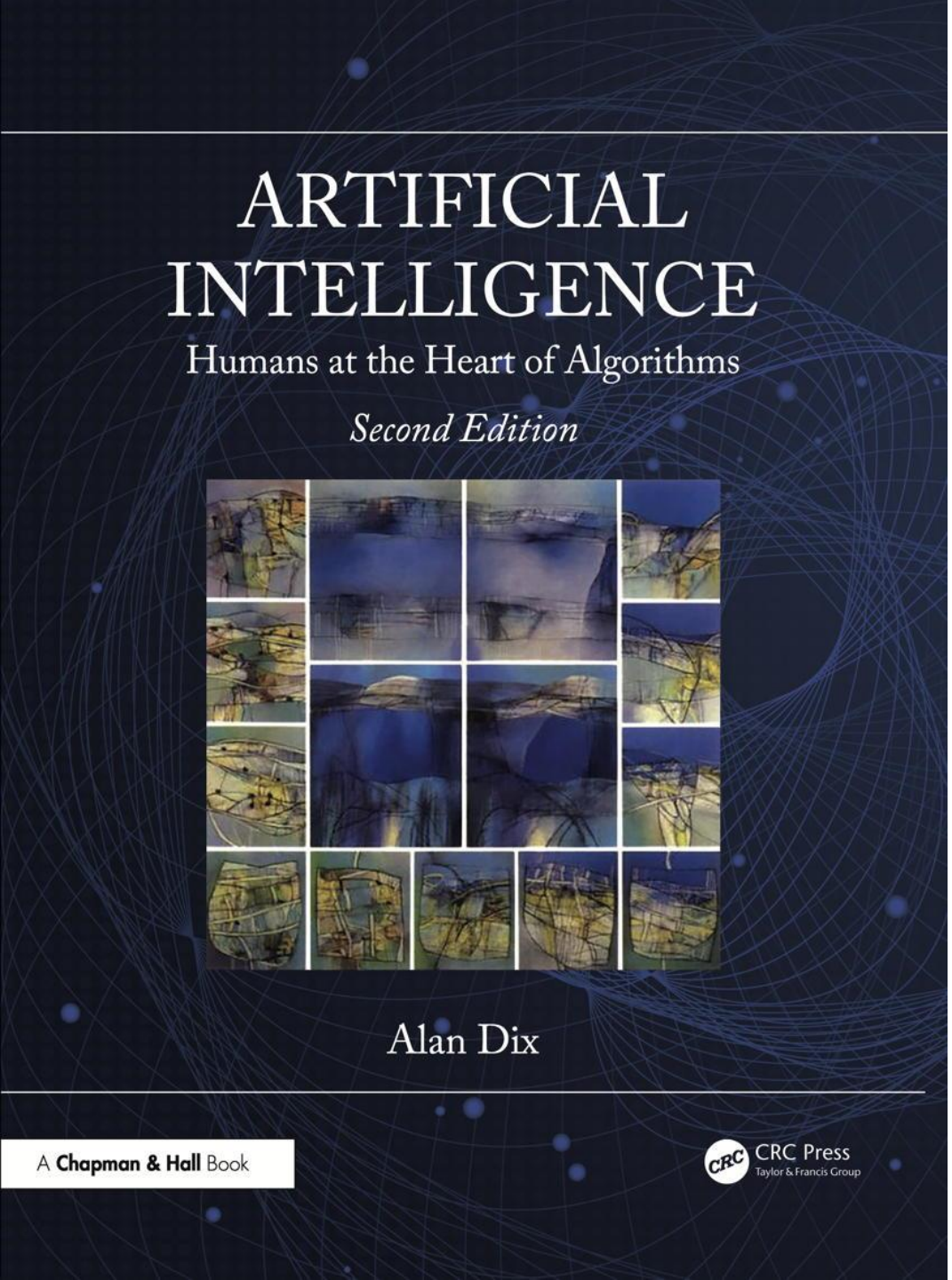


Chapter 18

Expert and decision support systems

Different forms of expert involvement.

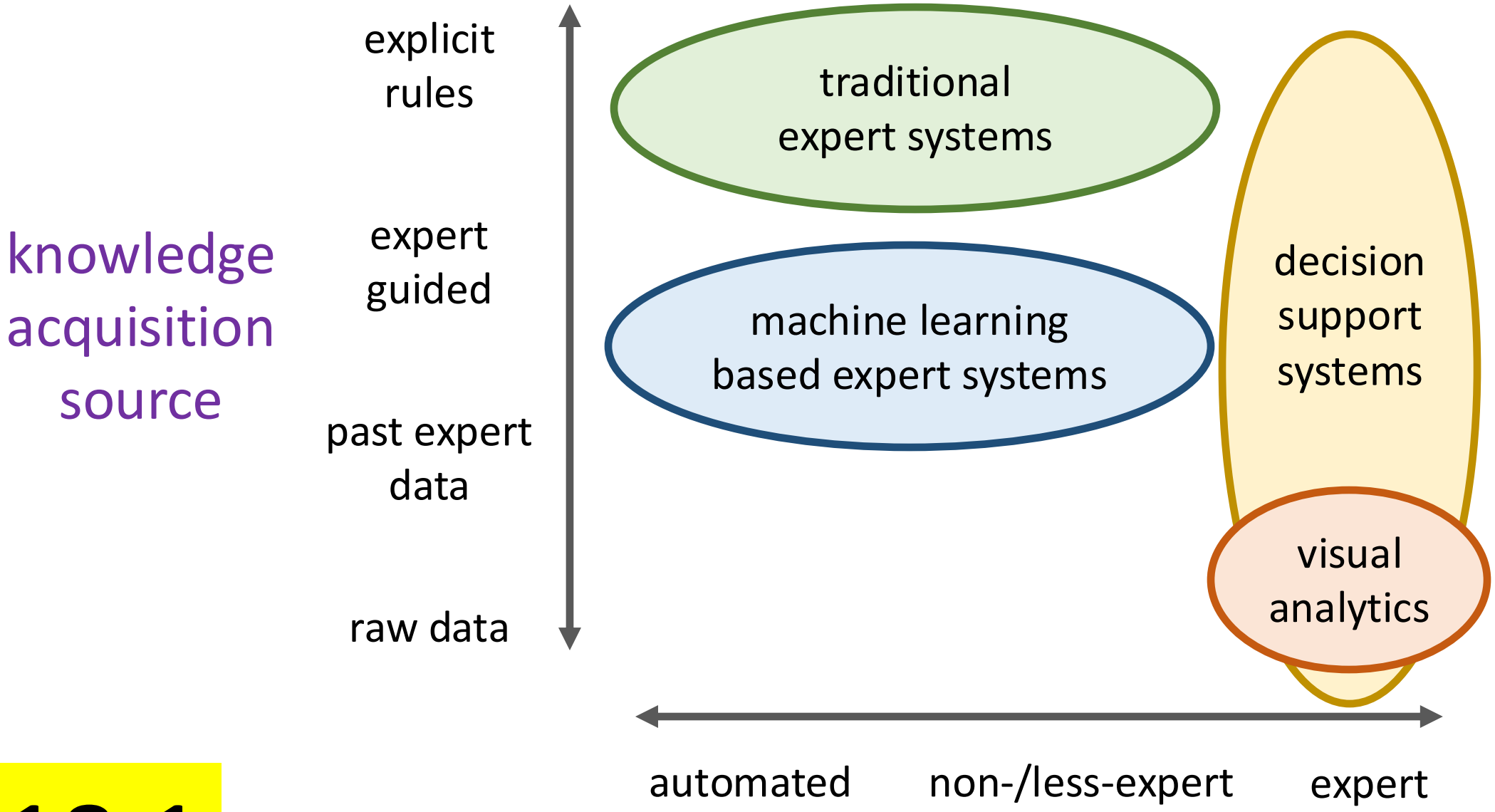


Fig. 18.1

Expert system capturing and applying knowledge

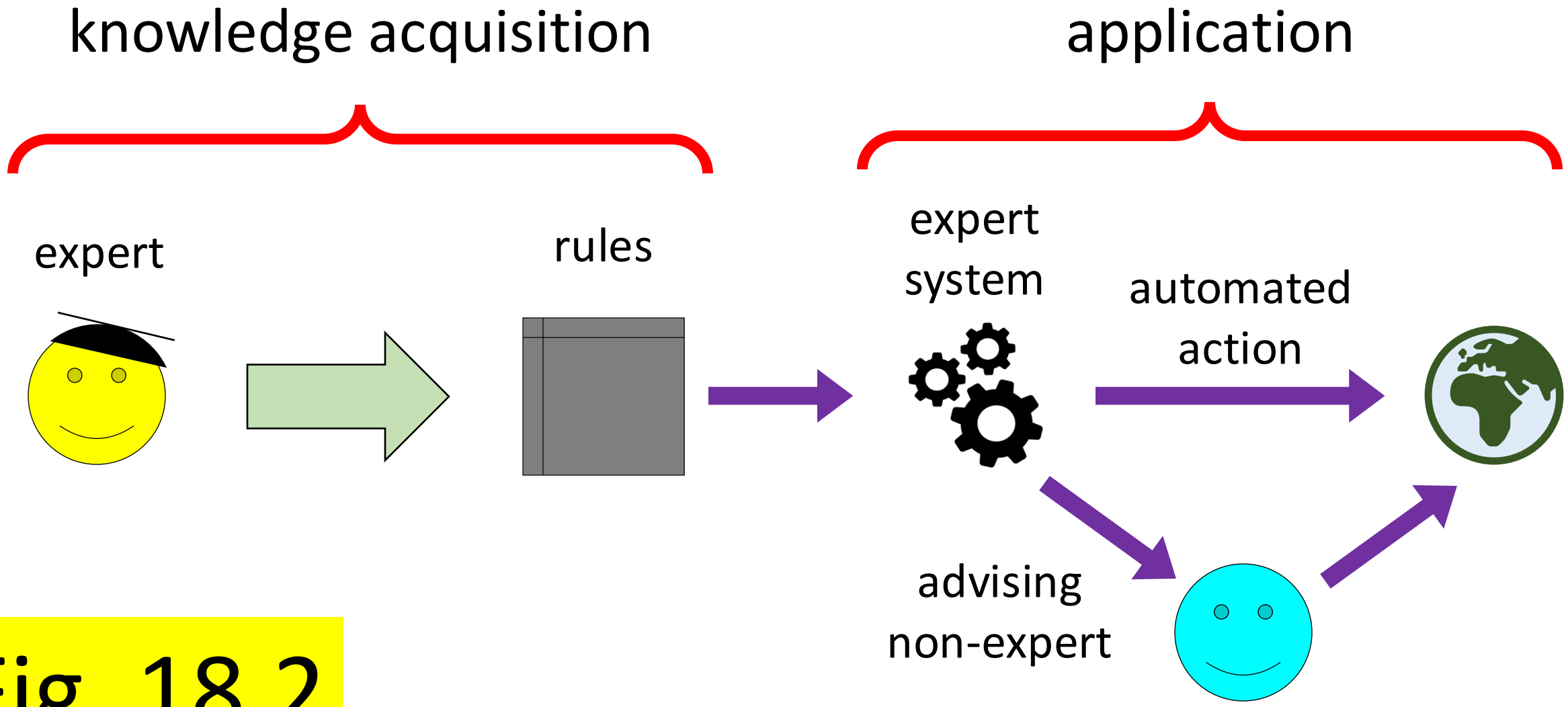


Fig. 18.2

Typical expert system architecture

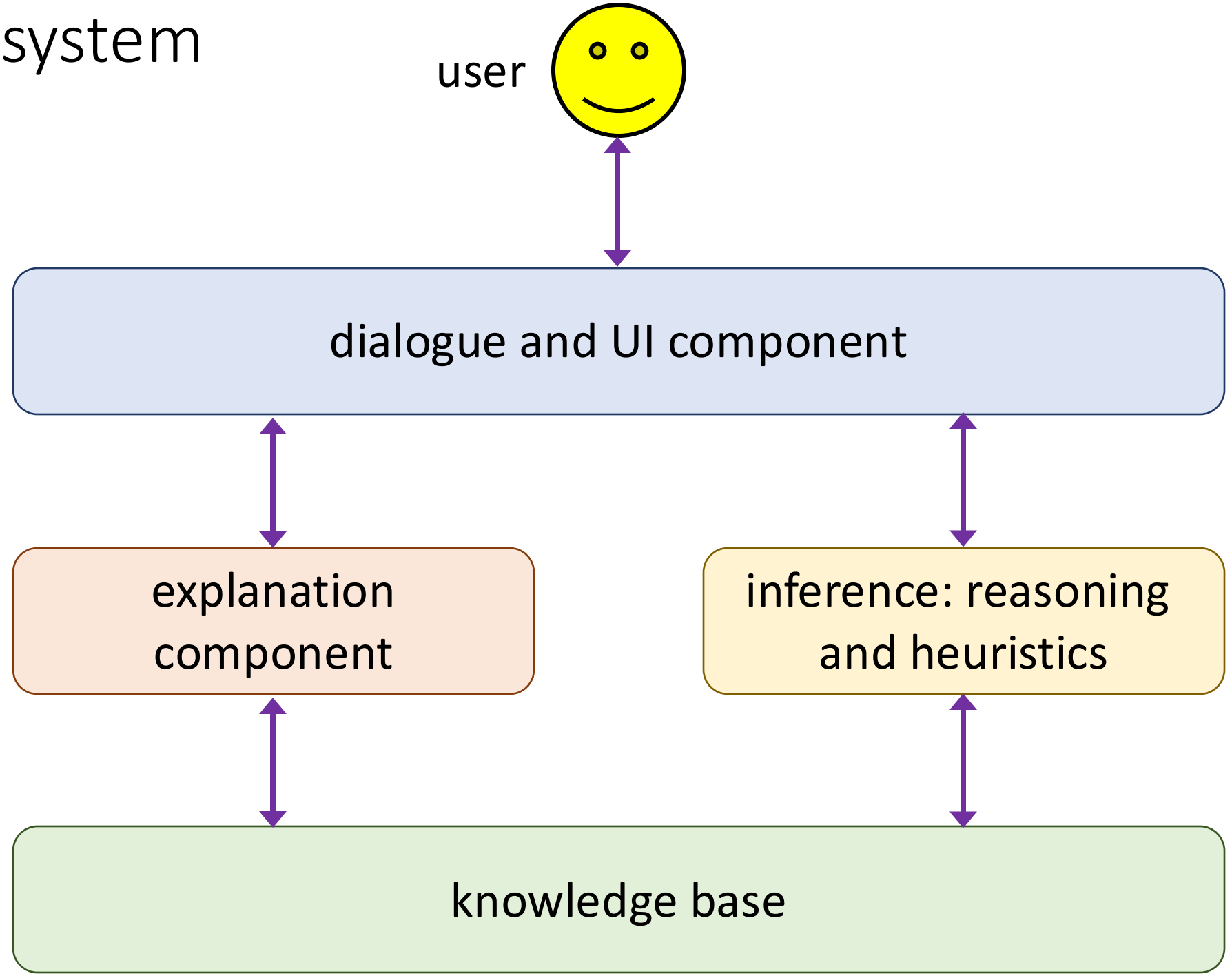


Fig. 18.3

WebProtégé – a web-based version of the Protégé ontology editor

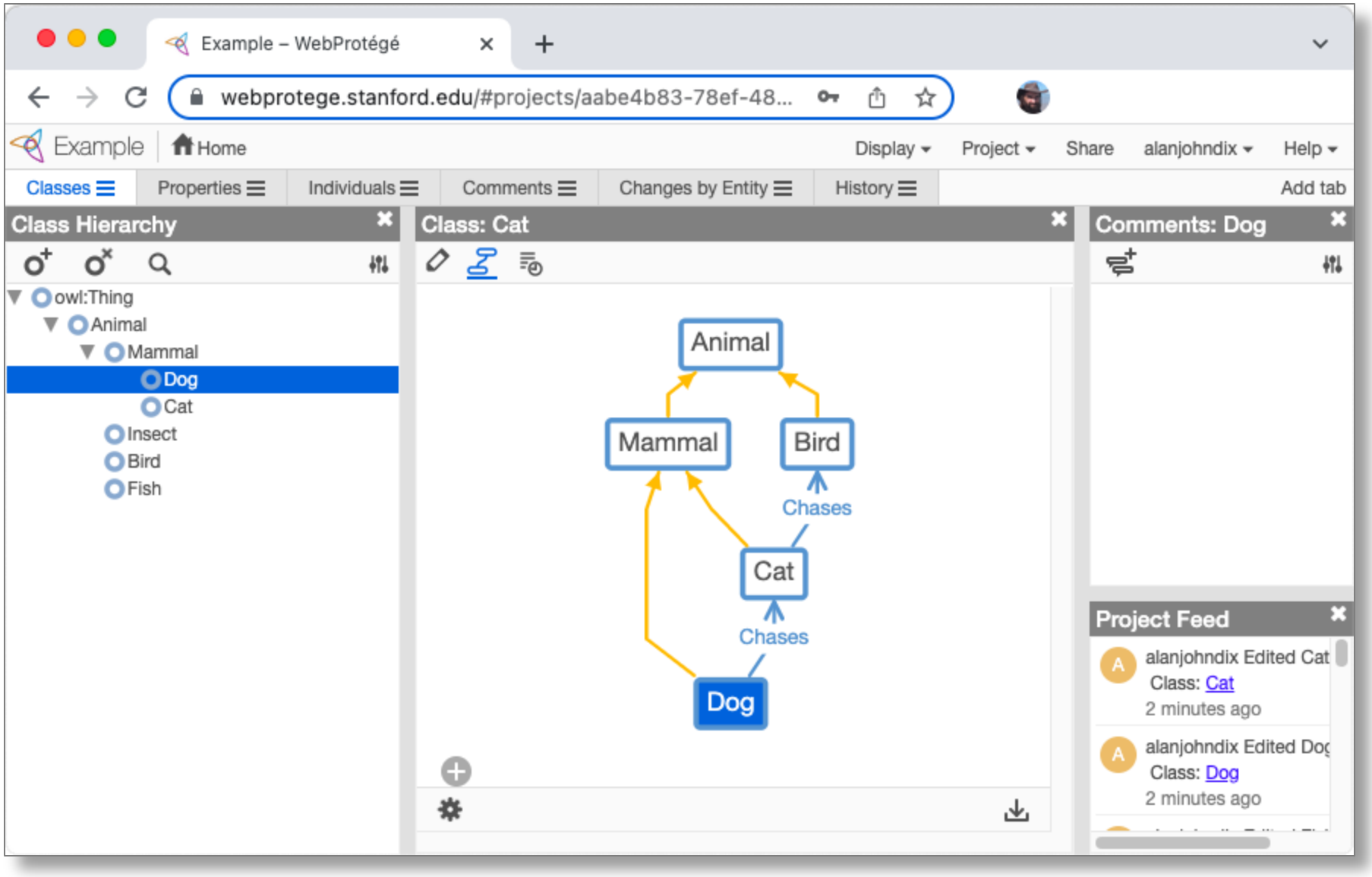


Fig. 18.4

Hybrid expert system incorporating machine learning guided by human expertise

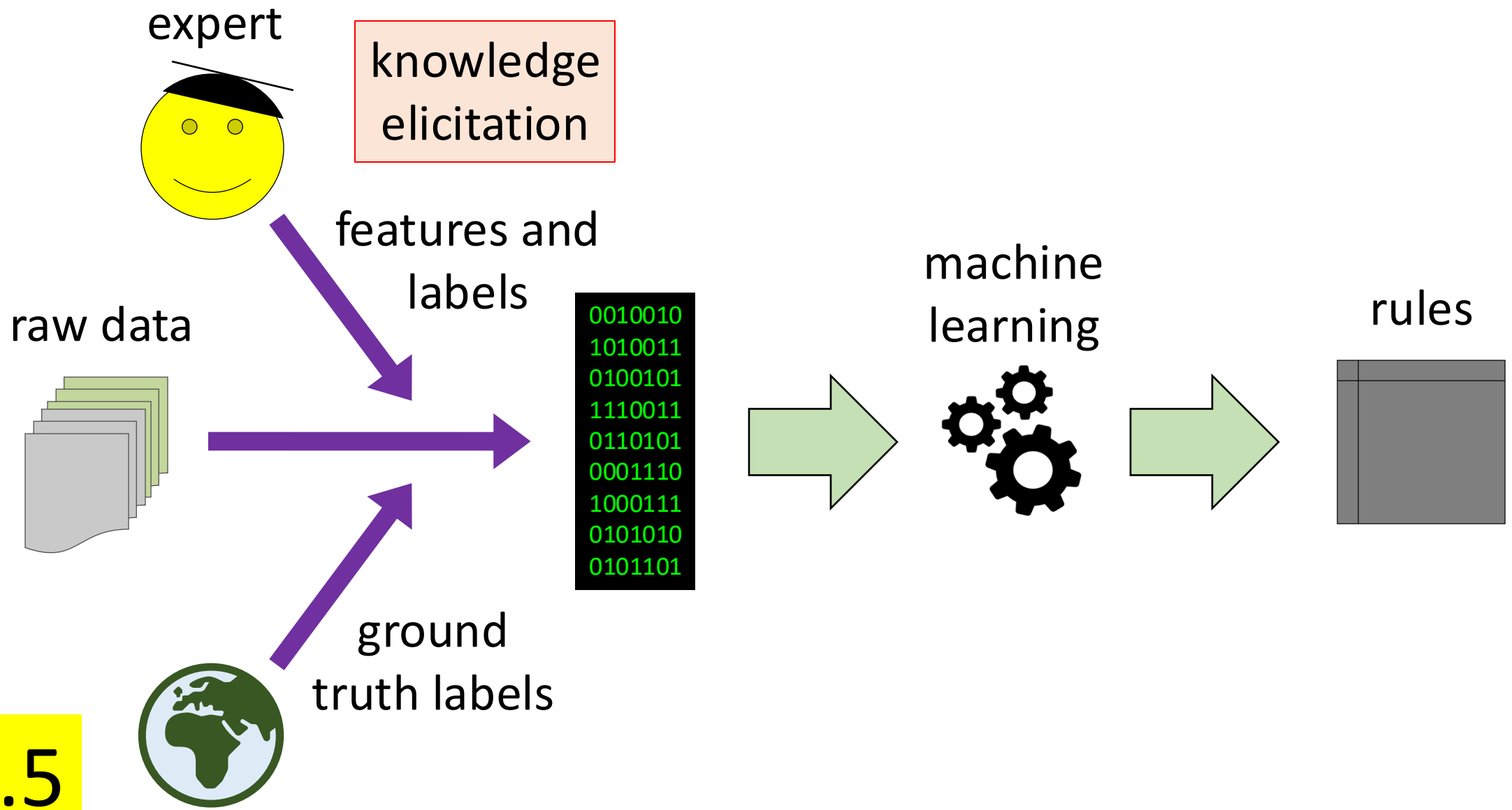
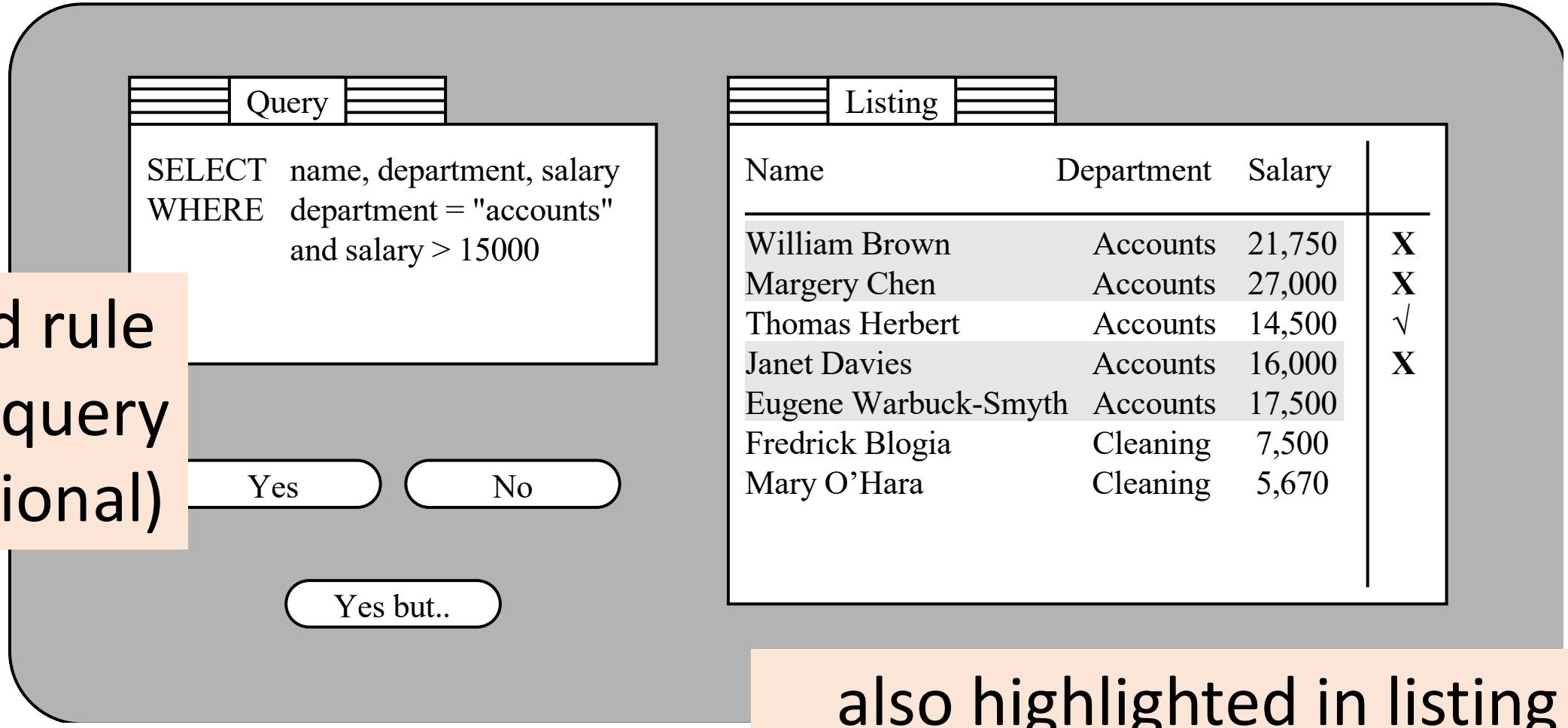


Fig. 18.5

Query-by-Browsing



inferred rule as SQL query (intensional)

also highlighted in listing (extensional)

Fig. 18.6

Dancing histograms: plain stacked histogram

easy to discern overall trends and trends in the baseline category (apples), but other categories less clear

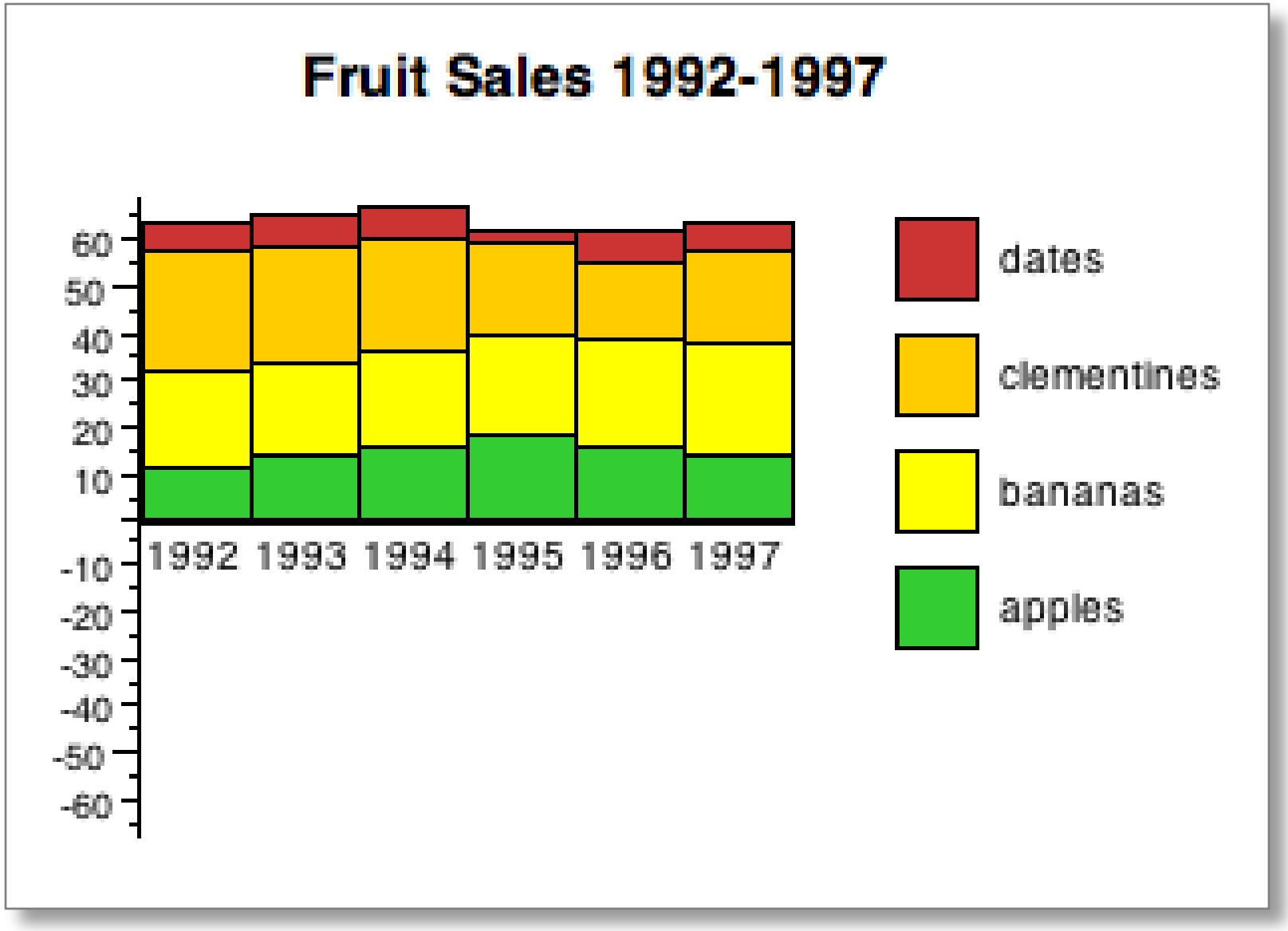


Fig. 18.7a

Dancing histograms: add interaction

click on a category (bananas) to alter the baseline and make trends in that category easier to see

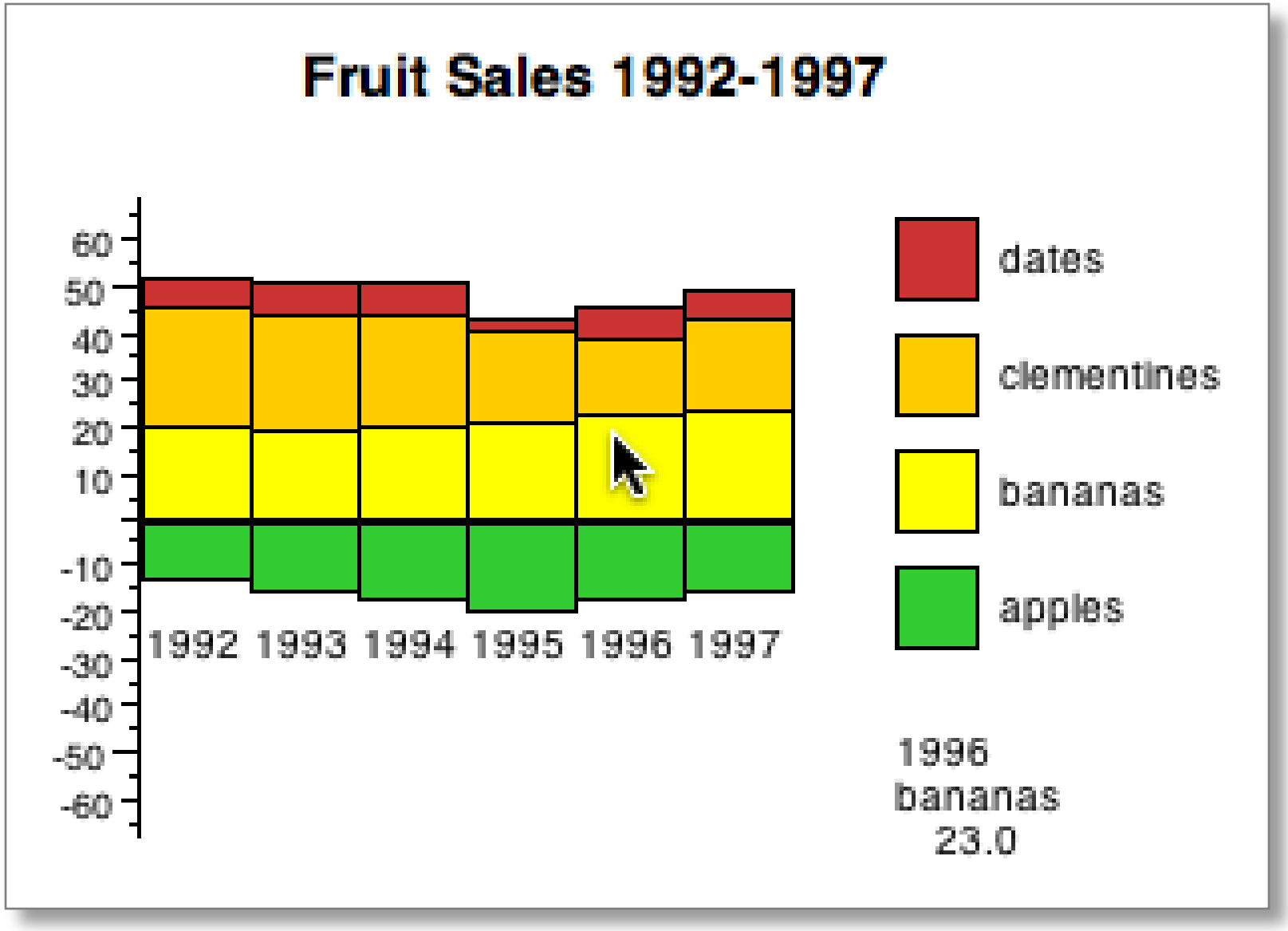


Fig. 18.7b

Connected visualisations

select documents
from network view

word cloud is recomputed
for selected documents

highlighting words
in the word cloud
will filter the
document
collection

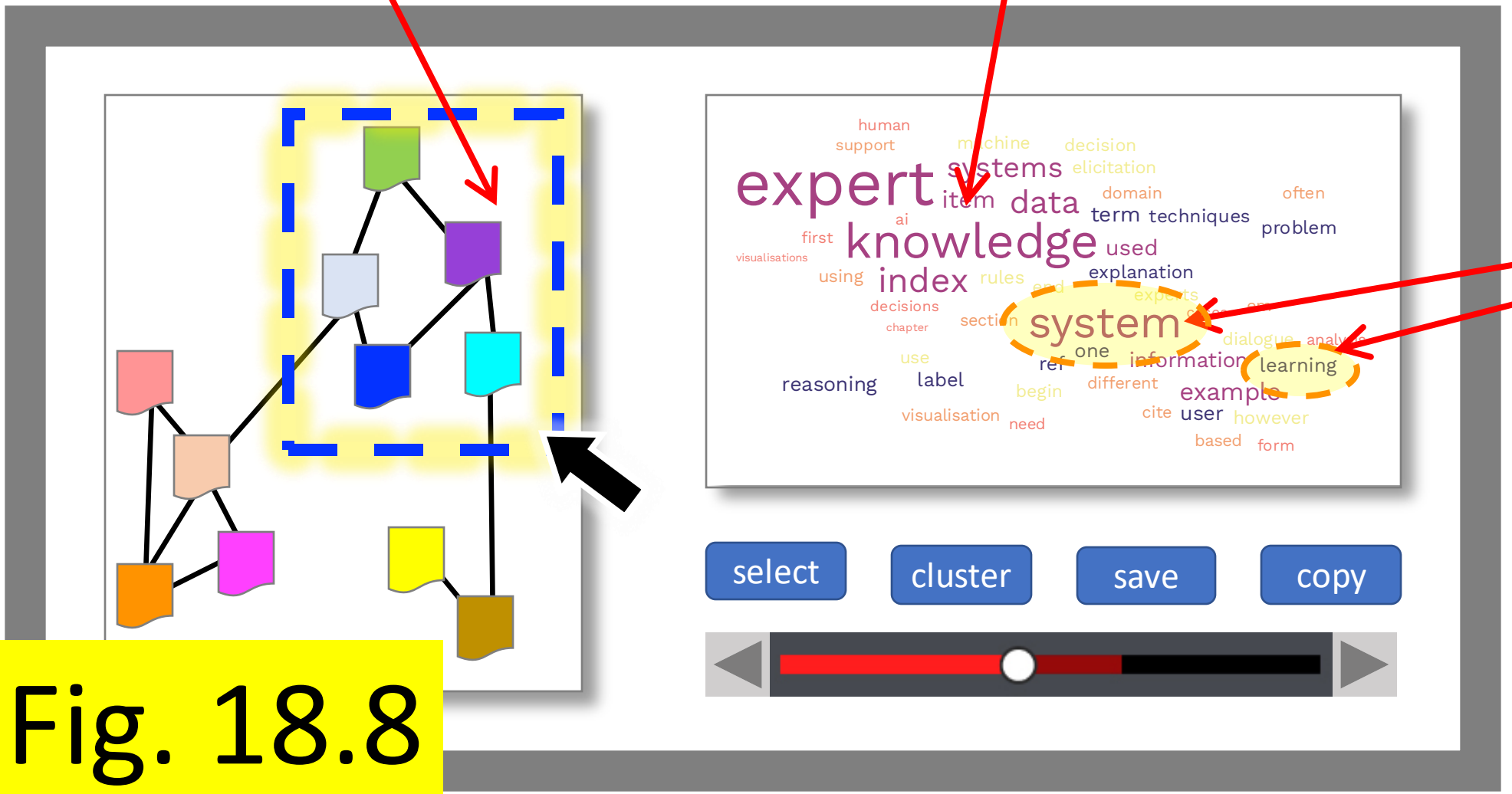


Fig. 18.8

Visual analytics – big picture

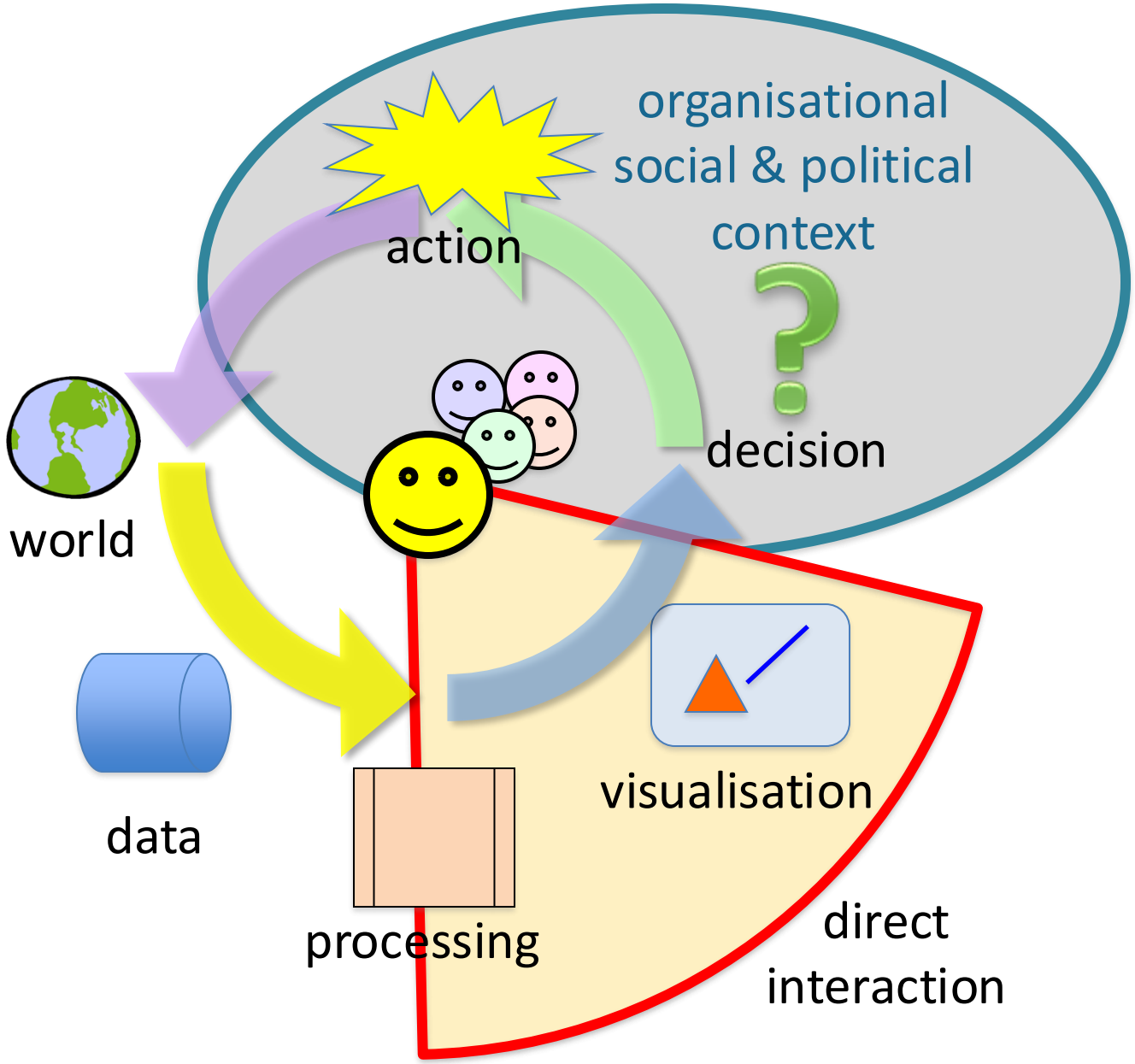


Fig. 18.9

Table 18.1 Strengths of Humans and Computers in Decision Making

(From Mary L. Cummings. Automation bias in intelligent time critical decision support systems. In AIAA 1st intelligent systems technical conference 2004.)

Humans are better at:	Computers are better at:
Perceiving patterns	Responding quickly to control tasks
Improvising and using flexible procedures	Repetitive and routine tasks
Recalling relevant facts at the appropriate time	Reasoning deductively
Reasoning inductively	Handling many complex tasks simultaneously
Exercising judgment	