Assessment 4: Literature Review
MA5840 – Data Science and Strategic Decision Making for Business
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In 1771, Edmund Burke warned “the greater the power, the more dangerous the abuse” (Oxford University Press, 2016) and just over one-hundred years later, Lord Acton wrote “everybody likes to get as much power as circumstances allow” (Acton Institute, n.d.). It is no wonder, then, that the word “power” often carries with it highly negative connotations; particularly when the literature of a multitude of different domains and actual events have demonstrated that power is obtained through both legitimate and illegitimate means. In contrast, “influence” is often considered far more benign even though both power and influence are often a consequence of authority and in themselves, neither good nor bad.

Moreover, there is evidence to suggest that the increasing use of data and business intelligence in strategic decision-making is shifting the levels of power and influence of individuals in organisations. For example, Barends et al. (2014) showed that the use of evidence rather than relying on managerial rules-of-thumb, personal experience and/or anecdotal evidence often resulted in better decisions. Top-level executives are generally prized more for their conceptual acumen than their technical skills, and the trend towards evidence-informed management is allowing data scientists and other technical experts to take advantage of these changing dynamics (Tyrańska, 2016).

In this review literature on the role of the power and influence of people in strategic decision-making, the first half focused on what has been said about how decisions are made before moving onto some of the more prominent theories on power and influence. The final section related the discussion to the role of the data scientist.

Decision-making is defined as the process of making a choice (Cambridge University Press, n.d.). In the organisational context, whilst there are many different ways of classifying the types of decisions made, they can be broadly divided into three levels: strategic, tactical and administrative. Administrative decisions are at the base of the pyramid and refer to decisions that determine how organisational activities are actually carried out. Tactical decisions form the middle layer, and are decisions taken

in accordance with current organisational goals and strategy. At the top are strategic decisions. These are usually made by senior leaders of an organisation as they are long-term decisions that determine future direction, typically involve a lot of risk, and can require significant organisational resources to implement (Eyes Wide Open, n.d.).

Research into organisational and strategic decision-making has been extensive, but the first foray into the field is often attributed to Chester Bernard, who introduced the concept of “decision-making” into the lexicon of the private sector executive with the publication of *The Functions of the Executive* (Buchanan & O'Connell, 2006). Since that time, there have been a number of different models proposed that often highlight different aspects of the decision-making process. However, Das and Teng (1999) observed that although there is empirical evidence to support a number of these different models, there has been sufficient confusion in the literature regarding the differences between them that there have been a number of attempts to classify the different models into a finite set of distinct types.

For example, Schwenk (1995) divided decision-making models into two categories based on the level of rationality or incrementalism in the process and the degree of conflict and political manoeuvring. Alternatively, Das and Teng (1999) adopted the typology devised by Lyles and Thomas back in 1988 because they argued that it covered the most important types of strategic decision-making known at the time and appeared to capture an underlying continuum of the types of processes – from the most systematic and structured to the most unstructured and “anarchial”. Das and Teng (1999) proposed that all decision-making approaches could be classified as rational, avoidance, logical incrementalist, political or garbage can, which was very similar to Nitta’s own categorisation (Nitta, 2014).

In a more expansive typology, Turpin and Marais (2004) synthesised the research of Keen and Morton, Huber, and Das and Teng to come up with nine major types of strategic decision-making process. They differentiated between models of classical or perfect rationality from Herbert Simon’s (1979) model of bounded rationality, noting that this is not always done as some literature argues that it still describes a rational approach to decision-making. Their organisational procedures category was the same as Das and Teng’s (1999) “avoidance mode”, which otherwise referred to

decision-making that maintained the status quo. Finally, Turpin and Marais (2004) added the individual differences perspective, naturalistic decision-making and the Mitroff and Linstone's (1996) multiple perspectives approach to their typology.

Note that in their research, Das and Teng (1999) observed that none of the five main approaches to strategic decision-making they identified explicitly incorporated cognitive bias into their models. Cognitive bias refers to the use of heuristics and other rules-of-thumb to get around different information processing constraints, such a limited time (Haselton et al., 2005). Research into cognitive biases has been just about as thorough as research into organisational decision-making, and originated with the work of Kahneman and Tversky in the 1970s when they challenged the dominance of strictly rational models of decision-making (Gilovich et al., 2002).

That being said, one of the biggest opponents of the idea of cognitive bias put forward by Kahneman and Tversky has been Gerd Gigerenzer. He viewed the role of heuristics and rules-of-thumb in a far more positive light than much of the other literature on the subject. In particular, Gigerenzer argued that these biases were in actual fact "gut feelings" or intuition that assisted in smart and accurate decision-making rather than having the potential to lead to severe and systematic errors of judgement (for example Gigerenzer, 1991; Todd & Gigerenzer, 2000).

Awareness of some of theory relating to decision-making processes provides important contextual background to any investigation on power and influence in the organisational context as the three concepts are interrelated. Furthermore, understanding how decisions are being made, particularly of the strategic and tactical flavour, can reveal important insights into the types of power that might be preferred by organisational leaders and hence, the types of strategies that technical experts such as data scientists should consider using to ensure their work has the largest possible impact on the decision-making process. This is particularly relevant when it is recognised that the act of making a decision is one of, if not the most visible use of power in an organisation (Langhorne, 2020).

Similar to the impact that Bernard has had on research into organisational decision-making, and Kahneman and Tversky's introduction of cognitive bias, John French and Bertram Raven's seminal paper in 1959 on power and influence inspired much of the subsequent research into the field. Furthermore, despite its age, French and

Bertram's work is still very relevant today in comprehending organisational behaviour.

French and Raven defined social influence as the change in the belief, attitude or behaviour of an individual or group (the target) due to the actions of another individual (the agent), and social power as the potential or capacity of that individual to bring about the change with resources currently available to them (Raven, 2004). French and Raven argued that there were six main types of social power:

1. Informational power, which stemmed from the ability of the agent to control the possession of knowledge required by the target
2. Reward power, which stemmed from the ability to offer positive incentives
3. Coercive power, which stemmed from the ability to threaten non-compliance with negative consequences
4. Legitimate power, which stemmed from the target's acceptance of the agent's formal right to request change
5. Expert power, which stemmed from the agent's possession of a certain level of skills and knowledge, and
6. Referent power, which stemmed from the identification of the target with the agent (French & Raven, 1959; Raven, 2008).

This research, along with additional later insights eventually formed the basis of Raven's power/interaction model of interpersonal influence, which broke down the six bases into 11 variants and divided them into "harsh" and "soft" bases. That is, the degree to which the target of a particular power felt they had to comply and therefore the extent to which its use would result in public compliance or private acceptance (Raven et al., 1998).

That being said, French and Raven's theory regarding power and influence is only one of many in the literature. For example, Max Weber considered power to be a far more adversarial concept than French and Raven. He defined power as any opportunity in a social setting for an agent to impose his or her will on another, irrespective of their desires and the circumstances that gave rise to this opportunity. He also considered to there to be only three legitimate forms of power: rational-legal, traditional and charismatic. Any other form was coercive (Guzzini, 2017). Similar to Max Weber, Michel Foucault considered power to be antagonistic in that where

power existed, there was always resistance (Fisher, 2017). Foucault also argued that power simply existed in society and knowledge was a form of power to the point that they were inextricably interlinked (Gutting & Oksala, 2018). As an aside, it is interesting to observe that Foucault's commentary on power is receiving a resurgence in interest in light of the "big data" phenomenon and the rapidly increasing amount of surveillance in the public domain (Pollard, 2019).

A number of experiments have demonstrated that, whilst the possession of power can be beneficial, it can be very dangerous for both the target and holder of that power. For example, Milgram's classic experiments on obedience to authority were in themselves a result of trying to understand how historical figures such as Adolf Hitler could command such obedience despite murdering millions. Or Zimbardo's Stanford Prison experiment that had to be pre-maturely ended due to the effects of the scenario on the participants (Stangor, 2014).

Although it may not appear immediately apparent, there is more than one message relevant to the role of the data scientist in the current environment that can be taken from this review into the relationship between power and influence and strategic decision-making. If it is accepted that strategic decisions are those have significant implications for the future direction of the organisation, such as those deciding on its mission, vision, product investment or company structure, then it follows that the people making those decisions will almost certainly be top-level executives. It is also true that to make smart decisions, those same executives would need to have a detailed knowledge of the operating environment and some of the more significant implications of the decision. However, it is also generally true that the skills required of an upper-level executive are very different from those at lower levels of the organisation, particularly with regards to technical and conceptual skills (Tyrańska, 2016).

Therefore, setting aside the bureaucratic and hierarchical barriers that are often present in any organisation, in order to maximise their influence on the strategic decision making process, a data scientist needs to be acutely aware of the channels they have available to them and the decision making preferences of the executive members. For example, as a technical expert a data scientist is likely to possess a lot of expert and informational power.

Furthermore, in the current environment in which evidence-based or more recently, evidence-informed management and decision making is becoming increasingly prominent, the ability of the data scientist to influence decision making processes is becoming somewhat easier. This of course assumes that the executive or decision the data scientist is seeking to influence is receptive to their influence. For example, Steve Jobs' decisions to launch the iPhone and iPhone were based on the distillation of corporate instinct rather than data (Jones, 2012).

Power is often defined as the capacity for an individual to influence a change in another, whether it be a change in behaviour, attitude or belief. According to this definition, authority is only one source of power and therefore technical experts such as data scientists have channels available to them to influence the strategic decision making that more often than not occurs in the upper echelons of an organisation. However, the data scientist needs to be cognisant of the types of decision making processes employed by executives and other managers, as their ability to influence may be reduced if the agent they are seeking to influence relies more on intuition or experience. The first half of this literature review highlighted several of the major theories regarding decision making, including an introduction to the possible impacts of the use of heuristics.

The second half of this review focused on some of the major theories regarding social power and influence. Perhaps one of the most pertinent cautionary tales that arose from the literature was that the possession of power can have unintended consequences, particularly when the social environment is conducive to its mis-use (Stangor, 2014). As such, it could be sufficient for a data scientist simply to become aware of how power is being used to shape their way of being, thinking and acting if Foucault is correct and power simply exists (Gaventa & Pettit, n.d.).

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