A Brief History Of DECISION MAKING

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1. Introduction
“Life is the sum of all your choices”

Albert Camus

History equals the accumulated choices of all mankind
Decision Making

- Chester Barnard imported the term from the lexicon of public administration into the business world
- Replace narrower descriptions such as “resource allocation” and “policy making”
- Introduction of the phrase changed how managers thought about what they did
“Decision implies the end of deliberation and the beginning of action.”

Prof. William Starbuck, University of Oregon
The study of managerial decision making (1)

- Foundation laid by Chester Barnard, James March, Herbert Simon and Henry Mintzberg

- Decision making within organizations only one ripple in a stream of thoughts flowing back to a time when man facing uncertainty sought guidance from the stars

- The question of who makes decisions and how have shaped the world’s systems of government, justice and social order
The study of managerial decision making (2)

- A palimpsest of intellectual disciplines: mathematics, sociology, psychology, economics and political sciences, etc.
- Philosophers ponder what our decisions say about ourselves and about our values
- Historians dissect the choices leaders make at critical junctures
Decision making

- A good decision does not guarantee a good outcome
- Improved through a growing sophistication with managing risk, a nuanced understanding of human behaviour and advances in technology that support and mimic cognitive processes
Contextual and psychological constraints exist

• On the ability to make optimal choices
• Complex circumstances, limited time and inadequate mental computational powers reduce decision making to a state of “bounded rationality”;
• “People can make economically rational decisions if only they can gather enough information” – Herbert Simon
• Daniel Kahneman and Amos Tversky identify factors that cause people to decide against their economic interest even when they know better
• Antonio Damasio draws on work with brain damaged to demonstrates that in the absence of emotion it is impossible to make any decisions at all
• Erroneous framing, bounded awareness, excessive optimism: the debunking of Descartes’s rational man threatens to swamp our confidence in our choices, with only improved technology acting as a kind of empirical breakwater
Imperfectability of decision making

- Theorists sought ways to achieve if not optimal outcomes, at least acceptable ones
- Mastering simple heuristics, a “fast and frugal” reasoning to make virtue of our limited time and knowledge – Gerd Gigerenzen
- “Humble decision making” an assortment of nonheroic tactics that include tentativeness, delays and hedging – Amitai Etzioni
- In a high-powered round of rock-paper-scissors, a game that date as far as as Ming Dynasty in China, a Japanese TV equipment manufacturer turned over its US$20 million art collection to Christie when it beat archrival Sotheby
2. Chances Are
Risk

• An inescapable part of every decision
• Organizations must calculate and manage the attendant risks to make good choices
• In the past, risk management tool kit consists of faith, hope and guesswork; before the 17th century, humankind’s understanding of numbers wasn’t up to the task
• Today, myriad sophisticated tools can help managers make good choices
Numbering Methods

• The Hindu-Arabic numeral system (which radically include zero) simplified calculations and enabled philosophers to investigate the nature of numbers.

• During the Renaissance, scientists and mathematicians such as Girolamo Cardano thought about probability and developed puzzles around games of chance; in 1494 a Franciscan monk named Luca Pacioli proposed “the problem of points” for dividing the stakes in an incomplete game.

• In the 17th century, French mathematicians Blaise Pascal and Pierre de Fermat developed a way to determined the likelihood of each possible result of a simple game.
Scientific basis of risk management (1)

- In the 18th century, Swiss scholar Daniel Bernoulli studied random events, focusing not on the events themselves but on human beings who desire or fear certain outcomes to a greater or lesser degree (also introduced the concept of human capital).

- He wanted to create mathematical tools to “estimate prospects from any risky undertaking in light of specific financial circumstances” – i.e., given the chance of a particular outcome, how much are you willing to bet.
• In the 19th century,
• Carl Friedrich studied the bell curve of normal distribution,
• Francis Galton came up with the concept of regression to the mean while studying generations of sweet peas—he later applied the principle to people observing that few of the sons, and fewer of the grandsons of eminent men were themselves eminent
• In 1921 Frank Knight distinguished between risk (when the probability of an outcome is possible to calculate (or is knowable), and uncertainty, when the probability of an outcome is not possible to determine (or is unknowable)
Scientific basis of risk management (3)

• In the 1940s, John Neuman and Oskar Morgenstern developed game theory, which deals in situations where people’s decisions are influenced by unknowable decisions of “live variables” (aka other people)

• Today corporations uses modern techniques such as derivatives, scenario planning, business forecasting and real options

• But since chaos so often triumphs over control, even centuries worth of mathematical discoveries can only do so much
“Life is a trap for logicians. Its wildness lies in wait.”

G.K. Chesterton
3. The Meeting of Minds
Nobility in the people pooling their wisdom and making decisions that are fair and acceptable to all

- In the 5th Century Athens became the first (albeit limited) democracy
- In the 17th Century, the Quakers developed a decision making process that remains a paragon of efficiency, openness and respect
- In 1945, the United Nations sought enduring peace through the actions of free peoples working together
- During the last century, psychologists, sociologists, anthropologists and biologists unlocked the secrets of cooperation within groups
- Later the popularity of high-performance teams fostered the collective ideal
Scientific study of groups

(1)

- Began in 1890s as part of the field of psychology
- In 1918, Mary Parker Follett in *The New State: Group Organizations – The Solution of Popular Government* made case for value of conflict in achieving integrated solutions
- Breakthrough in understanding of group dynamics occurred just after WWII when Kurt Lewin “field theory” posited that actions are determined in part by social context and that group members with different perspectives will act together to achieve a common goal
Scientific study of groups (2)

- Over the next decades knowledge about groups and teams evolved rapidly
- Victor Vroom and Philip Yetton established the circumstances under which group decision making is appropriate
- R. Meredith Belbin defined the components required for successful teams
- Howard Raiffa explained how groups exploit “external help” in the form of mediators and facilitators
- Peter Drucker suggested that the most important decision may not be made by the team itself but rather by management about what kind of team to use
The downside of collective decision making

- Consensus is good unless it is achieved too easily

- Irving Janis coined the term “group think” in 1972 to describe the mode of thinking that people engage in when they are deeply involved in a cohesive in-group when members’ strivings for unanimity override their motivation to realistically appraise alternative courses of action

- Poor group decisions are often attributed to the failure to mix things up and question assumptions

- Decisions reached through group dynamics require, above all, a dynamic group
“To think is to differ”

Clarence Darrow
4. Thinking Machines
Electronic computing

- The philosopher’s stone that alchemized the ideas of Herbert Simon, Allen Newell, Harold Guetzkow, Richard M. Cyert and James March at Carnegie Institute of Technology (CIT) who were studying organizational behavior and the workings of the human brain
- They were envisioning how the new tools might improve human decision making
- Scientists from CIT, MIT and Stanford produced early computer models of human cognition – the embryo of artificial intelligence (AI)
Artificial Intelligence (AI)

- Intended both to help researchers understand how the brain makes decisions and to augment decision making processes for organizations
- Decision support systems targeted the practical needs of managers
Executive Information Systems

• Proposed by John Rockart to provide data about key jobs that the organization must do well to succeed

• Launched a breed of technology specifically geared toward improving strategic decision making at the top

• “Business intelligence” systems that help decision makers throughout the organization understand the state of the company’s world
Technology-aided decision making

• In the 1990s customers started using the Internet, giving them more power to choose from whom to buy

• Customers did not have to factor in “zillions of calculations “ into their choices

• The newfound ability of customers to make the best possible buying decisions is the technology’s most significant impact to date on corporate success or failure
5. The Romance of Gut
Gut and Guts

- Gut – emotional response
- Guts – fortitude, nerve
Gut decision making

- In recent years instinct appears ascendant
- “Pragmatists act on evidence, Heroes act on guts”
- “Intuition is one of the X factors separating the men from the boys”
- Testify to the confidence of the decision maker
- Made in moment of crisis when there is no time to weigh arguments and calculate the probability of every outcome; made in situations where there is no precedent and consequently no evidence, sometimes made in defiance of evidence
Intuition

- Decision makers have good reasons to prefer instinct
- In a study, executives said they use their intuition as much as their analytical skills, but credited 80% of their success to instinct
- Henry Mintzberg explains that strategic thinking calls for creativity and synthesis and this is better suited to intuition than to analysis
- A “gut” is a personal, non-transferable attribute
Gut/Brain dichotomy

• Largely false – few decision makers ignore good information when they can get it and most accept that when they can’t get it they will have to rely on instinct

• Behavioural economists describe natural mistakes our brains are heir to

• There are many examples of many good business people who have made bad guesses
“People with high levels of personal mastery .. cannot afford to choose between reason and intuition, or head or heart, any more than they would choose to walk on one leg or see with one eye.”

Peter Senge, The Fifth Discipline
“A blink, after all, is easier when you use both eyes. And so is a long, penetrating stare.”
6. A History of Choice
A HISTORY OF CHOICE

• The history of decision making is long, rich and diverse

• The following timeline represents only a small sample of the people, events, research and thinking that contributed to the subject

• Many dates are approximate
## A HISTORY OF CHOICE

<table>
<thead>
<tr>
<th>Prehistory</th>
<th>6th Century BC</th>
<th>5th Century BC</th>
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<tbody>
<tr>
<td>For millennia, human decisions guided by interpretations of entrails, smoke, dreams and the like; hundreds of generations of Chinese rely on the poetic wisdom and divinations instructions complied in the <em>I Ching</em></td>
<td>Lao Tzu teaches the principle of “nonwillful action”: letting events take their natural course</td>
<td>Male citizens in Athens, in the early form of democratic self-government, make decisions by voting</td>
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<td>The Greeks consult the Oracle of Delphi. Prophets and seers of kinds peer into the future</td>
<td>Confucius says decisions should be informed by benevolence, ritual, reciprocity, and filial piety</td>
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**A HISTORY OF CHOICE**

<table>
<thead>
<tr>
<th>4th Century BC</th>
<th>399 BC</th>
<th>333 BC</th>
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<tbody>
<tr>
<td>Plato asserts that all perceivable things are derived from eternal archetypes and are better discovered through the soul than through senses</td>
<td>In an early jury-trial decisions, 500 Athenian citizens agree to send Socrates to his death</td>
<td>Alexander the Great slices through the Gordian knot with his sword, demonstrating how difficult problems can be solved with both strokes</td>
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<td>Aristotle takes an empirical view of knowledge that values information gained through the senses and deductive reasoning</td>
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333 BC

399 BC

4th Century BC
A HISTORY OF CHOICE

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<tr>
<th>49 BC</th>
<th>9th Century</th>
<th>11th Century</th>
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<tbody>
<tr>
<td>Julius Caesar makes the irreversible decision to cross the Rubicon, and a potent metaphor in decision making is born</td>
<td>The Hindu-Arabic number including the zero, circulates throughout the Arab empire, stimulating the growth of mathematics</td>
<td>Omar Khayyam uses the Hindu-Arabic number system to create a language of calculation, paving the way for the development of agenda</td>
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A HISTORY OF CHOICE

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<thead>
<tr>
<th>14th Century</th>
<th>17th Century</th>
<th>1602</th>
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| An English friar proposes what became known as “Occam’s razor”, a rule of thumb for scientists and others trying to analyze data: the best theory is the simplest one that accounts for all evidence. | Stable keeper Thomas Hobson presents his customers with an eponymous “choice”: the horse nearest the door or none. | Hamlet facing arguably the most famous dilemma in Western literature, debates whether “to be, or not to be”.

<table>
<thead>
<tr>
<th>Horse</th>
<th>Horse</th>
<th>Hamlet</th>
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<tr>
<td><img src="image1.png" alt="Horse" /></td>
<td><img src="image2.png" alt="Horse" /></td>
<td><img src="image3.png" alt="Hamlet" /></td>
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<tr>
<td>Year</td>
<td>Event</td>
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<td>1620</td>
<td>Francis Bacon asserts the superiority of inductive reasoning in scientific inquiry</td>
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<td>1641</td>
<td>Rene Descartes proposes that reason is superior to experience as a way of gaining knowledge and establishes the framework for the scientific method</td>
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<td>1654</td>
<td>Prompted by a gamblers' question about the &quot;problem of points&quot;, Blaise Pascal and Pierre de Fermat develop the concept of calculating probabilities for chance events</td>
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## A History of Choice

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<thead>
<tr>
<th>Year</th>
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<tr>
<td>1660</td>
<td>Pascal’s wager on the existence of God shows that for a decision maker the consequences, rather than the likelihood, of being wrong can be paramount.</td>
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<td>1738</td>
<td>Daniel Bernoulli lays the foundation of risk science by examining random events from the standpoint of how much an individual desires or fears each possible outcome.</td>
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<td>19th Century</td>
<td>Carl Friedrich Gauss studies the bell curve, described earlier by Abraham de Moivre, and develops a structure for understanding the occurrence of random events.</td>
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<td>Year</td>
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<td>1907</td>
<td>Economist Irving Fisher introduces the net present value as a decision making tool, proposing that expected cash flow be discounted at the rate that reflects an investment’s risk.</td>
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<tr>
<td>1921</td>
<td>Frank Knight distinguishes between risk, in which an outcome’s probability can be known (and consequently insured against), and uncertainty, in which an outcome’s probability is unknowable.</td>
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<td>1938</td>
<td>Chester Barnard separates personal from organizational decision making to explain why some employees act in the firm’s interest rather than their own.</td>
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<th>1944</th>
<th>1946</th>
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<td>John von Neumann and Oskar Morgenstern in <em>Game Theory</em> describe a mathematical basis for economic decision making. Like most theorists before them, they take the view that decision makers are rational and consistent.</td>
<td>The Alabe Crafts Company of Cincinnati markets the Magic 8 Ball.</td>
<td>Herbert Simon argues that because of the costs of acquiring information, executives make decisions with only “bounded rationality” – they make do with good enough decisions. Rejects the notion that decision makers behave with perfect rationality.</td>
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<tr>
<th>1948</th>
<th>1950s</th>
<th>1951</th>
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<tr>
<td>Project RAND separates from Douglas Aircraft and became a non-profit think tank</td>
<td>Research at the Carnegie Institute of Technology and MIT led to the development of early computer-based decision support tools</td>
<td>Kenneth Arrow introduced the Impossibility Theorem which holds that there can be no set of rules for social decision making that fulfils all the requirements of society</td>
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<td>Decision makers uses its analyses to form policy on education, poverty, crime, the environment, sand national security</td>
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<tr>
<td>1952</td>
<td>Harry Markowitz demonstrates mathematically how to choose diversified stock portfolios so that the returns are consistent.</td>
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<td>1960s</td>
<td>Edmund Learned, C. Roland Christensen, Kenneth Andrews and others develop the SWOT (strengths, weaknesses, opportunities and threats) model of analysis, useful for decision when time is short and circumstances complex.</td>
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<tr>
<td>1961</td>
<td>Joseph Heller’s term “catch-22” becomes a popular shorthand for circular, bureaucratic illogic that thwarts good decision making.</td>
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<th>1965</th>
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<th>1968</th>
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<td>Corporations use IBM’s System/360 computers in implementing management information systems</td>
<td>“Nuclear option” coined with respect to developing atomic weapons and used to designate a decision to take the most drastic course of action</td>
<td>Howard Raiffa’s Decision Analysis explains many fundamental decision making techniques, including decision trees and the expected value of sample (as opposed to perfect) information</td>
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<td>Roger Wolcott Sperry begins publishing research on the functional specialization of the brain’s two hemispheres</td>
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<th>1970</th>
<th>1972</th>
<th>1973</th>
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<tr>
<td>John D.C. Little develops the underlying theory and advances the capability of decision-support systems</td>
<td>Irving Janis coins the term “groupthink” for flawed decision making that values consensus over the best result</td>
<td>Fischer Black, Myron Scholes and Robert Merton show how to accurately value stock options, beginning a revolution in risk management</td>
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<tr>
<td>Michael Cohen, James March and Johan Olsen publish “A Garbage Can Model of Organizational Choice” which advices organizations to search for their information trash bins for solutions thrown out earlier for lack of a problem</td>
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<td>Henry Mintzberg describes several kinds of decision makers and positions decision making within the context of managerial work</td>
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<th>1973</th>
<th>1979</th>
<th>1980s</th>
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<tr>
<td>Victor Vroom and Philip Yetton develop the Vroom-Yetton model which explains how different leadership styles can be harnessed to solve different types of problems</td>
<td>Amos Tversky and Daniel Kaheman publish their Prospect Theory that demonstrates that the rational model of economics fail to describe how people arrive at decisions when facing the uncertainties of real life</td>
<td>“Nobody gets fired for buying IBM” comes to stand for decisions whose chief rationale is safety</td>
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<th>1984</th>
<th>1989</th>
<th>1992</th>
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<td>W. Carl Kester suggests that managers think of investment opportunities as options on the company’s future growth</td>
<td>Howard Dresner introduces the term “business intelligence” to describe the set of methods that support sophisticated analytical decision making aimed at improving business performance</td>
<td>Max Bazerman and Margaret Neale connect behavioural decision research to negotiations in <em>Negotiating Rationally</em></td>
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<tr>
<td>Daniel Isenberg explains that executives often combine rigorous planning with intuition when faced with a high degree of uncertainty</td>
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# A History of Choice

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<tr>
<td>1995</td>
<td>Anthony Greewald develops the Association Test, meant to reveal unconscious attitudes to beliefs that can influence judgement</td>
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<td>1996</td>
<td>Web users start making buying decisions based on the buying decisions of people like themselves</td>
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<td>2005</td>
<td>In <em>Blink</em> Malcolm Gladwell explores the notion that our instantaneous decisions are sometimes better than those based on lengthy rational analysis</td>
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