

MA5840 Data Science and Strategic Decision Making for Business

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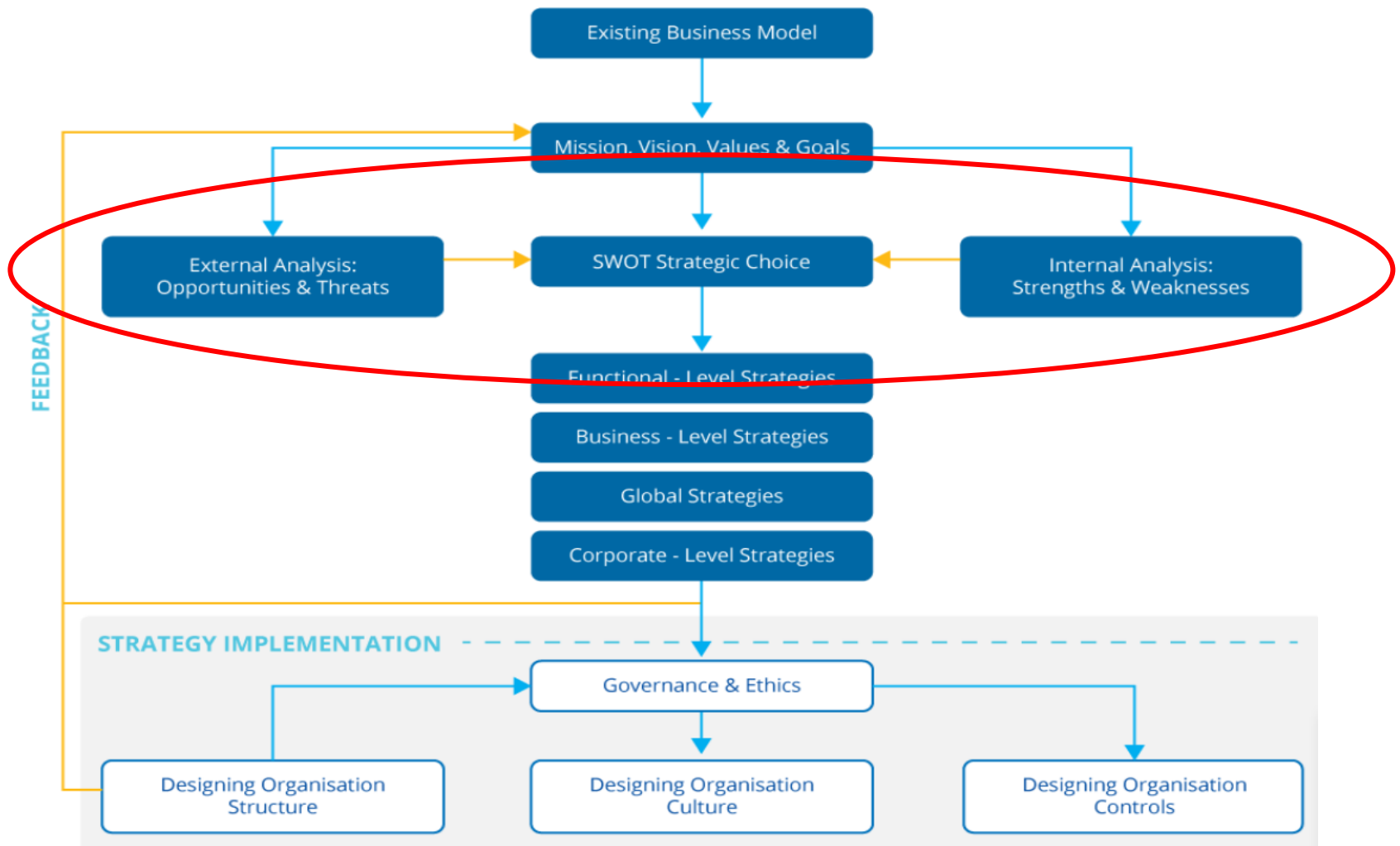
Cairns
Singapore
Townsville

Internal Analysis

- Judgement and uncertainty
- Decision trap
- Enhancing strategic thinking
- How might machines enhance strategic decisions?
- Q+A

(Adapted from Michael Cohen 2019)

STRATEGY FORMULATION



WHAT A DILEMMA

- What is an ethical dilemma?
- Why are dilemmas hard?

THE CHOICES WE MAKE.

MORAL CHOICE

good vs bad

Moral choice is committing to act for what one believes is right and good.

ETHICAL CHOICE

good vs good
bad vs bad

Ethical choices is the process of choosing among alternatives consistent with ethical principles.

There is a lot of judgmental language around this
topic

(traps, bias, blindness, errors, flaws, mistakes)

Objectivity / Subjectivity ?

Descartes: 'I Think Therefore I Am'

JUDGEMENT AND UNCERTAINTY

DECISION PROCESS

Decision process

Research has revealed that we use unconscious routines to cope with the complexity inherent in most decisions.

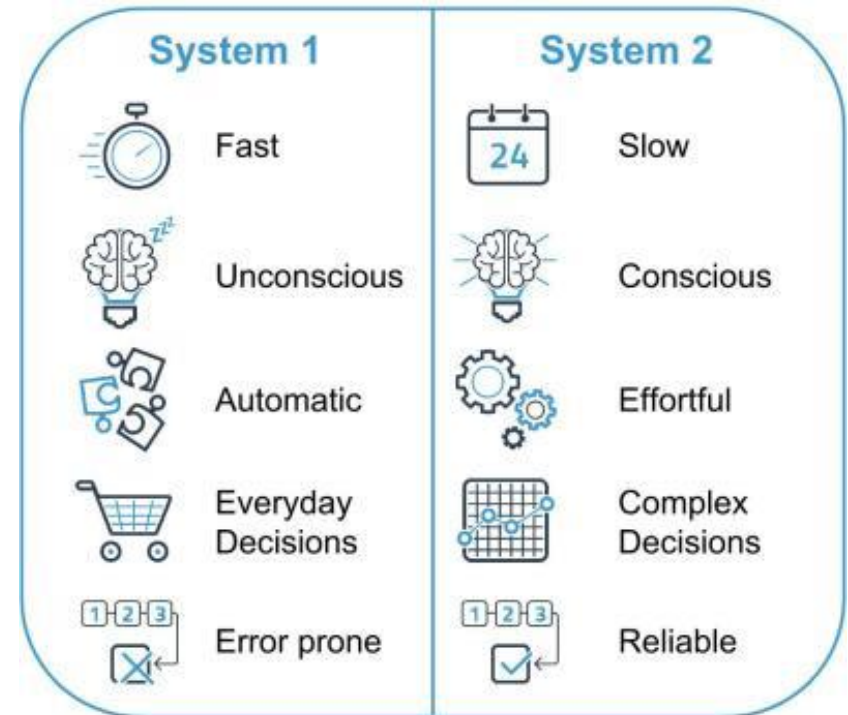
These routines serve us well in most situations, but researchers have identified a whole series of flaws in the way we think when making decisions.



MAKING DECISIONS

Making a decision

People draw from a frame of reference when making a decision that derives from each person's way of observing, interpreting and acting in the world.



Filtering

Filtering is a cognitive process by which individuals organise and attend to information from the environment.

Group think

Most strategic decisions are made by groups. The group context within which decisions are made is clearly an important variable in determining whether cognitive biases will operate to adversely affect the strategic decision-making processes (Mestel, 2016).

Group think occurs when a group of decision-makers embarks on a course of action without questioning underlying assumptions.

DECISION TRAPS

DECISION TRAPS

There are two kinds of decision trap:

A. Traps that influence the way we make decisions when confronted with uncertainty

- The anchoring trap
- The status-quo trap
- The sunk-cost trap
- The confirming-evidence trap (or prior hypothesis bias)
- The framing trap
- Estimating and forecasting Traps

B. Traps that cloud our ability to assess probabilities.

- The overconfidence trap (or illusion of control)
- The 'recallability' trap
- The prudence trap

My Plus 1.

Groupthink is a psychological phenomenon that occurs within a group of people in which the desire for harmony or conformity in the group results in an irrational or dysfunctional decision-making outcome.

<https://corporatefinanceinstitute.com/resources/careers/soft-skills/groupthink-decisions/>

ENHANCING STRATEGIC DECISIONS

ENHANCE STRATEGIC DECISIONS

- The **efficiency of information flow** is tied to the **effectiveness of an organisation** but it is also **directly related to our cognitive capacity to decipher the complexity, ambiguity, uncertainty and volatility in information.**

This is key for Data science!

ENHANCE STRATEGIC DECISIONS

Two techniques known to enhance strategic thinking and counteract group think and cognitive biases are devil's advocacy and dialectic inquiry.

- **Devil's advocacy**

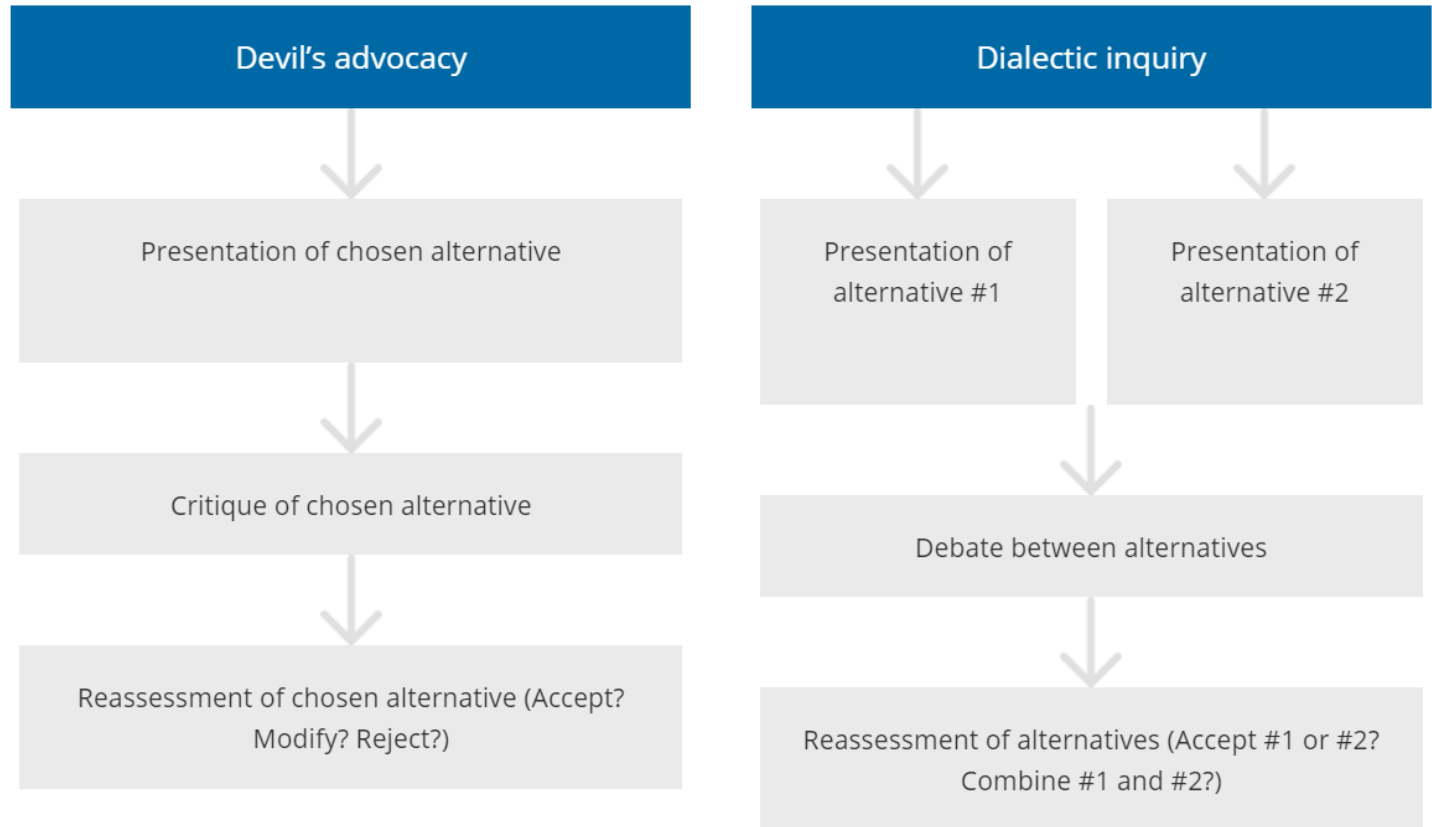
Devil's advocacy requires the generation of both a plan and a critical analysis of the plan.

- **Dialectic inquiry**

Dialectic inquiry is more complex, for it requires the generation of a plan (the thesis) and a counter plan (an antithesis) that reflect plausible but conflicting courses of action.

ENHANCE STRATEGIC DECISIONS

Flow chart



ENHANCE STRATEGIC DECISIONS

Improving story-telling to improve strategic decisions

Tasks

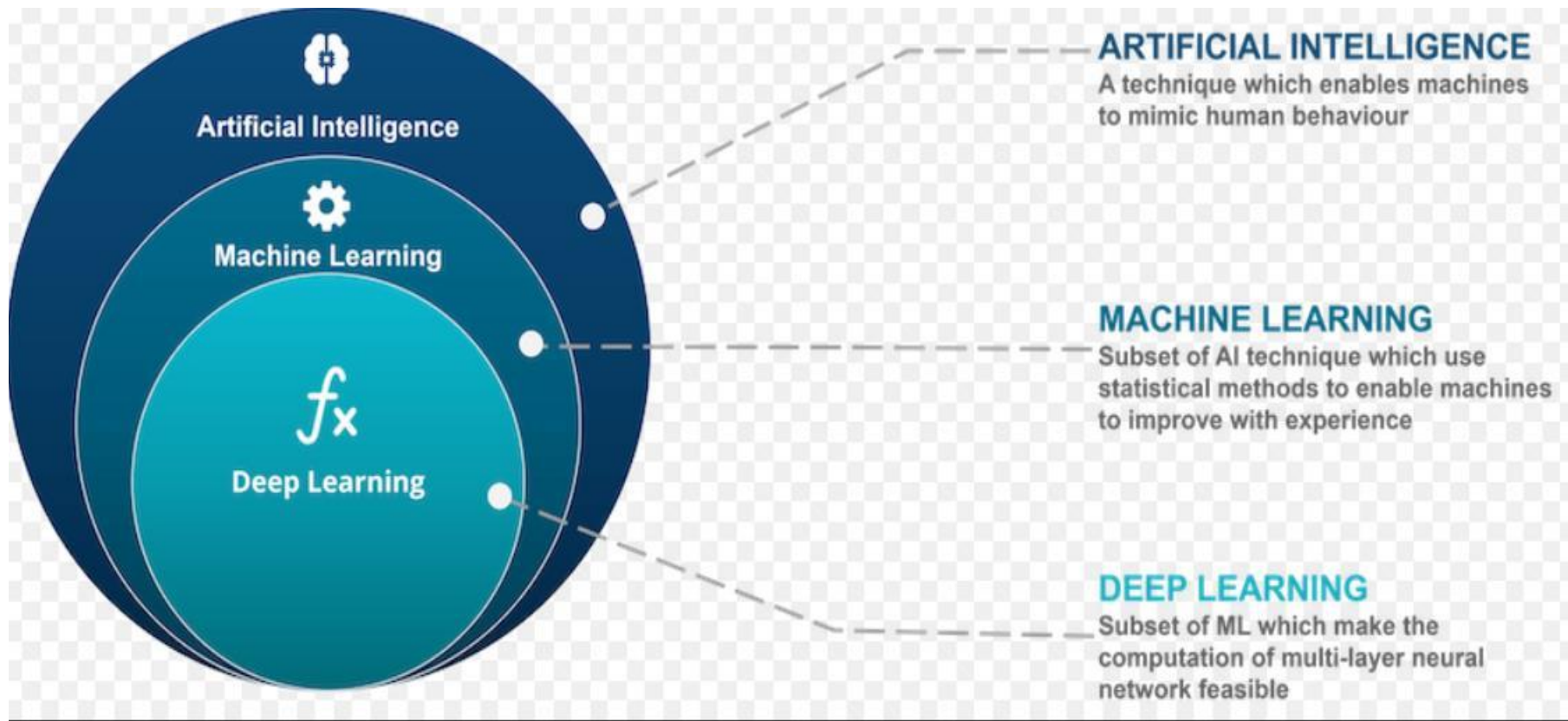
- Develop stories from data and visuals
- Help construct presentations in story format
- Present to non-technical audiences

Skills

- Information design
- Writing and editing
- Presenting
- Persuasive communication

HOW MIGHT MACHINES ENHANCE DECISIONS

ENHANCE DECISION TOOLS

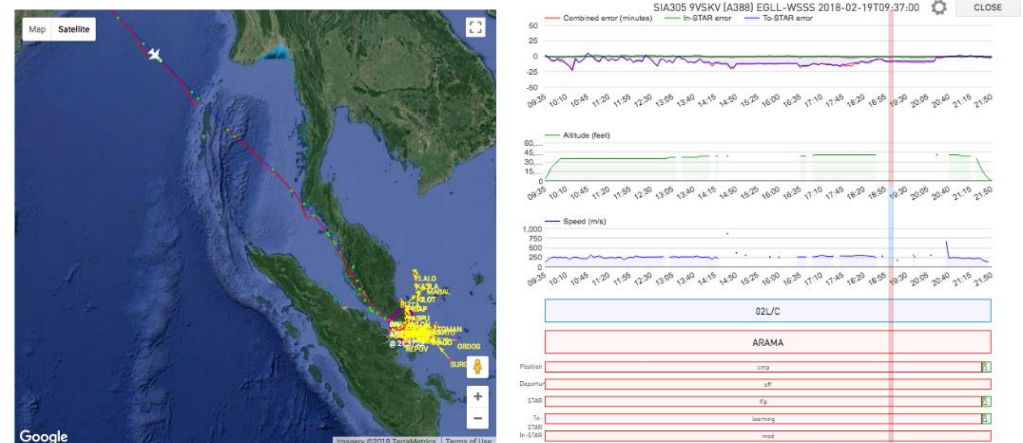
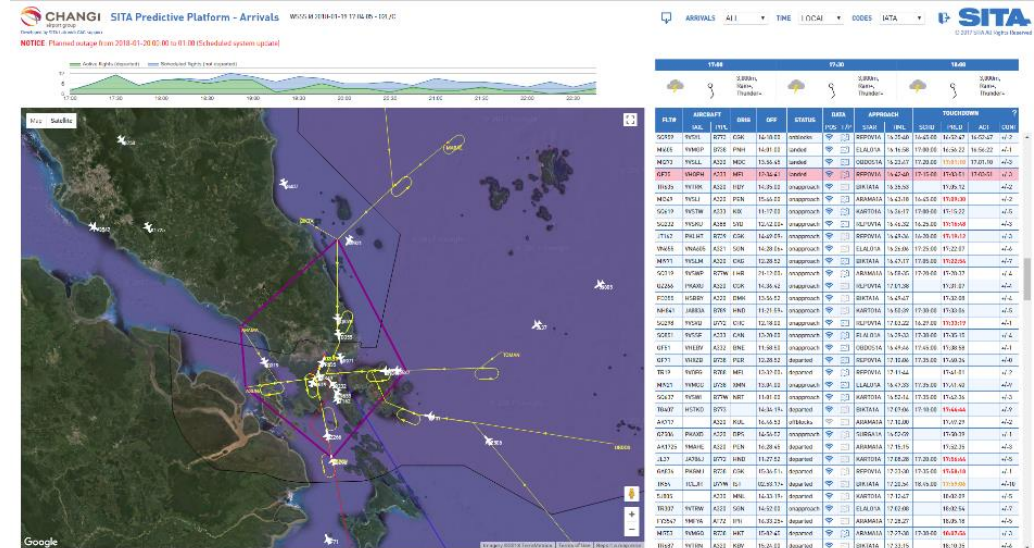




ENHANCE DECISION TOOLS

Arrival Flight Prediction

- A Machine Learning based Flight Arrival Prediction for arrival flights, looking at flight history and several weather sources.
 - *Predict flight landing time, forecast ground delays before take-off, effect of head/tail winds, holding time before approach, runway approach direction, STAR route taken, and STAR approach time*
- Prediction of landing time vs flight schedule help airports and ANSP manage manpower, slot management, facility and ground equipment.



ENHANCE STRATEGIC TOOLS

Flight Aware - As of 12:56 26/11/2020



ENHANCE DECISION TOOLS

The Moral Machine

- Should a self-driving car full of old folks crash to avoid puppies on a pedestrian crossing?
- Is it OK to run over two criminals if you save one doctor?
- Whose lives are worth more, seven-year-olds or senior citizens?
- Should pedestrians be saved instead of passengers who knowingly got into an inherently dangerous speeding metal box?
- Should we rely on the air bags and other safety features in a crash instead of swerving into unprotected pedestrians?

Would you buy a car programmed to kill you for the greater good?

<https://newatlas.com/driverless-car-ethics/43926/>

Consequential based Ethics

Groups of **ethical** theories that place central importance on the **consequences** of an action, all of which maintain that an action is morally right only when its positive outcomes are maximized, and negative effects mitigated

Thank you.