

Engineering the Bridge between Vision and Reality

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Presentation Test Card



The Bridge.....



Two Tables – the question

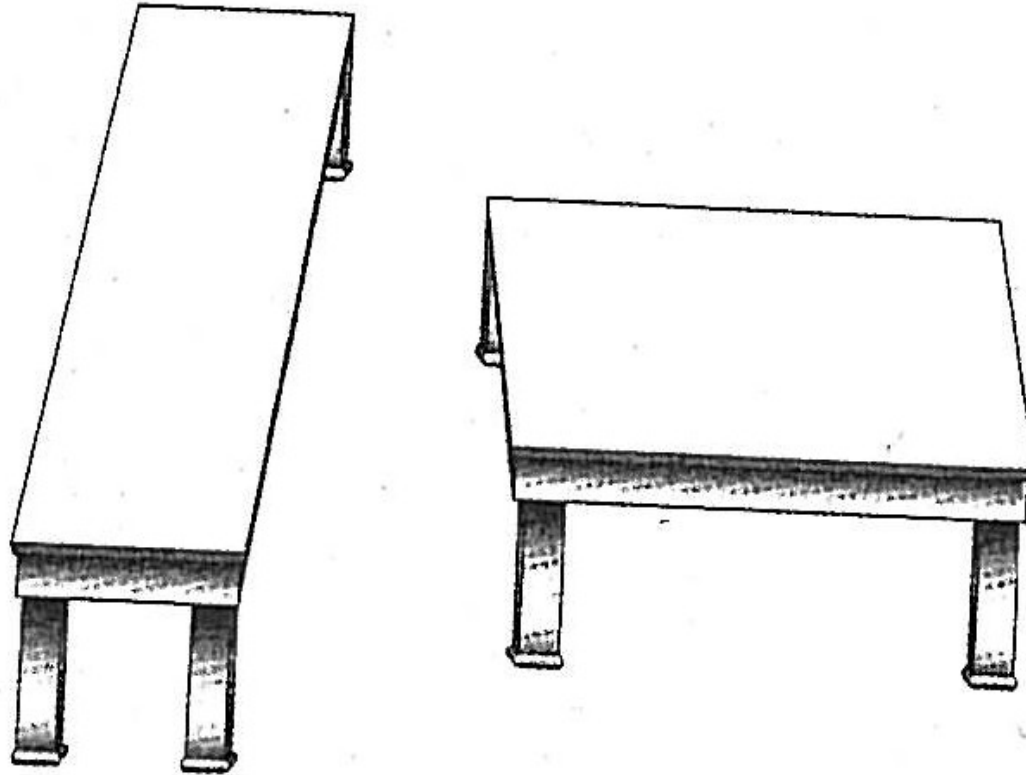
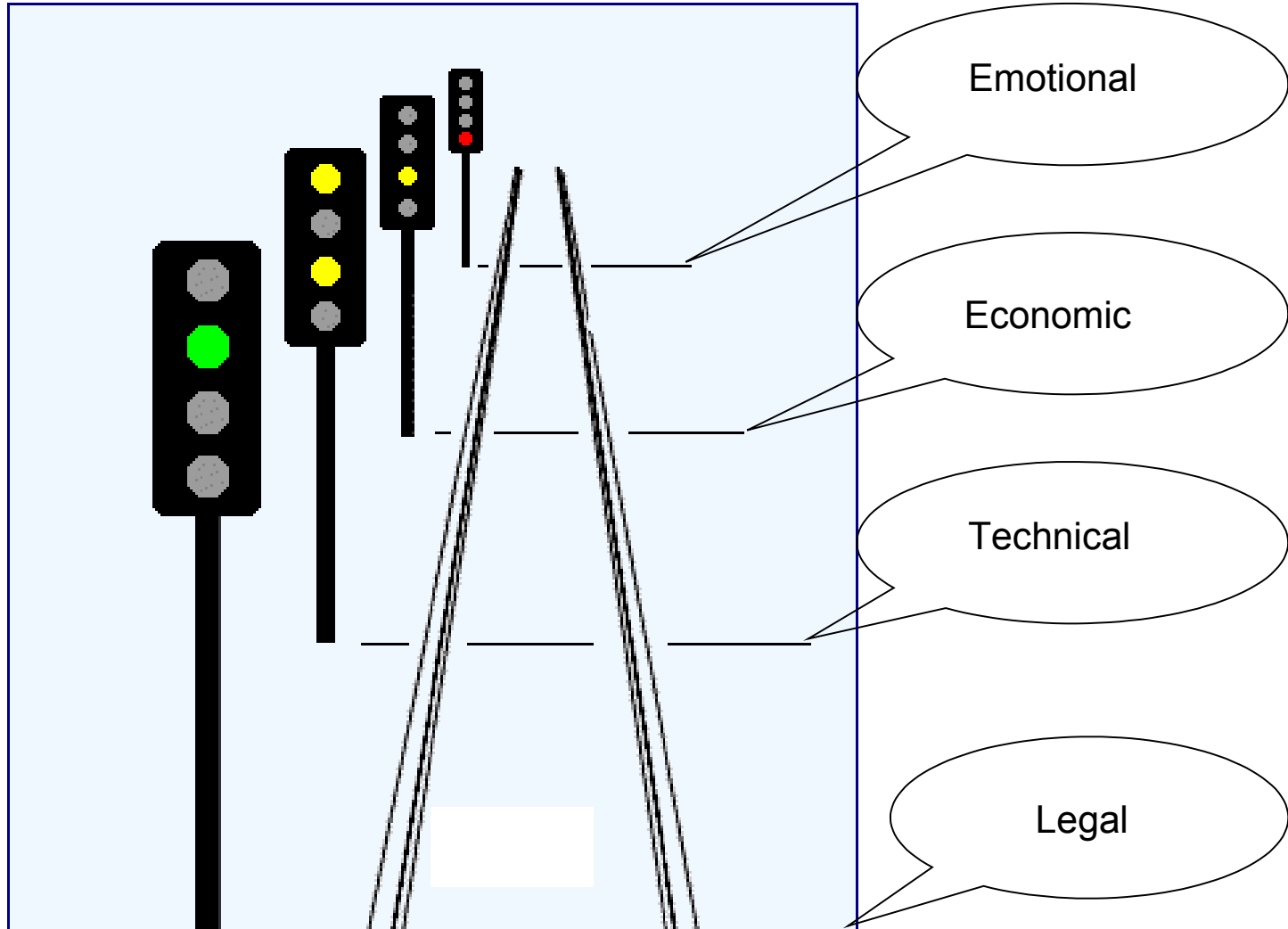
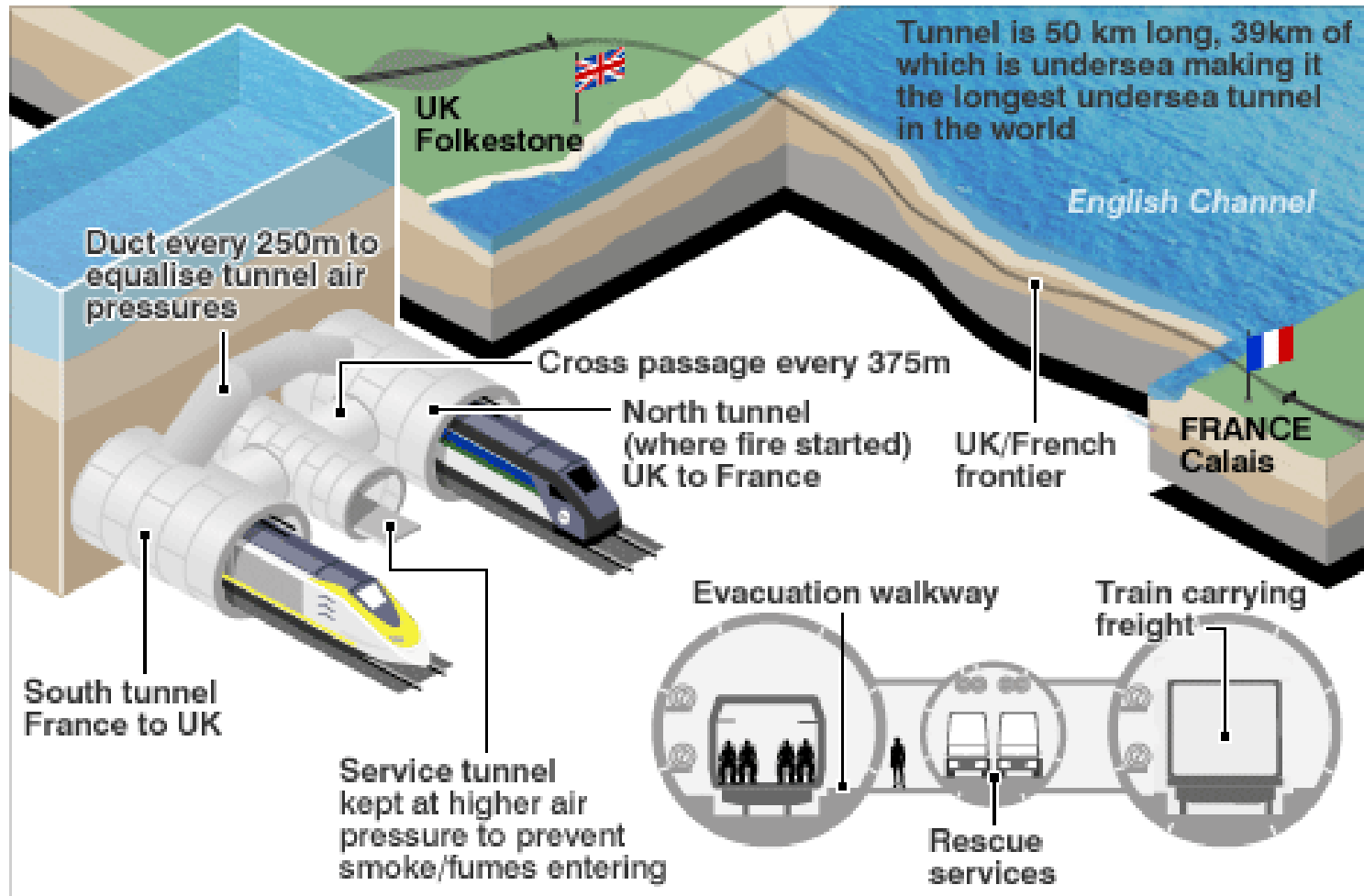


Figure 1.1. *Two tables (Adapted from Shepard [1990])*

Progress Restrictions



Case Study: The Channel Tunnel



Background

- Construction started in 1988 and completed in 1994.
- Operating concession & governance under the Treaty of Canterbury
- Maximum speed 160kph
- TVM430 signalling system
- Traffic is Eurostar, Shuttle services and Freight.

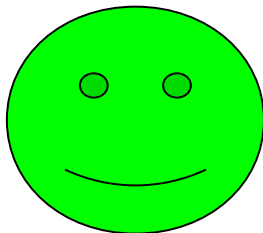
Liberalisation

- New Legal requirements (open access)
- New Operators wanting to use the tunnel
- Old Operators wanting to use new trains
- Ministry of Transport wanting to notify rules for the UK
- ERA wanting the UK to develop its Reference document

Liberalisation

Legal framework

- 2001/14
- Safety Directive
- Interoperability Directive (very nearly)



Technical Requirements

- How do TSIs apply?
- What are the rules?
- ERA Technical Opinion




Phase I - Consultation on concepts (July 2009)

1. Train running of 30mins with fire on board
2. Keep speed up gradients 11 per thousand
3. Hauling a same train dead
4. Start from stand with 50% power
5. Must have two Locomotives
6. Automatic extinguishing system and driver safe for 30mins
7. Smoke penetration protection



Phase I - Consultation on concepts (July 2009)

1. Minimum train length
2. Through corridor
3. Splittability
4. No Diesels
5. Fire Standards for passenger coaches & fittings
6. Call buttons in passenger coaches

Phase II – Amending the rules (March 2010)

1. Train running of 30mins with fire on board
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Phase II – Amending the rules (March 2010)

1. Minimum train length 
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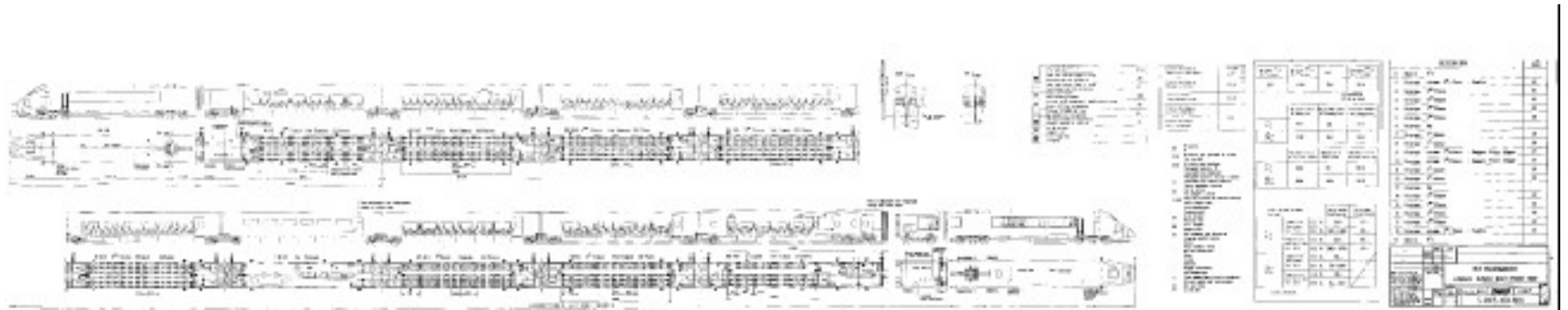
What the ERA said

1. The requirements related to the ten concepts are not in line with the EU legislation.
In particular:
 - a) The existing requirements for vehicle authorisation for the Channel Tunnel are not clearly established, published and notified as technical rules.
 - b) The existing requirements may prevent or make more difficult the authorisation for the Channel Tunnel of TSI compliant rolling stock, or existing rolling stock with an equivalent level of safety to trains already running in the Channel Tunnel.
 - c) Some requirements are based on one particular design solution and evacuation scenario which may prevent or make authorisation more difficult for other technical solutions proposed to be applied in the Channel Tunnel.
2. The EU legal framework for vehicle authorisation shall be respected in the Channel Tunnel. Specific rules for vehicle authorisation are only allowed where, either, not covered by the TSIs, or are necessary for technical compatibility with the Channel Tunnel infrastructure. Any additional specific technical rules shall be justified with a risk assessment and a cost/benefit analysis, and be requested to be incorporated as specific cases in the TSI and added as Category C rules in the Reference Document.

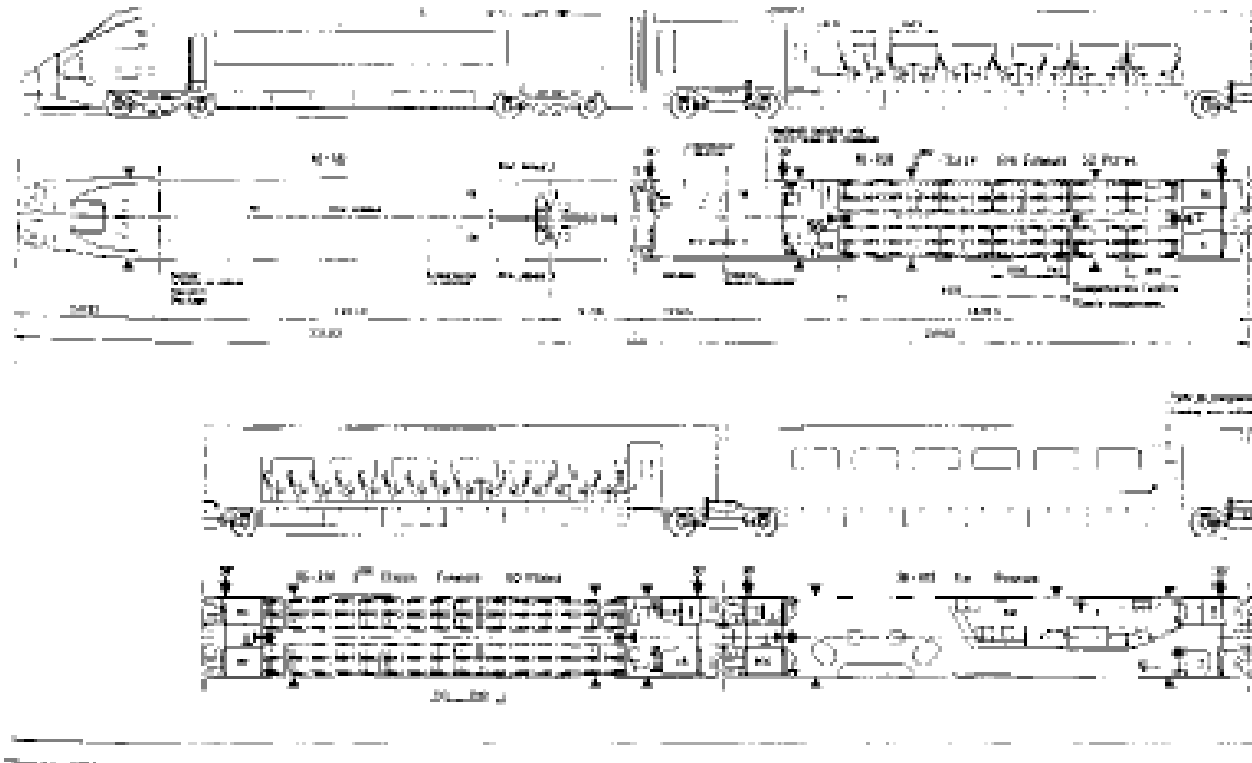
Phase III – Remember 4 aspect signals?

- The need for clarity for Eurostar & DB
- The uncertainty of concepts' legal status
- Two key issues;
 - Train length
 - Distributed power
- Who makes the rules (MS, NSA or IM?)
- How can the rules be changed?
- If Engineers can't solve it.....

E.g. The problem



E.g.errr which bits are rules?



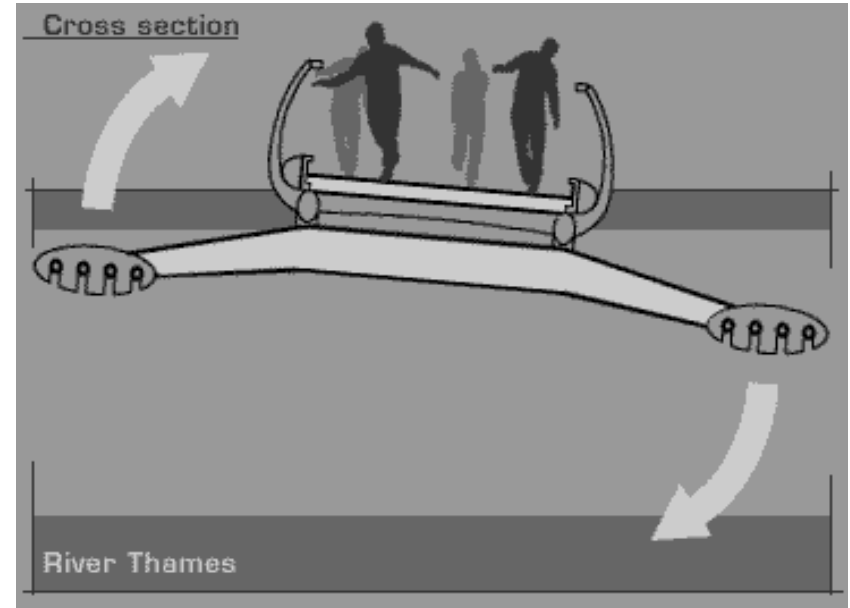
The Problem with rules

- Rules are a historical map of our accidents
- They may not prevent new risks from emerging technologies
- We can't remember why we made them
- They are rarely built up from scenario analyses
- We become emotionally attached to ours and don't trust others'
- We hide behind them

Building the Bridge

- Distributed Power not prohibited
- Train length (other than 375m) may be possible
- CTSA working party to look at the ERA technical opinion
- Allowing the notification of rules and completion of the reference document
- SRT revision inputs to give transparency for any retained rules.
- Working to develop a transparent, logical set of rules

The Bridge - great vision, a bit wobbly



Delivering the vision

- Physics is Physics
- Engineering is key
- Emotional engineering should be acknowledged but not acted on
- Evidenced based decisions essential
- Should not assume the status quo will remain

Two Tables – the answer

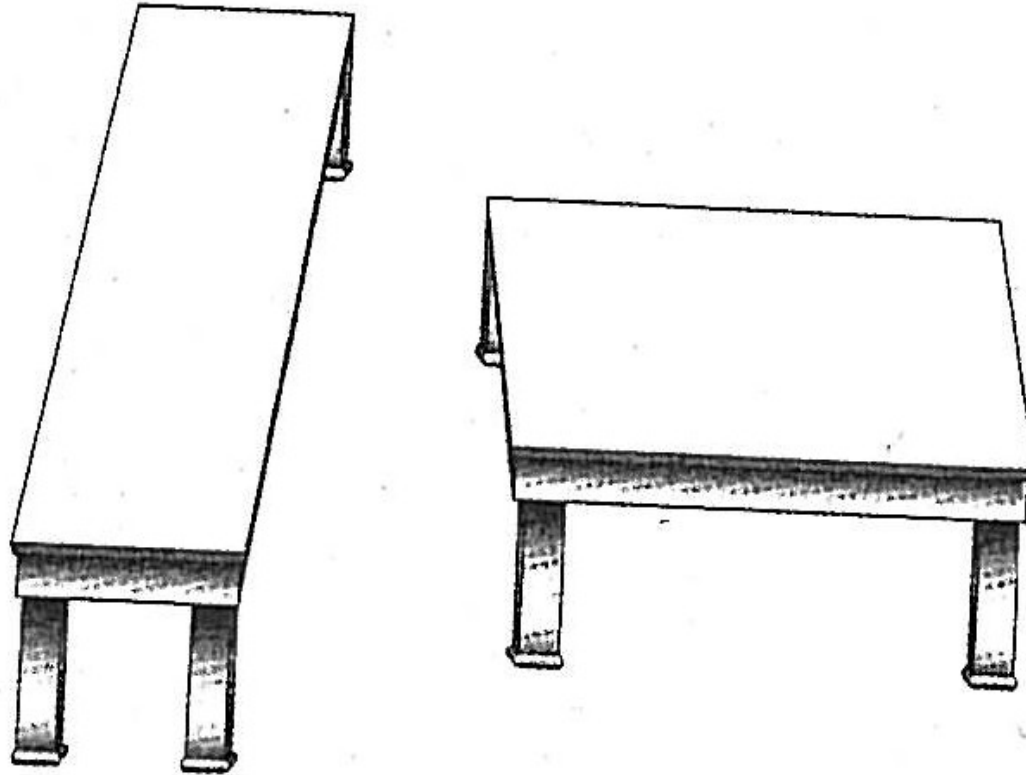


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“Vision without Action is merely a dream.
Action without Vision is merely passing time.
Vision with Action can change the world.”

Nelson Mandela

Questions?

