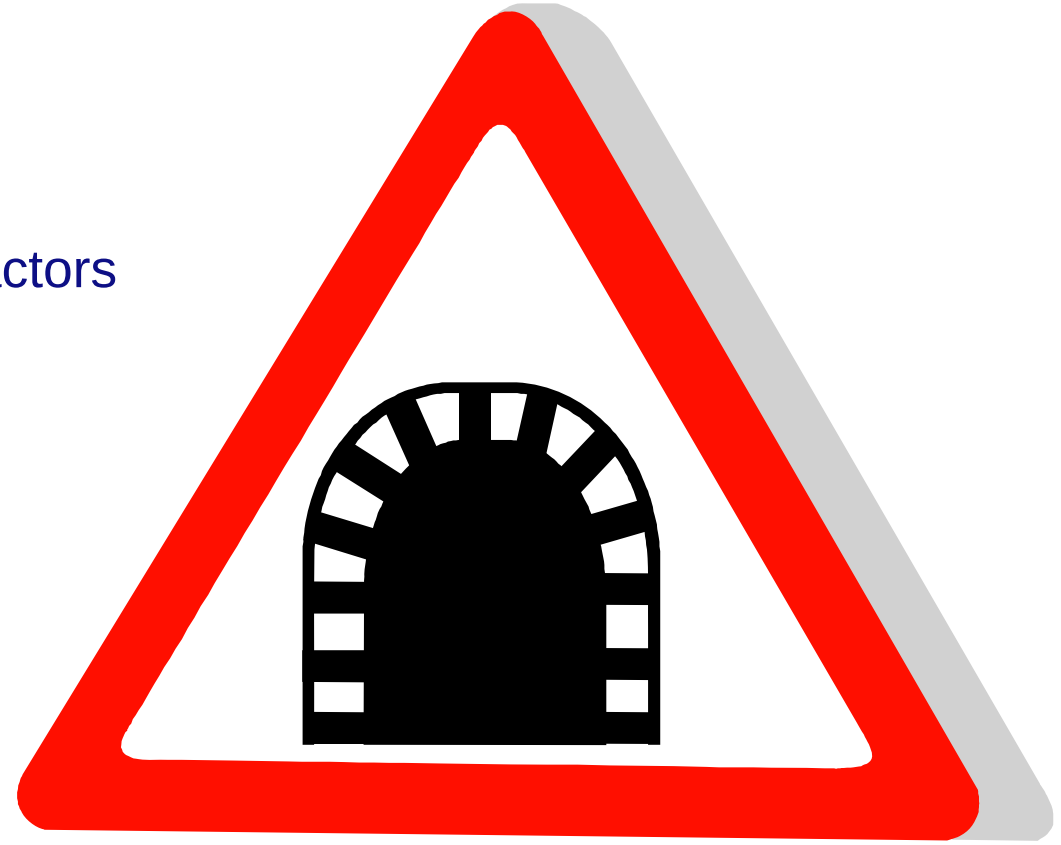
Tunnel Vision

Cognitive, affective, social and technical factors

Content

- General introduction
- Cognitive factors
- Social and organisational factors
- ‘Vincennes incident’
- Computer support



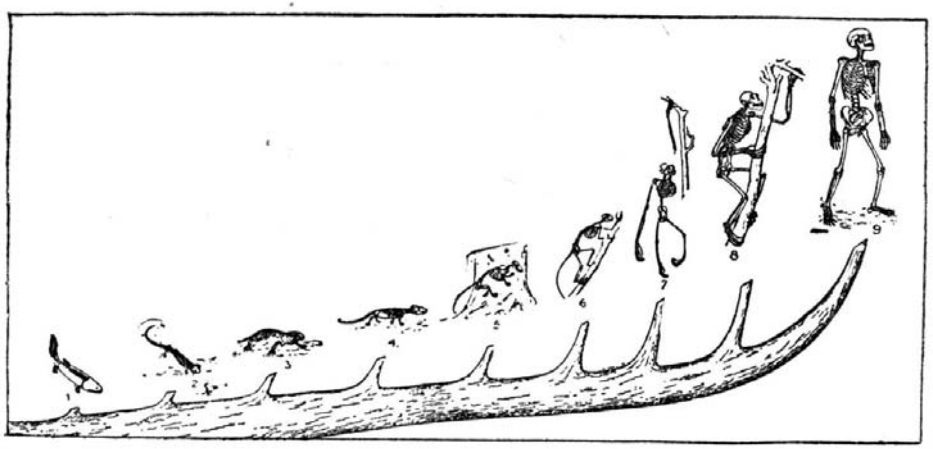
Tunnel Vision?

The combination of cognitive, affective and social factors that brings about a too fast or too strict focus on specific information, neglecting other info.

- Varieties
- Our definition
- Not all or nothing
- Hindsight
- Who to blame?
- Hype?

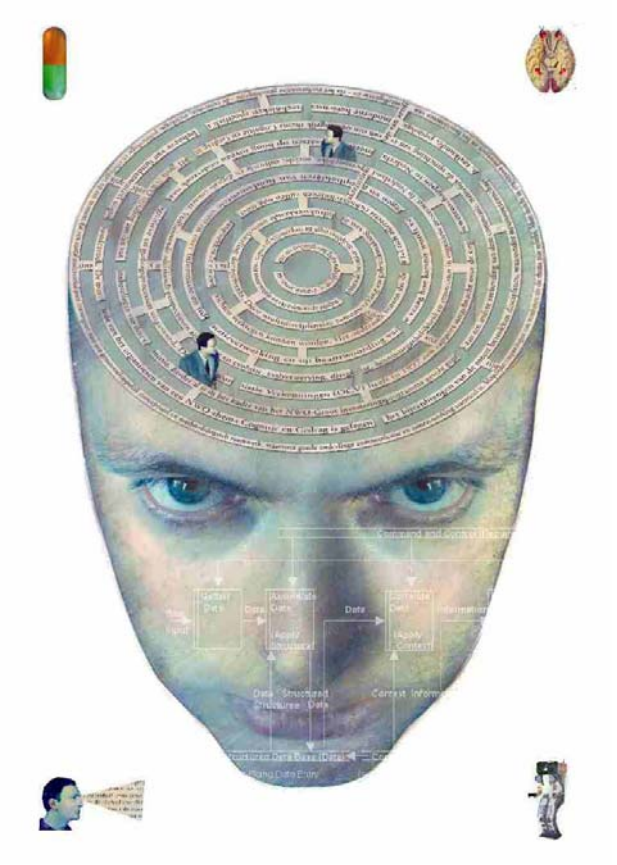
Why tunnel vision?

- Biases are side effects of the need for efficient information processing. We need structure and selection. 'William James: blooming, buzzing confusion'.
- Evolutionary origin
- Not always bad
- *High-risk* organisations
- Why is it rising?



Cognitive factors

- Several cognitive biases contribute to tunnel vision
- Biases for seeing, hearing, memory and interpretation
- In general, there is no intention involved (unconscious)



Biases (1) – Confirmation Bias

- I am in the right bus!

- Behind every vowel (at the other side of the card), there is an even number.

A B 2 3

- Larger: emotional investment, high self-esteem

Biases (2) – Hindsight bias

Heuristics – Anchoring (base-line, reference)

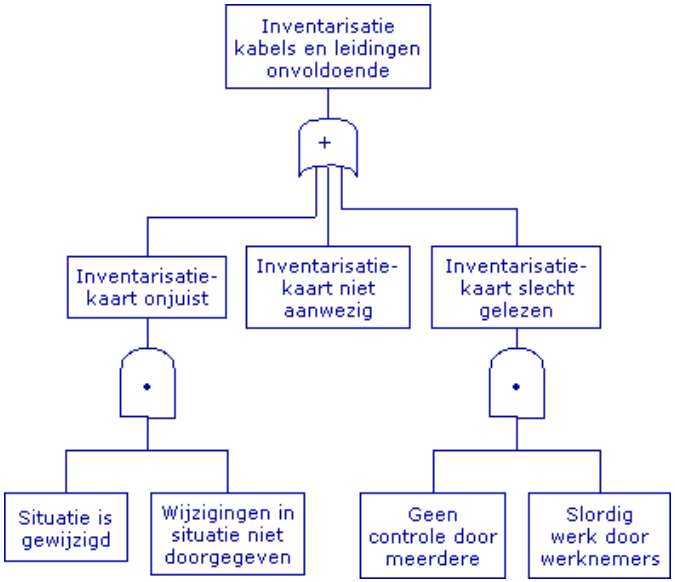
Percentage of countries from Africa in UN?

1 x 2 x 3 x 4 x 5 x 6 x 7 x8

8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

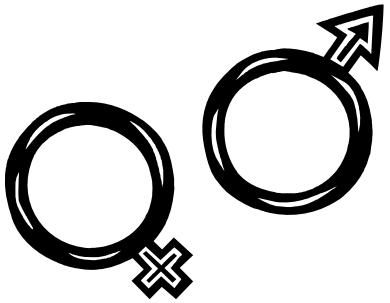
Heurististics - Availability

More words with K as 1st or 3rd letter?



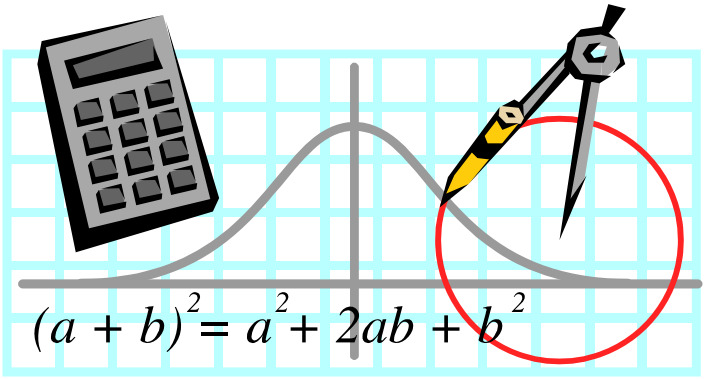
Explicit in fault tree?

liveliness

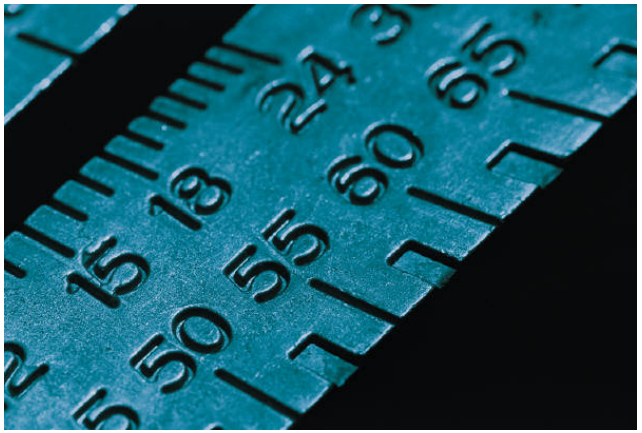


Saillance (well-known persons)

Heuristics - Representativeness



Librarian,
pilot,
hairdresser, or
shop assistant?



Social and organisational factors (1)

- Group thinking
  - Antecedents: cohesion, isolation, lack of procedures, directive leadership, high pressure
  - Symptoms: overestimation of own group, not receptive for de environment, pressure for conformity
  - Consequences:
    - Incomplete search for alternatives
    - selective information processing
    - no active search for information
    - no reconsideration
    - ….

Social en organisational factors (2)

- Emotional investment
- Reduction of fear and/or insecurity
- Status
- Pressure of superior
- Expectation of media and society
- Methods
- Obligations
- Performance measrues
- Self-imposed pressure
- Involvement of an expert

Maritim operation *vs.* Crime investigation

Vincennes Incident

- A civilian airliner, Iran Air Flight 655, was shot down by US missiles on Sunday July 3, 1988, over the Strait of Hormuz, towards the end of the Iran-Iraq War.
- The aircraft was destroyed by the U.S. Navy's guided missile cruiser USS Vincennes, killing all 290 aboard.
- According to the US government, an inexperienced crew mistakenly identified the Iranian Airbus A300 as an attacking F-14 Tomcat fighter.

What went wrong?

- stress, fear
- Supposed similarity with previous incident (*availability bias*)
- Only use of information that confirms expectation (*confirmation bias info assess*)
- Perception failures (*design error displays*)
- Weighing error (one F14 no ‘real’ danger for Aegis-cruiser, take more time)
- ‘scenario-fulfillment’ (confirmation bias *info search*)
- groupthink

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Computer support

- Hard to accomodate
  - enormous interests/importance
  - emotional load (stress). But…..

- Time pressure
  - Consequence of complexity, volume, uncertainty

Accommodate ‘Volume’ factor?

- processing
- recording
- disclosure (anti-bias search)
- maintain history (over cases)
- Auto-summary

(bijv. Zylab, Novalist, PARANOID)

ZyScan

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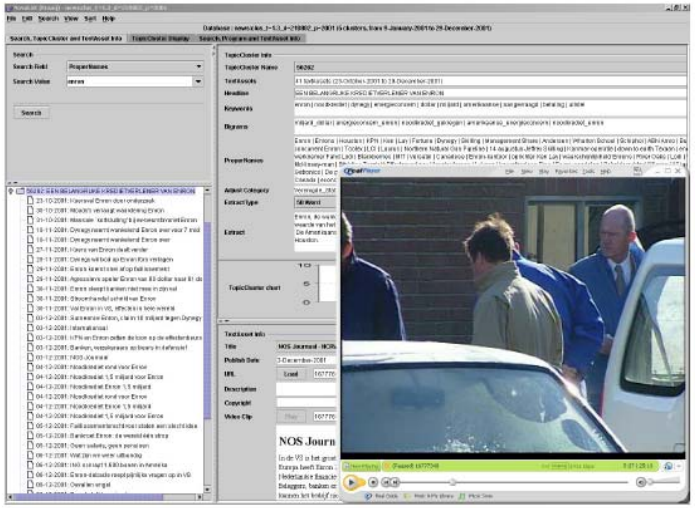
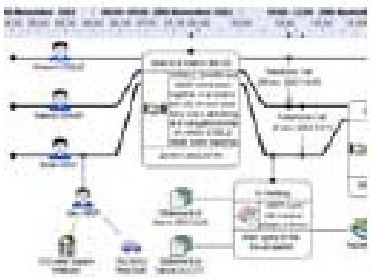
Accommodate ‘Complexity’ factor:

- Visualisation (e.g. time-line, relation schemes in Analist Notebook)
- Representation (e.g. dialogue visualisation)
- Hypothesis analysis (e.g. PARANOID)
- ‘Simple’ checks time/location
- Cross-media clustering (e.g. Novalist)
- Data-mining
- provide structure/templates

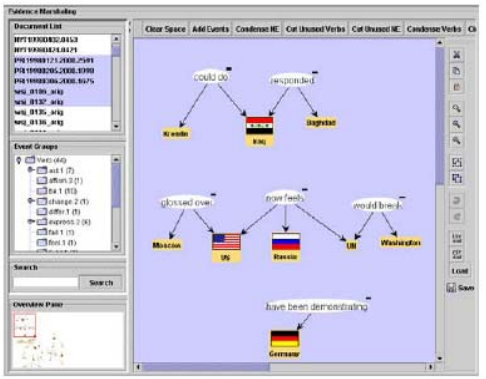


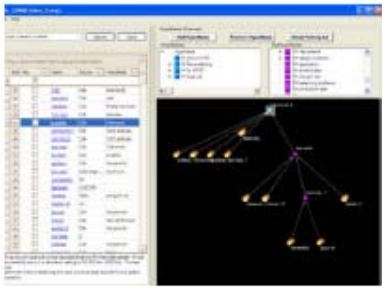


Novalist

Accommodate ‘Uncertainty’ factor

- Reasoning with uncertainty
- Calculate with reliability information and its origin
- Disclosure of historical data & ‘base-rates’
- Evidence tracing & revalue data





DECIDE

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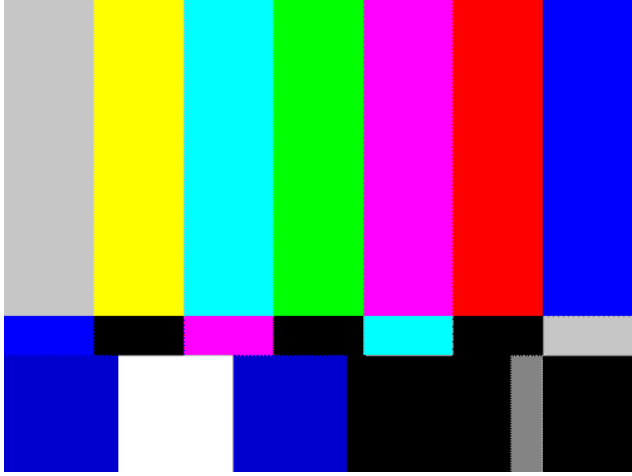
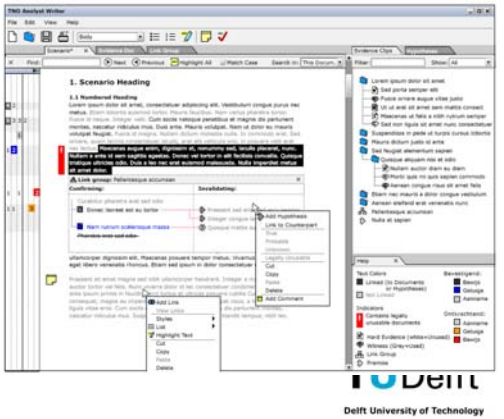
Problems of technology



- Usability & training insufficient
  - sub-optimal use
  - no transparancy
- Integration systems (technical, organisational, security)
- Technology can cause biases by itself (e.g. visualisation, data-mining, wrong formats, schemes)
- Problems input reliability and chances

Analyst Writer - Critique scenarios

- Based on strengths of human and computers
- Scenarios should be easy critique and share
- Link source data to the scenario
- Make explicit which data are not used
- Make explicit which parts are not covered by the source data



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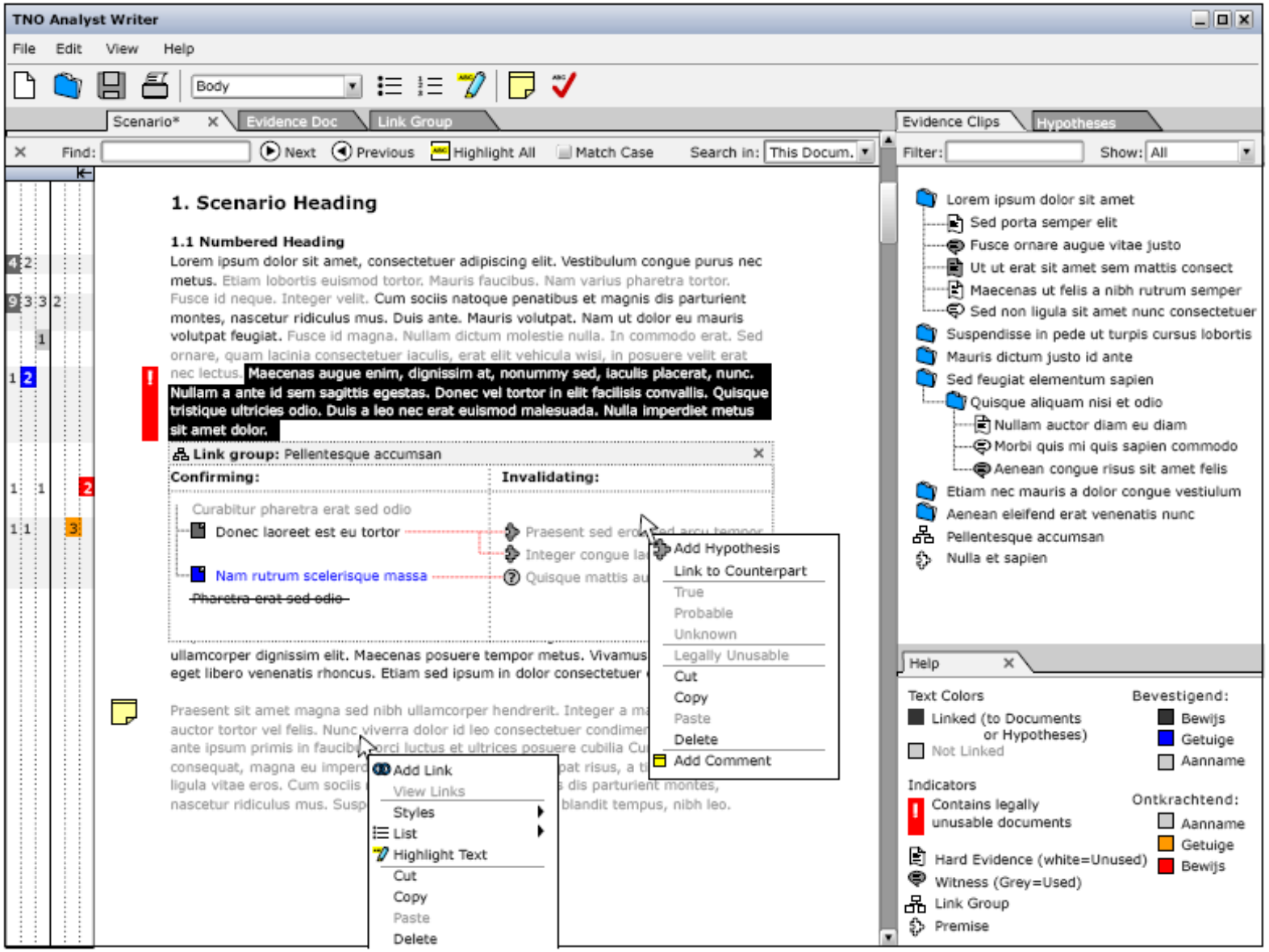
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1.1 Numbered Heading
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