British Computer Society
The Chartered Institute for IT

HOW TO BE A CONSULTANT

a programme for new and aspiring consultants

Analysis & Problem Solving

by Stephen Aldridge
Managing Director of Numeritas Ltd

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numeritas

ANALYSIS AND PROBLEM SOLVING

STEPHEN ALDRIDGE

26 MAY 2021

2011 IARPA COMPETITION

- 5 competing teams
- 20,000+ people
- 500+ questions over 4 years
- Example – “will North Korea detonate a nuclear device before the end of this year”
- Used Brier score to measure accuracy
- Beat control group by 60% in year one, 78% year two.

SUPER-FORECASTING

PHILIP TETLOCK & DAN GARNDER

ANALYSIS TYPES AND TOOLS

TYPES

- Scientific / Chemical
- Statistical
- Engineering
- Linguistic
- Mathematical
- Literature
- Pyschotherapy
- Business
- Strategic

SOFTWARE

- Excel
- SPSS
- Simul8
- Matlab
- Power BI
- R
- Python
- Tableau

FRAMEWORKS

- Porters 5 forces
- BCG Growth Share matrix
- Value chain analysis
- Decision trees
- Weighted ranking
- Any 2x2 matrix!!

TOO MANY TO MENTION !!

HOW WE THINK

17 x 24

THINKING FAST AND SLOW – DANIEL KAHNEMAN

System 1 – Intuitive / instinctive	System 2 – Rational thought
Intuitive (snap decisions / impressions)	Requires Cognitive effort
Learned skills	Can only focus on one task
Easily mistaken	Should use to validate system 1
Subject to bias	Example: calculation / analysis

HOW WE MAKE DECISIONS

- ‘System 1’ thinking believes what it sees (or hears)
- If not challenged by ‘system’ 2 thinking, this becomes embedded
- Once we have taken a position, we defend it
- We seek out confirmatory information
- We ignore contradictory evidence

CONFIRMATION BIAS

We need to engage system 2 thinking to keep this in check!

INTERPRETATION

STATEMENT	NATO Officers interpretation
+ PROBABLE	+ 35% - 91%
+ HIGHLY LIKELY	+ 51% - 91%
+ CHANCES ARE SLIGHT	+ 1% - 45%

Source: https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/psychology-of-intelligence-analysis/PsychofIntelNew.pdf

PROBLEM SOLVING STEPS

1. Define the problem
2. Generate alternatives
3. Evaluate and select alternatives
4. Implement

- ‘correct’ problem
- Rephrase the problem to generate different perspectives
- Why? When? Who? etc
- Break down large problems into smaller sub-problems

PROBLEM SOLVING STEPS

1. Define the problem
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- Brainstorming
- ‘Messy’ (Tim Harford)
- Cognitive diversity
- Solve the opposite problem

HOW THE SUPER-FORECASTERS DID IT

- Learnt to deal with probabilities
- Learn from similar situations (background incidence)
- Sought out all relevant information – adjust accordingly
- Create **competing hypotheses** to avoid confirmation bias

Stephen Aldridge

www.numeritas.co.uk

Recommended reading list

Super-forecasting by Philip Tetlock and Dan Gardner

Thinking Fast and Slow by Daniel Kahneman

Messy by Tim Harford

PsychOfIntelNew.pdf from CIA (available on internet)

NUMERTAS LTD

info@numeritas.co.uk e
+44 (0) 845 869 4960 t
+44 (0) 207 490 4003 f
www.numeritas.co.uk

142 Central Street
London EC1V 8AR